Nukus 200 MW Phase 2 Wind Farm Uzbekistan

Environmental & Social Impact Assessment (ESIA):

Volume 2: Main Text –

WORKING DRAFT

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Document Information

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CONTENTS

LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
5 Capitals	5 Capitals Environmental & Management Consultancy
ADB	Asian Development Bank
AFD	French Development Agency
AIIB	Asian Infrastructure Investment Bank (AIIB)
AZE	Alliance for Zero Extinction
BOP	Balance of Plant
COO	Countries of Operation
DEG	German Investment Corporation
E&S	Environmental and Social
EAAA	Ecologically Appropriate Area of Analysis
EBRD	European Bank for Reconstruction and Development
EI	Evacuation Infrastructure
EIA	Environmental Impact Assessment
EPC	Engineering, Procurement and Construction
EPFIs	Equator Principles Financial Institutions
ESA	Environmental and Social Assessment
ESIA	Environmental & Social Impact Assessment
GBVH	Gender Based Violence and Harassment
GHG	Greenhouse Gas
GIP	Good Industry Practice
GOU	Government of Uzbekistan
HGV	Heavy Goods Vehicles
IBA	Important Bird Area
IFC	International Finance Corporation
ILO	International Labour Organisation
KBA	Key Biodiversity Area
LLA	Land Lease Agreement
MOE	Ministry of Energy
NEGU	National Electric Grid of Uzbekistan
OHTL	Overhead Transmission Line
OVOS	National Uzbekistan acronym for EIA assessment process
PEF	Purchase Electrical Facilities
PPA	Power Purchase Agreement
PPP	Public-Private Partnership
PR	Performance Requirement
SAC	Special Areas of Conversation
ToR	Terms of Reference
UNESCO	United Nations Educational, Scientific, and Cultural Organisation
WDA	Wind Development Area
WTG	Wind Turbine Generator

1 INTRODUCTION

1.1 National Context

The Government of the Republic of Uzbekistan (GOU) through the Ministry of Energy aims to increase the electricity production in the country from 12.9 GW in 2019 to 29.3 GW in 2030 in order to foster economic growth as part of the Republic of Uzbekistan (Uzbekistan) 2030 Energy Strategy.

The Uzbekistan 2030 Energy Strategy defines the mid-term and long-term objectives and direction for development in the power sector to ensure electricity supply in Uzbekistan. One of the objectives of the Energy Strategy includes the development and expansion of renewables and their integration into the unified power system.

In regard to the development of wind farms, the Energy Strategy states the following as priority:

"Creation of large-scale wind farms with single site capacities ranging from 100 MW to 500 MW mostly concentrated in North-Western region (Republic of Karakalpakstan and Navoi region) shall be the main priority of wind power development"

Of the 29.3 GW of power generating capacity in 2030, 8 GW will be from renewable energy, with wind power accounting for 3 GW.

The Nukus 200 MW Wind Project is a facility contributing towards the 2030 Energy Strategy.

1.2 The Project

The GOU has launched a program for the development of large-scale wind power projects in Uzbekistan. The GOU has signed a memorandum of understanding with the European Bank for Reconstruction and Development (EBRD) with a view to cooperate on the development of large-scale wind power projects up to a total capacity of 1,000 MW. As an extension of 100 MW Wind Farm in Qoraozak district (Phase I), the implementation of 200 MW wind farm with a Battery Energy Storage System (BESS) between Beruniy and Qoraozak districts is considered by GoU.

ACWA Power has been awarded the contract to design, finance, construct, operate, maintain and (at the request of the Government) decommission or transfer, the Nukus 200 MW Wind Project including the Evacuation Infrastructure (EI) (the Project) in the Karatau mountain region of the Republic of Karakalpakstan.

1.3 Scope of Document

Five Capitals Environmental and Management Consultancies (5 Capitals) has been engaged by ACWA Power to undertake various Environmental & Social consultancy services, including the national Environmental Impact Assessment (EIA) and lenders required Environmental and Social Impact Assessment (ESIA); the main volume of which is this document herein.

At this stage, it is understood that ACWA Power is seeking an amount of project finance from banks and financial Institutions (together "lenders"). At this stage it is understood that key lenders include those bulleted below:

- Asian Development Bank (ADB)
- Asian Infrastructure Investment Bank (AIIB)
- Netherlands Development Finance Company (FMO)

Other lenders may also be part of the lending group. Lenders such as those outlined above may have their own internal environmental & social investment policies/standards which the Project must align with, which are further outlined in Section 3.4.

Based on the requirements of the lenders, a process for undertaking ESIA to assess potential impacts and determine suitable mitigation measures and monitoring plans is necessary as a process to reach financial close.

This ESIA has been informed by:

- The ESIA Scoping Report prepared by 5 Capitals and issued in May 2024;
- Analysis of the Project details and proposed works (as advised by ACWA Power);
- Review of the Environmental and Social Assessment (ESA) prepared by Juru (formerly Juru Energy), issued in April 2023 as part of the tender documentation;
- Consultations with stakeholders, including herders, ministries, local community, local governmental institutions, project affected people (PAPs) and nearby industrial facilities;
- Desk-based study of available mapping and aerial photography;
- E&S Constraints Analysis Report prepared by 5 Capitals and submitted to ACWA Power in July 2023;
- The initial site visit conducted in July 2023;
- The Bird Baseline Survey provided as part of the tender documentation which comprised bird and bat monitoring surveys conducted for Spring 2021-Winter 2021-22 and Collision Risk Modelling (CRM) for the Wind Turbine Generator (WTG) site;
- Site surveys conducted between February 2024 and May 2024 (including botany surveys, reptile surveys, bat surveys which started in April and will extend till October 2024, mammal surveys, noise monitoring, landscape and visual survey, and bird surveys in the WF site and along the OHTL);

- Review of available secondary information, including but not limited to:
    - BirdLife International <birdlife.org>; World Database of Protected Areas <protectedplanet.net>; Key Biodiversity Areas <keybiodiversityareas.org>; Climate Change Knowledge Portal - World Bank Group <https://climateknowledgeportal.worldbank.org> etc.;
- 5 Capitals' experience of conducting ESIAs for similar wind projects in Uzbekistan and the wider region; and
- 5 Capitals' experience of working with lenders to ensure necessary financing requirements are met.

1.4 Objectives of the ESIA Report

The primary objectives of the ESIA are as follows:

Provide an overview of the Project design and construction and operational processes and requirements;

- Identification of sensitive receptors in the Project's areas of influence;
- Review of the regulatory and legislative framework, including national laws, applicable international regulations and standards, and international lender requirements;
- Assessment of the existing environmental baseline conditions prior to the development of the Project through a review of available existing data and the undertaking of environmental baseline surveys;
- Assessment of the Project's environmental and social impacts for the construction and operational phases;
- Assessment of the Project's alternatives;
- Determination of applicable mitigation and management measures to be implemented in order to avoid or minimise potential adverse impacts and enhance beneficial impacts;
- Preparation of a framework for which the construction and operational phase management systems and plans can be developed and implemented.

In addition to this ESIA, the Project requires an EIA in compliance with Uzbekistan national EIA requirements (OVOS). 5 Capitals has partnered with a locally based consultant, 'Juru ' (based in Tashkent, Uzbekistan) to undertake certain elements of the scope, including baseline surveys, consultations and submission of the national EIA to the Ministry of Ecology, Environmental Protection and Climate Change (MEEPCC). This is a separate process and is subject to different EIA documentation that is specific to the MEEPCC. Accordingly, two national EIA studies were prepared, one for the wind farm and one for the overhead transmission line (OHTL). The national EIA were approved in May 2024, with the approval provided in Volume 4. Approval at Stage 1 was attained, meaning that Stage II is not required.

Stage III of the National EIA process shall be required following construction, before operation commences.

1.5 Structure of the ESIA Report

To align the ESIA with the requirements for environmental and social assessment established by the various lenders and good practice, the ESIA report is proposed to be presented in the following format developed by 5 Capitals:

- Volume 1: Non-Technical Summary
- Volume 2: ESIA - Main Text, Tables and Figures
- Volume 3: Environmental & Social Management Plan (ESMP)
- Volume 4: Appendices

Volume 1 is a Non-Technical Summary (NTS) of the ESIA, including the main outcomes, and conclusions.

Volume 2 is the main text of the ESIA and full impact assessment, with mitigation, management and monitoring measures identified.

Volume 3 is the Environmental and Social Management Plan linking together the outputs for mitigation and E&S management as determined from the ESIA Volume 2.

Volume 4 includes the technical appendices relevant to the studies and this ESIA.

2 PROJECT INFORMATION

2.1 Key Project Information

Table 2-1 Key Project Information

PROJECT TITLE	Nukus 200 MW Phase 2 Wind Farm
PROJECT DEVELOPER	ACWA Power
PROJECT COMPANY	"ACWA Power Beruniy" Wind FE LLC
OFF TAKER	JSC National Electric Grid of Uzbekistan
EPC CONTRACTOR	HDEC (POWERCHINA)
O&M COMPANY	NOMAC
ENVIRONMENTAL CONSULTANT	5 Capitals Environmental and Management Consulting (5 Capitals) PO Box 119899, Dubai, UAE Tel: +971 (0) 4 343 5955, Fax: +971 (0) 4 343 9366 www.5capitals.com
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POINT OF CONTACT	Ken Wade (Director), Ken.wade@5capitals.com

2.2 Project Location

The Project is a 200 MW wind farm located in the Karakalpakstan Republic between Qoraozak and Beruniy districts at range of Sultanuizdag mountains, with new overhead transmission line (OHTL). The nearest cities to the Project area are Urgench (Khorezm region, 57 km) and Nukus (Karakalpakstan, 120 -140 km).

The overall size of land allocated for the development of the wind farm is approximately 6,500 hectares at an altitude ranging from approximately 320 – 380 m above sea level (ASL). This area is designated for the construction of the WTGs, Battery Energy Storage System (BESS), proposed substation, internal OHTL, and internal access road.

As part of the Project, a new 220 kV OHTL approximately 42 - 44 km in length will connect the planned substation and BESS to the existing Beruniy grid substation located inside the buffer zone of the lower Darya Biosphere Reserve. Approximately 20 km of the route goes through mountains and desert area, while the remaining part crosses agricultural fields in close proximity to living houses and structures. Additionally, the Project will require the expansion of the 220 kV switchyard originally designed for Phase 1 project (Nukus 100 MW Wind Farm) under scope of Evacuation Infrastructure (EI).The following figures depict the national and local context of the Project.

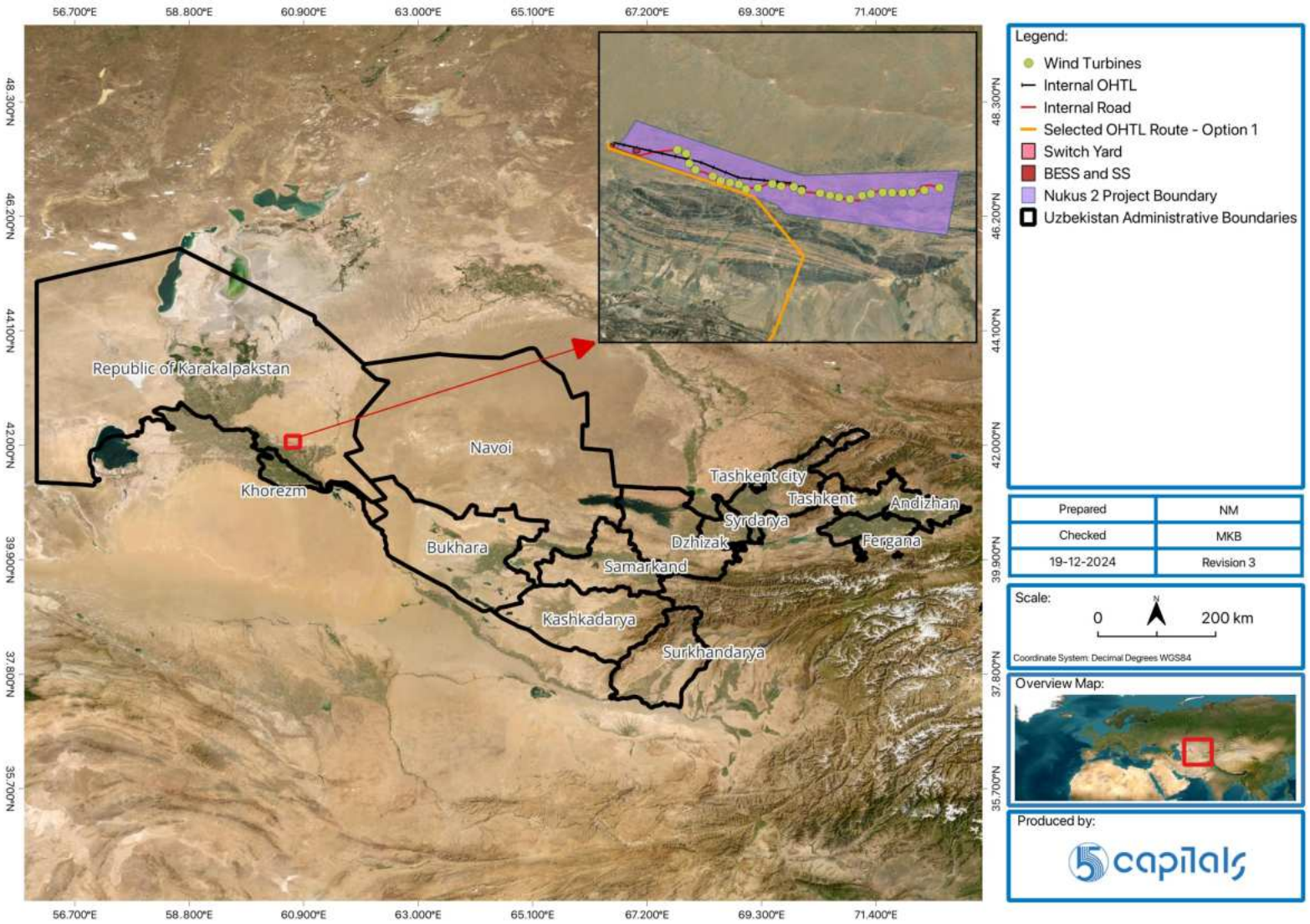


Figure 2-1 Project Location – National Context

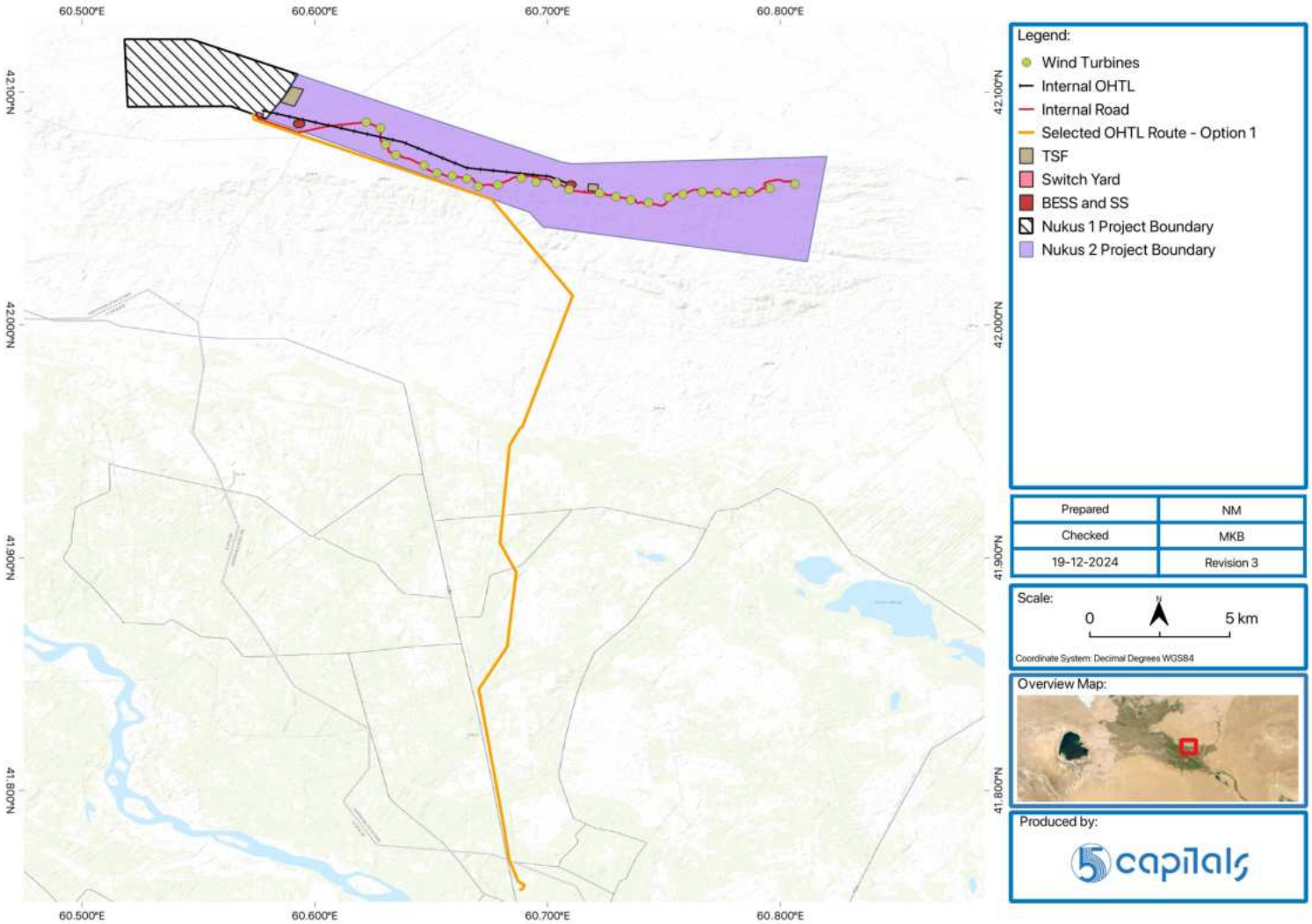


Figure 2-2 Project Location – Local Context

2.3 Land Use and Site Condition

2.3.1 Land Ownership

According to the 1998 Land Code of the Republic of Uzbekistan, all land in Uzbekistan is state property and permits for use of land are granted and monitored by the State through the regional and district administrations. In 2021, the GoU reformed the land allocation process by introducing an e-auction system. As a result, local authorities are no longer authorized to allocate land plots directly to individuals or legal entities. Currently, both land leases and land purchases are conducted exclusively through the e-auction platform.

Land within the wind farm site and along the proposed OHTL route is owned/leased by 49 different groups including private enterprises, individuals, and state organisations.

Consultations undertaken with the Beruniy Cadastral department in February 2024 revealed that the land within the WF and surrounding areas is owned by the State Committee for Sericulture and Wool Development Industry (SWID). It was also confirmed that SWID has leased this land to Beruniy Karakul LLC for a period of 49 years. The lease covers an area of 266,340ha which is designated for agricultural activities. Furthermore, it was confirmed through consultations that the Ministry of Mining and Geology has no active excavation works ongoing within the wind farm site nor within the OHTL site and their direct area of influence.

It is noted that even though the land is designated for pastural activities, the weather conditions are extreme with highs of +60 degrees in summer and lows of -20 degrees in winter. As such, the vegetation is poor and not suitable for prolonged periods of grazing.

Surveys undertaken at the Project site at the ESIA stage and as part of the draft LALRP in April 2024 revealed that there are 6 seasonal herders who use the project area in spring to early summer when the weather is considered favourable. These herders are informal, and they do not have a lease agreement with SWID or Beruniy Karakul LLC. These herders come from the communities in Abay and Dustlik which are approximately 9.5km away from the project site and they utilise temporary structures such as movable vans, fenced areas for livestock and watering areas etc when at the site. It is noted that no permanent structures were observed. It is noted that while these herders were observed within the Project footprint, their grazing areas change every year depending on the availability of grazing pastures. It is noted that the herders moved their structures from the project site in May 2024 due to the onset of summer and the rise in temperatures.

Consultations undertaken with the LLC in March and September 2024, revealed that their land is also used informally by nomadic herders (they stated there were 3 nomadic herders), but

they do not keep a record of them, and they did not have their contact information. Additionally, these herders change their grazing locations depending on the availability of good pastures. It is noted the project social team did not identify any additional herders during the surveys undertaken and the 6 herders within the project footprint did not know about nomadic herders using the site. It is noted that the presence of other seasonal and/or nomadic herders in Beruniy Karakul land is possible as they have been allocated 266,340ha of grazing land and the project accounts for less than 3% of this land. Approximately 20km of the proposed OHTL goes through mountains and desert area, while the remaining part crosses agricultural fields and is close to residential areas. It is noted that the residential homes fall outside of the 50m (25m on each side) health protection zone (HPZ) required for the 220kV OHTL and therefore will not be impacted.

A Land Lease Agreement (LLA) would be prepared between the Ministry of Energy (MOE) and the Project Company for both Wind Farm and OHTL route. Once the OHTL is built and operational, the land area permanently acquired for the OHTL towers will be transferred from the Project Company to JSC "National Electric Grid of Uzbekistan" (NEGU).

The overall size of land allocated for the development of the wind farm is approximately 6,500, however the land allocation for the footprint of the different Project components is as provided in the table below.

Table 2-2 Land Allocated to the Project

PROJECT FACILITIES	NO./TOTAL KM	FOOTPRINT AREA IN HA	TYPE OF OWNERSHIP
WTG Base (including foundation & hardstand & WTG transformer)	26	19.5	Land lease for project lifetime
Access roads	24.7km	22.5	
BESS	-	5.57	
Wind Farm substation	-	2.09	
220kV OHTL	44km, with 178 Towers	7.12	
Sub-total for Permanent Land Take	**n/a**	**52.06**	**n/a**
Temporary Construction Site Facilities area (Temporary site facilities, laydown yard, offices, other storage, accommodation camps)	-	52.72	Temporary, for use during the construction phase
Note: *The project footprint areas have been confirmed by the EPC Contractor. This is not the overall land allocation, but estimated size of the affected footprint of project facilities that will fall under the land lease, or temporary construction use respectively. Additionally, the 2.4ha of land required for the OHTL is based on the tower footprint and it does not include the restrictions on land use that will be established as part of the HPZ on each side of the line.*			

Note: *The design of the Project may be subject to small adjustments depending on the outcomes of certain site studies such as geotechnical surveys that will be undertaken during*

the early construction phase (also referred to herein as 'Limited Notice to Proceed' – LNTP Phase).

2.3.2 Land Use and Site Condition

WIND FARM AREA

The wind farm site is located in a desert area approximately 9 km from the nearest living community. There are 3 small communities located approximately 9 km to the south and south-east, as shown in Figure 2-9.

The proposed wind farm is located on the Sultan Uvaiz plateau. The plateau combines low-mountain plains with hills and traces of temporary watercourses formed during rainstorms. In terms of area coverage, the plateau is a gravel desert with sandy areas. Throughout the territory there are geological pits ranging in length from several tens of meters to several kilometres, with a depth of up to 1 m.

The southern slope of the plateau is strongly dissected, characterized by outcrops of bedrock and narrow valleys. The slope of the road in some places reaches 30^0. The foothills are an alluvial cone with large clastic sedimentary rocks at the foot of the plateau and gravel in the distance, creating a rocky desert landscape. To the south, the terrain transitions into a gently sloping plain characterized by slight elevation variations ranging from 89 to 98 m. This area is predominantly occupied by agricultural fields intersected by irrigation canals.

Sultan Uvais Plateau

High part of the southern slope of the Plateau

Mining on the southern slope of the Plateau

Settlements and arable land

Figure 2-3 General View of Wind Farm Site

The three-day site visit undertaken by 5 Capitals team between the 4th and 6th of July 2023, and review of satellite imagery did not identify the presence of any structures or settlement within the wind farm site, noting that not all the site was visited. However, numerous signs of livestock grazing were observed over north-western part of site. In addition, horses grazing were observed in the north-west of the wind farm site, alongside smoke from a presumed herder. In addition, two stone cairns were noted on top of hills, it is understood that herders use these as waypoints in order to navigate the area.

Stone cairn on top of the hill

Fresh livestock excrement

Horses grazing on top of the hill

Figure 2-4 Land Use at the Wind Farm Site

These findings were further validated during a site visit by the Juru team at the Scoping stage (February 20-21, 2024) and at the ESIA stage for E&S surveys (March-April, 2024).

It has been confirmed that the land allocated for the Project is owned by the State Committee on Sericulture and Wool Development Industry (SWID) and leased to Beruniy Karakul LLC for a period of 49 years, starting from October 10, 2020.

Observations from the ESIA stage showed that the Project site is used for grazing by 6 seasonal herders who bring their livestock in spring through mid-summer. These herders utilize temporary structures, such as fences, watering facilities, and movable vans, which are owned by the herders themselves and not by Beruniy Karakul LLC.

Consultations with Beruniy LLC and herders confirmed that none of these herders using the Project site are employed by Beruniy LLC.

These herders are informal and predominantly originate from nearby communities, lacking formal agreements with either the landowner (SWID) or the leaseholder (Beruniy Karakul LLC).

Figure 2-5 Herders' structures at the Wind Farm Site

During the construction phase, herders will temporarily lose access to grazing areas due to the construction activities, which may pose significant health and safety risks to both the herders and their livestock.

In the operational phase, herders will regain access to the area. However, they will be restricted from constructing any temporary or permanent structures within the established Health Protection Zone (HPZ), which is a 250m radius around each WTG. Additionally, other project components such as the BESS and substation will be permanently fenced to restrict unauthorized access.

OHTL – General Land Area

The OHTL is approximately 42 - 44 km in length and crosses through the Beruniy District only. About half of the OHTL route runs through arable land and along populated areas. Land along the proposed OHTL is mainly used for agricultural purposes. Surrounding areas are represented

by fields with crops, decorative trees, irrigation ditches as well as with structures both residential and warehouses.

In addition to residential areas (as illustrated above), there are various infrastructures such as gas and water pipelines, communication cables, and irrigation canals. This is further discussed in Chapter 2.4. Approximately 90% of the land affected by the OHTL towers is primarily used for agricultural activities, while the remainder is managed by residential landowners and state organizations. Various types of trees were identified along the OHTL corridor, including both decorative and fruit trees. The OHTL corridor will also affect two commercial stores. The impacts on land users, both temporary and permanent, resulting from the construction of the OHTL are comprehensively addressed in the Land Acquisition and Livelihood Restoration Plan (LALRP). These impacts will primarily involve economic displacement due to temporary land use during construction and permanent restrictions on land use in certain areas. However, it is important to note that the scale of these impacts will be managed through the implementation of site-specific mitigation measures. No physical displacement is anticipated as long as these measures, outlined in the relevant sections of this ESIA, are properly implemented.

LOAD ACCESS AND ROADS

Project vehicles will gain access to the WF site using the existing access road developed for the Nukus 1 WF project. This road leads to the existing switching station and Nukus 1 TSF & temporary construction accommodation area. Hence the road will link to the internal access road to be constructed as part of the Nukus 2 WF project. Prior to the existing Nukus 1 access road, the primary transportation route in the region is the A380 asphalt road, extending from the village of Beruni towards the foot of Sultan Uvais, and another road leading east from the Flour Mill towards the village of Kizilkala. These roads accommodate trucks, cars, and specialized equipment, as illustrated in the figures below.

In the areas occupied by agricultural fields (i.e. along the OHTL), movement is possible along dirt and asphalt roads, though driving along some of those routes is challenging for larger vehicles. Country roads are not used frequently by cars. Trucks typically travel along the two-lane roads running along the slopes of the Sultan Uvais plateau.

Along the plateau itself, the existing roads have narrow tracks, sharp turns, and steep slopes. Therefore, driving through this area is difficult for trucks and cars with low suspension as depicted in the unpaved and narrow road figures below. Additional details on the access road are provided in Section 2.5.2.

Figure 2-6 Heavy Truck on the A380 Asphalt Road

Figure 2-7 Unpaved Roads

Figure 2-8 Narrow Road

2.4 Potential Receptor Identification

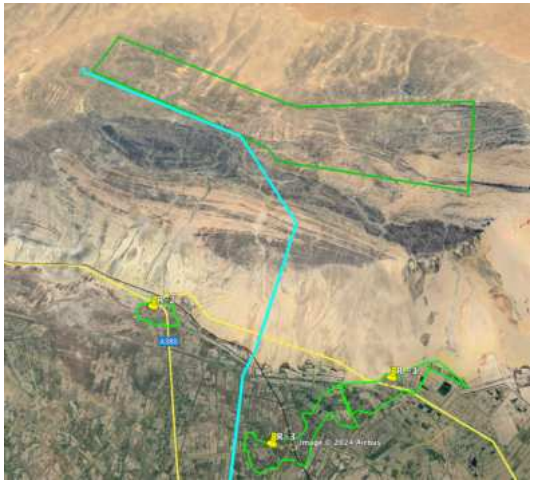
The wind farm project area remains undeveloped and is situated over 9km away from the closest permanent residential communities and receptors. Potential cultural and industrial receptors were identified through a combination of site visits and desktop review. Unlike the wind farm, the OHTL route traverses developed regions, including residential zones and agricultural lands. The following table outlines the location of the identified receptors relative to the Project and describes the receptors in related to both the Wind Farm and the OHTL in further detail.

Table 2-3 Potential Receptors in the Surrounding Area

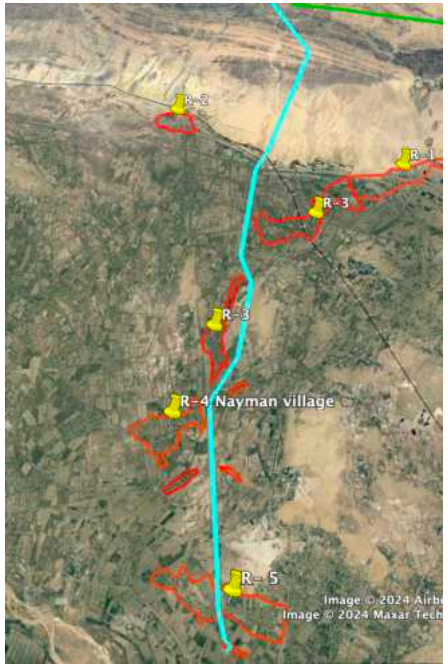
ID	Receptor Name	Proximity to Project	Description	Images/Maps
Wind Farm and OHTL				
M-1	Excavations/trenches	At Wind farm and OHTL areas	Several long trenches were excavated by the Ministry of Mining Industry and Geology for the purpose of researching the current area. These efforts were aimed at assessing the presence of natural resources. The trenches are no longer of interest to the Ministry since no significant natural resources were discovered in the area.	
M-2	Mramor LLC active mining area	4.5 km from wind farm site boundary App 1 km from OHTL	Mramor LLC is a private company that has obtained a license from the Ministry of Mining Industry and Geology for marble mining operations. The license allows Mramor LLC to conduct marble mining activities within the designated area for a period of 27 years, , starting from December 6, 2022.	

ID	Receptor Name	Proximity to Project	Description	Images/Maps
M-3	Active mining area	6 km from wind farm site boundary 900 m from OHTL	This area identified for potential mining, was found to be empty during a site observation. Consultations with Ministry of Mining Industry confirmed the presence of other mining areas surrounding the project site, however it was assured that sufficient distances between the WF and OHTL are maintained in accordance with established buffer zones for distance from such mining areas.	N/A 
C - 1	Munojat Mountain	2.5 km from wind farm boundary 2.8 km from OHTL	After visiting the Sultan Uvays Complex, pilgrims often journey to Munojat Mountain, a significant pilgrimage site in Uzbekistan. The pilgrimage involves a notable tradition of climbing the stairs to the mountain's summit.	

ID	Receptor Name	Proximity to Project	Description	Images/Maps
C - 2	Sultan Uvays Complex	8.2 km from wind farm boundary 5.3 km from OHTL	Largest cultural heritage site that has high importance Muslims that visit the complex to honour Sultan Uvays. In addition, this complex has large cemetery located 2 km away from complex.	
C - 3	Cemetery of Sultan Uvays complex	6 km from wind farm boundary 5.4 km from OHTL	Cemetery is a part of Sultan Uvays complex. Pilgrims who visit the complex often extend their prayers and respects to those interred in this cemetery.	
Wind Farm				

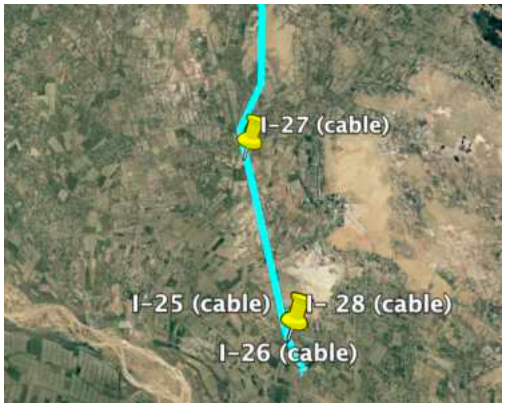
ID	Receptor Name	Proximity to Project	Description	Images/Maps
R 1-3	Kyzyl Kala Abay Dustlik	9-10 km from wind farm site boundary	Wind farm is located at obsolete area. The nearest residential area Kyzyl Kala village is located at distance of app 9 km, Abay village – 9,5 km, and Dustlik village – 10 km	
I-1	Karakalpak Cement LLC Facility	8 km from wind farm	The Karakalpak Cement plant is situated along the A380 road, around 8 km south of the wind farm site	
OHTL				

ID	Receptor Name	Proximity to Project	Description	Images/Maps
C-3	Remnant of tower	1.5 km from OHTL	This structure is part of the Sultan Uvays complex and has been identified as an old observation tower.	
C-4	Local cemetery	In buffer zone of OHTL (no towers are going to be placed within the territory of the cemetery)	Cemetery is located near Beruniy substation and has cultural importance for local communities. No towers are going to be places in the territory of cemetery. It is going to be within the buffer zone of the OHTL, however there won't be any access restrictions.	

ID	Receptor Name	Proximity to Project	Description	Images/Maps
R-1	Railway line	Intersects with OHTL corridor	The nearest towers 102 and 103 to railway are located at safe distances following the required buffer zone distances from railway infrastructure.	
R 1-5	• Abay village • Kyzyl Kala village • Dustlik village (split into two areas) • Nayman village • Makhtumkuli village	Along OHTL route	Proposed OHTL line crosses the residential areas and distance till them is as follows: • Kyzyl Kala – 4.4 km • Dustlik (R3 west of the OHTL) – 420 meters • Dustlik (R3 east of the OHTL_ - 80 meters • Abay – 4.3 km • Nayman – 190 meters • Makhtumkuli – OHTL route goes through the area of this village.	

ID	Receptor Name	Proximity to Project	Description	Images/Maps
I 2-6	Existing Overhead Transmission Lines	Along the OHTL route	Several lines of existing OTL are located along proposed OHTL. Mostly these lines goes in parallel with OHTL and have intersections with its corridor at 6 places	
I 7-15	Irrigation and drainage canals/channels	Along the OHTL	The route of the OHTL crosses eight canals; however, all towers are positioned at a sufficient distance, adhering to the buffer zone distance requirements established by the Ministry of Water for these canals. Following measures will be taken to avoid obstructing water channels, ensuring continued access to water resources and irrigation: - OHTL towers will be located at the required minimum buffer distances from specified canals as established by the Ministry of Water Resources, as below;	

ID	Receptor Name	Proximity to Project	Description	Images/Maps
			<table><tr><th></th><th>Canal</th><th>Buffer zone</th></tr><tr><td>1</td><td>Kazak-yab canal PK329</td><td>27,2 meters</td></tr><tr><td>2</td><td>Beshtam canal PK165</td><td>26 meters</td></tr><tr><td>3</td><td>Beshtam canal PK86</td><td>27,5 meters</td></tr><tr><td>4</td><td>Beshtam canal PK82</td><td>27,5 meters</td></tr><tr><td>5</td><td>Ishan-yab canal PK48+20</td><td>22,2 meters</td></tr><tr><td>6</td><td>Kazak-yab canal PK 17+20</td><td>30,6 meters</td></tr><tr><td>7</td><td>Collector GUKK PK913</td><td>30 meters</td></tr><tr><td>8</td><td>Collector K-10 PK16</td><td>20,0 meters</td></tr><tr><td>9</td><td>Collector K-11 PK273+50</td><td>27,5 meters</td></tr><tr><td>10</td><td>Collector K-12-1-1 PK82</td><td>18 meters</td></tr></table> - During construction the EPC Contractor will use existing access roads where possible to avoid any crossing irrigation or drainage canals/channels. Where no access roads are available, the EPC will put temporary bridges/ramps to enable crossing.	
I 16-23	Water pipes	Along the OHTL	Route of OHTL crosses 7 water pipes, however all towers are located at distance following the required buffer zone distances established by JSC Usuvtaminot for these canals.	

ID	Receptor Name	Proximity to Project	Description	Images/Maps
I 24	Main gas pipeline	Along OHTL	Route of OHTL has intersection with Zaungur main pipeline at 4 places, however all towers are located at distance following the required buffer zone distances established by JSC Uztransgaz for this pipeline	
I 25 - 28	Underground communication cables	Along OHTL	The relocation of two communication cables will be required, as they are located in close proximity to towers 168-170. This impact has been discussed with Uztelecom, and a relocation plan and budget have been outlined. The relocation of these cables will be carried out by local Uztelecom departments before the commencement of construction works.	

2.4.1 Local Communities

The closest communities to the Project are Kyzyl Kala, Abay, Beruniy, Makhtumkuli and Dustlik. Their proximity to the Project is shown in the following figure, with further details with regards to their distance provided in the following table.

The nearest residential area is located at distance of approximately 9km from the Wind Farm Project boundary. Five (5) communities are in proximity to the OHTL alignment, and these include: Kyzyl Kala, Abay, Dustlik, Nayman ,and Makhtumkuli.

Their proximity to the WF and OHTL are shown in the following figure, with further details with regards to their distance provided in the following table.

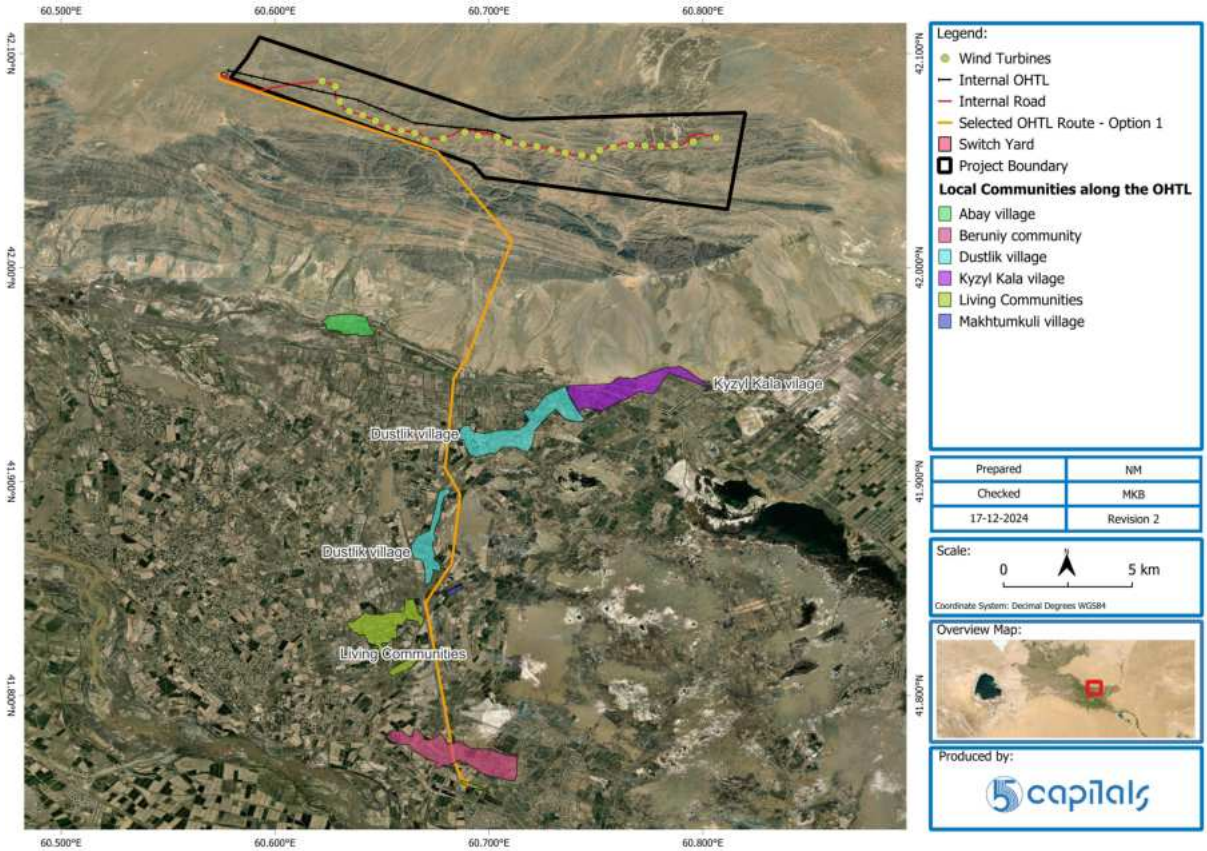


Figure 2-9 Local Communities

Table 2-4 Proximity of Local Communities

Community Name	Distance to WF Project Boundaries	Distance to OHTL Corridor
Kyzyl Kala	9 km	4.4 km
Abay	9.5 km	4.3 km
Dustlik (split into two areas)	10 km	80m

Community Name	Distance to WF Project Boundaries	Distance to OHTL Corridor
	Out of Area of Influence (AoI) of WF	420 m
Makhtumkuli	Out of AoI of WF	OHTL route goes through the area of this village
Nayman	Out of AoI of WF	190 m

The following figure highlights all the identified sensitive receptors, including residential, agricultural, industrial and cultural areas. The figure also demonstrates that, while the wind turbine area remains no closer than 10 km from the Legally Protected Areas (LPA) of the Lower Amu Darya State Biosphere Reserve, the southern portion of the Project's OHTL interconnection segment appears to be in very close proximity to it. This is further detailed in Section 9 of the ESIA report.

The Lower Amu Darya State Biosphere Reserve (LASBR) falls under the jurisdiction of MEEPCC and is managed by a dedicated administrative division, also called the Lower Amu Darya State Biosphere Reserve. The LASBR consists of a strictly protected core zone, a buffer (tourist) zone, and a transition (economic) zone. Economic activities are permitted within the transition zone, provided prior notification and approval is obtained from both the MEEPCC and the LASBR's administrative division. Since the southern end of the planned OHTL overlaps slightly with the LASBR's transition zone (approximately 30 km from the core zone), the Project is required to obtain a non-objection by submitting an official request letter to the MEEPCC and the LASBR's administrative division. The National EIA for the OHTL was submitted and received positive conclusions allowing construction for OHTL as provided by MEEPCC and hence acts as this NOC. Note: there are not further requirements in the conditions of the conclusions requiring other permits/notifications for such works.

A meeting was held with LASBR during the ESDD site visit and the outcome of this concluded that no separate permission is required and that only letter should be submitted to them informing about the start of construction. This stakeholder requirement is included to the standalone SEP.

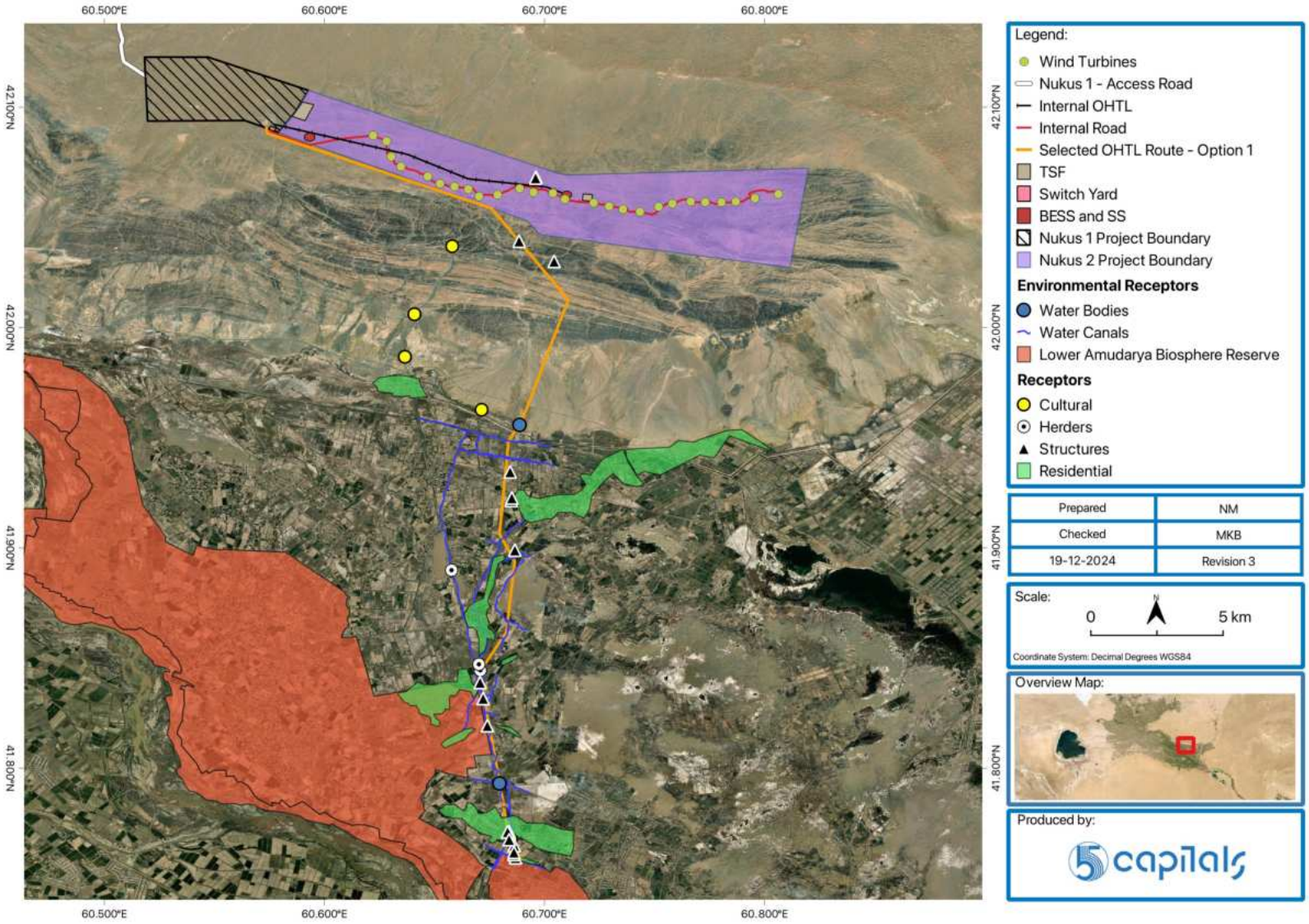

60.500°E
60.600°E
60.700°E
60.800°E
42.100°N
42.000°N
41.900°N
41.800°N
Legend:
Wind Turbines
Nukus 1 - Access Road
Internal OHTL
Internal Road
Selected OHTL Route - Option 1
TSF
Switch Yard
BESS and SS
Nukus 1 Project Boundary
Nukus 2 Project Boundary
Environmental Receptors
Water Bodies
Water Canals
Lower Amudarya Biosphere Reserve
Receptors
Cultural
Herders
Structures
Residential
Prepared
NM
Checked
MKB
19-12-2024
Revision 3
Scale:
0
5 km
Coordinate System: Decimal Degrees WGS84
Overview Map:
Produced by:

Figure 2-10 Sensitive Receptors Identified around the Project Area

2.4.2 Planned and Potential Developments

2.4.2.1 Wind and Mining Projects

The surrounding region has been selected as an area of potential for developing wind and mining projects.

There is an ongoing construction of a 100 MW wind project (Nukus 100 MW WF) on the adjacent land plot. Ongoing construction activities of workers accommodation camp has been observed to the north of the Nukus 2 Wind Farm site in February 2024 by China Power (Chinese EPC Contractor) for current Project. The Nukus 200 MW wind project will connect to the adjacent Project's substation.

The 100 MW wind project was procured through a separate process and is not included within the assessment of the Project, however, reference is made within the Cumulative Impact Assessment of this Report.

In addition, areas adjacent to the Project are allocated for future mining exploitation with the mineral rights currently owned by the State. However, it was confirmed by the Ministry of Mining and Geology that these areas will not be exploited for the next 25 years (please refer to ESIA Volume 4 - Appendix H). If the rights to exploit minerals is exercised, a buffer zone distance of at least 400 m around all the WTG must be maintained to preserve the operability and safety of the WTG's and a setback of at least 500 m between the WTG and any O&M buildings or accommodation facilities must also be maintained.

2.4.2.2 Karatau Metal Processing Plant

A Karatau Processing Plant is scheduled to open in 2024 and the development of the plant includes a phased expansion of Karatau town. Current plans indicate the population of Karatau will increase from 3021 in 2019, to 5300 in 2041; and the town footprint will expand from 127 ha to 204 ha by 2041.Based on discussion with the administrative representative in Karatau and review of Presidential Decree 3473 (12 January 2018), the metal processing plant will generate up to 2000 jobs.

This facility is located outside the AoI of the Project, which is defined as 10 km; therefore, it was not considered during the ESIA assessment stage.

2.4.2.3 Solid Waste Management Facilities

It is understood that new solid waste management facilities will be developed in Nukus province, although locations have not been specified.

This facility is most likely located outside the AoI of the Project, which is defined as 10 km; therefore, it was not considered during ESIA assessment stage.

2.5 Project Description

2.5.1 Wind Turbines

Wind turbines harness the energy of the wind and convert it to electricity. The amount of energy produced by wind turbines increases with wind speed and modern turbines are able to adapt efficiently to extract energy from a range of wind speeds.

Wind speeds typically increase with height above ground as turbulence (due to topography and ground features) intensity decreases. This typically allows turbines with higher hub heights to produce more energy than a turbine with a lower height at the same location. In addition, longer blades (the rotor radius from the turbine) significantly increase the swept area from which wind energy can be extracted.

The Project consists of 26 WTGs, located within the allotted site boundary. The Envision EN 182-8.0MW HH 138m Steel Tower Turbine model has been selected and will have the following specifications. The appearance of the WTGs is shown in the following figure.

Table 2-5 WTG Specifications

WTG Model	Envision EN 182-8.0MW HH 138m Steel Tower Turbine
Capacity	8 MW
Blades	3
Hub Height	138 m
Rotor Diameter	182 m
Swept Area	26,016 m^2
Cut-in Wind Speed	3 m/s
Cut-out Wind Speed	25 m/s
Design Lifetime	25 years

Figure 2-11 WTG Appearance (Envision, nd)

The locations of the WTGs are shown in the following figure. Other balance of plant (BOP) items such as the Temporary Storage Facilities (TSFs), BESS and substation are also shown.

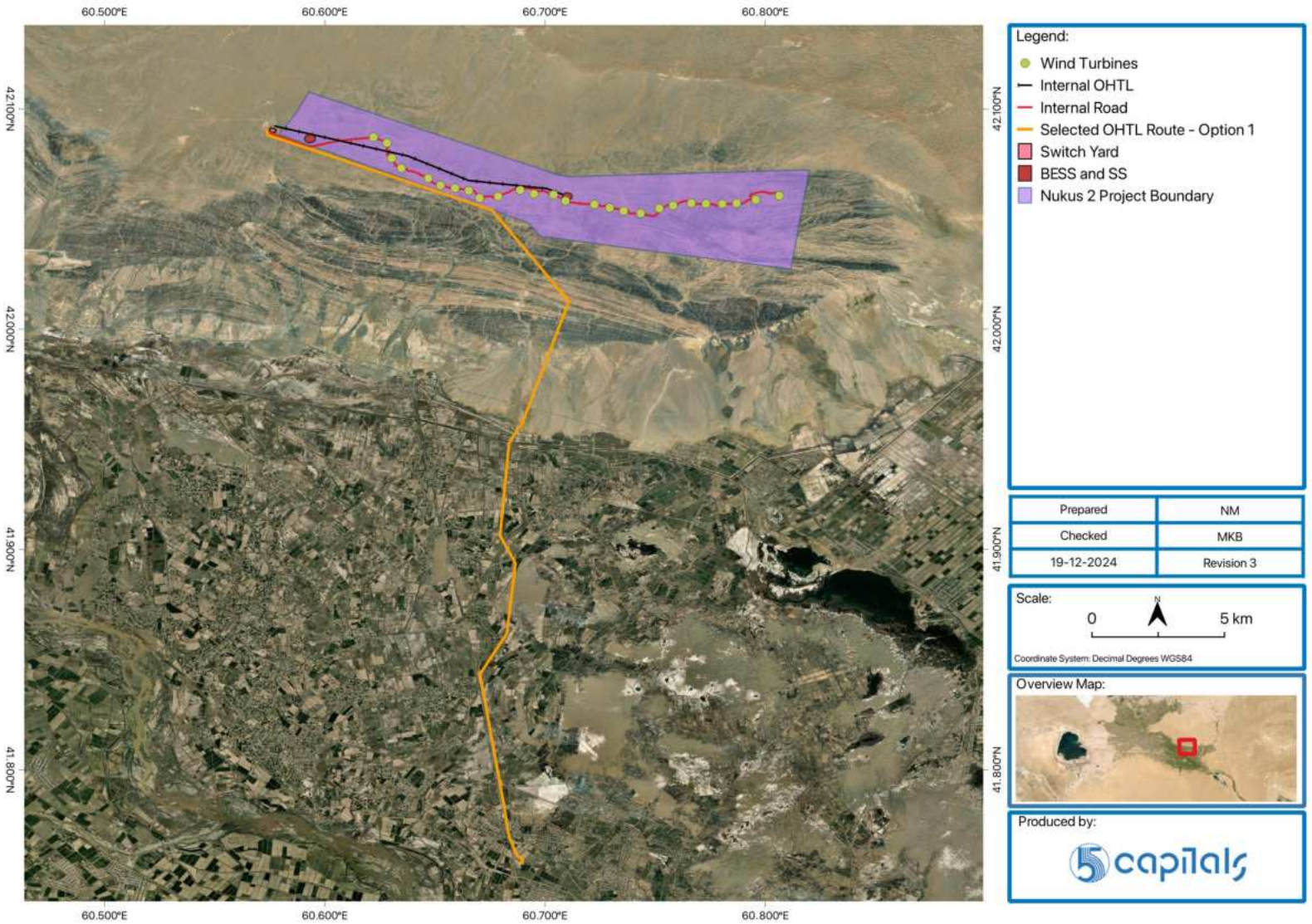


Figure 2-12 Project Layout

2.5.2 Project Facilities

POWER EVACUATION INFRASTRUCTURE

The power evacuation infrastructure includes expansion of the 220 kV switchyard originally designed for Phase 1 project (Nukus 100 MW Wind Farm), OHTL route of approximately 42-44 km length. The OHTL will connect the planned substation and BESS to Beruniy grid substation.

BESS

The Project will also involve the establishment of a 100 MWh AC-coupled Battery Energy Storage System (BESS). The BESS facility will serve the following main functions:

- Storage of electrical energy from power sources feeding into the project-associated utility grid during off-peak grid time, and the dispatch of the operating reserves in the event of grid congestion (i.e., instances of power demand exceeding power supply).
- Stabilization of the frequency of the project-associated utility grid by provisioning power reserves to equalize power demand and power supply within the grid.

The BESS facility is designed to address power shortages within the grid connecting to the Wind Farm planned under the Project, to prevent and alleviate the occurrence of power outages within Beruniy District. Power shortages can arise in the event of peak power demands, downtime events of power generation facilities feeding into the grid and declines in the electrical yield of the Wind Farm as a result of wind variability or icing and snow accumulation.

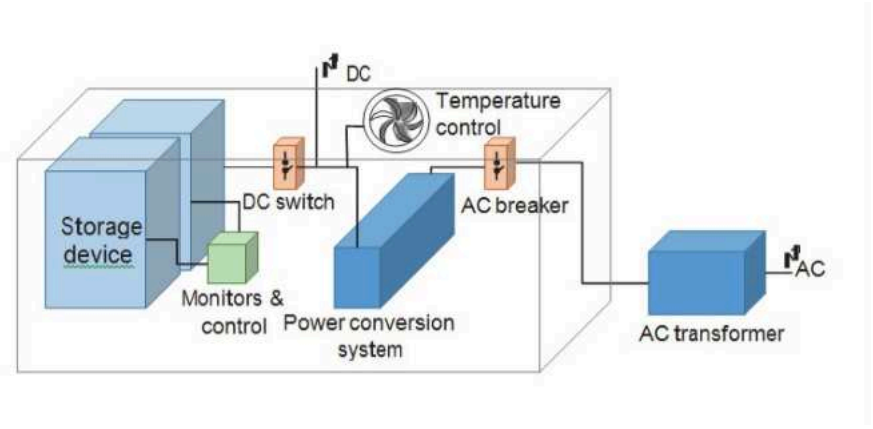


Figure 2-13 General schematic of a BESS facility

The main components of the BESS facility are outlined below.

Battery assembly

The BESS will operate with Lithium-Ion batteries. On utility-scale BESS facilities, Li-ion batteries are superior to lead acid, nickel-cadmium, sodium-sulphur and redox flow batteries, due to

their high performance on energy density, fast response time, longevity, coulombic efficiency, charging time and maintenance costs. A few disadvantages related to this battery technology include low charging rates in sub-zero temperatures and susceptibility to thermal runaway (uncontrolled heating and degradation), which necessitate over-current protection.

The BESS will be housed in dedicated containers within the Phase 2 Project site perimeter, installed on concrete foundations. The battery containers will have sumps on the bottom for any leakage or water accumulation which can be drained out of the container in a controlled manner using the drain valve for appropriate disposal. The housing will feature a fully redundant air conditioning system to ensure continuous operation, even if one system fails. It will monitor and maintain battery temperature and humidity within manufacturer specifications, with fire-retardant thermal insulation for maximum cooling efficiency. All electronics will meet IP65 standards, and the containers will have sufficient space for up to 20% additional battery capacity. The housing will have a sealed design with no external airflow, and will include a fire and smoke detection system connected to the SCADA system, powered by an uninterruptible power supply (UPS) to ensure operation during grid failures.

The table below provides the counts of the battery assembly units constituting the BESS facility.

Table 2-6 Total number BESS battery assembly components

BATTERY UNITS	TOTAL NUMBER
Lithium battery cells	173,056
Battery modules	3,328
Battery racks	416
Battery containers	72 skids

Battery Management System

The Battery Management System (BMS) will be designed to monitor and control the charging and discharging of the BESS. It will interface with the Phase I Wind Project, the Power Plant, and the 220 kV Switching Station to collect data necessary for BESS operation, such as power readings and system status. The BMS also displays real-time project status, monitors alarms needing operator intervention, and requires the installation of industry-standard components, including fiber optic data cables. The fiber optic termination point is located at the Phase I Wind Project's SCADA interface panel.

Power Conversion System

The Power Conversion System (PCS) is an automated system that is bidirectional, functioning both as inverters and chargers for the batteries. They are sized to deliver the maximum power at the AC connection terminal and support grid stability by operating in both grid-following and grid-forming modes. The inverters will include accessible DC breakers and fuses, and will

have a voltage range compatible with the batteries to maximize capacity utilization, and will be equipped with AC circuit breakers. Essential protections, including ground fault monitoring, grid monitoring, and surge protection, will also be provided.

Power Transformer

The BESS will be connected to the 220 kV Switching Station via a dedicated, high-quality, outdoor, oil-filled transformer supplied by a reputable manufacturer. The transformer must be environmentally and fire safety compliant, featuring essential components like oil conservators, alarm systems, and surge protection. It will be designed to handle various operational scenarios, including over and under voltage, with protections such as oil containment for leakage scenarios. The transformer must achieve over 99% efficiency, be capable of full continuous output, and include advanced cooling systems. The design will ensure accessibility for inspection and maintenance, with a construction that prioritizes durability and safety.

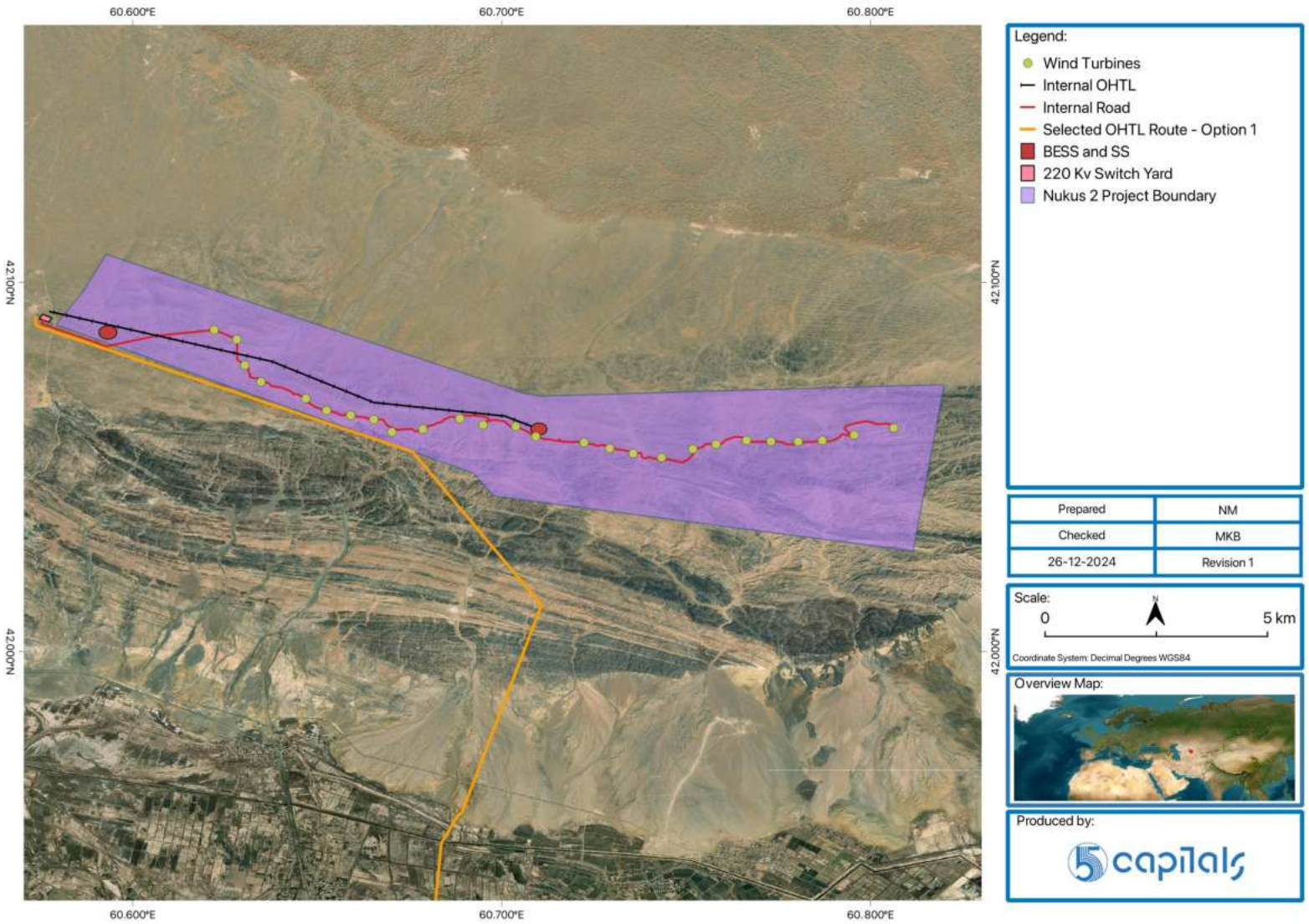


Figure 2-14 Power Evacuation Infrastructure

ACCESS ROAD

The Project site is separated from surrounding roads and the regional A380 highway by the Karatau hills. However, access to the Project will be facilitated using the same access road constructed for Nukus 1, which is already in use. Hence there will not be further construction to the access road to the site from the A380 road.

INTERNAL ACCESS ROAD TO WTGS

An internal access road between the WTGs will be constructed to link the proposed project to the Nukus 1 project switchyard area, which is where the access road to the site currently terminates. This internal road will be approximately 20.5 km .

2.5.3 OHTL

The 220-kV double-circuit OHTL will transfer power from the project's proposed 220 kV substation to the existing 220/110 kV Beruniy substation. This OHTL spans approximately 42-44 km.

A brief preliminary description of the main components of the transmission lines are as provided below:

Towers/Pylons

The exact type of tower structures that will be used for this Project has not been selected at the time of writing the ESIA. However preliminary details are described below.

It is anticipated that the transmission line will consist of a large number of towers/pylons that will be self-supporting and grounded to ensure low resistance. At this stage it is anticipated that the type of towers could be either:

- Suspension towers - used for straight section of the line to keep the wires off the ground or;
- Angle angular (tension) towers – used to tension the wires and accommodate changes in direction of the line.

Suspension towers are used for sections of the line that follow straight paths or for small deviations, typically at angles close to 0°. These towers are primarily designed to support the vertical load, which includes the weight of the conductors, insulators, and other hardware.

On the other hand, tension towers (also known as angle or towers) are employed where the line changes direction or at points subject to mechanical stresses, such as crossing rivers or roads. These towers bear both vertical and horizontal forces and are also used in locations with uplift forces or in challenging terrains where maintaining line tension is crucial. Their design

ensures that they can handle the additional mechanical loads that occur when the line bends or crosses infrastructure.

Suspension Tower	Angle Angular Tower
	

Figure 2-15 Example of Typical 220kV Suspension & Angle Angular Towers

Foundations

The foundation for the towers will be constructed using concrete and reinforcement. The concrete used will be suitable to the specific carrying capacity of the different terrain along the OHTL route. The type and size of the foundation will be dependent on the outcome of the geotechnical investigations undertaken along the OHTL route.

Conductors & Wires

It is anticipated that each 220kV tower supports three (3) phases and two (2) earthing wires that protect the line from lighting strike.

Conductors

Conductors are the wires used to carry electrical power. These wires/conductors are made of aluminium core steel reinforced and they are in large drums. The wires will be mounted on the towers and will use a single conductor per phase, made up of 54 individual strands. For 220kV transmission the wires will have a cross-section of 400mm.

Earthing Wire

The earthing wires also called Optical Ground Wires (OPGW) combines the function of grounding and communications. It is anticipated that there will be one (1) earthing wire which

will be connected to an isolator so in the event of a lightning strike, the electric shock effect will go through the closest isolator to the ground ensuring safety and protection. It is often run between the tops of high voltage electricity pylons with the conductive part bonding adjacent towers to the ground and shielding the high voltage conductors from lightning strikes.

Insulators

Insulators are OHTL components installed between live conductors and earthed parts and subjected to mechanical and electrical stress. They are used to isolate the towers from the live wires that carry the electricity and are typically made of glass, ceramic or some form of composite materials, however the selected insulators will most likely be made of glass. The insulators for the OHTL will be designed to ensure effectiveness during adverse climatic conditions during OHTL operation.

All OHTL component will be designed and constructed to ensure safe operations in all climatic conditions that exists in the area where the OHTL will run through.

2.5.4 Operations and Maintenance Facility

The Project will include an Operations & Maintenance (O&M) building, which will be part of the substation and therefore there will be no additional land take for this facility. The O&M building will be used to:

- Provide security to the Project
- Support the operation of the Project
- Store spare parts
- Management of wastes produced at the Project.

2.6 Shared Facilities

As outlined below, the Project will utilise/share several existing facilities that are in place locally for the Nukus 1 WF project and other infrastructure.

Nukus 1 WF - Access Road

The Project will utilise the existing access road that was constructed by the EPC Contractor for the Nukus 1 WF project. This access road connects to the existing road network and leads to the Nukus 1 temporary site facilities area and the existing EPC Contractor temporary accommodation area. This is adjacent to the Nukus 2 WF TSF area and where the internal site road that will connect to this access road to enable transit between the WTGs.

The Nukus 1 access road is currently in use and is shown in the images below.

Figure 2-16 Existing Nukus 1 WF Access Road (photographs from EPC Contractor)

Nukus 1 WF – Temporary Construction Workers Accommodation

The existing Nukus 1 accommodation area will be expanded so the EPC Contactor staff can stay in this same area and make use of this as an optimised approach (as it is under the same contractor), which will also lessen the burden for new construction requirements.

Figure 2-17 Existing Nukus 1 WF Temporary Construction Workers Accommodation (photographs from EPC Contractor)

Sub-contractors will construct temporary workers accommodation in the Main TSF area of Nukus 2 WF area, which will be located in close proximity to the existing Nukus 1 WF accommodation area.

There will not be dedicated workers accommodation constructed in areas off-site. However the EPC Contractor has advised that certain sub-contractors may need to seek guest houses/hotels in local area for a small number of workers. Where appropriately skilled workers are available locally (locally to the project or elsewhere within Uzbekistan) the EPC Contractor aims to engage 50% of their workers from this pool to lessen the influx burden and need for dedicated accommodation.

Nukus 1 WF – Temporary Construction Power Supply

On-site power for construction at Nukus 1 WF is being conveyed from the grid via a temporary OHTL line to the Nukus 1 TSF and accommodation area. The EPC has advised that this line will be extended via an underground cable to the Nukus 2 WF main TSF area (a short distance from the Nukus 1 TSF).

Nukus 1 & 2 Shared Switching Station

The Nukus 1 WF switching station is still being constructed and is being sized to accommodate the load from the Nukus 2 WF project without additional expansion or modification. It will provide a tie in for Nukus 2 WF only.

Existing Beruniy Sub-station

It is understood that the Beruniy sub-station that will not be expanded, but will have slight modifications to allow a tie-in the OHTL from the Nukus 2 OHTL.

2.7 Associated Facilities

Due to the shared facilities outlined above there are not specific associated facilities (outside of the Project's financing) that will be constructed, or expanded to ensure the viability of the Nukus 2 WF project.

2.8 Project Construction

2.8.1 Construction Activities

The principal construction activities and associated requirements in relation to the wind farm are anticipated to include the following;

- Transportation of components to the Project site;

- Delivery of machinery & equipment to the site;
- Construction of temporary laydown facilities and building site equipment (e.g. containers at the Project site);
- Site preparation (comprising excavation, grading, levelling, and land clearing at WTG platforms) to create flat land area for preparation of turbine pads, installation of wind turbine towers and various project components. Blasting may need to be conducted for hard rock excavation at the WTG pads only, if required as identified by the geotechnical survey;
- Additional facilities to facilitate construction work (comprising excavation and levelling etc.) for access road and the internal road network, construction of any building infrastructure (if required);
- Provision of electricity supply, generation and distribution system as required for installation, including temporary overhead lines connected to the national grid;
- Erection of WTGs;
- Constriction of the substation and BESS;
- Commissioning tests of electrical infrastructure (including WTGs) and inspection of civil engineering quality records.

Principal construction activities for the OHTL and access road are anticipated to include:

- Site preparation (comprising excavation, grading, levelling, and land clearing at tower footprint, OHTL corridor and access road alignment;
- Transportation and delivery of equipment/machinery and OHTL components;
- Construction of platforms for pylons/towers and delivery of materials along OHTL route;
- Assembly of OHTL towers/pylons;
- Installation & erection of OHTL towers/pylons, installation and laying of wires & transmission cables on pylons, connecting wires and cables, stringing of conductors, tensioning and sagging of conductors;
- Construction of gravel access road and local strengthening if required; and
- Provision of electricity supply, generation and distribution system as required for installation, erection, etc.

2.8.2 Laydown Areas

Temporary construction laydown areas will be established adjacent to the site boundary allocated for the WTGs (within the site boundary of the Nukus Phase 1 Project). Additionally, a separate laydown area will be set up within the footprint of the Nukus Phase 2 Project, where a batching plant will also be located. After completion of construction, the construction laydown areas will be disassembled, and the area will be returned to its original condition. The laydown area will include:

- Office containers;
- Storage areas for equipment;
- Parking areas;
- Bathroom and waste collection facilities;
- Equipment for power generation;
- Communications equipment; and
- Other miscellaneous small items as required.

The location of the laydown areas is shown in the following figure.

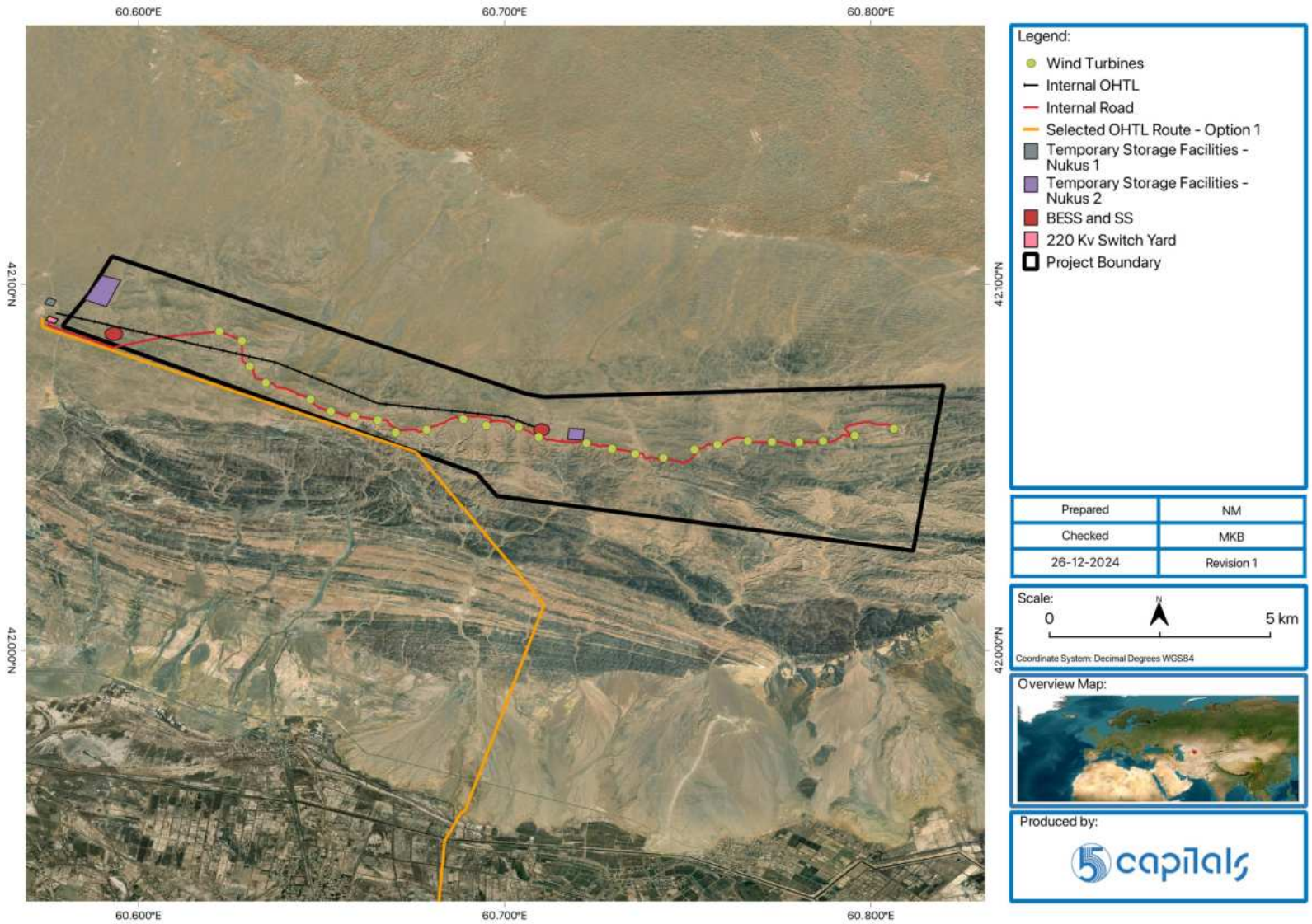


Figure 2-18 Nukus 1 & 2 WF - TSF Areas

Where temporary construction laydown area(s) will be established along the OHTL corridor/ROW, these areas will be required for the storage of materials such as pre-assembled tower sub-structures, for the further assembly of these sub-structures into final tower structures, for storage of foundation reinforcement steel or steel tower metal bars, tools & equipment to be used by the Engineering Procurement and Construction (EPC) contractor as well as sub-contractors responsible for OHTL construction.

After completion of construction, the laydown areas will be disassembled and returned to its original condition.

2.8.3 Construction Workforce and Accommodation

The construction workforce will comprise skilled and semi-skilled labour, with a peak total of 200 workers. Where available and with appropriate skills, the EPC Contractor is targeting that approximately 50% of the contracted workforce will be reserved for Uzbek nationals and residents of the Projects' affected communities, while the rest of the workforce are expected to be hired from China and other Central Asian countries.

It is understood that the workers' accommodation will most likely be located within the Phase 1 Project site footprint. in which the existing accommodation will be used and expanded to accommodate additional manpower if needed. Alternatively, workers' accommodation may be provided within the nearby villages close to the Project footprint, but sufficiently distant from the host population to avoid any issues related to sexual exploitation and abuse/sexual harassment (SEA/SH). The accommodation will align with the local regulatory requirements and the IFC/EBRD Workers' Accommodation: Processes and Standards. This includes providing good quality living accommodation, services and amenities to reduce the need for interaction with local communities. Based on experience from other construction sites, this accommodation is expected to be dedicated for EPC Contractor and possibly Project Company and other specialist staff. It is likely that the sub-contractors, if necessary, will need to arrange for alternative accommodation facilities for their workers, which may also be off-site. Sub-contractor accommodation will also align with the Project standards for worker accommodation.

2.8.4 Utilities & Waste

ELECTRICAL SUPPLY & FUEL

The Project will connect to the national grid, as is the case with the adjacent Nukus Phase 1 Project. However, one or two diesel generators, each with a maximum capacity of 500 kW, may be installed within the wind farm site for emergency use. Diesel storage tanks will not be required, as the generators will be refuelled by the supplier whenever needed.

WATER SUPPLY

The Project will require both potable and non-potable water supplies for the construction phase.

The EPC Contractor has confirmed that potable water (i.e. for drinking) will only be purchased by bottled supply from stores. They have advised they have an existing arrangement in place with suppliers for the Nukus 1 WF project in this regard, which will be continued. Hence there will not be specific water quality monitoring for drinking water.

For domestic water (e.g. for washing, cleaning, flushing etc.) this will be delivered to the site by a government licensed water supplier by a tanker. Further to delivery, water will be subject to further treatment on-site via a reverse osmosis unit installed at the Nukus 1 EPC Contractor accommodation area.

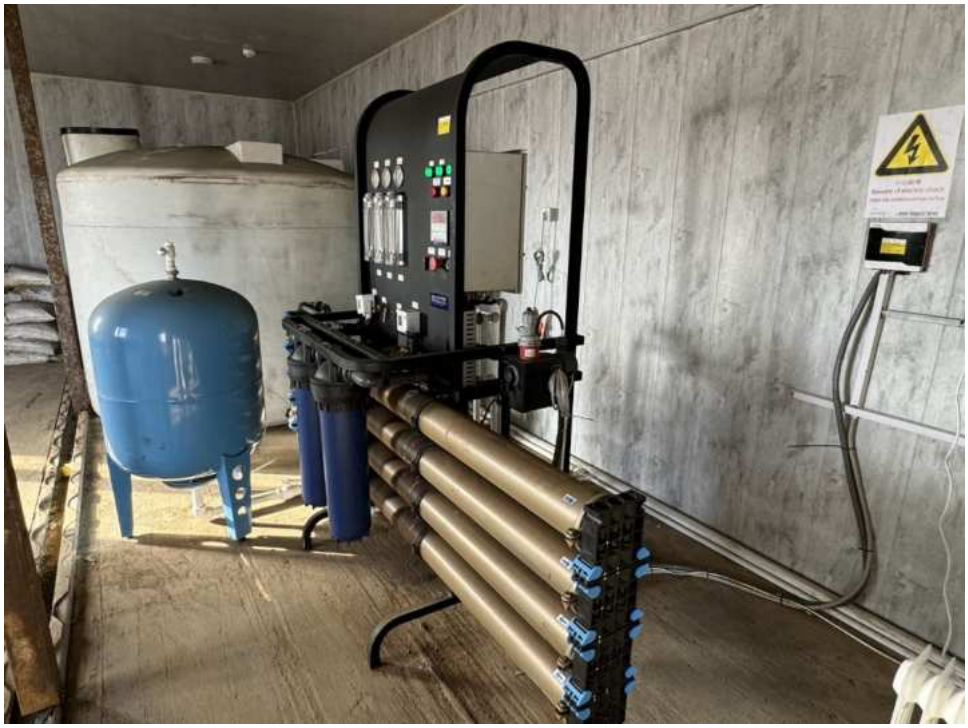


Figure 2-19 Existing Reverse Osmosis Unit in Place at the Nukus 1 WF Accommodation Area

Note: *RO treatment can be effective in removing dissolved & suspended solids, virus', bacteria & other pathogens, chlorine & chloramines, heavy metals and other chemical contaminants. They have advised that the same process will be implemented during Nukus 2.*

Water consumption estimates have been provided by the EPC Contractor as outlined below.

Table 2-7 Water Consumption Estimates

ACTIVITY	WATER REQUIREMENT (M^3)
LNTP Phase (4.5 months)	
Domestic Water	810m^3 (total for 4.5 months, based on an average of 100 workers over this duration)
Dust Suppression	1,700m^3 (total for 4.5 months)
Full Construction (after NTP)	
Domestic Water	6m^3 per day per 100 workers
Dust Suppression	4,500m^3 (per full year)
Concrete works	900 m^3 (total)
WTG Components Cleaning before Erection	2m^3 per WTG

WASTES

Wastes will be generated throughout the construction period. Waste streams will include excavation wastes, packaging wastes, domestic waste from construction workforce etc. Wastes will be segregated and stored onsite before being collected when required by a licensed waste management contractor. Refer to Chapter 11 for further details regarding waste streams and management.

The waste streams and estimated quantities that are expected to be generated during construction of the Project are listed in the following table.

Table 2-8 Waste Streams and Estimated Quantities

WASTE STREAM	ANNUAL QUANTITY
Domestic waste	45 ton
Industrial waste	
Construction and demolition waste (CDW)	25 ton
Wood	20 ton
Plastic packing (polyethylene waste)	15 ton
Insulation materials (mineral wool, polystyrene etc.)	1 ton
Medical waste	0.1 ton
Ferrous metal scrap and stubs	0.8 ton
Used engine oil	1.5 ton
Wiping material (rags)	0.05 ton
Waste paper	0.4 ton
Packaging materials	0.25 ton
Oily Filters	0.5 ton

WASTEWATER

Domestic wastewater will be generated from toilets on-site, as well as any canteen/catering activities, estimated at 7117,0 m^3/year. Wastewater will be stored in septic tanks and collected when required by a licensed wastewater management contractor. No sewage treatment activities will be undertaken on-site.

2.9 Project Operation and Maintenance

As per the Power Purchase Agreement (PPA), the Project lifetime is 25 years, the following subsections discuss operation and maintenance activities, and Section 2.9 discusses the decommissioning / transfer of the Project after completion of the 25 years.

2.9.1 Activities

Wind farms generally require limited operational activities and typically include the following:

- Operation and maintenance to include normal daily operation of equipment including maintenance (electromechanical and housekeeping) to optimise energy yield and life of the system;
- Remotely activated turbine shutdown during excessive wind speeds;
- Management of operations in relation to resident bird and bat species (summer and winter) and migration periods during Spring and Autumn (if required); and
- Routine planned preventative maintenance and unplanned maintenance (if required).

Preventative maintenance specific to the BESS facility include battery health monitoring, thermal management, and the maintenance of the HVAC system.

2.9.2 Workforce

The operational period is expected to require a permanent workforce of 10 – 15 with up to 5 temporary employees. Recruitment efforts will primarily focus on sourcing labours locally and regionally, including from neighbouring countries within Asia. In cases where specialized expertise is required, recruitment may extend internationally to meet specific operational needs.

The Project will not require shifts and the working period of all employees will be 8 hours, shifts are not required as the site can be remotely supervised by SCADA and employees will be on-call if required.

The company promotes equal opportunities for the employment of males and females, and employees receive the same salary and benefits for the same positions regardless of their gender. Special provisions such as maternity and parental leave safeguard the rights of female employees during pregnancy and childcare. Moreover, equal opportunities for promotion

and access to training resources are extended to female employees. Additionally, the project company implements a strict Sexual Exploitation and Abuse and Sexual Harassment Prevention and Response Action Plan, along with a Gender-Based Violence and Harassment (GBVH) Prevention and Response Policy. In addition to the grievance redress mechanism (GRM), further discussed in the following sections, a women's rehabilitation and adaptation centre at "Madad" NGO is available for incidents related to GBVH and/or SEA/SH. This centre provides support to women and their children who have experienced GBVH and/or SEA/SH, and is located in Nukus city, Republic of Karakalpakstan. The centre is registered under the National Agency of Social Protection, operating under the President of the Republic of Uzbekistan. The centre can also support GBVH victims through its hotline at 1169. Additionally, the Ministry of Support of Mahalla and Elderly People offer hotline assistance via 1146.

Victims of GBVH can also report incidents to the police inspector within their community.

In adherence to local labor laws, the company's hiring practices in the local area shall comply with regulations. All employees will have equal employment opportunities, compensation and benefits, and the same working hour regulations.

2.9.3 Utilities and Waste

ELECTRICAL SUPPLY AND FUEL

The operational buildings will be fed from the Project auxiliary bus bar, which shall be backed up by an emergency diesel generator, which has a tentative capacity of 300 kW. The electricity will be used to power the operational buildings to ensure security of the site and monitoring of operations.

WATER

The peak potable water requirement is estimated to be 300 m^3 per month. This water will be used by operational staff for uses such as drinking and cleaning. The process operation of the Project does not require water.

WASTE

A limited amount of domestic waste shall be produced be the O&M team, and this shall be removed from the site daily.

Wastes from maintenance or repair activities could include spent fuel and chemical containers, oily rags, WTG components. The amount of this type of waste is expected to be negligible. Additionally, electronic waste and degraded batteries is expected from the operation of the BESS. Wastes will be segregated and stored onsite before being collected

when required by a licensed waste management contractor. Refer to Chapter 13 for further details regarding waste streams and management.

A septic tank will be constructed for wastewater, the volume of the tank will be determined during detailed design, and it will be emptied as required by a licensed contractor.

2.10 Project Milestone

The following table outlines key project milestones.

Table 2-9 Key Project Milestone/Timeline Dates

MILESTONE	DATE
Project Award	20th December 2023
Signing of Power Purchase and Project Agreement (PPPA) and Grid Service Agreement (GSA)	28th March 2024
Signing of EPC & O&M Agreement	TBC
Financial Close and Full Notice to Proceed (Construction)	January 2025
Project Commercial Operation Date (PCOD)	Wind Farm: 18 months from FC
	OHTL: 12 months from FC

2.11 Decommissioning of the Project

Upon completion of the Project, it shall either be decommissioned or transferred, at the discretion of the GOU.

Potential impacts relating to decommissioning will be similar to those encountered during the construction phase. There are only likely to be a few decommissioning related risks to wind turbines such as minor quantities of hazardous components. Due to the small footprint of the project WTG, all structures and infrastructure could feasibly be dismantled for material recovery.

Given that the decommissioning phase, if chosen by the GOU, will not occur before 25 years from COD, there are no specific requirements for decommissioning at this time, since future environmental and social regulations have yet to be developed. As such, it is not considered practical to speculate on future environmental and social conditions or the sensitivity of current or future receptors at this time. However, high level key risks (e.g., from Project wastes) have been considered within this Report.

It is proposed that the decommissioning process will be managed via an updated ESIA and ESMS to identify measures for the prevention, avoidance or minimisation of impacts. A specific Decommissioning Plan will also be required. The studies should be undertaken at least 12 months prior to the time of decommissioning to reflect changes in regulations and standards,

and requirements for compliance with the expected "circular economy" that is likely to be a condition at that time. This will require maximising the re-use, recovery and recycling of components and materials to provide resource for future use.

Where potentially significant decommissioning risks have been identified, these have been discussed at a high level herein, however, as stated previously, decommissioning impacts are expected to be further assessed for appropriate management at a later time in the Project lifecycle.

2.12 Project Alternatives

2.12.1 No Project Alternative

The GOU, through the Ministry of Energy, aims to increase the electricity production in the country to foster economic growth, develop and expand the use of renewables and develop public-private partnerships in the country's energy sector.

The Project forms part of the Ministry of Energy's plan to develop and expand renewable use to 8 GW and increase total electricity production in the country to 29.3 GW by 2030. The generating capacity of the Project will be 200 MW and this will contribute to the 3 GW estimated wind power contribution to the total renewable power generating capacity.

Given the national strategy for additional renewable energy contribution to the total power generating capacity, a 'No Project' option has not been considered further. This alternative would delay the GOU from meeting its renewable energy target and potentially continue the reliance on non-renewable energy sources.

Upon reviewing the anticipated impacts as a result of the development of the Project, although the construction phase may likely result in potential temporary negative impacts, the operational phase of the project will result in an overall positive impact, particularly due to the socio-economic benefits and the increase in renewable energy being supplied to the Uzbekistan grid.

2.12.2 Alternative Project Site

The assessment of wind power potential in Uzbekistan, as detailed in the pre-feasibility and feasibility studies, considered several key factors for selecting potential wind development sites. These factors included areas with an average wind speed of 7.5 m/s or more at 100m, suitable topography for wind farm construction, accessible terrain and ensuring proximity to existing electrical infrastructure, and the absence of critical environmental and social constraints based on preliminary site screening assessments. This included avoiding residential

receptors, nationally protected areas, areas of ecological sensitivity, and conflicts with mining exploitation areas.

The Wind Development Area (WDA) has been selected from one of two potential sites, specifically the Nukus WDA. This project site represents an expansion into the previously designated WDA for the Phase 2 Project. The proposed site is located outside the area monitored by the initially installed meteorological mast, and thus additional meteorological masts were installed to verify the suitability of the new site. The meteorological masts were subsequently dismantled.

The wind farm project site is undeveloped and located more than 10 km from the nearest permanent residential receptors and communities. Therefore, the impacts related to noise, air quality, and shadow flicker are insignificant, minimizing the potential for resettlement.

2.12.3 Project Technology

Turbines from Envision, Windey, Sany, Goldwind, and Mingyang have all been considered.

The Envision EN 182-8.0MW HH 138m Steel Tower Turbine model has been selected for the current layout and was based on the following criteria:

- Technology options for flexible use and maximising energy generation during high and low wind conditions;
- Least cost of energy which results in highest generation at lowest cost;
- Site suitability of the chosen WTG model; and
- Project schedule.

From an environmental and social perspective, the turbines are essentially the same and will each result in similar impacts. However, one difference will be with respect to supply chain risks, which will be assessed separately.

2.12.4 Project Layout

WTG

Initially the Project was to consist of 37 WTGs, however, it was deemed cost and energy effective to have only up to 29 WTGs. It is considered likely that the reduction in number of WTGs would have environmental and social benefits, due to the reduction of transport needed, reduction in required construction effort and the reduction in operational impacts such as noise. Nonetheless, the reduction in the number of WTGs, will not necessarily reduce the potential for birds collisions due to the increase in rotor swept area per turbine, as the blade length increased from 82.5 m to 110 m. Additionally, while the reduction in WTGs may not lessen

shadow flicker for the same reason, this is unlikely to be an issue for the project given that no permanent residential receptors are located within 10 km of the nearest WTG.

OHTL ALIGNMENT

During the desktop study stage, three preliminary options for the OHTL route were proposed based on the provided and available data. However, option 2 was rejected by the Ministry of Mining and Geology of the Republic of Uzbekistan in previous stages due to constraints with respect to mining rights, and option 3 was excluded for environmental considerations on the basis that the OHTL would cross the lower Amu Darya Biosphere Reserve, a Protected Area, which would potentially result in more severe environmental impacts. Additionally, option 3 although it does not traverse Khorezm National Park, it is in close proximity to it. The OHTL alignment (option 1) obtained no objections from government authorities, including the Ministry of Mining and Geology and the National Electrical Grid of Uzbekistan. Minor changes to the OHTL alignment were made following consultations with JSC Uztransgas to avoid any above-ground gas network pipelines. The following figure depicts the different OHTL alignments considered.

Additionally, the design considered closely aligning the proposed OHTL with existing OHTLs, however from a technical standpoint this would introduce significant complications during the construction phase, as the proposed OHTL would then intersect with four existing OHTLs, hence creating logistical challenges and increasing the risk of interference. Notably, this route would also cross the same 220 kV OHTL three times, which is technically unfavourable. Additionally, the alignment of the planned OHTL with the existing OHTL would result in significant impacts on residential areas, as houses were constructed within the health protection zone of the existing OHTL. Therefore, to minimize impacts, the planned OHTL was designed to align closely with the highway road. Subsequently, this would facilitate easier construction and maintenance and minimizes the need for additional access roads.

At initials stages the design evaluated the possibility of aligning the new route with the existing OHTL. However, this option was ultimately deemed unfeasible due to several key constraints.

The primary constraint was the presence of archaeologically significant sites. The ancient tower of Sultan Uvays Bobo is a site of historical importance, and is located along the proposed alignment. The proximity of the route to this tower posed a substantial risk of damage to the heritage site, making this option unsuitable.

Another critical issue was the presence of active mining operations, in which the Ministry of Mining Industry and Geology confirmed that two operational marble mines are located along the proposed alignment. Consultations with the Ministry revealed that these mining activities

are expected to continue until 2049, leading to the rejection of the aligned route by the Ministry of Mining Industry and Geology.

To avoid the archaeological site and mining zones, an alternative alignment to the east was considered. However, this area was identified to be subject to a high risk of flooding due to the natural terrain characteristics. Given the lack of detailed hydrological data at the time, it was determined that this area should be avoided.

Furthermore, aligning the proposed route with existing OHTLs would result in crossing the mining area of Mramor LLC. During the OHTL routing stage multiple shorter alignments were proposed, however consultations with the Ministry of Mining Industry and Geology revealed the presence of mining areas, though specific locations were withheld for confidentiality reasons. Consequently, the Ministry recommended the current alternative route to avoid impacting any mining areas.

Additionally, to minimize environmental and social impacts, several site visits were conducted along the proposed OHTL alignment to identify prominent features, such as utilities, structures, and residential houses that could be affected. Based on these visits, the OHTL layout was slightly rerouted to avoid impacts on these structures and utilities, thereby mitigating the risk of triggering physical displacement. The proposed transmission line traverses approximately 25-27 km of irrigated agricultural areas. Where the OHTL crosses existing infrastructure, such as other transmission lines, highways, and railways, the alignment has been designed to maintain a 60°-90° crossing angle. Moreover, the transmission line has been further rerouted in areas near residential settlements to prevent houses from being located within the OHTL's health pro, thus reducing potential safety risks and avoiding the need for physical relocation of residents.

Below is a summary of the different OHTL alignments considered, along with the justification for selecting the most favourable option.

Table 2-10 Summary of OHTL Alignment Options and Description

OHTL Alignment Options	Description	Status (Approved/Rejected)	Decision Justification
Option 1 (selected)	Follows the existing highway and avoids ecologically and culturally sensitive zones.	Approved Received formal approval from key regulatory bodies, including the Ministry of Mining and Geology and the National Electrical Grid of Uzbekistan, with minor route adjustments to avoid above-ground gas pipelines.	• Reduces direct impacts on residential zones. • Minimizes logistical complexity during construction and operational phases. • Facilitates streamlined construction and easier long-term maintenance. • Limited impacts on cultural heritage, environmental conservation zones, and active mining operations
Option 2	Follows the alignment of existing OHTLs.	Rejected Rejected by the Ministry of Mining and Geology due to mining rights constraints and the presence of operational marble quarries along the proposed corridor.	• Significant interference with four existing OHTLs, including multiple crossings of the same 220 kV OHTL. • Potential adverse impacts on residential areas within the health protection zones of the existing OHTL alignments. • Risk of disturbance to cultural heritage assets, including the ancient Sultan Uvays Bobo Tower.
Option 3	Crosses the Lower Amu Darya Biosphere Reserve, with proximity to Khorezm National Park.	Rejected Excluded due to severe environmental risks, including crossing a designated Protected Area, which is the lower Amu Darya Biosphere Reserve, and potential impacts on the nearby Khorezm National Park.	• Potentially significant ecological disturbance due to the intersection with a Protected Area. • Increased vulnerability to biodiversity loss and ecosystem disruption in proximity to Khorezm National Park. • Potential for heightened negative effects on sensitive habitats and wildlife corridors.
Initial OHTL Routing Options	Relocated to avoid archaeological and mining zones, while also considering	Rejected	• Elevated flood risk due to terrain characteristics, posing safety hazards.

OHTL Alignment Options	Description	Status (Approved/Rejected)	Decision Justification
	topographical constraints.	High flood risk identified due to natural terrain characteristics. Lack of detailed hydrological data at the time led to avoidance of this area.	• Increased technical and safety challenges for construction and ongoing maintenance in flood-prone areas.

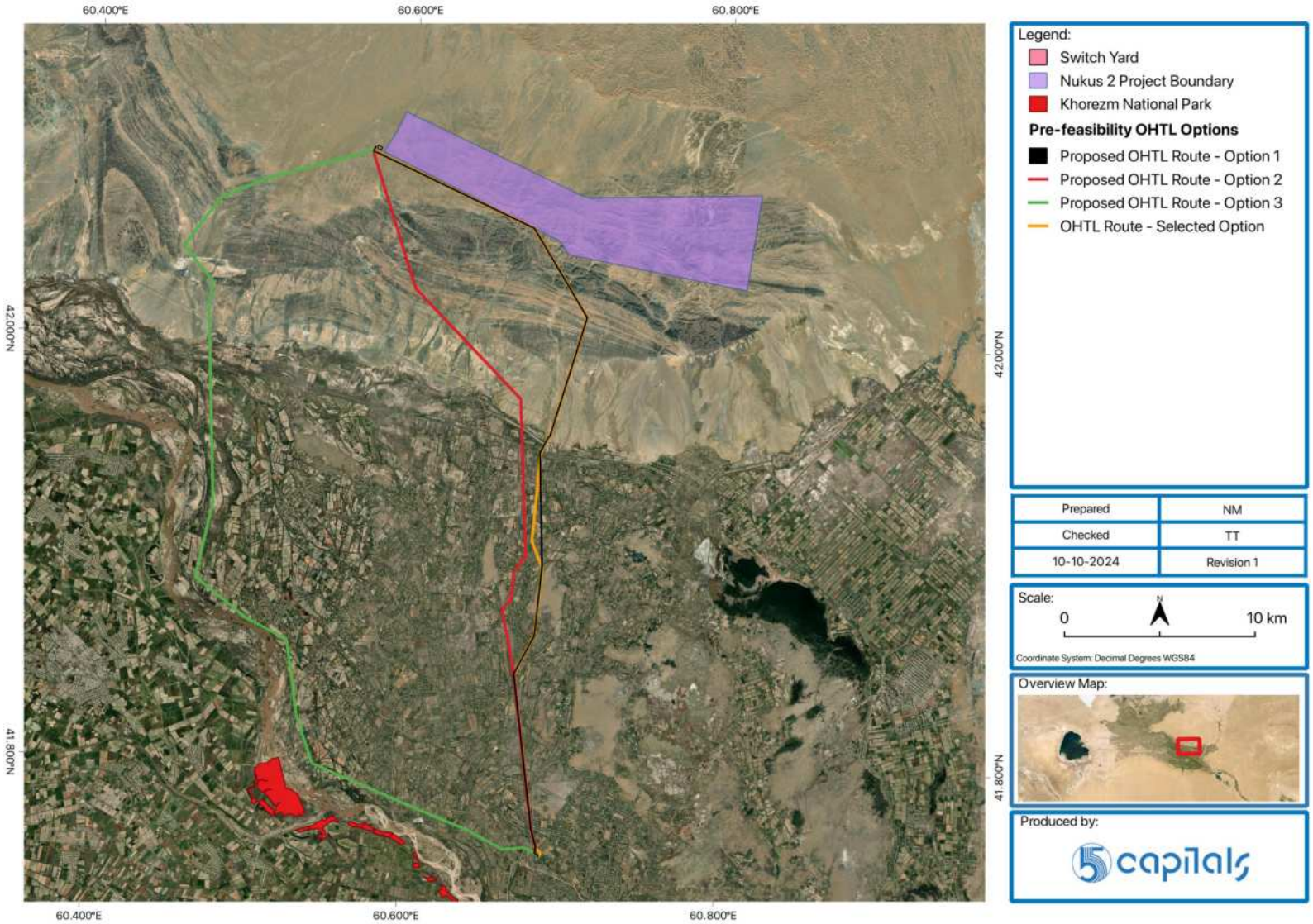


Figure 2-20 OHTL Layout Differences

3 REGULATORY FRAMEWORK

3.1 National Regulations

3.1.1 Constitution of Uzbekistan

The Constitution of Uzbekistan has been amended following a referendum that took place on 30th of April 2023. Key constitutional reforms in the context of the ESIA are as follows:

- Uzbekistan is a legal, social, and secular state.
- Human rights may be restricted in order to maintain social morality and public order (for instance, homosexualism, considering cultural and religious perceptions of majority of population).
- Land can be private property (it is expected that more cases of owning land will be allowed, compared to the previous years when ownership status was granted in very few case).
- Prohibition of death penalty
- Moreover, the following articles of the Constitution may be applicable for provisions relating to environmental and social aspects:
- Article 30. No one shall be convicted, punished, deprived of property, or any other right on the basis of a law that is not publicly promulgated.
- Article 40. Everyone shall have the right, both individually and collectively, to submit applications, proposals, and to lodge complaints with competent state bodies and organizations, citizens' self-governing bodies, officials and public representatives. Such applications, proposals and complaints shall be considered in accordance with the procedure and within the time-limit specified by law.
- Article 41. Everyone shall have the right to own property. The privacy of bank operations, deposits, and accounts, as well as the right to inheritance shall be guaranteed by law.
- Article 42: Everyone shall have the right to decent work, to free choice of profession and occupation, favourable working conditions that meet the requirements of safety and hygiene, to fair remuneration for work without any discrimination and not below the established minimum wage, as well as the right to unemployment protection in the manner prescribed by law. The minimum wage shall be determined taking into account the need to ensure a decent standard of living for a person. It shall be prohibited to refuse to hire women, dismiss them from work and reduce their wages on the basis of pregnancy or having a child.
- Article 44: Any forced labour shall be prohibited, except as punishment under the court decision, or in some other Instances specified by law. Any form of child labor that poses a threat to the health, safety, morality, mental and physical

development of the child, including those that prevent him or her from getting an education, shall be prohibited.

- Article 49: Everyone shall have the right to a favourable environment, reliable information about its condition. The State shall create conditions for the implementation of public control in the field of urban planning activities in order to ensure the environmental rights of citizens and prevention of harmful environmental impact. Draft urban planning documents shall be subject to public discussion in the manner prescribed by law. The State, under the principle of sustainable development, shall implement measures to improve, restore and protect the environment, maintain ecological balance.
- Article 58. Women and men shall have equal rights. The State shall ensure equal rights and opportunities for women and men in the administration of public and state affairs and in other spheres of social and state life.
- Article 61. It is the duty of citizens to protect the historical, spiritual and cultural scientific and natural heritage of the people of Uzbekistan. The historical, spiritual, cultural, scientific, and natural heritage shall be protected by the state.
- Article 62. Citizens shall be obliged to protect the environment.
- Article 65. The basis of the economy of Uzbekistan, evolving to enhance the well-being of citizens, shall be a property in its various forms. The State shall create the conditions for the development of market relations and fair competition, and guarantee the freedom of economic activity, enterprise and labour, taking into account the priority of consumer rights. Equality and legal protection of all forms of property shall be ensured in Uzbekistan. Private property shall be inviolable. An owner may not be deprived of his or her property except in the cases and according to the procedure prescribed by law and on the basis of a court decision.
- Article 66. An owner, at his/her discretion, shall possess, use and dispose of his/her property. The use of any property must not be harmful to the environment or violate the rights and legitimate interests of other persons, society and the state.
- Article 68. The land, its minerals, waters, flora and fauna, other natural resources shall constitute the national wealth and shall be rationally used and protected by the state. Land may be privately owned on the terms and in the manner prescribed by law, which ensure its rational use and protection as national wealth.

3.1.2 Uzbekistan Policy Framework for Wind Projects

The primary legislation for the development of the Wind Energy Projects is the Law of the Republic of Uzbekistan No. 537 "On Public-Private Partnership" dated 10th May 2019 and the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 259 "On Improving the Procedure for Implementing Public, Private Partnership Projects" dated April 26, 2020.

The Law of the Republic of Uzbekistan No. 539 "On the Use of Renewable Energy Sources" (RE Law) dated May 21, 2019; and the Law of the Republic of Uzbekistan No. 412-1 "On the Rational Use of Energy" dated April 25th, 1997 will also be applicable to the Project.

In October 2019, Uzbekistan issued an environmental strategy: Uzbekistan's Environmental Strategy 2030 (approved by the Decree of the President of the Republic of Uzbekistan No. 5863 dated October 30th 2019) which promotes renewable energy development.

The Strategy also contains measures to preserve the environment (air, water, land, soil, biodiversity etc) from anthropogenic impacts and other negative factors, expand protected areas and improve the environmentally safe systems of waste management.

3.1.3 President Decree № PD-4477 on the Strategy for the Transition of the Republic of Uzbekistan to a Green Economy in the period 2019-2030

This decree was adopted to fulfil Uzbekistan's obligations under the Paris Climate Agreement signed on April 19, 2017 and to implement the Action Strategy for five priority areas of development for 2017-2021.

This decree sets out a strategy for the transition of the Republic of Uzbekistan to a green economy for the period 2019-2030, aimed at improving energy efficiency, rational consumption and conservation of natural resources, reducing greenhouse gas emissions, providing access to green energy, creating green jobs and ensuring climate sustainability. It sets several targets for this transition, including the further development of renewable energy sources, covering over 25% of total electricity generation.

3.1.4 Law on Nature Protection, 1992 (as Amended in 2021)

This law is the key national environmental law for the protection of the environment and the sustainable use of resources and the right for the population to a clean healthy environment. This law states legal, economic, and organisational basis for the conservation of the environment and the rational use of natural resources.

Article 25 of this law states that the State Environmental Expertise (SEE) is a mandatory measure for environmental protection, preceded to decision making process. In addition, the law prohibits the implementation of any Project without approval from SEE.

It should be noted that Article 53 of this law confirms that if an international treaty concluded by the Republic of Uzbekistan establishes rules other than those provided for by the legislation of the Republic of Uzbekistan on nature protection, the rules of the international treaty shall be applied, except in cases where the legislation of the Republic of Uzbekistan establishes stricter requirements.

3.1.5 Law on Environmental Control, 2013 (as Amended in 2022)

The law generally provides for the protection of the environment and natural (ecosystem) resources in Uzbekistan. The main objectives of this law include:

- Prevention, detection, and suppression of violation of legislative requirements relating to environmental protection and rational use of natural resources.
- Monitoring the state of the environment, identifying situations that can lead to environmental pollution, irrational use of natural resources, pose a threat to the life and health of citizens.
- Determination of compliance with environmental requirements of any ongoing economic development activities.
- Ensuring compliance with the rights and legitimate interests of legal entities and individuals performing their duties in relation to environmental protection and sustainable use of natural resources.

The Article 7 of this law states that, the objects of environmental control are:

- Land, its subsoil, waters, flora and fauna, and atmospheric air;
- Natural and man-made sources of impact on the environment; and
- Activities, action, or inaction that may lead to pollution of the environment and irrational use of natural resources, create a threat to the life and health of citizens.

3.1.6 Environmental Audit Law No. ZRU-678, 2021

The Environmental Audit Law was adopted to regulate environmental audits in the field of environmental protection and rational use of natural resources, including voluntary or mandatory environmental audits. The Law states that '*an environmental audit can be carried out on a voluntary form by businesses with low or insignificant (local) risk of environmental impact and on a mandatory form on an annual basis for businesses with high and medium risk of environmental impact*'.

An environmental audit is not a substitute for environmental control; however, in case of a positive conclusion of the audit, a business entity is not subject to an inspection by the State Committee on Ecology and Environmental Protection for one year, except for accidents and emergencies, as well as in connection with the investigation of criminal cases or by order of the President of the Republic of Uzbekistan or the Cabinet of Ministers of the Republic of Uzbekistan. The environmental audit is carried out on the basis of a contract concluded between the environmental auditing organisation and the client of the environmental audit. The Law comes into force in March, 2022."

3.1.7 Law on the Rational Use of Energy, 1997

This law is fundamental to the development and functioning of the whole energy sector, including renewable energy. It defines a general legal framework to ensure the conservation of national energy resources and the efficient use of the available production capacity, fuel and energy. The law provisions are applicable to legal entities and individuals whose activities are related to the extraction, production, processing, storage, transportation, distribution and consumption of fuel and energy.

The law is aimed at achieving the following objectives:

- Ensuring efficient and environmentally friendly use of energy in its production and consumption;
- Ensure reliability, uniformity of measurements and metering of quantity and quality of energy production and consumption
- Governmental control and supervision over efficient energy production and consumption, its quality, the technical condition of energy equipment, energy supply systems and energy consumption.

The law has a particular article that defines the framework conditions for the use of renewable energy sources and aims to stimulate the development of renewable energy in Uzbekistan. The law authorises independent producers of electricity and heat from renewable energy sources to supply energy to the energy networks of energy supply organisations, which are obliged to accept energy from these producers at prices formed according to the established procedure. The prices are formed by an authorised body, currently the Ministry of Finance of the Republic of Uzbekistan.

3.1.8 Presidential Decree No. 5863 on Environmental Protection Strategy (30th October 2019)

The Strategy contains measures to preserve the environment (atmospheric air, water, land, soil, subsoil, biodiversity, protected areas) from anthropogenic impact and other negative factors, expand protected areas, and improve the environmentally safe system of waste management.

The Strategy approved 24 target tasks until 2030, which aim to increase the area of forest plantations, restoration and reclamation of disturbed lands, rational use of water resources, reduction of emissions into the air, protection and reproduction of biological resources, and improvement of the waste management system.

Through the implementation of the Strategy, the following are expected to be achieved:

- Increasing the area of forest plantations on the Uzbek part of the dried Aral Seabed from 28% (0.9 million ha) to 60% (2 million ha);
- Reduction of pollutant emissions by 10% (from 2.492 million to 2.243 million tonnes);
- Converting 80% (about 6,500) of public transport to natural gas and electric propulsion;
- Increasing the area covered by forest from 3.2 million to 4.5 million hectares;
- Increasing the area of protected areas from 3.5 percent (1.5 million hectares) to 12 percent (5.4 million)
- Increasing the coverage of solid domestic waste collection and transportation services from 48% (16 million people) to 100%;
- Increasing solid domestic waste processing from 18% (1.3 million tonnes) to 65% (4.6 million tonnes).

3.1.9 Law of the Republic of Uzbekistan on Protection of Women Against Oppression & Violence (as amended 09.12.2021 No. ZRU-736)

The purpose of this law is to provide protection to women against all forms of oppression and violence. The law recognises different forms of violence including: sexual violence, physical abuse, violence, economic violence, workplace violence, psychological violence etc.

In addition, Article 4 details the rights of the victims of oppression and violence which include:

- Right to appeal to the relevant authorized bodies & organisations or court with the statement for making concerning it of oppression and violence or threat of their making;
- Receipt of free legal consultation, economic, public, psychological, medical and other assistance in the special centres and also by means of free phone line;
- The appeal to law-enforcement bodies with the requirement about issues of the security order, and in case of violation, of conditions of the security order informing them about it,
- Appeal to the court with the requirement about compensation of the material damage caused to it and compensation of moral harm owing to committed oppression and violence.
- The victim of oppression and violence in case of appeal to the court with the statement for compensation of the material damage caused to it and compensation of moral harm is exempted from payment of the state fee.

3.1.10 Other relevant legislation

3.1.10.1 National/local requirements for environmental impact assessment

The national Environmental Impact Assessment (EIA) procedure for various development projects is mandated by the following legislation:

- Law "On Environmental Expertise" No.73-II of 25.05.2000 (as amended on 29.04.2021).
- Regulation on State Environmental Expertise (SEE), approved by Decree No.949 of the Cabinet of Ministers on 22 November 2018 which is replaced by "On the further improvement of the environmental impact assessment mechanism No.541, approved by Resolution of the cabinet of ministers of the Republic of Uzbekistan on 9 July 2020."

3.1.10.2 Public participation in national EIA

Based on changes in the national legislation regarding the national EIA process, public consultation is now a mandatory part of the first EIA stage.

According to the Resolution of the Cabinet of Ministries of the Republic of Uzbekistan on "Further Improvement of the Environmental Impact Assessment Process" No. 541 dated 7th September 2020, the procedure of conducting public consultations is as follows:

- Annex 3 of the Resolution No 541 – Rules and regulations for conducting public consultations states that public consultations should include discussions and decision making regarding planned activities (for construction of any facility) that may have negative impacts on the environment.
- A non-technical summary regarding any planned project activity that is categorized as I & II group (in accordance with national requirements for categorization) shall be prepared. The NTS should include information about the following:
  - Brief description of the project.
  - Technology solutions and alternative options for the project.
  - Current state of the environment at the selected project site.
  - A brief assessment of socio-economic conditions.
  - Brief description of the causes and type of negative impacts on the environment as a result of the project.
  - Forecast and assessment of possible changes in the state of the environment, socio-economic conditions.
  - Forecast and assessment of project and non-project risks.
  - Measures to prevent, minimise and/or compensate for adverse impacts; and
  - Assessment of possible significant adverse cross-border impacts.
- A public consultation shall be based on the review of non-technical summary by providing equal rights to all participants to express their concerns, opinions, and suggestions.
- The following entities shall be considered as part of public consultations:
  - Representatives of local departments of State Committee on Ecology and Environmental Protection who will be considered as observers of public consultations.
  - Local municipalities (considered as the responsible organisation for organising and inviting participants to the meetings).

- NGOs'.
- All organisations interested in the project.
- Local communities.
- Mass media.

- Expenses, if any, related to the public consultations are to be financed by the Project Developer.

In addition to the above national requirements on conducting public consultations, the Law of the Republic of Uzbekistan 'Regarding Appeals of Individuals and Legal Entities' No 378 dated 3.12.2014 (with amendments on 17th August 2017), regulates the appeals of individuals and legal entities to state bodies as well as to their officials. Appeals can be oral, written, or electronic and regardless of their form and type are of equal importance. A people's 'Reception Office' is tasked with organising a direct dialogue with the population, ensuring the functioning of an effective system of appeals aimed at the full protection of their rights, freedoms and legitimate interests. Any applications are considered within 15 days from date of receipt and any additional consideration is completed within 1 month.

3.1.10.3 Environment

The following laws focused on the protection of specific environmental/ natural resource elements are in effect and applicable to the Project. An elaboration on the requirements of these laws in relation to the project is provided in Sections 5.1 to 5.5 of this Report.

- The Law of the Republic of Uzbekistan "On Water and Water Use" (1993) as amended in 2022.
- The Law of the Republic of Uzbekistan "On Ecological Expertise" (2000) as amended in 2021.
- The Law of the Republic of Uzbekistan "On Atmospheric Air Protection" (1996, amended on 21.04.2021).
- The Law of the Republic of Uzbekistan "On Protection and Use of Vegetation" (1997) as amended in 2016.
- The Law of the Republic of Uzbekistan "On Protection and Use of the Wildlife" (1997) as amended in 2016.
- The Law of the Republic of Uzbekistan "On Protected Natural Reserves" (2004) as amended in 2022.
- The Law of the Republic of Uzbekistan "On Wastes" (2002) as amended in 2021;
- The Law "On the sanitary and epidemiological well-being of the population" (2015) as amended in 2021.

- The Resolution of the Cabinet of Ministries of the Republic of Uzbekistan №.541 " On further improvement of the environmental impact assessment mechanism' (2020) as amended in 2022.
- The Resolution of Cabinet of Ministries of the republic of Uzbekistan №.820 "On measures to further improve the economic mechanisms for ensuring nature" (2018) as amended in 2021.
- The Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No 14. "On approval of the regulation on the procedure for the development and agreement of projects with environmental standards" (2014) as amended in 2022.
- Resolution of Cabinet of Ministers of Republic of Uzbekistan No.95 "On approval of general technical regulations of environmental safety" (2020) as amended in 2022.

3.1.10.4 Land rights, acquisition and resettlement

The following laws govern the process of land tenure, expropriation, and reallocation in Uzbekistan. The specific requirements of these laws in relation to the project are elaborated in Section 14 of this Report.

- Civil Code of the Republic of Uzbekistan (1997) as amended on 8.11.2022.
- Land Code of the Republic of Uzbekistan (1998) as amended on 1.10.2022.
- Law of the Republic of Uzbekistan on State Land Cadastre No.666-I of 28.08.1998.
- Presidential Decree №. UP-5495. Decree "On measures on cardinal improvement of investment climate in the republic of Uzbekistan".
- Appendix No. 2 to the Resolution of the Cabinet of Ministers №. 146 (2011), regulation "On the Procedure for Compensation for Losses of Landowners, Users, Tenants and Owners, as well as Losses of Agricultural and Forestry Production".
- Resolution №. 911 of the Cabinet of Ministers (2019) "On the Procedure for withdrawal of land plots and compensation to owners of immovable property located on the land plot.
- Presidential Decree № DP-6243, dated June 8, 202 "On measures to ensure equality and transparency in land relations, reliable protection of rights to land and their transformation into market assets".
- Law No 781 "On procedures for the withdrawal of land plots for public needs with compensation" October 1st, 2022. The Law specifies cases when the land plots can be acquired for public need among which construction (reconstruction) of roads and railways of national and local significance is also specified. Law No. 781 also prescribes procedures of land acquisition, communication with project affected people (PAPs), compensation calculation, and demolition of affected assets. As of October 1st, 2022, all projects that require the acquisition of land for public needs should be managed in accordance with this Law.

With regard to wayleaves and exclusion zones that are mandated for the establishment of certain infrastructure, specific legal provisions for land acquisition are as follows:

- With regards to the acquisition of land for Right of Way, procedures to establish a right of way (ROW) in Uzbekistan are the same for legal entities and individuals. ROW or limited use of a land plot is determined in the Land Code of Uzbekistan, Civil Code (under the term servitude), and the Resolution of Cabinet of Ministries No.911 dated 16.11.2019. All grid interconnection works are expected to be undertaken within the existing ROW; however, for completeness, the requirements for establishing a ROW are presented below, and their applicability will be confirmed during the ESIA process.
- Article 30 of the Land Code (LC) determines engineering, electrical power and other lines and constructions as a reason for receiving the right to servitude. Following Article 30 of the Land Code, Article 173 of the Civil Code (CC), and Article 30 of Annex 1 of the Resolution of Cabinet of Ministers No. 1060 dated December 29, 2018, servitude is established by agreement between persons demanding the establishment of servitude and the owner, user, lessee, proprietor of the land plot. If they do not achieve consent, the servitude shall be established by a court decision at the user's claim. The agreement on servitude shall be subject to state registration and preserved when the land plot is transferred to another person. Servitude agreements can be terminated in cases of the cessation of the reason according to which it was established.
- Article 173 of CC also states that the burdening of a land parcel by servitude does not deprive the owner of the parcel of the rights of possession, use, and disposition of this parcel.
- Calculation and compensation of losses due to servitude agreement are performed following Law No 781 "On procedures for the withdrawal of land plots for public needs with compensation" (if it is a project for public needs) the Resolutions of Cabinet of Ministers No.146 from 25 May 2011 "On measures to improve the procedure for granting land plots for urban development activities and other non-agricultural purposes" and No. 911 from 16 November 2019 "On additional measures for enhancing modalities of providing compensation on withdrawal and allocation of land plots and safeguard the property rights legal and physical entities".
- Article 86 of the LC states that losses caused to the owners of land parcels, landowners, land users and lessees are liable to be fully refunded (including the lost profit) in the case of limitation of their rights in connection with land acquisition. Refunding of losses is carried out at the expense of the resources of the corresponding centralized funds for compensation of losses to individuals and legal entities in connection with the seizure of land plots from them for public needs and by enterprises, establishments and organizations the activity of which causes limitation of rights of land parcel owners, landowners, land users and lessees or worsening the quality of the neighbouring lands in the order established by legislation.
- Article 173 of the CC states that the parcel owner burdened with the servitude has the right unless otherwise provided by a Law, to demand from the person in whose interests the servitude is established proportional payment for the use of the parcel.

3.1.10.5 Labour and employment

The following laws pertain to the recruitment and management of labour in Uzbekistan, and the protection of labour rights within the workplace. An elaboration of key relevant provisions is provided in Section 16 of this report.

- Labour Code of the Republic of Uzbekistan 1996 as amended on 18.05.2022.
- Law "On the employment of the population" No. 642 of 20.10.2020.
- Resolution of the Ministry of Labour and Social Protection of the Population, Ministry of Health of the Republic of Uzbekistan, registered on 29.07.2009, reg. number 1990 "About the approval of the list of occupations with unfavourable conditions, in which the use of the labour of persons under 18 years of age is prohibited".
- Decree No. 133 of 11 March 1997 to approve normative acts necessary for the realization of the Labour Code of the Republic of Uzbekistan.
- Decree of the Cabinet of the Ministers No. 1011 of 22 December 2017 "On Perfection of the Methodology of Definition of Number of People in Need of Job Placement, including the Methodology for Observing Households with Regard to Employment Issues, also for the Development of Balance of Labour Resources, Employment and Job Placement of Population".
- Decree of the Cabinet of the Ministers No. 965 of 5 December 2017 "On the Measures of Further Perfection of the Procedure of Establishment and Reservation of Minimum Number of Job Places for the Job Placement of Persons who are in need of Social Protection and Face Difficulties in Searching Employment and Incapable of Competing in Labour Market with Equal Conditions".
- Decree No. 964 of 5 December 2017 "On the Measures for Perfection of the Activity of Self-Government Bodies Aimed at Ensuring Employment, Firstly for the Youth and Women".

3.1.10.6 Archaeology and cultural heritage

The laws pertaining to the exploration, protection and preservation of archaeological resources and cultural heritage sites in Uzbekistan are listed below. Detailed mandatory requirements for different aspects of cultural heritage in relation to the Project will be provided in the detailed ESIA report.

- Constitution of the Republic of Uzbekistan, the Criminal Code of the Republic of Uzbekistan.
- Law No. ZRU-229 "On protection and use of the objects of archaeological heritage" (13 October 2009).
- Law No. 269-II "On the Protection and Use of Cultural Heritage Sites (30 August 2001, as amended).

- Presidential Decree No. R-5181 "On improving the protection and use of objects of tangible cultural and archaeological heritage" (16 January 2018).
- Presidential Decree no. PP-4068 "Regarding the strengthening of the protection, management and enhancement of tangible and intangible cultural heritage" (19 December 2018). The relevance of these requirements will be determined during the ESIA process.

3.1.10.7 Safety along overhead transmission lines

An essential standard for establishing OTL is SanPiN No.0236-07 on "Ensuring Safety for the Population Living Near High Voltage Power Lines". This standard specifies Health Protection Zones (HPZs), also known as setbacks, for the overhead power lines with different voltage ratings. The purpose of the HPZs is to protect any human receptors (and occupied buildings in particular) from any substantial electromagnetic fields (EMFs) that pose adverse impacts on human health. For newly designed OTL, buildings and structures must be set back the following distances either side of the OTL[1]:

- 15 m for OTL with a voltage of 220kV.
- 20 m for OTL with a voltage of 330 kV.
- 30 m for OTL with a voltage of 500 kV.
- 40 m for OTL with a voltage of 750 kV.
- 55 m for OTL with a voltage of 1150 kV.

All of the OTLs planned under the Project have a voltage rating of 220 kV. Accordingly, the HPZ for the OTLs is 15 metres, from the outer most conductors on each side of the OTLs.

Other relevant national laws and regulations pertaining to the installation and operation of transmission and distribution powerlines, in the context of E&S assessment, include the following:

- Resolution of Cabinet of Ministers of Republic of Uzbekistan No.95 "On approval of general technical regulations of environmental safety" (2020).
- Decree of the Cabinet of Ministers of the Republic of Uzbekistan No.1050 "On approval of Rules for Protection of Power Grid Facilities, 2018".
- SanPiN & Norms No. 0236-07 "Sanitary norms and rules to ensure safety for people living near high voltage power transmission lines, 2007".

Electrical safety regulations pertaining to ecological receptors include the following:

- Resolution of Cabinet of Ministers of Republic of Uzbekistan No.95 "On approval of general technical regulations of environmental safety" (2020). This law requires the implementation of environmental safety measures for the protection of flora and fauna. This includes the prevention of faunal mortalities

1 The HPZ (set back) is defined as the distance from the outermost wires in a direction perpendicular to the OTL.

due to electrocution through provisions such as equipment housing and plant site barriers.

- Decree of the Cabinet of Ministers of the Republic of Uzbekistan No.1050 "On approval of Rules for Protection of Power Grid Facilities, 2018". This law established the procedure for establishing protected zones for power grid facilities, as well as special conditions for using land located within the protected zones and ensure the functioning and operation of the said facilities. Construction of power grid facilities with 110, 220 or 500kV in protected areas of state nature reserves, protected areas of nature parks and state biosphere reserves requires prior permission from the Cabinet of Ministers of the Republic of Uzbekistan.

  Grid Security Zones for power grid facilities shall be established on both sides of the power transmission line from the outermost wires and along the perimeter of substations at the following distances for voltages:

  - 110kV – 20 meters from each outer-most conductor
  - 220kV – 25 meters from each outer-most conductor
  - 500kV – 30 meters from each outer-most conductor

  The Grid Security Zones (GSZ) applicable to the protection of the Project's 220 kV OTLs are 25 metres (from the outermost conductors).

3.1.10.8 Management of public grievances

The Resolution No. 728 provides for the resolution of communal and private grievances in relation to various development projects and programs within Uzbekistan.

The law establishes a centralized public Grievance Redress Mechanism (GRM) which employs a publicly accessible online platform for the collection of grievances from residents across the country. The Portal allows any member of the public to submit a grievance, for the attention of various authorities within the various domains of local and central Government. The application for grievance resolution can target any authority within the hierarchy of executive Government.

Upon initial review of the grievance statement by the target authority, the grievance is allocated to the most relevant LGA for further review and remedial action. In the event that resolution cannot be delivered by the most relevant LGA level, the grievance is cascaded higher along the administrative hierarchy, until an appropriate executive decision is provided by a competent authority.

In addition to the above, the Law of the Republic of Uzbekistan 'Regarding Appeals of Individuals and Legal Entities' No 378 dated 3.12.2014 (with amendments on 17th August 2017), regulates the appeals of individuals and legal entities to state bodies as well as to their officials. Appeals can be oral, written, or electronic and regardless of their form and type are of equal

importance. A people's 'Reception Office' is tasked with organising a direct dialogue with the population, ensuring the functioning of an effective system of appeals aimed at the full protection of their rights, freedoms and legitimate interests. Any applications are considered within 15 days from date of receipt and any additional consideration is completed within 1 month.

3.2 International Conventions and Protocols

Uzbekistan is signatory to a number of effective international conventions pertaining to environmental management, social sustainability, climate change and human rights. The nationally binding E&S commitments enshrined in these accords will apply to the Project, as outlined in the following table.

Table 3-1 International protocols and conventions

NAME OF INTERNATIONAL PROTOCOL/CONVENTION	SIGNED/ RATIFIED	RELEVANCE TO THE PROJECT
UN Framework Convention on Climate Change	Accession: 20 June 1993	The Project will comply with all national standards for GHG emissions in order to contribute to Uzbekistan's targets.
Kyoto Protocol to UNFCCC	Ratified: 12th October 1999	
Paris Agreement to UNFCCC	Signed: 19th April 2017	
Montreal Protocol on Substances that Deplete the Ozone Layer (with London, Copenhagen, Montreal amendments)	Accession: 10th June 1998	The Project will support Uzbekistan's contribution towards the protection of the ozone layer by refraining from use of ozone depleting substances.
Vienna Convention on the Protection of Ozone Layer	Accession: 18 May 1993	
UN (Rio) Convention on Biological Diversity	Accession: 19th July 1995	The Project will implement mitigation and management measures to ensure the conservation and protection of terrestrial and canal ecology during the Project lifecycle.
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	Accession: 10th July 1997	The Project staff and workers will be strictly forbidden from trading in any wild flora and fauna found in the Project site or outside the Project boundaries.
Convention on Migratory Species of Wild Animals	1 May 1998	The project will implement mitigation and management measures to ensure conservation of terrestrial and avian migratory species where identified.
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	Accession: 7th February 1996	The Project will be required to adhere to all national and international standards for hazardous waste generation and management.

Name of International Protocol/Convention	Signed/ Ratified	Relevance to the Project
United Nations Convention to Combat Desertification	Ratified: 31 August 1995	The Project will not result in accelerated desertification through sourcing of its materials and will contribute to sustainable development.
UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes	Accession: 4th September 2007	The canal south of the project site is found between the border of Uzbekistan and Tajikistan. Therefore, the Project will ensure that any impacts to the canal I.e. discharge are mitigated and managed in accordance with the national and lenders requirements.
Paris Convention on Protection of the World Cultural and Natural Heritage	Succession: 13th January 1993	The Project will implement mitigation and management measures where items/sites/monuments of cultural or natural heritage are identified within or near the Project boundaries and notify the relevant authorities immediately.
Stockholm Convention on Persistent Organic Pollutants	Accession: 28th June 2019	The Project will implement control measures to eliminate any use of chemicals under Annex A and B and reduce the unintentional release of those under Annex C.

In addition to the national labour requirements, the Republic of Uzbekistan has also ratified the following ILO conventions.

Table 3-2 ILO Conventions Ratified by Uzbekistan

ILO Conventions	Ratified
Convention No 29 on Forced Labour adopted in 1930	13th July 1992
Convention No 87 on Freedom of Association and Protection of the Right to Organise, adopted on 17th of June 1948	12th December 2016
Convention No 98 on the Right to Organise and Collective Bargaining adopted on 8th of June 1949	13th July 1992
Convention No 100 on Equal Remuneration adopted 6th of June 1951	13th July 1992
Convention 111 on Discrimination (Employment and Occupation) adopted 4th of June 1958	13th July 1992
Convention 138 on Minimum Age adopted 6th of June 1973	6th March 2009
Convention 182 on the Worst Forms of Child Labour adopted 17th June 1999	24th June 2008
Convention C105 on the Abolition of Forced Labour Convention, 1957	15th Dec 1997

ILO CONVENTIONS	RATIFIED
C187 Promotional Framework for Occupational Safety & Health Convention, 2006	14th September 2021
C081 Labour Inspection Convention 1947	19th Nov 2019
Protocol 29 – to the Forced Labour Convention	16th September 2019

3.3 Institutional Framework

Key organisations with responsibility for environmental management in Uzbekistan are:

- Cabinet of Ministers of the Republic of Uzbekistan (COM).
- Ministry of Ecology, Environmental Protection and Climate Change (MEEPCC).
- The Centre for State Ecological Expertise, which is under the MEEPCC.
- The Cabinet of Ministers of the Republic of Uzbekistan governs the executive body in the Republic of Uzbekistan following the Constitution of the Republic of Uzbekistan (Article 98), and the Law of the Republic of Uzbekistan "On the Cabinet of Ministers of the Republic of Uzbekistan" (new edition of 2019). The COM exercises the following main functions.

The Ministry of Ecology, Environmental Protection and Climate Change (MEEPCC) is the main regulating body of state administration on environmental protection issues. The primary responsibilities of the MEEPCC include ensuring the implementation of a unified state policy on environmental safety, environmental protection, and the use and reproduction of natural resources; and enforcing state control over the compliance of ministries, state committees, departments, enterprises, institutions, and organisations, as well as individuals, with respect to the use and protection of land, mineral resources, water, forests, flora and fauna, and atmospheric resources. Structurally, the MEEPCC consists of the central unit (located in Tashkent), regional units (oblast) and local (district) units.

The Centre for State Ecological Expertise: The Centre for State Ecological Expertise's activities are directly related to the evaluation of materials for EIA and the issuance of documents determining compliance with environmental requirements for planned or executed business and other activities, as well as determining the admissibility of the implementation of the object of environmental expertise.

Due to the cross-cutting nature of sustainable development and the environment, virtually all other state bodies have some responsibility towards them. Other Ministries, Departments and Agencies (MDAs) related to E&S impact management in the context of the Project include (but are not limited to):

Table 3-3 Main National Institutions and Roles

NAME OF INSTITUTION	MAIN ROLE
Ministry of Energy of the Republic of Uzbekistan (MoE)	The Ministry of Energy of the Republic of Uzbekistan is the authorised state body for: (i) implementation of production sharing agreements on issues related to the main areas of its activities; (ii) implementation of a unified state policy in the field of the use of renewable energy sources; (iii) development of a unified state policy and strategic directions in the development and use of nuclear energy; (iv) introduction of modern energy-efficient and energy-saving technologies in state bodies and organizations, as well as monitoring the efficiency of energy consumption.
Ministry of Ecology and Environmental Protection and Climate Change	Ministry is responsible for managing environmental monitoring for industrial facilities. It reviews and issues technical conditions for construction and operation of facilities, both planned and existing.
Ministry of Mining Industry and Geology of the Republic of Uzbekistan	Ministry is responsible for managing and monitoring mining and geological activities. It will dictate technical condition for conducting construction activities near ongoing geological/mining activities and surveys at the Project boundary.
State Committee on Sericulture and Wool development Industry	Committee owns pastural lands across Uzbekistan, including Project site. It will allocate land for permanent acquisition for installation of wind turbines.
Ministry of Transportation	Responsible for development of domestic and international transport corridors, improvement of the logistics system and amelioration of traffic safety. Important for the Project considering the use of public roads during construction and operation.
Sanitary and Epidemiological Welfare and Public Health Service of The Republic of Uzbekistan	Responsible for determining the Health Protection Zone (HPZ) under the Ministry of Health. The HPZ applicable for the Project is determined this government organisation.
JSC National Electric Grid of Uzbekistan (NEGU)	NEGU is entrusted with the following key functions: (a) transmission system operation and development; (b) dispatch management of the power system; (c) transmission of electricity within the country; (d) regional connectivity and electricity trade (export and import); and (e) single purchaser of electricity from generation companies, including IPPs, as well as the sale of electricity to distribution companies.

3.4 Lender E&S Requirements

The Project developer is pursuing an amount of project finance from a number of Financial Institutions (FIs), which seek to mainstream environmentally and socioeconomically sustainable development planning through the evaluation and management of E&S risks associated with investment projects, in step with:

- Internal E&S policies, standards, and guidelines
- Industry-wide, voluntary E&S risk assessment and management frameworks drawing on well-developed and internationally accredited E&S performance standards

The Project's prospective lenders include Asian Development Bank (ADB), Asian Infrastructure Investment Bank (AIIB), and Netherlands Development Finance Company (FMO). Some of these FIs have adopted the International Financial Corporation (IFC) and Equator Principles Financial Institutions (EPFIs).

The E&S policies, frameworks, and performance standards applicable the Project based on its prospective lenders are outlined in the following sub-sections.

3.4.1 Asian Development Bank (ADB)

The E&S policies, principles and objectives adopted by the ADB are enshrined in the Safeguard Policy Statement (SPS 2009). The main focal areas of the Policy are (i) environmental safeguards, (ii) involuntary resettlement, and (iii) Indigenous Peoples (IP) safeguards. The key objectives of the SPS include:

- To avoid adverse impacts of projects on the environment and affected people, where possible.
- To minimise, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is impossible.
- To help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

ADB's SPS sets out the policy objectives, scope and triggers, and principles for three key safeguard areas:

- Environmental safeguards;
- Involuntary resettlement safeguards; and
- Indigenous Peoples safeguards.

ADB's Indigenous People's Safeguard is not applicable to this Project. This is because as per the ADB's requirement on Indigenous Peoples, there are no indigenous peoples within the project area of influence.

The Project is required to comply with the following policies and associated 'operations manuals' and guidelines:

- ADB Safeguard Policy Statement (2009);
- ADB Social Protection Strategy (2001) (national laws and key ILO standards);
- ADB Gender and Development Policy (1998); and
- ADB Access to Information Policy (2018).

3.4.2 Asian Infrastructure Investment Bank (AIIB)

As stated in the AIIB Environmental and Social Framework (ESF), 2024), the Bank has established an Environmental and Social Policy (ESP), which sets forth mandatory environmental and social requirements applicable to all Projects. The Policy underlies the AIIB Environmental and Social Standards (ESSs) and Environmental and Social Exclusion List (ESEL). The ESSs that govern E&S performance on AIIB-funded project include:

- ESS 1: Environmental and Social Assessment and Management (ESS 1);
- ESS 2: Land Acquisition and Involuntary Resettlement (ESS 2); and
- ESS 3: Indigenous Peoples (ESS 3).

For the screening, assessment and management of E&S risks pertaining to pollution control and environmental health and safety, the ESF stipulates conformance to the World Bank Group Environmental Health and Safety Guidelines (EHSGs).

3.4.3 Netherlands Development Finance Company (FMO)

FMO is committed to work constructively with other DFIs and banks. This includes exchanging information, collaborating in developing a mutual understanding of ESG risks, impacts and mitigation strategies, co-financing and engaging with customers. FMO may partially or fully rely on trusted Partner institutions to operationalize the intentions of FMO's Sustainability Policy during due diligence, contracting and monitoring, in line with their own processes and procedures. FMO is a member of EDFI, and has a Friendship Facility agreement with the German Investment Corporation or DEG (Deutsche Investitions- und Entwicklungsgesellschaft) and Proparco under which FMO relies on the Partner's investment due diligence and customer monitoring. Similarly, FMO has a Master Cooperation Agreement with IFC (International Finance Corporation).

GERMAN INVESTMENT CORPORATION (DEG)

The DEG undertakes E&S due diligence for its investment portfolio, in accordance with its Guideline for Environmental and Social Sustainability (GESS). The Corporation is a member of the KfW Bankengruppe, having endorsed the United Nations Environment Programme (UNEP) Initiative for Financial Institutions on the Environment and Sustainable Development. The GESS references a commitment to observing E&S requirements promoted by the European Development Finance Institutions (EDFIs), which include the Equator Principles (EPs), IFC Performance Standards (IFC PSs) and the material stipulations of the Environmental, Health and Safety Guidelines of the World Bank Group, and the Conventions of the International Labour Organisation (ILO). These requirements are broadly described further below.

PROPARCO

Proparco is a development finance institution partly owned by the French Development Agency. The Corporation's Environmental and Social Governance (ESG) framework is rooted in the E&S management instruments of the AFD Group, the principles common to European donors, IFC's Performance Standards, the ILO international labour standards, the FAO criteria, and basic principles such as those of the Universal Declaration of Human Rights.

AFD E&S RISK ASSESSMENT AND MANAGEMENT FRAMEWORK

The French Development Agency has established an Environmental and Social Risk Management Policy (2017), which provides for the development of operating procedures to identify, prevent or mitigate environmental and social risks and impacts, as well as any human rights violation that could result from AFD-funded activities.

All operations financed by AFD are required to comply with the national regulations of the country where the operation is implemented, including for environmental and social issues. However, as regulations in some of the countries where AFD operates are incomplete or under development, AFD uses as a reference a number of performance standards, good practices and directives produced by international standard-setting organizations, as well as major conventions on sustainable development, which altogether include:

- The World Bank Safeguard Policies for public sector financing.
- The UN Principles for Responsible Investment (UNPRI).
- The IFC Performance Standards.
- The United Nations Universal Declaration on Human Rights.
- The ILO fundamental conventions on labour law.
- The United Nations Convention on the Elimination of All Forms of Discrimination against Women.
- The OECD guidelines for multinational enterprises.

Equator Principles

The Equator Principles (EP) is a risk assessment framework used by financial institutions to determine, assess and manage the environmental and social risk in Project's financing. Currently, over seventy-five major financial institutions from around the world have adopted the EPs. These financial institutions operate in more than 100 countries worldwide.

The Equator Principles were updated in 2006 (EPII), 2013 (EPIII) and a further update EPIV came into effect in October 2020. The EPs currently include provisions for the following:

- Principle 1: Review and Categorisation;

- Principle 2: Environmental and Social Assessment;
- Principle 3: Applicable Environmental and Social Standards;
- Principle 4: Environmental and Social Management System and Equator Principles Action Plan;
- Principle 5: Stakeholder Engagement;
- Principle 6: Grievance Mechanism;
- Principle 7: Independent Review;
- Principle 8: Covenants;
- Principle 9: Independent Monitoring and Reporting; and
- Principle 10: Reporting and Transparency.

EP IV establishes the minimum E&S standards to be adopted by EP Financial Institution (EPFIs) as those from IFC Performance Standards on Environmental and Social Sustainability (Performance Standards), the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines) and/or the relevant host country laws, regulations and permits that pertain to environmental and social issues.

IFC Performance Standards

The IFC Performance Standards are a key component of the IFC's Sustainability Framework and directed towards clients (i.e. party responsible for implementing and operating the project that is being financed), providing guidance on how to identify risks and impacts. The IFC Performance Standards are designed to help avoid, mitigate, and manage risks and impacts throughout the life of a project as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities.

The IFC Performance Standards (2012) are listed below:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
- Performance Standard 2: Labour and Working Conditions
- Performance Standard 3: Resource Efficiency and Pollution Prevention
- Performance Standard 4: Community Health, Safety, and Security
- Performance Standard 5: Land Acquisition and Involuntary Resettlement
- Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- Performance Standard 7: Indigenous Peoples
- Performance Standard 8: Cultural Heritage

WBG EHS Guidelines (2007)

The World Bank Group International Finance Corporation (IFC), Environmental, Health and Safety (EHS) General Guidelines of April 2007 superseded the World Bank Handbook issue of 1998.

In terms of specific guidelines to control environmental externalities (e.g. wastewater quality etc.), EHS guidelines have been set out by IFC and the World Bank Group to provide general guidelines for its members when involved in a project or when providing financial support to a project. These guidelines contain general and industry-specific examples of Good International Industry Practice (GIIP). In summary, it should be noted that the following IFC EHS Guidelines are relevant to this project:

- General EHS Guidelines, Environmental:
    - Air Emissions and Ambient Air Quality;
    - Energy Conservation;
    - Wastewater and Ambient Water Quality;
    - Water Conservation;
    - Hazardous Materials Management;
    - Waste Management;
    - Noise; and,
    - Contaminated Land.
- General EHS Guidelines, Occupational Health & Safety:
    - General Facility Design and Operation;
    - Communication and Training;
    - Physical Hazards;
    - Chemical Hazards;
    - Radiological Hazards;
    - Personal Protective Equipment (PPE);
    - Special Hazard Environment; and,
    - Monitoring.
- Community Health & Safety:
    - Water Quality and Availability;
    - Structural Safety of Project Infrastructure;
    - Life and Fire Safety (L&FS);
    - Traffic Safety;
    - Transport of Hazardous Materials;
    - Disease prevention; and,
    - Emergency Preparedness and Response
- Industry Sector Guidelines, Power:

- Electric Power Transmission and Distribution (2007); and
- Wind Energy (2015).

3.5 Applicable Environmental Standards

Applicable standards required for Project compliance are included to the respective environmental parameter sections of this report. This includes national standards and those expected for the lenders.

3.6 EIA/ESIA Requirements

3.6.1 National Requirements

PROJECT CATEGORISATION

As per the Resolution of the Cabinet of Ministries of the Republic of Uzbekistan No. 541 'On measures for the further improvement of environmental impact assessment' dated 7.10.2020 (amended on 30 April 2022), Projects with a total capacity of with a capacity of 100 MW to 300 MW are categorised as Category II.

EIA PROCESS

In accordance with the resolution of the Cabinet of Ministries of the Republic of Uzbekistan No. 541 the national EIA process consists of three stages:

- Stage I: "A Preliminary Statement of the Environmental Impact ("PSEI") - this is performed at the planning stage of the proposed Project prior to the allocation of funds for development.
- Stage II: The "Statement of the Environmental Impact" ("SEI") - this is prepared following Stage 1 and where the outcome of Stage 1 identified the need for additional studies or analyses. The SEI shall be submitted to State committee on ecology and environmental protection prior to the Feasibility Study or financing of the Project and, therefore, prior to the beginning of construction.
- Stage III: The "Statement on Environmental Consequences" ("SEC") is the final stage of the SEE process and is performed prior to approval of the Project. The report describes in detail the changes in the project made as a result of the outcomes of Stage 1 and Stage 2, the comments received during public consultations, the environmental standards applicable to the project (as defined by the modelling and assessment process), the environmental monitoring requirements and the main conclusions.

State Ecological Expertise approval: The State Committee on Ecology and Environmental Protection provides their opinion at Stage I and II is a typically a mandatory document for project financing by Uzbek banks, other Lenders and for Project commissioning at Stage III. However, it is possible to obtain approval after Stage I should the submitted EIA be sufficiently

detailed and comprehensive with respect to project information and baseline conditions. The conclusion of the State Committee is typically valid for three years from the date of its issuance. If the project is not implemented within three years from the date of issue of the conclusion, the EIA report needs to be revised and re-submitted for approval.

3.6.2 Lender Requirements

ADB

ADB Safeguard Requirements 1 requires an environmental assessment to be developed depending on the significance of the project impacts and risks, the assessment may comprise a full-scale environmental impact assessment (EIA) for category A projects, an initial environmental examination (IEE) or equivalent process for category B projects, or a desk review.

ADB uses a system to assess the potential environmental impacts of projects. The most sensitive environmental aspect determines the project's classification, taking into account all potential direct, indirect, cumulative, and induced effects. A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence. Each proposed project is scrutinized as to its type, location, scale, and sensitivity and the magnitude of its potential environmental impacts. Projects are assigned to one of the following four categories:

- "Category A: A proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required.
- Category B: A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.
- Category C: A proposed project is classified as category C if it is likely to have minimal or no adverse environmental impacts. No environmental assessment is required although environmental implications need to be reviewed.
- Category Financial Intermediary (FI): A proposed project is classified as category FI if it involves investment of ADB funds to or through a FI."

AIIB

AIIB's ESS1: Environmental and Social Assessment and Management outlines the requirement for environmental assessment if a Project is likely to have adverse environmental risks and impacts or social risks and impacts (or both).

AIIB assigns each proposed Project to one of the following four categories and determines the type of assessment and instrument required, as noted below and further elaborated throughout their ESP:

- Category A: A Project is categorized A if it is likely to have significant adverse environmental and social impacts that are irreversible, cumulative, diverse or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works and may be temporary or permanent in nature.
- Category B: A Project is categorized B if: (i) it has a limited number of potentially adverse environmental and social impacts; (ii) the impacts are not unprecedented; (iii) few if any of them are irreversible or cumulative; (iv) they are limited to the Project area; and (v) they can be successfully managed using good practice in an operational setting.
- Category C: A Project is categorized C if it is likely to have minimal or no adverse environmental and social impacts. The Bank does not require an environmental and social assessment, but does require the Client to prepare an analysis of the environmental and social aspects of the Project.
- Category FI. A Project is categorized FI if the financing structure involves the provision of funds to or through a financial intermediary (FI) for the Project, whereby the Bank delegates to the FI the decision-making on the use of the Bank funds, including the selection, assessment, approval and monitoring of Bank-supported activities, based on a sound environmental and social management system (ESMS) adopted by the FI.

DEG

The Corporation is an EPFI and will therefore follow the project E&S risk categorization established in the Equator Principles. In the EP framework, projects are categorised based on the magnitude of potential environmental and social risks and impacts, including those related to human rights, climate change, and biodiversity. Such categorisation is based on the International Finance Corporation's (IFC) environmental and social categorisation process, as outlined below. The EPFI's environmental and social due diligence is commensurate with the nature, scale and stage of the Project, and with the categorised level of environmental and social risks and impacts.

- Category A – Projects with potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible or unprecedented. the Assessment Documentation includes an Environmental and Social Impact Assessment (ESIA). One or more specialised studies may also need to be undertaken.
- Category B – Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures. A limited or focused environmental or social assessment may be appropriate, applying

applicable risk management standards relevant to the risks or impacts identified during the categorisation process.

- Category C – Projects with minimal or no adverse environmental and social risks and/or impacts. A limited or focused environmental or social assessment may be appropriate, applying applicable risk management standards relevant to the risks or impacts identified during the categorisation process.

PROPARCO

As stated in the AFD Environmental and Social Risk Management Policy (2017), AFD analyzes and classifies all potential projects into High – Substantial – Moderate – Low environmental and social risks, depending on the extent of the potential risks borne by the operation. The classification takes into account the nature and scale of the operation, the location and sensitivity of the affected area, the severity of the potential environmental and social risks and impacts, as well as the client's capacity to manage them.

This classification aims to determine the nature and depth of the environmental and social assessment required and the level of environmental and social standards the project will be required to comply with, as well as the needs to engage stakeholders and the level of information required. The project categorization is conducted right from the identification stage, of the expected intensity of its most sensitive component from an environmental and/or social perspective. In this classification process, AFD takes into account the direct, indirect, cumulative and induced risks and impacts in the area of influence of the operation.

The Policy establishes the need for a detailed Environmental and Social Assessment (ESA) for projects in both the High and Substantial Risks category, and a simplified form (e.g., a specific chapter of the feasibility study) for those in the Moderate Risks category. It is stated that no environmental and social assessment is required for projects in the Low Risks category. For High and Substantial risk projects, the analyses conducted (ESA, ESMP, RAP) must be subject to a free, prior and informed consultation of the people potentially affected by the project, the central and local administrations impacted, and civil society representatives involved in environmental and social issues.

On this basis, the Project in its entirety is provisionally classed as a Substantial Category undertaking, which requires a detailed ESIA study, an ESMP and sufficient stakeholder engagement.

EPFIs

According to EP2, *'The EPFI will require the client to conduct an appropriate Assessment process to address, to the EPFI's satisfaction, the relevant environmental and social risks and scale of impacts of the proposed Project'*.

IFC

Performance Standard 1 outlines the need to "*establish and maintain a process for identifying the environmental and social risks and impacts of the project*". The standard further states that "*The process may comprise a full-scale environmental and social impact assessment, a limited or focused environmental and social assessment, or straightforward application of environmental siting, pollution standards, design criteria, or construction standards*".

As part of the review of environmental and social risks and impacts of a proposed investment, IFC also uses a process of environmental and social categorization to reflect the magnitude of risks and impacts. These categories are:

- Category A: Business activities with potential significant adverse environmental or social risks and/or impacts that are diverse, irreversible, or unprecedented.
- Category B: Business activities with potential limited adverse environmental or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.
- Category C: Business activities with minimal or no adverse environmental or social risks and/or impacts.
- Category FI: Business activities involving investments in financial institutions (FIs) or through delivery mechanisms involving financial intermediation. This category is further divided into three categories.

4 APPROACH TO ESIA

4.1 ESIA Team

ACWA Power has engaged 5 Capitals to lead the environmental and social process with regard to the Project. This includes supporting the Project consortium up to financial close with their prospective lenders.

In order to ensure that the Project meets the requirements of the SCEEP, 5 Capitals sub-contracted Juru, who were responsible for the national EIAs for submission to SCEEP and certain elements of the ESIA process, including baseline studies, stakeholder identification and engagement/consultation and liaison with relevant government authorities in Uzbekistan.

Table 4-1 5 Capitals' Project Team

NAME	ROLE
Ken Wade	Project Director
Tarek Tabaja	Project Manager and ESIA Specialist
Max Burrow	ESIA Specialist
Umida Rozumbetova	ESIA Specialist
Dr. Caleb Gordon	Biodiversity Specialist and Ornithologist

Table 4-2 Juru Project Team

NAME	ROLE
Dinara Rustami	Project Manager
Gulchekhra Nematullayeva	Social specialist
Dilshod Kurbanov	Valuator
Anna Ten	National Ornithologist
Natalia Beshko	Botanist
Oleg Khegay	Environmental Specialist
Eleonora Ishmukhamedova	EIA Specialist

4.2 Impact Assessment Methodology

4.2.1 Process

The ESIA process is a systematic tool for examining and assessing the potential beneficial and adverse environmental and social impacts of a proposed development. In addition to identifying impacts of the Project, the ESIA has also identified key environmental and social mitigation measures and guidance to avoid, minimise and compensate for any adverse

environmental and social impacts associated with the construction and operation of the Project. The ESIA process is summarised in the table below and in the following sections.

Table 4-3 Overview of the ESIA process

STAGE	TASK	OBJECTIVE
Scoping	Gap Analysis	Identify the approach, methodology and data requirements of the ESIA
ESIA ↓	Consultation	Consult with statutory and non-statutory organisations and individuals with an interest in the development
	Desk Based Literature Review	Use existing secondary information and data sources to obtain information on the environmental and social conditions of the development site and immediate surroundings.
	Primary Data Collection	Characterise the existing physical, ecological and social conditions of the development site and immediate surroundings.
	Specialist Studies	Further investigate those environmental parameters which may be subject to potentially significant impacts.
	Impact Assessment	Evaluate the existing environment and social conditions in terms of sensitivity to predict the magnitude and associated significance of the potential impacts.
	Mitigation Measures	Identify appropriate and practicable mitigation and enhancement measures to avoid, minimise and/or offset any adverse impacts. Monitoring plans are proposed to monitor residual impacts.

To obtain a credible assessment of environmental and social impacts, the assignment of 'significance' to each identified impact needs to be a robust, consistent and transparent process. The methodology to assess 'effect significance' is outlined below and follows a GIIP approach based on the assumption that the significance of an impact on resources or receptors is considered to result from an interaction between two factors:

The nature and magnitude of the impact (i.e., a change in the environment, social and/or health baseline conditions); and

The environmental value or sensitivity of those resources or receptors to the change.

A three-step approach has been used to determine the significance of environmental and social impacts, as follows:

- **Step 1** – Evaluation of value/sensitivity/vulnerability of resource or receptor;
- **Step 2** – Assessing the magnitude of the impact on the resource or receptor; a
- **Step 3** – Determining the significance of impacts

4.2.2 Impact Assessment Significance Criteria

4.2.2.1 Determining Receptor Sensitivity

The sensitivity of a receptor is understood as the sensitivity of the environmental or social receptor to change, including its capacity to accommodate changes that the Project may bring about. The sensitivity is assigned at the receptor level and as such details regarding sensitivity are provided within the topic specific chapters of this Report. The table below outlines the definition criteria upon which the receptor sensitivities of this ESIA are based.

Sensitive receptors are defined as:

> Elements of the environment that are of value to the functioning of natural systems (i.e., areas or elements of ecological, landscape or heritage value, species, habitats and ecosystems, soil, air and water bodies or land-use patterns); and
>
> **Human** receptors, such as stakeholders (i.e., users of dwellings, places of recreation, places of employment, community facilities or household relocation, cultural heritage – tangible & intangible-, community health, livelihoods & economic activities, gender relationships) and human systems (e.g. employment market, population disease susceptibility and disease communicability, public infrastructure and services, exposure to toxicity of chemicals).

Table 4-4 Receptor Sensitivity Criteria

SENSITIVITY	DESCRIPTION OF VALUE
Very High	• High importance and rarity on an international scale (IUCN Endangered or Critically Endangered) and limited or no potential for substitution. • The receptor has already reached its carrying capacity, so any further impact is likely to lead to an excessive damage to the system that it supports (e.g., very limited or non-existent infrastructure and services such as hospitals and schools, available natural, economic or local resources are not sufficient to provide means of livelihoods for all local populations). • Locations or communities that are highly vulnerable to the environmental and social impact under consideration or critical for society (e.g., indigenous peoples, hospitals, schools). • Other examples are very high proportion of vulnerable groups (women, elderly, disabled, etc.) in the Project area, very frequent occurrences of gender-based violence, very low probability of female participation in decision making and in the labour market, archaeological items of international importance or designated UNESCO world heritage sites, tangible or intangible cultural assets that contribute to international research objectives, etc.
High	• High importance and rarity on a national scale, and limited potential for substitution. • The receptor is close to reaching its carrying capacity, so a further impact may lead to a significant damage to the system that it supports (e.g., poor or limited public infrastructure and services, with limited access and high pressure on existing natural or economic resources available).

SENSITIVITY	DESCRIPTION OF VALUE
	• Locations or communities that are particularly vulnerable to the environmental impact under consideration (e.g., residential areas, vulnerable/marginalized groups). • Other examples are high proportion of vulnerable/marginalised groups (women, elderly, disabled, etc.), locations with poor health practices, poor education level, high crime rate, frequent occurrences of gender-based violence, tangible or intangible cultural assets that contribute to national research objectives, etc).
Medium	• High or medium importance and rarity on a regional scale, limited potential for substitution. • The receptor is already significantly impacted, but it is not close to reaching its carrying capacity. Further impacts will get increase the stress of the underlying system, but evidence does not suggest that it is about to reach a critical point (e.g., public infrastructure and services with some capacity, alternative natural or economic resources are available but not sufficient or easily accessible). • Locations or groups that are relatively vulnerable to the environmental impact under consideration (e.g., commercial areas). • Other examples area: average proportion of vulnerable/marginalised groups, occasional occurrences of gender-based violence, tangible or intangible cultural assets that contribute to regional research objectives, etc).
Low	• Low or medium importance and rarity on a local scale. • The receptor is not significantly impacted and shows a large spare carrying capacity. Impacts are not likely to generate any noticeable stress in the underlying system (e.g., reasonable public infrastructures and services, sufficient natural, economic or local resources available but not easily accessible). • Locations or groups that show a low vulnerability to the environmental impact under consideration (e.g., industrial areas). • Other examples are low proportion of vulnerable/marginalised groups, rare occurrences of gender-based violence, tangible or intangible cultural assets that contribute to local research objectives, etc).
Very Low	• Very low importance and rarity on a local scale. • The receptor is not impacted and shows a very large spare carrying capacity. Impacts are very unlikely to generate any noticeable stress in the underlying system (e.g., very good public infrastructures and services with some capacity, equivalent natural, economic or local resources available and easily accessibly). • Locations or groups that show a very low vulnerability to the environmental impact under consideration (e.g., industrial areas). • Other examples are very low proportion of vulnerable/marginalised groups, no occurrence of gender-based violence, tangible or intangible cultural assets that are not legally protected and have no significance to local people (i.e. local people no longer use the cultural asset, etc).

4.2.2.2 Identifying Potential Impacts

The following types of impacts have been considered:

Direct Impacts - Potential impacts that may result from the construction, commissioning, and operations of the Project acting directly on an environmental or social receptor;

Indirect Impacts – Potential impacts which are not a direct result of a Project activity, that may be realised later in time or at distances further removed from the project footprint, but are normally a result of a complex pathway;

Cumulative Impacts – Changes to the environment that are caused by an action in combination with other past present and future actions;

Beneficial Impacts – Those impacts that have a positive, desirable or favourable effect on the sensitive resources or receptors (e.g. landscape providing artificial habitat for a variety of species, jobs opportunities during the construction and/or occupation phases of a project);

Adverse Impacts – Those impacts that are detrimental and have a negative influence on the environment, social structures, resources or other receptors;

Secondary Impacts - Potential impacts that may result from the implementation of protection measures applied to mitigate potential direct impacts; and

Event Related Impacts - Potential unplanned or accidental impacts stemming from an unintentional event such as fire, explosion, oil spill, etc.

4.2.2.3 Determining Impact Magnitude

The magnitude of an impact has numerous components, for example:

The extent of physical change;

The level of change in an environmental condition;

The permanence of impact and the reversibility of the impacted condition;

Its spatial footprint;

Its duration and frequency; and

Its likelihood of occurrence where the impact is not certain to occur.

The magnitude of the impact will be defined wherever possible in quantitative terms and where necessary, the determination of impact magnitude will be assisted through the use of modelling. The general criteria used for identifying the magnitude of impacts is provided within the table below.

Table 4-5 Impact Magnitude Criteria

MAGNITUDE	DESCRIPTION OF MAGNITUDE
Major	**Adverse**: Loss of resource and/or quality and integrity; severe damage to key characteristics, features or elements. A major impact is usually large in extent, permanent and irreversible. **Beneficial**: Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	**Adverse**: Significant impact on the resource, but not adversely affecting the integrity; Partial loss of/damage to key characteristics, features or elements. Moderate impacts usually extend outside the site boundary, and are usually permanent, irreversible or cumulative. **Beneficial**: Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.

Magnitude	Description of Magnitude
Minor	**Adverse**: Some measurable change in attributes quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. Minor impacts usually are only noticeable within the site and are temporary and reversible. **Beneficial**: Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	**Adverse**: Very minor loss or detrimental alteration to one or more characteristics, features or elements. **Beneficial**: Very minor benefit to or positive addition of one or more characteristics, features or elements.
No change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.

4.2.2.4 Determining Significance

The significance of effects is a combination of the sensitivity of a receptor or resource and the magnitude of the project impact.

The following matrix provides criterion used for determining the significance of environmental effects through consideration of the potential magnitude of impact and sensitivity of the associated receptor.

As is evident from the matrix, in some cases the significance product is a range (i.e., a 'Minor' Magnitude and a 'Very High' Sensitivity results in a 'Moderate or Major' Significance). In these cases, professional judgement will be used to determine which significance the impact best represents.

Table 4-6 Criteria for Determining Significance of Effects

		Magnitude of Impact (Degree of Change)				
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
Sensitivity of Receptor	**Very High**	Neutral	Minor	Moderate or Major	Major	Major
	High	Neutral	Minor	Minor to moderate	Moderate or Major	Major
	Medium	Neutral	Negligible or minor	Minor	Moderate	Moderate or Major
	Low	Neutral	Negligible or minor	Negligible or minor	Minor	Minor or moderate

		MAGNITUDE OF IMPACT (DEGREE OF CHANGE)				
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
	Very Low	Neutral	Negligible	Negligible or minor	Minor	Minor

The following table outlines general definitions of significance.

Table 4-7 Definition of Significance

SIGNIFICANCE CATEGORY	CRITERIA
Major	• The impact is large scale and would cause a large improvement or deterioration in the environment, • Adverse impacts may be considered unacceptable due to exceeded of statutory limits and may require additional studies to ascertain if alternatives (in terms design and location) with the potential for lower impacts should be considered. These impacts represent key factors in the decision-making process. • These impacts are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category.
Moderate	• The impact gives rise to noticeable improvement or deterioration to the existing environment at a regional or local scale. • If adverse, impacts are potential concerns to the project and may become key factors in the decision-making process. • Whilst the impacts will be experienced, mitigation measures and detailed design work may reduce (or enhance) the effect. Some residual effects will still arise.
Minor	• The impact is small scale and would cause a small improvement or deterioration to the existing environment. • Adverse effects are undesirable but acceptable and within statutory limits and not likely to be key decision-making issues. • Mitigation measures are typically not requited to mitigate such effects. • The cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.
Negligible	• No discernible improvement or deterioration to the existing environment as a result of the Project will occur. • Local issue unlikely to be of importance in the decision-making process. • Effects do not exceed statutory limits. • They are of relevance in enhancing the subsequent design of the project and consideration of mitigation or compensation measures.
Neutral	• No effect or effect that is beneath the level of perception, within normal bounds of variation or within the margin of forecasting error. • No mitigation is required.

The approach to assigning significance relies on reasoned argument, professional judgement and cognisance to the advice and views of the appropriate regulators and organisation. For some disciplines, it is determined by comparison, wherever possible with locally, nationally or internationally accepted standards.

4.2.3 Mitigation and Management Measures

A key component of the ESIA process is to explore practical ways of avoiding or reducing potentially significant impacts caused by development of the Project. These are commonly referred to as mitigation measures and will be incorporated into this Report and the future CESMP and Operational ESMP (OESMP). Mitigation will be aimed at preventing, minimising or managing significant adverse impacts to as low as reasonably practicable (ALARP) and enhancing and maximising any potential beneficial impacts of the Project.

The approach taken to identifying and incorporating mitigation measures into the Project is based on a typical hierarchy of decisions and measures. This is aimed at ensuring that, wherever possible, potential impacts are mitigated at source rather than mitigated through restoration after the impact has occurred. In ensuring the Project achieves the applicable environmental standards and guidelines, mitigation measures have been adopted within the Project's design. In addition to specific measures included within the design of the Project, the ESIA will outline further mitigation and/or management measures for the construction and the operational phases, upon which the Project can further minimise or avoid negative impacts and enhance positive impacts.

Upon approval of the Project, the stated mitigation and management measures in the approved ESIA will be required for implementation as a condition of the Environmental Permit or as part of the lenders loan agreement.

4.2.4 Residual Impacts

The residual impacts section considers the overall significance of impacts following the implementation of the additional mitigation and management measures not included by design. The significance of such impacts is based upon the same criteria used to determine the impact significance stated above.

4.2.5 Cumulative Impacts

Cumulative impacts are those impacts that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones.

In practice, the assessment of cumulative effects requires consideration of some concepts:

- Assessment of effects over a larger (i.e., "regional") area that may be transboundary/cross-jurisdictional; (including effects due to natural perturbations affecting environmental components and human actions).
- Assessment of effects during a longer period of time into the past and future;

- Assessment of effects on Valued Environmental Components due to interactions with other actions, and not just the effects of the single action under review; and
- Evaluation of significance in consideration of other than just local, direct effects.

5 STAKEHOLDER ENGAGEMENT

The following sections outline the objectives of stakeholder engagement and preliminary identification of various project stakeholders, in terms of their roles and broader relation to the project. A description of stakeholder engagement activities completed at the time of this assessment also provided below. A more elaborate description of the stakeholder engagement process and the way forward for future stakeholder engagement is provided in the Stakeholder Engagement Plan (SEP) submitted in tandem with this Report.

5.1 Stakeholder Engagement Objectives

Stakeholder engagement is a crucial element of the Project's ESIA, as prescribed in relevant national legislation and the Project Lenders' E&S performance standards. The legal framework requires a meaningful and adaptive stakeholder engagement process which begins at reasonably early stages of project planning and continues throughout subsequent stages of project implementation. Continual stakeholder engagement serves to fulfil the following E&S performance objectives:

- To establish a participatory, informative, and transparent dialogue with parties with the potential to influence the project and/or become affected by the project, as well as constituencies with an interest in the outcome of the project.
- To leverage and integrate local and expert knowledge in the identification and assessment of E&S impacts, subsequent optimization of the project design and effective mitigation planning.
- To establish community, buy-in and ensure the delivery of sustainable and equitable project benefits to targeted beneficiaries.

Stakeholder engagement is a 'live' process that must be organized by means of a dedicated and documented Stakeholder Engagement Plan (SEP). The SEP developed at the bankable ESIA stage was built upon the rounds of stakeholder engagement discharged as part of the national EIA process. The basis for the preparation of the project SEP and an overview of the SEP commitments are detailed below.

5.2 Stakeholder Mapping

The preparation of the Stakeholder Engagement Plan (SEP) commenced with a stakeholder mapping exercise. The wide range of stakeholders associated with the Project were identified and categorized based on a review of the Project's legal framework and preliminary identification of E&S impact receptors. In terms of administrative capacity, the project stakeholders were categorized as follows:

1. Directly affected People.
2. Project-Affected Communities.
3. Indirectly affected facilities.
4. Local Government Authorities.
5. National Agencies/Institutions.
6. State organizations/Ministries
7. Non-Governmental Organizations (NGOs).

Subsequently, the stakeholders were characterized and prioritized in terms of their relevance to the project to enable a differential engagement strategy, such that the scope, modes and frequency of planned consultation and disclosure are commensurate with the parties' roles, risks, and interests in relation to the Project. This systematic characterization enabled a subsequent round of stakeholder categorization, based on their relation to the project:

- Decision-making stakeholders (Category 'D') – entities charged with the implementation, appraisal and/or regulation of the various project aspects, which can critically affect the course of the Project (i.e., national regulators and Project Lenders).
- Impact-based stakeholders (Category 'A') – entities that are potentially impacted by the Project directly or indirectly.
- Interest-based stakeholders (Category 'I') – entities that are neither affected by the project nor bear any executive influence on the project but hold certain interests in the project.

Table below provides an overview of the stakeholder categories (by administrative order), stakeholder ratings (by role), their respective consultation and disclosure agenda and the engagement mode for each.

Table 5-1 Stakeholder Engagement Matrix for the Project

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT:	CONSULTATION AGENDA
Directly affected people	**WIND FARM**		
	SWID – land owner Beruniy Karakul LLC – land lease	D: Landowner, custodianship of land reserved for governmental and pastural use.	Providing information about Project Identification of land use and number of land users Phone Calls/Face to Face meetings/Letters
	Herders	A: Informal land-users subject to economic displacement because of land acquisition for the Project's development.	Providing information about Project Identification of land use (type and frequency) Conducting surveys for assessment of impact from economic displacement to the land acquisition Formal meetings/phone calls
	OHTL		
	Business structures	A: Land-users subject to economic displacement as a result of land acquisition for the Project's development.	Providing information about Project Identification of land use (type and frequency)/ affected structures, crops, trees and assets Conducting surveys for assessment of impact from economic displacement to the land acquisition Formal meeting/phone calls
	Owners of residential land plots		
	Farmers		
	Dekhkan farms		
Directly affected private enterprises	Private agricultural enterprises (clusters)		
Directly affected local infrastructures	JSC "Uztelecom"	A: In charge of communication cables are	Providing information about Project

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT:	CONSULTATION AGENDA
		subject to relocation due to installation of the OHTL tower	Identification of cables that are subject to relocation due to the tower installation Conducting site survey to determine type and length of impacted cables Formal meeting/phone calls/site walkovers
Directly impacted organisations	Beruniy distirct agricultural department	A: Land-users subject to economic displacement as a result of land acquisition for the Project's development.	Providing information about Project Identification of affected crops /trees/ assets , if any Conducting inventory survey at affected land plots Formal meetings/phone calls
	Beruniy district khokimiyat		
	Beruniy department of State forestry fund		
	NEGU		
	WIND FARM&OHTL		
Project-affected Communities	Abay village, including vulnerable groups (as defined in Section 14.2.10)	A: Communities subject to indirect E&S impacts from various project aspects.	I Inform village residents about planned Project Determine current socio-economic state of village Determine types of land use by residents at WF site, if applicable Involvement during public hearing/disclosure process. Formal Meetings & Bi-Lateral/ Phone Calls/Face to Face meetings
	Dustlik village, including vulnerable groups (as defined in Section 14.2.10)		
	Kyzyl Kala village, including vulnerable groups (as defined in Section 14.2.10)		
	Makhtumkuli village, including vulnerable groups (as defined in Section 14.2.10)		
	Nayman village, including vulnerable groups (as defined in Section 14.2.10)		

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT:	CONSULTATION AGENDA
	WIND FARM		
Indirectly affected facilities	Nukus Phase I Wind Farm	I: Potentially affected due to the construction activities share the same cumulative impacts	Nukus Phase I Wind Farm is being developed by the same Company. As such cumulative impacts that may occur will be assessed in ESIA report
	Mramor LLC	I: Potentially affected by traffic and transportation at construction stage	Request for any form of land use at WF site and frequency of A 380 highway use Phone Calls/Face to Face meetings/ Letters
	Karakalpak sement LLC (Cement plant)	I: Potentially affected by traffic and transportation at construction stage	Request for any form of land use at WF site and frequency of A 380 highway use Phone Calls/Face to Face meetings/ Letters
Local Government Authorities	Council of Ministries of Republic of Karakalpakstan (Jukory Kengesh)	D: Higher governmental organisation that oversees state monitoring at district/city levels in Republic of Karakalpakistan	Informing Council of Ministries about Project and upcoming activities associated with E&S assessment and reporting. Formal meetings & Bi-Lateral/Phone Calls/Face to Face meetings/Letters
	Beruniy distirct khokimiyat	D: District-level planning and administration of development projects. Preparation of land-use proposals, approval of subsequent land-use plans, commissioning of cadastral registration of landholdings, and administration of Land Lease Agreements (LLAs). Issuing permission as well as assistance in arranging various E&S surveys	Request information for: - secondary data related to environmental and socio-economic state of district; - identification of local communities under AoI of Project; - identification of land use at WF area and along OHTL. Request assistance for: - arranging public hearing meetings; - arranging social surveys at affected communities;

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT:	CONSULTATION AGENDA
			- conducting surveys with affected land owners/leases - arranging public disclosure meetings. Formal Meetings & Bi-Lateral/ Phone Calls/Face to Face meetings/ Letters
	Beruniy district cadastral department	D: Cadastral registration of landholdings, based on approved land-use plans developed by Uzdaverloyiha State Research and Design Institute	Request for information on land ownership, land leases at WF area and along OHTL Formal Meetings & Bi-Lateral/ Phone Calls/Face to Face meetings/ Letters
	Beruniy department of State Forestry fund	D: Provision of technical conditions/ approvals for conducting construction works at land plots belonging to forestry reserve	Request for: - information on land ownership, land leases, if applicable; - information on existing utility infrastructure (gas/water pipes etc); - Feedback/ recommendation for construction activities. Formal Meetings & Bi-Lateral/ Phone Calls/Face to Face meetings/ Letters
	Council of farmers, dekhkan farms and owners of tomorka[2] of Republic of Karakalpakistan	I: Assistance in allocation of expert to the LALRP committee for supporting in resolving disputes, if any, related to compensation packages	Request for allocation of relevant specialist to Project LALRP Committee, Collecting feedback for Project preliminary entitlement matrix

[2] Tomorka is land plot within residential area (garden for cultivation of crops)

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT:	CONSULTATION AGENDA
	Department of SWID in Republic of Karakalpakstan	I: Assistance in allocation of expert to LALRP committee for supporting in resolving disputes, if any, related to compensation packages	Request for allocation of relevant specialist to Project LALRP Committee, Collecting feedback for Project preliminary entitlement matrix
	Makhtumkuli makhalla committee	I: Provision of assistance in submission of formal request for prioritizing 3 Project Affected Households (PAHs) (2 commercials and 1 residential land owner) during land e-auction; Participation in the activities of the LALRP committee to resolve disputes raised by PAPs, if any, related to compensation packages	Request for allocation of relevant specialist to Project LALRP Committee, Collecting feedback for Project preliminary entitlement matrix Following up on status of request submission to local authorities for replacement land to 3 PAHs
	Dostlik makhalla committee	I: Participation in the activities of the LALRP committee to resolve disputes raised by PAPs, if any, related to compensation packages	Request for allocation of relevant specialist to Project LALRP Committee,
	Abay makhalla committee	I: Participation in activities of the LALRP committee to resolve disputes raised by PAPs, if any, related to compensation packages	Collecting feedback for Project preliminary entitlement matrix

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT:	CONSULTATION AGENDA
	Local public utility service operators – JSC Uztelecom, Hudugaz, Uzsuvtaminot, NEGU	I: Should be consulted by Project Company/EPC contractor during construction work if any unforeseen impacts are expected to public utilities	In the event of any additional/unforeseen impacts (not discussed and assessed with ESIA) identified by the EPC contractor, the following actions should be undertaken: - identify relevant service provider - assess additional/unforeseen impacts with service provider - discuss appropriate impact mitigation measures - agree on mitigation requirements with the service operator and obtain any additional technical conditions for addressing the impacts
	Department of Cultural Heritage Agency at Republic of Karakalpakstan	D: Should be immediately contacted in case of finding any archaeological artefact or any relevant finding during excavation and drilling work at Wind Farm site and part of OHTL crossing deserted area	If any archaeological findings or artifacts are discovered during construction or excavation works, the following actions should be undertaken: - the EPC contractor must contact the local department of the Cultural Heritage Agency (CHA) and report the findings. - obtain further instructions from the local cultural department of the CHA regarding the requirements and conditions for continuing construction activities at the site where the findings were made.
National Agencies/Institutions	JSC "Uztransgaz"	I: Indicates existing main gas pipes in AoI of Project and, if existing, provides technical conditions for construction as well as buffer zones for these main pipes	Request data on existing main gas pipes at WF site and along OHTL. Formal Meetings / Letter Correspondence / Phone Calls

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT:	CONSULTATION AGENDA
	JSC "Hududgaz"	I: Indicates existing gas pipes in AoI of Projects and, if existing, provides technical conditions for construction as well as buffer zone for these pipes	Request data on existing gas pipes at WF site and along OHTL. Formal Meetings / Letter Correspondence / Phone Calls
	JSC "Uzsuvtaminot"	D: Indicates existing water pipes in AoI of Projects and, if existing, provides technical conditions as well as buffer zone for these pipes	Request for - information on existing water supply facilities in and around the project sites and OHTL - information of technical conditions/buffer zones that should be followed during construction stage. Formal Meetings / Letter Correspondence / Phone Calls
	Cultural Heritage Agency	I: Provision of information on tangible and intangible cultural heritage within the project-affected areas.	Request for: - information on nearby cultural heritage objects in Project site and its AoI - recommendations /requirements that should be followed during Project construction. Formal meetings/Letter Correspondence / Phone Calls
	Sanitary and Epidemiological Welfare and Public Health Service of The Republic of Uzbekistan	D: Establishes size of Health Protection Zone for Project and its facilities, if required	Confirmation of Health Protection Zone for Wind Far, since such types of facilities do not listed in existing legislation.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT:	CONSULTATION AGENDA
			Formal Meetings / Letter Correspondence / Phone Calls
	JSC "Uzbektelekom"	I: Provision of information on planned and existing telecommunication facilities (e.g., transmission cables) within the project-affected areas, and providing technical conditions for project construction, if required	Request for: - information on existing telecommunication facilities in and around the project sites; - technical condition, i.e., size of buffer zones that should be followed for existing cable along OHTL. Formal Meetings / Letter Correspondence / Phone Calls
	JSC "UzRailways"	D: Provision of technical conditions for construction works and establishing buffer zone for intersection point of OHTL route with local railway line	Request for: - information on buffer zone between OHTL towers and local railway; - providing technical conditions for construction. Formal Meetings / Letter Correspondence / Phone Calls
	State Committee for Roads	I: Provision of information on the existing roads within the project-affected areas	Request for: - Technical conditions that should be followed for construction of OHTL - Confirmation of buffer zones for road A 380 prescribed by legislation. Letter correspondence/ Phone Calls

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT:	CONSULTATION AGENDA
	Institute of Zoology of the Academy of Sciences of the Republic of Uzbekistan	I: Provision of information on biodiversity and technical support on ad-hoc baseline surveys for specific faunal species and habitats.	Request for information on the extent of occurrence and are of occupancy (or population statistics), for any potentially affected faunal species or habitats of conservation concern. Letter correspondence/ Phone Calls
	Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan	I: Provision of information on biodiversity and technical support on ad-hoc baseline surveys for specific floral species and habitats.	Request for information on the extent of occurrence and are of occupancy (or population statistics), for any potentially affected floral species or habitats of conservation concern. Letter correspondence/ Phone Calls
	Academy of Sciences – Institute of Archaeology	I: Provision of information on tangible and intangible cultural heritage within the project-affected areas, and completion of archaeological surveys for the national inventory of cultural heritage sites.	Request for: - information on any ongoing archaeological surveys in and around the project sites; - information on any archaeological findings and/or cultural heritage sites in and around the project sites. Formal meetings/ Letter Correspondence / Phone Calls

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT:	CONSULTATION AGENDA
State organisations/Ministries	Ministry of Water Resources	I: Provides information on types of water bodies (river, canals, ponds) and establishes buffer zone as well as requirements to be followed during construction works	Request for: - information on existing water sources at WF site and along OHTL; - recommendations/ requirements to be followed while conducting construction activities; - size of buffer zones that should be followed for existing water sources. Formal Meetings / Letter Correspondence / Phone Calls
	Ministry of Ecology, Environmental Protection and Climate Change (MEEPCC)	D: Reviews and issues permission for reports submitted in a framework of National EIA process. In addition Ministry provides requirements for monitoring of E&S compliance	All issues regarding the preparation and submission of national EIA Formal Meetings / Letter Correspondence & Study Submissions / Phone Calls
	Ministry of Mining Industry and Geology of the Republic of Uzbekistan	D: Provision of information on ongoing and planned and existing mineral exploration surveys (and related exclusion zones within the project-affected areas, and any geotechnically hazardous land.	Request for: information on trenches at WF site and OHTL; active mining areas at AoI of the Project and size of buffer zone that should be followed – Areas at Project AoI that might be at interest of Ministry for conducting surveys in future. Formal Meetings / Letter Correspondence / Phone Calls
	Ministry of Transportation	I: Provision of information on the transport infrastructure within the project-affected areas, and execution of laws and regulations pertaining to the operation and	Request for feedback/ recommendations on conducting construction activities near highways as well as confirming required buffer zones for roads Letter Correspondence / Phone Calls.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT:	CONSULTATION AGENDA
		maintenance of related infrastructure (e.g., tonnage, drainage, upgrade or extension of existing roads and traffic regulation).	
Non-Governmental Organizations (NGOs)	Uzbekistan Society for the protection of birds	I: Provision of information on avifaunal species and habitats of conservation importance, and related conservation programs.	Request for: information on avifaunal species and habitats of concern, which occur in and around the project sites; any additional considerations and recommendations regarding potential impacts of avifauna.
	Civic Initiatives Support Center	I: Might be interested in the execution of the Project and its social impacts. Will potentially be involved in disseminating information about the Project.	Request for any additional considerations and recommendations with regard to potential social impacts.
	National Association of non-governmental nonprofit organization of Uzbekistan (NANOUZ)		
	Center for social and legal support for women and their families "Qalb mehri" NGO		

5.3 Stakeholder Engagement Program

For the purposes of this ESIA, a number of stakeholder engagement modes are planned for subsequent consultation and disclosure vis-à-vis the various stakeholder groups identified. The table below outlines the applicability of these engagement modes, taking into account the stakeholder categories, the size and geographical distribution of the stakeholder groups, sensitivity of stakeholder information, and sociocultural factors affecting the participation and expression of certain community groupings.

Table 5-2 Applicability of different stakeholder engagement modes

STAKEHOLDER ENGAGEMENT MODE	APPLICABILITY
Formal consultative letters/ correspondence	Inviting stakeholders to public meetings. Disclosing information to a large and/or extensive target audience. Formal project introduction and preliminary rounds of consultations with local state organisations and governmental bodies.
Community meetings	Initial disclosure for project introduction, description of potential E&S impacts impact management strategies, for the information of the general public within project-affected communities. Initial consultation with community members with regard to the general E&S context, potential E&S receptors and impacts, appropriate management measures and related recommendations. Responses to general project-related queries from affected communities. Presentation of the plan for subsequent rounds of engagement and grievance management.
Leaflets and infographics	Presentation of lucid summary information regarding the project objectives, plan, associated E&S impacts and corresponding management measures. Illustration of project design, and various E&S management processes (i.e., ESIA, grievance redress mechanism etc.). Providing reference where attendance of meetings is not possible or oral presentations delivered during prior meetings is not well understood.
Focus Group Discussions (FGDs)	Collective consultations with affected communities, which target a specific groups or guilds for discussions based around certain E&S topics. Exclusive and safe platforms for engaging with marginalized or minority groups who may otherwise be underrepresented or intimidated with regard to self-expression, during general community meetings.

Following the stakeholder analysis and the selection of suitable engagement modes, a forward Stakeholder Engagement Plan (SEP) was drawn up to ensure that an appropriate scope, frequency, and means of communication are allocated to each stakeholder group.

The above-described modes of stakeholder engagement were conducted in a manner that is culturally appropriate, understandable to target audiences, and free of manipulation, coercion, and intimidation. The timing and location of community meetings and FGDs were organized with efforts to ensure sufficient and equitable representation of groupings or constituencies whose attendance may be constrained by a lack of mobile communication, transportation means and overriding workplace or domestic commitments. Verbal and written communication were made in local languages, namely Uzbek, as appropriate.

Figure 5-1 FGD meetings with residents of affected communities

The table below provides an overview of the project stakeholders (grouped by administrative capacity and relation to the project), their respective consultation and disclosure agenda, and engagement modes.

Table 5-3 Overview of project stakeholders, and their respective engagement modes, consultation agenda and inputs

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
WIND FARM					
Directly affected people	SWID – land owner Beruniy Karakul LLC – land lease	D: Landowner, custodianship of land reserved for governmental and pastural use.	Providing information about Project Identification of land use and number of land users	Business correspondence/ phone calls/face to face meetings Formal request has been sent to SWID on March13th, 2024. Response letter has been received from Beruniy Karakul LLC on April 5th, 2024. Inventory survey has been conducted on April 22nd 2024	Confirmation from SWID during a phone consultation revealed that the land designated for the Wind Farm and portions of the land along the OHTL are leased to Beruniy Karakul LLC. Beruniy Karakul LLC indicated that there are no formal land lease agreements between the LLC and herders. However, the project area is utilized by informal herders with their livestock during the spring and summer seasons. All land plots affected by the construction of the Wind Farm and OHTL, leased by Beruniy Karakul LLC, were assessed during inventory surveys conducted by an independent valuator with the presence of a Beruniy LLC representative. The survey concluded that no physical assets will be impacted, and the LLC will only experience land acquisition impacts.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
	Herders	A: Land-users subject to economic displacement because of land acquisition for the Project's development.	Providing information about Project Identification of land use (type and frequency) Conducting surveys for assessment of impact from economic displacement to the land acquisition	Face to face meetings/ phone calls 1) Initial consultations with herders were conducted over phone calls during March - April 2024 2) Inventory surveys with 5 PAHs who owns assets at the WF area and along OHTL corridor were conducted on April 22nd -25th 2024. 3) Socio economic surveys of affected herder's households were conducted between April 15th – May 3rd 2024.	Initial consultations conducted with herders identified the type of owned livestock as well as frequency of grazing activities. Assets owned by herders that are going to be impact due to the Project (both WF and OHTL) were assessed by independent valuator. Scale of impact to herders' households due to the Project were assessed during socio-economic surveys. During all communication with PAHs, information regarding GRM was provided to ensure that they have access to Project ESIA team. No concerns or comments were raised by herders so far.
	OHTL				
	Commercial structures	A: Land-users subject to economic displacement as a result of land acquisition for the Project's development.	Providing information about Project Identification of land use (type and frequency)/ affected structures, crops, trees and assets	Face to face meetings/phone calls 1) Initial consultations with owners of 2 grocery stores were conducted over phone calls during March -April 2024	Initial consultations conducted with owners of grocery stores identified the type of business and its location along OHTL route. Impacted stores due to the construction of OHTL were assessed by independent valuator.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
			Conducting surveys for assessment of impact from economic displacement to the land acquisition	2) Inventory surveys for both stores were conducted between April 16th and 22nd 2024 Socio-economic survey of grocery store owners were conducted between April 15th – May 8th 2024.	Scale of impact to households of store owners due to the Project were assessed during socio-economic surveys. During all communication with PAHs, information regarding GRM was provided to ensure that they have access to Project ESIA team.
	Owners of residential land plots			Face to face meetings/phone calls 1) Initial consultations with owners of affected residential land plots were conducted over phone calls during March - April 2024 2) Inventory surveys for affected residential land plots were conducted between April 16th and 22nd 2024 3) Socio-economic survey of residential land plot owners were conducted between April 15th – May 8th 2024.	Initial consultations conducted with owners of residential land plots identified the existing structures that fall under OHTL health protection zone. Affected assets of residential land plots were assessed by independent valuator. Scale of impact to households of residential land owners were assessed during socio-economic surveys. During all communication with PAHs, information regarding GRM was provided to ensure that they have access to Project ESIA team.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
	Farmers			Face to face meetings/phone calls 1) Initial consultations with farmers were conducted over phone calls during March - April 2024 2) Inventory surveys for affected residential land plots were conducted between April 16th and 22nd 2024 3) Socio-economic survey of residential land plot owners were conducted between April 15th – May 8th 2024.	Initial consultations conducted with affected farmers identified the form of land use as well as types cultivated crops and fruit trees. Affected land plots both by OHTL health protection zone and tower footprint were assessed by independent valuator. Scale of impact to households of farmers were assessed during socio-economic surveys. During all communication with PAHs, information regarding GRM was provided to ensure that they have access to Project ESIA team. All questions raised within GRM were responded.
	Dekhkan farms				
	Private agricultural enterprises (clusters)			Face to face meetings/phone calls 1) Initial consultations with farmers were conducted over phone calls during March - April 2024 2) Inventory surveys for affected residential land plots were conducted between April 16th and 22nd 2024	Initial consultations conducted with affected farmers identified the form of land use as well as types cultivated crops and fruit trees. Affected land plots both by OHTL health protection zone and tower footprint were assessed by independent valuator.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
	JSC "Uztelecom"	A: In charge of communication cables are subject to relocation due to installation of the OHTL tower	Providing information about Project Identification of cables that need to be relocated Conducting site inspection with relevant experts from Uztelecom	Site observation along OHTL on July 26th	Site inspection revealed that 2 underground communication cables needs to be relocated. Budget to cover expenses associated with relocation works has been provided by Uztelecom
	Beruniy distirct agricultural department	A: Land-users subject to economic displacement as a result of land acquisition for the Project's development.	Providing information about Project Identification of affected crops /trees/ assets , if any Conducting inventory survey at affected land plots	Face to face meetings/phone calls 1) Initial consultations with owners of affected residential land plots were conducted over phone calls during March - April 2024 2) Inventory surveys for affected residential land plots were conducted between April 22nd and 25th 2024	Inventory surveys at all impacted land plots belonging to state organisations revealed that these land plot are empty. No assets, trees or crops were determined during the observations.
	Beruniy district khokimiyat				
	Beruniy department of State forestry fund				
	NEGU				

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
WIND FARM&OHTL					
Project-affected Communities	Abay village, including vulnerable groups (as defined in Section 14.2.10)	A: Communities subject to indirect E&S impacts from various project aspects.	Inform village residents about planned Project Determine current socio-economic state of village Determine types of land use by residents at WF site, if applicable Involvement during public	FGD/face to face meetings Focus group discussion meetings with residents were conducted on March 15th 2024 Meetings for Public hearing were conducted on April 24-25th 2024	As part of the ESIA, FGDs were held with the residents of Abay community to build a socio-economic profile of the village. These discussions covered: • Providing details about the planned project. • Gathering socio-economic data of the village. • Understanding the residents' housing and living conditions. • Assessing the availability of public utilities such as gas, electricity, and potable water. • Identifying the nature and frequency of land use at the WF site and along the OHTL. • Evaluating the presence of cultural heritage sites important to the community. • Collecting feedback and concerns from residents about the project. Project information leaflets, which included general details about the project and the GRM, were distributed to meeting participants. For residents who could not attend, door-to-door meetings were held to ensure inclusivity. Public hearings, organized as per the National EIA requirements, reiterated the

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
			hearing/disclosure process.		project details previously shared with representatives of village residents. They were also provided in-depth information about the planned E&S surveys to be conducted at the WF site and along the OHTL, highlighting both potential positive and negative impacts. Additionally, participants were reminded of the GRM process and contact information.
	Kyzyl Kala village, including vulnerable groups (as defined in Section 14.2.10)			FGD/face to face meetings Focus group discussion meetings with residents were conducted on March 15th 2024 Meetings for Public hearing were conducted on April 24-25th 2024	As part of the ESIA, FGDs were held with the residents of Kyzyl Kala community to build a socio-economic profile of the village. These discussions covered: • Providing details about the planned project. • Gathering socio-economic data of the village. • Understanding the residents' housing and living conditions. • Assessing the availability of public utilities such as gas, electricity, and potable water. • Identifying the nature and frequency of land use at the WF site and along the OHTL. • Evaluating the presence of cultural heritage sites important to the community. • Collecting feedback and concerns from residents about the project. Project information leaflets, which included general details about the project and the

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
					GRM, were distributed to meeting participants. For residents who could not attend, door-to-door meetings were held to ensure inclusivity. Public hearings, organized as per the National EIA requirements, reiterated the project details previously shared with representatives of village residents. They were also provided in-depth information about the planned E&S surveys to be conducted at the WF site and along the OHTL, highlighting both potential positive and negative impacts. Additionally, participants were reminded of the GRM process and contact information.
	Dustlik village, including vulnerable groups (as defined in Section 14.2.10)			FGD/face to face meetings Focus group discussion meetings with residents were conducted on March 15th 2024 Meetings for Public hearing were conducted on April 24-25th 2024	As part of the ESIA, FGDs were held with the residents of Dustlik community to build a socio-economic profile of the village. These discussions covered: • Providing details about the planned project. • Gathering socio-economic data of the village. • Understanding the residents' housing and living conditions. • Assessing the availability of public utilities such as gas, electricity, and potable water. • Identifying the nature and frequency of land use at the WF site and along the OHTL.

Stakeholder Group	Stakeholder Bodies	Relevance to Project	Consultation Agenda	Approach/ Type of Engagement	Main Outcome
					• Evaluating the presence of cultural heritage sites important to the community. • Collecting feedback and concerns from residents about the project. Project information leaflets, which included general details about the project and the GRM, were distributed to meeting participants. For residents who could not attend, door-to-door meetings were held to ensure inclusivity. Public hearings, organized as per the National EIA requirements, reiterated the project details previously shared with representatives of village residents. They were also provided in-depth information about the planned E&S surveys to be conducted at the WF site and along the OHTL, highlighting both potential positive and negative impacts. Additionally, participants were reminded of the GRM process and contact information
	Makhtumkuli village, including vulnerable groups (as defined in Section 14.2.10)			FGD/face to face meetings Focus group discussion meetings with residents were conducted on March 15th 2024 Meetings for Public hearing were	As part of the ESIA, FGDs were held with the residents of Makhtumkuli community to build a socio-economic profile of the village. These discussions covered: • Providing details about the planned project. • Gathering socio-economic data of the village.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
				conducted on April 24-25th 2024	• Understanding the residents' housing and living conditions. • Assessing the availability of public utilities such as gas, electricity, and potable water. • Identifying the nature and frequency of land use at the WF site and along the OHTL. • Evaluating the presence of cultural heritage sites important to the community. • Collecting feedback and concerns from residents about the project. Project information leaflets, which included general details about the project and the GRM, were distributed to meeting participants. For residents who could not attend, door-to-door meetings were held to ensure inclusivity. Public hearings, organized as per the National EIA requirements, reiterated the project details previously shared with representatives of village residents. They were also provided in-depth information about the planned E&S surveys to be conducted at the WF site and along the OHTL, highlighting both potential positive and negative impacts. Additionally, participants were reminded of the GRM process and contact information

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
	Nayman village, including vulnerable groups (as defined in Section 14.2.10)			FGD/face to face meetings Focus group discussion meetings with residents were conducted on March 15th 2024 Meetings for Public hearing were conducted on April 24-25th 2024	As part of the ESIA, FGDs were held with the residents of Nayman community to build a socio-economic profile of the village. These discussions covered: • Providing details about the planned project. • Gathering socio-economic data of the village. • Understanding the residents' housing and living conditions. • Assessing the availability of public utilities such as gas, electricity, and potable water. • Identifying the nature and frequency of land use at the WF site and along OHTL. • Evaluating the presence of cultural heritage sites important to the community. • Collecting feedback and concerns from residents about the project. Project information leaflets, which included general details about the project and the GRM, were distributed to meeting participants. For residents who could not attend, door-to-door meetings were held to ensure inclusivity. Public hearings, organized as per the National EIA requirements, reiterated the project details previously shared with representatives of village residents. They

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
					also were provided in-depth information about the planned E&S surveys to be conducted at the WF site and along the OHTL, highlighting both potential positive and negative impacts. Additionally, participants were reminded of the GRM process and contact information
WIND FARM					
Indirectly affected facilities	Nukus Phase I Wind Farm	I: Might be affected due to the construction activities share the same cumulative impacts	N/A	N/A	Nukus Phase I Wind Farm is being developed by the same Company. As such cumulative impacts that may occur will be assessed in ESIA report
	Mramor LLC	I: Might be affected by traffic and transportation at construction stage	Request for any form of land use at WF site and frequency of A 380 highway use	Phone call on April 3rd 2024	Mining might be impacted only due to the traffic while transporting WTGs, construction materials to the site as it also uses local highway A 380. Phone call consultation revealed that current plant is using A 380 predominantly for transportation of goods via trucks and lorries 4 and 5 times per day. Mining confirmed that it doesn't use WF area at all.
	Karakalpak cement LLC (Cement plant)	I: Might be affected by traffic and transportation at construction stage	Request for any form of land use at WF site and frequency of A 380 highway use	Phone call on April 3rd 2024	Cement plant might be impacted only due to the traffic while transporting WTGs, construction materials to the site as it also uses local highway A 380.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
					Phone call consultation revealed that current plant is using A 380 predominantly for transportation of goods via trucks and lorries. The frequency of use heavily depends on volume of production they need to deliver based on various agreements. Cement plant confirmed that it doesn't use WF area at all.
WF & OHTL					
	Council of Ministries of Republic of Karakalpakstan (Jukory Kengesh)	D: Higher governmental organisation that oversees state monitoring at district/city levels in Republic of Karakalpakistan	Informing Council of Ministries about Project and upcoming activities associated with E&S assessment and reporting	Business correspondence Formal letter with Project overview, timeline, ESIA activities and introduction of Consultants' team has been sent February 16th 2024	Letter has been accepted by Council of Ministries and further monitoring as well as assistance for activities associated with Project were delegated to Beruniy district khokimiyat.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
Local Government Authorities	Beruniy distirct khokimiyat	D: District-level planning and administration of development projects. Preparation of land-use proposals, approval of subsequent land-use plans, commissioning of cadastral registration of landholdings, and administration of Land Lease Agreements (LLAs). Issuing permission as well as assistance in arranging various E&S surveys	Request information for: secondary data related to environmental and socio-economic state of district; identification of local communities under AoI of Project; identification of land use at WF area and along OHTL Request assistance for: arranging public hearing meetings; arranging social surveys at affected communities; conducting surveys with affected land owners/leases arranging public disclosure meetings	Business correspondence/ phone calls/ face to face meetings Formal request letters on various aspects were sent between February – April 2024 Face to face meetings were conducted during site visits at Scoping and ESIA stages	There is an ongoing dialog with Beruniy district khokimiyat for data collection, arranging meetings and conducting surveys.
	Beruniy district cadastral department	D: Cadastral registration of landholdings, based on approved land-use plans developed by Uzdaverloyiha State Research	Request for: - information on land ownership, land leases at WF area and along OHTL	Face to face meetings/phone calls/ business correspondence Formal request with asking assistance in identification of land	Communication with cadastral department over face-to-face meetings and phone calls has been conducted during February - April 2024. Over this period department provided information on type of land affected by WF and OHTL as well list of land leases for affected land plots.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
		and Design Institute.		owners/leases was sent on February 16th 2024 Invite for public hearing meeting has been sent on April 19th 2024	In addition, department assisted in finding contact details of land leases. And finally, department was invited to meeting arranged for conducting public hearings as part of Stage I of National EIA process.
	Beruniy department of State Forestry fund	D: Provision of technical conditions/ approvals for conducting construction works at land plots belonging to forestry reserve	Request for: - information on land ownership, land leases, if applicable; - information on existing utility infrastructure (gas/water pipes etc); - Feedback/ recommendation for construction activities	Business correspondence Formal request has been sent on March 27th 2024; response received on April 8th 2024	Beruniy department of Forestry fund confirmed sole ownership of land plot affected by OHTL corridor. No comments or recommendations were raised with regards to constructional activities. Additionally, it has been informed that there are no utility infrastructures crossing the forestry lands.
	Council of farmers, dekhkan farms and owners of tomorka[3] of Republic of Karakalpakistan	I: Assistance in allocation of expert to the LALRP committee for supporting in resolving disputes, if any, related to compensation packages	I: Assistance in allocation of expert to the LALRP committee for supporting in resolving disputes, if any, related to compensation packages	Face to face consultations/ video calls Video call with representatives of LALRP Committee was conducted on September 20th 2024	Information was provided about the project land use types and the potential construction and operation phase impacts. This also included the provision of preliminary information regarding the entitlements which will be disclosed to those impacted for their feedback to the project. Participants did not have any additional comments but wanted to know the timeline for compensation disclosure

[3] Tomorka is land plot within residential area (garden for cultivation of crops)

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
					which they were informed would occur in October 2024.
	Department of SWID in Republic of Karakalpakstan	I: Assistance in allocation of expert to LALRP committee for supporting in resolving disputes, if any, related to compensation packages	I: Assistance in allocation of expert to LALRP committee for supporting in resolving disputes, if any, related to compensation packages		
	Makhtumkuli makhalla committee	I: Provision of assistance in submission of formal request for prioritizing 3 Project Affected Households (PAHs) (2 commercials and 1 residential land owner) during land e-auction;	I: Provision of assistance in submission of formal request for prioritizing 3 PAPs (2 commercials and 1 residential land owner) during land e-auction; Participation in the activities of the LALRP committee to resolve		

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
		Participation in the activities of the LALRP committee to resolve disputes raised by PAPs, if any, related to compensation packages	disputes raised by PAPs, if any, related to compensation packages		
	Dostlik makhalla committee	I: Participation in the activities of the LALRP committee to resolve disputes raised by PAPs, if any, related to compensation packages	I: Participation in the activities of the LALRP committee to resolve disputes raised by PAPs, if any, related to compensation packages		
	Abay makhalla committee	I: Participation in activities of the LALRP committee to resolve disputes raised by PAPs, if any, related to compensation packages	I: Participation in activities of the LALRP committee to resolve disputes raised by PAPs, if any, related to compensation packages		

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
State organisations/ Ministries	Ministry of Ecology, Environmental Protection and Climate Change (MEEPCC)	D: Reviews and issues permission for reports submitted in a framework of National EIA process. In addition Ministry provides requirements for monitoring of E&S compliance	All issues regarding the preparation and submission of national EIA Formal	Business correspondence/ submission of National EIA report Formal request has been sent on March 27th 2024, response received April 1st 2024 National EIA reports (both for WF and OHTL) were submitted on May 13th 2024 Conclusion with results of Ministry's review was received on May 27th 2024 (refer to ESIA Volume 4 - Appendix B for the Ministry's positive conclusion).	Ministry stated the need for detailed survey of flora and fauna both for WF and OHTL. In addition, implementation of chance find procedure for rare flora and fauna species during construction/excavation works was proposed as mitigation measure. Ministry issued positive Conclusion for Stage I reports of National EIA thus enabling project to start construction works.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
	Ministry of Mining Industry and Geology of the Republic of Uzbekistan	D: Provision of information on ongoing and planned and existing mineral exploration surveys (and related exclusion zones within the project-affected areas, and any geotechnically hazardous land.	Request for: - information on trenches at WF site and OHTL; - active mining areas at AoI of the Project and size of buffer zone that should be followed – Areas at Project AoI that might be at interest of Ministry for conducting surveys in future	Business correspondence Consultations with Ministry were conducted at site selection stage for WF; Consultations with Ministry were conducted at pre-feasibility stage of OHTL At ESIA stage formal request has been sent on March 13th 2024; response received on April 30th 2024	Mistry provided their recommendation related to project at site selection stage (2021-2022) as well as recommended suitable OHTL route at pre-feasibility stage (2023). At ESIA stage Ministry has confirmed that existing trenches at WF area and OHTL were done for surveying purposes and have no longer importance for Ministry. Furthermore, Ministry confirmed that active mining areas at AoI of Project are located in safe distance and no impact is overseen for construction and operation stages of Project. In addition, Ministry concluded that Project area will be considered for future survey works for 25 years due to the mutual agreements concluded with other governmental agencies responsible for implementation of current Project.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
	Ministry of Water Resources	I: Provides information on types of water bodies (river, canals, ponds) and establishes buffer zone as well as requirements to be followed during construction works	Request for: - information on existing water sources at WF site and along OHTL; - recommendations/ requirements to be followed while conducting construction activities; - size of buffer zones that should be followed for existing water sources	Business correspondence/ phone calls Formal request has been sent on March 19th 2024, response received on April 1st 2024 Follow up call on May 15th 2024	Ministry confirmed absence of water sources at WF area and stated no further comments or specific requirements for conducting construction activities. With regards to OHTL route, Ministry specified names and types of irrigation and drainage canal by indicating the size of buffer zone that should be followed between water source and nearest OHTL tower to this source. As a result, only one tower (No 121) wasn't matching the buffer zone in relation to nearby canal. Nevertheless, follow up call on May 15th 2024 confirmed that exception for tower 121 is applicable for Ministry and it was confirmed that distance can be 13 meters instead of required 26 meters.
	Ministry of Transportation	I: Provision of information on the transport infrastructure within the project-affected areas, and execution of laws and regulations pertaining to the operation and maintenance of related infrastructure (e.g., tonnage, drainage,	Request for feedback/ recommendations on conducting construction activities near highways as well as confirming required buffer zones for roads	1) The letter has been sent on 05.04.2024. 2) Follow up has been made on 15.04.2024. 3) Response latter has been received on 03.05.2024.	Ministry informed that State Committee for roads will provide response on behalf of Ministry (as it is Ministry's subordinate organisation) Formal letter from State Committee for roads has been received.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
		upgrade or extension of existing roads and traffic regulation).			
National Agencies/Institutions	Cultural Heritage Agency	I: Provision of information on tangible and intangible cultural heritage within the project-affected areas.	Request for: -information on nearby cultural heritage objects in Project site and its AoI - recommendations /requirements that should be followed during Project construction.	Business correspondence/ phone calls/ site observation Consultations were conducted at pre-feasibility stage of OHTL to determine the preferred option among suggested 3 routes. At ESIA stage formal request has been sent on March 29th 2024; response was received from Institute of Archaeology on April 4th 2024 Additional archaeological surveys were conducted between May 10th -30th 2024 at WF site and along OHTL.	Agency commented on proposed 3 routes for OHTL at the pre-feasibility stage, highlighting the most preferred route from its perspective. At ESIA stage, Agency forwarded request to its subordinate organisation – Institute of Archaeology. In turn, Institute recommended conducting archaeological surveys to ensure that constructions works will not damage undiscovered artifacts. Archaeological surveys conducted at WF area and along OHTL didn't reveal any findings. However, archaeological supervision during excavation works was strongly recommended.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
	Sanitary and Epidemiological Welfare and Public Health Service of The Republic of Uzbekistan	D: Establishes size of Health Protection Zone for Project and its facilities, if required	Confirmation of Health Protection Zone for Wind Far, since such types of facilities are not listed in existing legislation	Business correspondence Formal request has been sent on March 19th 2024; response has received on March 25th 2024	Agency has verified HPZ for OHTL as 15 meters from both sides of tower. Regarding WF, Agency advised HPZ as 250 meters considering the absence of residential and other infrastructure in proximity.
	JSC "Uzsuvtaminot"	D: Indicates existing water pipes in AoI of Projects and, if existing, provides technical conditions as well as buffer zone for these pipes	Request for - information on existing water supply facilities in and around the project sites and OHTL - information of technical conditions/buffer zones that should be followed during construction stage	Business correspondence Formal request has been sent on March 13th 2024, response received on April 26th 2024	Uzsuvtaminot has confirmed absence of any pipes at WF site. Re OHTL, Uzsuvtaminot shared location of water pipes that supply local residential areas with potable water as well as diameter of these pipes. Although there are no intersection of these pipes with towers (2 water pipes intersects with OHTL corridor) Uzsuvtaminot has recommended to invite their representative for observation of construction works, to ensure that existing pipes will not be damaged.

Stakeholder group	Stakeholder bodies	Relevance to project	Consultation agenda	Approach/ type of engagement	Main outcome
	JSC "Uztransgaz"	I: Indicates existing main gas pipes in AoI of Project and, if existing, provides technical conditions for construction as well as buffer zones for these main pipes	Request data on existing main gas pipes at WF site and along OHTL	Business correspondence Consultations were conducted at pre-feasibility stage of OHTL to determine the preferred option among suggested 3 routes. At ESIA stage formal request has been sent on March 13th 2024; response received on March 15th 2024	Institute commented on proposed 3 routes for OHTL at the pre-feasibility stage, highlighting the most preferred route from its perspective. In addition, Uztransgas has recommended minor changes at tower location, since it overlaps with existing main gas pipe Zaungur. At ESIA stage, Uztransgas provided the same technical conditions that were specified at pre-feasibility stage and supervision of constructional works by representative of Uztransgas has been requested.
	JSC "Hududgaz"	I: Indicates existing gas pipes in AoI of Projects and, if existing, provides technical conditions for construction as well as buffer zone for these pipes	Request data on existing gas pipes at WF site and along OHTL	Business correspondence / phone calls Request letter has been sent on March 13th 2024, response was received on March 20th 2024 Follow up calls has been made between March, April and May Follow up request is sent on June 12th, 2024; response was provided on July 8th, 2024	Hududgaz has confirmed absence of pipes at WF site. However the same statement was missing with regards to OHTL route. As such, Hudugaz has been contacted during three months over phone calls asking to provide statement regarding OHTL. Follow up written request has been sent on behalf of the Project Company. JSC "Hududgaz" provided a response in July specifying the technical conditions for the construction works.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
	Academy of Sciences – Institute of Archaeology	I: Provision of information on tangible and intangible cultural heritage within the project-affected areas, and completion of archaeological surveys for the national inventory of cultural heritage sites.	Request for: - information on any ongoing archaeological surveys in and around the project sites; - information on any archaeological findings and/or cultural heritage sites in and around the project sites.	Business correspondence Consultations were conducted at pre-feasibility stage of OHTL to determine the preferred option among suggested 3 routes. Recommendations of Institute were received through formal letter on April 4th 2024	Institute commented on proposed 3 routes for OHTL at the pre-feasibility stage, highlighting the most preferred route from its perspective. At ESIA stage, Institute raised strong recommendation to conduct dedicated survey at WF area and along OHTL since the area has high importance from archaeological perspective. Following the recommendation of the Institute, department of archaeology of Karakalpak State University conducted surveys at WF area and along OHTL, concluding the need for archaeological supervision during construction/excavation works since they didn't find any artifacts on topsoil.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
	JSC "UzRailways"	D: Provision of technical conditions for construction works and establishing buffer zone for intersection point of OHTL route with local railway line	Request for: information on buffer zone between OHTL towers and local railway; - providing technical conditions for construction activities, if required	Business correspondence/ phone calls/ site observation Consultations were conducted at pre-feasibility stage of OHTL to determine the preferred option among suggested 3 routes. At ESIA stage formal request has been sent on March 19th 2024; response was received on May 8th 2024 Site walkover along OHTL route was carried out on April 23rd 2024	Uzrailways commented on proposed 3 routes for OHTL at the pre-feasibility stage, highlighting the most preferred route from its perspective. At ESIA stage, Uzrailways indicated that a buffer zone of 20 meters should be maintained between the OHTL towers and the railway, and 30 meters between OHTL tower and railway overhead communication line. In addition, technical conditions for construction activities were provided. These conditions will be followed by the EPC Contractor during the OHTL construction. Site observations concluded that distance between railway and nearest towers are sufficient and required buffer zone is followed.
	JSC "Uzbektelekom "	I: Provision of information on planned and existing telecommunication facilities (e.g., transmission cables) within the project-affected areas, and providing technical conditions for project	Request for: - information on existing telecommunication facilities in and around the project sites; - technical condition, i.e., size of buffer zones that should be followed for existing cable along OHTL.	Business correspondence/ phone calls/ site observations Consultations were conducted at pre-feasibility stage of OHTL to determine the preferred option among suggested 3 routes At ESIA stage formal request has been sent on March 13th 2024;	Uztelecom commented on proposed 3 routes for OHTL at the pre-feasibility stage, highlighting the most preferred route from its perspective. At ESIA stage, Uztelecom indicated size of buffer zone as 2 meters that should be between OHTL tower and cable line. Site observations concluded that representative of Uztelecom together with EPC contractor should conduct another walkover along OHTL corridor to ensure the

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
		construction, if required		response was received on March 28th 2024 Site walkover along OHTL route was carried out on April 23rd 2024	avoidance of impact to other cable lines the location of which is confidential and cannot be shared with third parties. Site observations with Uztelecom in July revealed that 2 cable lines need to be relocated. Thus, budget for relocation expenses has been provided in August.
	State Committee for Roads	I: Provision of information on the existing roads within the project-affected areas	Request for: a) Technical conditions that should be followed for construction of OHTL b) Confirmation of buffer zones for road A 380 prescribed by legislation	Business correspondence/phone calls/ face to face meetings Request letter has been sent on March 19th, 2024; response was provided on May 5th 2024. Several phone call consultations were conducted between April 1st and 20th to follow up on request letter.	Committee was informed about Project both WF and OHTL during the face-to-face meeting, however no feedback was received. Formal response obtained from Committee suggested following buffer zone from the edge of A 380 highway as 57 meters, although current road is categorised under Cat III. was received from Committee. Local standards, in particular ShNK 2.05.02-07, prescribe following 25 meters from the edge of the road as buffer zone for roads under Category III. Follow up requests to revise the response remained unanswered. Thus, Proposed OHTL route matches requirement as 25 meters, so it was decided to follow buffer zone indicated in ShNK, rather than following suggested 57 meters by Road Committee

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
	Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan	I: Provision of information on biodiversity and technical support on ad-hoc baseline surveys for specific floral species and habitats.	Request for information on the extent of occurrence and are of occupancy (or population statistics), for any potentially affected floral species or habitats of conservation concern	Business correspondence Formal request has been sent on March 27th 2024, response received on April 17th 2024	Institute has shared response providing overall information on current state of flora at project site. Considering the local specification of Project landscape, it was suggested to conduct detailed flora surveys. Institute also confirmed availability to support in conducting these surveys based on separate agreement
	Institute of Zoology of the Academy of Sciences of the Republic of Uzbekistan	I: Provision of information on biodiversity and technical support on ad-hoc baseline surveys for specific faunal species and habitats.	Request for information on the extent of occurrence and are of occupancy (or population statistics), for any potentially affected faunal species or habitats of conservation concern	Business correspondence Formal request has been sent on March 27th 2024, response received om March 29th 2024	Institute provide any specific information related to fauna of Project area. Instead, they suggested arranging agreement for conducting fauna surveys between Institute and Consultant team to obtain information on the current state of biodiversity of the fauna of Project area. Considering that seasonal biodiversity surveys were already planned by local consultant team, the consultation with the Institute was stopped at this stage.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT	CONSULTATION AGENDA	APPROACH/ TYPE OF ENGAGEMENT	MAIN OUTCOME
Non-Governmental Organizations (NGOs)	Uzbekistan Society for the protection of birds	I: Provision of information on avifaunal species and habitats of conservation importance, and related conservation programs.	Request for: information on avifaunal species and habitats of concern, which occur in and around the project sites; any additional considerations and recommendations regarding potential impacts of avifauna.	Business correspondence Request letter has been sent on March 27th 2024, response received on March 29th 2024.	Response letter stated absence of threat to Key Biodiversity Areas (KBAs) or Important Bird Areas (IBAs) due to the location of Project and its components. However, it was strongly suggested to consider mitigation measures for bird migration routes and terrestrial wildlife habitats.

5.4 Grievance Redress Mechanism (GRM)

The Project's external Grievance Redress Mechanism (GRM) was established at the outset of the ESIA study, with the following key objectives:

- To enable the receipt of concerns and complaints regarding the Project's performance on the management of potential or ongoing E&S impacts, from to Project's third-party stakeholders (e.g., affected communities, PAPs, and authorities).

To ensure prompt resolution of third-party E&S grievances, the GRM system involves collecting, investigating, and addressing concerns through corrective actions or by providing key project information. The system is structured around these principles:

- **Community-oriented:** Focuses on addressing the needs of project-affected communities and familiarizing them with the GRM.
- **Risk-proportionate:** Scaled to match the project's potential impacts.
- **Prompt:** Aims for quick resolution of complaints.
- **Transparent:** Follows clear, documented procedures with meaningful information disclosure.
- **Consultative:** Captures essential information for resolution and includes follow-up engagement.
- **Culturally appropriate:** Multiple grievance platforms, with submissions accepted in Uzbek and Russian, involving at least one female CLO.
- **Accessible:** Available to all community sections, accepting oral and written grievances.
- **Free of charge:** No service fees for using the system.
- **No retribution:** Protects against reprisals and allows anonymous grievances.
- **Alternative remedies:** Permits recourse to external arbitration or judicial systems if the GRM fails to satisfy the aggrieved party.

The GRM includes a range of channels for the receipt of grievances, which are meant to provide convenient GRM access to all sections of communities and stakeholders. These platforms include phone calls, email correspondence, general consultation forums (i.e., FGDs, inventory surveys).

GRM will be accessible during construction and operations as well thorough grievance boxes at project site entry points and project CLOs or security personnel.

Information will be provided at the Project entrance and at the location of grievance boxes, which may also include the makhalla offices, to inform people about the process and timeline to follow up their grievances.

The grievance redressal process involves three management tiers. If not resolved initially, the grievance is escalated to the Project Company's E&S Manager and relevant top management. The final remedial action or investigation report is then communicated to the grievant. If this fails, the grievant can seek administrative or judicial recourse outside the project. The GRM timeline is described in the table below.

Table 5-4 Grievance Process and Timeline

STAGE	TIMELINE
Grievance Received/Submitted	-
Grievance logged and acknowledged	Within 7 days of grievance being submitted
Grievance investigated	Within 14 days of grievance being submitted*
Proposed resolution conveyed to grievant	Within 14 days of grievance being submitted
If applicable following dissatisfaction of resolution by Grievant	
Actions to re-assess grievance/propose new solution/inform Grievant of final decision	Within 14 days of notification of dissatisfaction by the Grievant
In the event that a grievance cannot be resolved between the two parties a mediator will be involved i.e. local leaders who understand the culture and practices within the Project site.	Within 14 days of notification of dissatisfaction by the Grievant
Grievances that are not resolved at the Project level - a grievance committee involving senior management from ACWA Power, municipality and any other relevant authorities (if required).	Within 30 days of notification of dissatisfaction by the Grievant

***Note**: Where complex grievances, or other factors are extending the investigation time, the Grievant will be informed of this delay and advised of an updated expected timeline for response.*

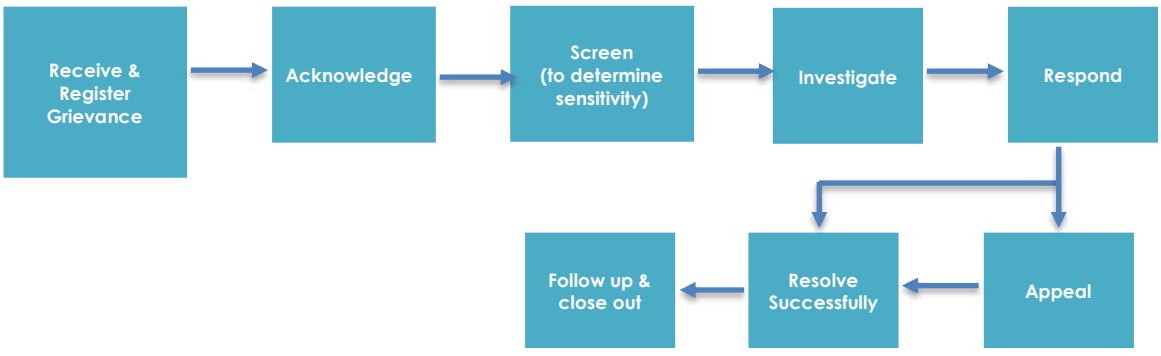


Figure 5-2 Grievance Flow

During the ESIA and LALRP stages, the Consultant will help the Project Company publicize and implement the GRM. The Project Company will be notified of each grievance and participate in investigations to determine responses. All grievances and resolutions will be recorded in the Project's external grievance register. After completing the ESIA and LALRP studies, the Project

Company will manage the external GRM. This transition will be communicated to the affected communities, and they will be introduced to the Project Company's new CLOs. Updated GRM contact information will be shared through leaflets and social media.

SEP IMPLEMENTING PARTIES

In the ESIA phase of project planning, the SEP and GRM will be implemented by the Consultant, in collaboration with Juru Limited. The Consultant will report E&S grievances to the Project Developer and the Project Lenders, as appropriate, to initiate investigation and corrective action. The locally based CLOs will carry out the following stakeholder engagement tasks, on behalf of the Project Developer.

- Preparation of stakeholder engagement materials (i.e., consultative letters, presentations, leaflets etc.)
- Phased consultation and information disclosure in accordance with the SEP.
- Preparation and compilation of stakeholder engagement records.
- Receipt and record keeping for lodged grievances, follow-up liaison and record of feedback following resolution.

Upon the ESIA, the CLOs working with the Project Company and EPC Contractor will take over stakeholder engagement and the management of community grievances.

Table 5-5 ESIA Phase Grievance Mechanism Contact Details

COMPANY	CONTACT DETAILS
Juru Dinara Rustami – Project coordinator	Email: d.rustami@juru.org Work: +998 71 202 04 40
Juru Gulchekhra Nematullayeva – Social Specialist	Email: g.nematullaeva@juru.org Work: +998 71 202 0440

Table 5-6 Stakeholder Engagement - Grievance Mechanism Contact Details at Construction and Operation Stages

COMPANY	CONTACT DETAILS
Project Developer ACWA Power Akbar Mavlonov Senior Manager – Business Development	Block-A, 13th Floor, 107-B, Amir Temur Avenue, Tashkent, Uzbekistan Email: amavlonov@acwapower.com Mob: +998 71 238 9960
Project Company "ACWA Power Beruniy" Wind FE LLC	To be confirmed Email: amavlonov@acwapower.com
EPC Contractor	To be confirmed
O&M Company	To be confirmed

Further information of the stakeholder engagements completed to date, and the plan for future consultation and disclosure will be provided in the final (ESIA) version of the Stakeholder Engagement Plan (SEP).

6 AIR QUALITY

6.1 Applicable Requirements & Standards

6.1.1 National Regulations

THE LAW OF THE REPUBLIC OF UZBEKISTAN "ON ATMOSPHERIC AIR PROTECTION" (1996, AMENDED ON 13.03.2020)

This regulation specifies standards, quality and harmful effects norms, requirements on fuels, lubricants, production and operation of vehicles and other transport means and equipment, ozone layer protection requirements, obligations of enterprises, institutions and organisations toward atmospheric protection, and compensations of damages from atmospheric pollutions.

SANPIN № 0293-11 "Hygienic regulations. List of maximum permissible concentrations (MPC) of contaminants in the atmospheric air of inhabitant areas in the territory of the Republic of Uzbekistan"

Table 6-1 Ambient Air Quality MPC (mg/m³)

POLLUTANT	(MPC MG/M³)			
	ONE-TIME	24-HOUR	MONTHLY	ANNUAL
NO_2	0.085	0.06	0.05	0.04
NO	0.6	0.25	0.12	0.06
CO	5	4	3.5	3
SO_2	0.5	0.2	0.1	0.05
NH_3	0.2	0.12	0.06	0.04

Note: Maximum one-time concentration - the highest concentration detected at 20-30-minute sampling.

Average daily concentration is the average of the one-time concentrations detected during the day or obtained with continuous 24-hour sampling.

Monthly average concentration is the average of the average daily concentration detected during the month.

Average annual concentration is the average of the number of average monthly concentrations revealed during a year in the course of one-time sampling.

6.1.2 Lender Requirements

ADB, AIIB and EPFIs

ADB, AIIB and EPFIs require adherence to the World Health Organisation (WHO) Ambient Air Quality Guidelines (2021).

Table 6-2 WHO Ambient Air Quality Standards (µg/m³)

PARAMETER	24 HOUR	ANNUAL
PM_{10}	150 (Interim target 1)	70 (Interim target 1)
	100 (Interim target 2)	50 (Interim target 2)
	75 (Interim target 3)	30 (Interim target 3)
	50 (Interim target 4)	20 (Interim target 4)
	45 (guideline)	15 (guideline)
$PM_{2.5}$	75 (Interim target 1)	35 (Interim target 1)
	50 (Interim target 2)	25 (Interim target 2)
	37.5 (Interim target 3)	15 (Interim target 3)
	25 (Interim target 4)	10 (Interim target 4)
	15 (guideline)	5 (guideline)
NO_2	120 (Interim target 1) 50 (Interim target 2) 25 (guideline	40 (Interim target 1) 30 (Interim target 2) 20 (Interim target 3) 10 (guideline)
SO_2	125 (Interim target 1)	500 (10-minute guideline)
	50 (Interim target 2)	
	40 (guideline)	
O_3	100 (interim target 1) (8-hour daily maximum)	
	70 (interim target 2) (8-hour daily maximum)	
	60 (8-hour daily maximum guideline)	

6.2 Baseline Conditions

Within the wider region, there are vermiculite mines and cement factories (both approximately 10 km from the site boundary for the WTG) typically located along the A380. Emissions from the stack of the two cement facilities were clearly visible during the December 2021 site visit, as shown in the following figure.

The proposed Project area is located in a remote region of Uzbekistan away from major population clusters and away from key anthropogenic emission sources. However, the site is prone to high winds and it is expected that natural ambient dust concentration can be high due to the sandy soils and limited vegetation.

Within the wider region, the main anthropogenic sources of air and dust emissions are those resulting from the vermiculite mines and cement factories located along the A380. Emissions from the stack of the cement facilities are visible. Additionally, areas adjacent to the wind farm Project site were identified as areas allocated for future mining. However, consultations undertaken with the Ministry of Mining and Geology confirmed that these areas will not be exploited for the next 25 years. any prospects for exercising any mining activities.

Figure 6-1 Stack Emissions from the Cement Plants

Visual observation by Juru (2024) confirm the presence of mining sites that contribute to elevated levels of dust and particulates. The following image from February 2024 depicts excavation activities happening at an adjacent mining site.

Figure 6-2 Excavation at a Vermiculite Mine

The industrial facilities in the surrounding areas also require the frequent movement of Heavy Goods Vehicles (HGVs) often carrying materials which can be dispersed by wind if not properly covered and secured. Therefore, elevated particulate matter concentrations in the surrounding region are not uncommon.

6.3 Area of Influence and Receptors

6.3.1 Area of Influence

During construction, pollutants of concern that may impact ambient air quality include Particulate Matter (PM) from site clearance and other typical construction activities, gaseous emissions from vehicles, machinery and equipment, and minor Volatile Organic Compounds (VOCs) and odour emissions.

References for areas of influences for construction dust and gaseous emissions are provided in the following table.

Table 6-3 Air Quality Area of Influence

PHASE	POLLUTANT	AREA OF INFLUENCE AND STUDY AREA	REFERENCE

Construction	PM (Dust)	An assessment relating to dust generation is normally required where there is:
		• a 'human receptor':
		  ○ within 350 m of the boundary of the site.
		  ○ within 50 m of the route used by construction vehicles on public highway, up to 500 m from the project site entrance.
		• An 'ecological receptor':
		  ○ within 50 m of the boundary of the site.
		  ○ within 50 m of the route used by construction vehicles on public highway, up to 500 m from the project site entrance.
			Institute of Air Quality Management (IAQM) for construction dust, 2014

	Gaseous Pollutants (from vehicular and temporary plant emissions)	Receptors within 200 m of the site or access road to be considered (in regard to vehicular emissions, but considered to be appropriate for construction plant)	The Design Manual for Roads and Bridges, Volume 11, Section 3, Air Quality (HA207/07) 2017
	Odour from sanitary wastewater (only if poorly managed)	Only expected a maximum of 100 m from source for distributed and various temporary toilets/septic tanks.	5 Capitals' project experience
	VOC emissions and odour (only if poorly managed)	Only expected a maximum of 100 m from source for small quantity and distributed storage during construction.	5 Capitals' project experience

6.3.2 Receptors

The following figure depicts a 350 m buffer around the access road, OHTL and land allocated for the WTG site boundary and highlights the existing air quality sensitive receptors.

Construction workers have been considered as a receptor to air quality impacts, however, it is recognised that the workers will be provided with personal protective equipment (PPE) during onboarding process and/or site induction.

Project construction will impact upon the local airshed, and although this may result in exceedances of national and international limits, the local airshed is not considered an end receptor to air quality impacts. Those who utilise the local airshed are considered receptors to air quality impacts.

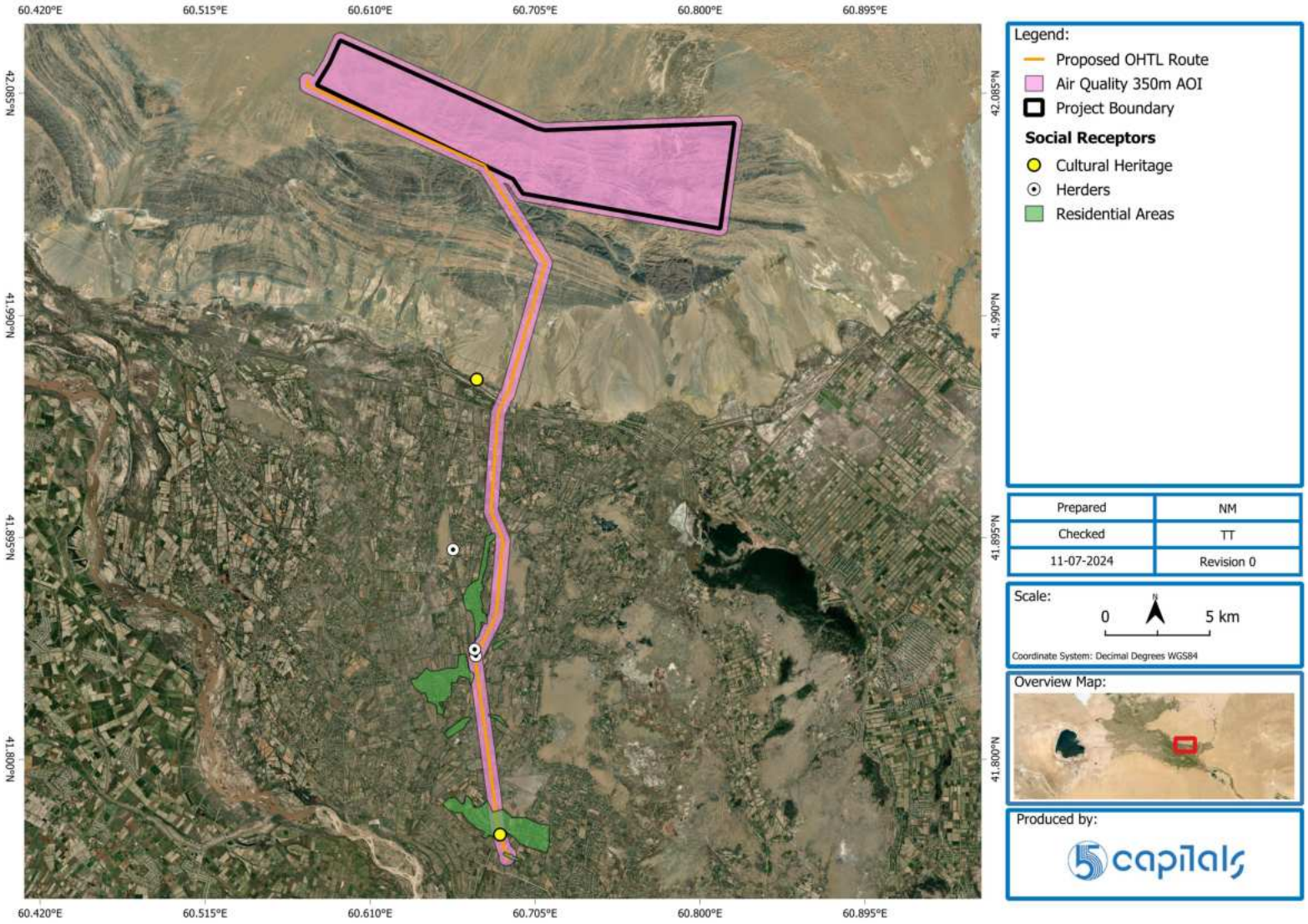


Figure 6-3 Air Quality Sensitive Receptors

Table 6-4 Receptor Sensitivity to Air Impacts

RECEPTOR ID	RECEPTOR	SENSITIVITY	JUSTIFICATION
-	Construction workforce	Low	The construction workforce will be supplied for PPE to manage potential air impacts arising from the Project.
-	Farmers & other users of the agricultural fields	Medium	Farmer, users of agricultural lands & irrigation canals. Herders and livestock will be relatively vulnerable to changes in ambient air quality as they are at the location for a short duration.
I7-I15	Users of the irrigation ditch & drainage canal	Medium	
-	Herder & Livestock stables	Medium	
C-5	Local cemetery	Medium	Visitors and workers at the cemetery will be vulnerable to changes in ambient air quality resulting from construction activities.
R3, R4 and R5	Dustlik, Nayman and Makhtumkuli village	Medium	Residents and visitors of the village will be vulnerable to changes in ambient air quality resulting from construction activities.

6.4 Potential Impacts, Mitigation, Management & Residual Impacts

6.4.1 Construction Phase

During construction, local ambient air quality may potentially be affected by increased dust (i.e. increased particulate matter), particularly during the site preparation stage (resulting from site clearance and earthworks etc.) and by the exhaust fumes of construction vehicles, equipment and temporary power generators. The typical air emissions resulting from these activities include: nitrogen oxides, sulphur dioxide, carbon monoxide, carbon dioxide, VOCs, particulates and BTEX.

The principle sources of dust, particulate and gaseous emissions during construction will be:

- Blasting (only at WTG pad areas if hard rock will be encountered during geotechnical surveys), excavations and earthworks, such as ground breaking, cutting, filling and levelling;
- Vehicle movements on unpaved, or compacted surfaces;
- Particulate matter dispersion from uncovered truckloads and from materials/aggregates at the batching plant (if uncovered);
- Vehicle and Construction equipment emissions (e.g. NO_x, SO_x and CO, CO_2, VOCs, particulates and BTEX) and particulates from vehicles, generators and other mechanical equipment;

- Construction of towers/pylons
- Stored VOCs and other volatile hazardous materials (if not sealed effectively) and;
- Odour from temporary wastewater facilities, or containment (if not sealed effectively).

6.4.1.1 Dust Generation

The principle sources of dust and particulate emissions during construction will be:

- Blasting, Excavations and earthworks, such as ground breaking, cutting, filling and levelling;
- Vehicle movements on unpaved, or compacted surfaces; and
- Particulate dispersion from uncovered truckloads and materials/aggregates at the batching plant (if uncovered).

Dust Emissions from Site Preparation

Dust resulting from blasting, excavations, and earthworks typically comprises large diameter particles, which settle rapidly and close to the generation source. Note: Blasting would only be at WTG pad areas if hard rock will be encountered during geotechnical surveys and away from human receptors.

According to the screening guidance of the UK's Institute of Air Quality Management (IAQM) for construction dust, detailed assessment relating to dust generation is required where there is a 'human receptor' within 350m of the boundary of the site. With regards to the wind farm project, this will be 350m from the nearest WTG. With respect to the screening criteria above, there are no human receptors within 350m of the nearest WTG. As such, there is no potential for impacts relating to dust emissions as a result of site preparatory activities upon receptors. With regards to the OHTL the following receptors are within 350m of the OHTL route: C-5, R-4 and R-5. As such, there is the potential for impacts relating to dust emissions as a result of OHTL preparatory activities.

However, the magnitude of such dust impacts from construction works will depend on the wind speed and wind direction which have been observed to predominantly come from the northeast and north direction (Juru, 2023).

However, the wind rose map indicates that the dominant wind direction is from the east, with winds coming from that direction 15% of the time. Winds also come from the northeast and east-southeast but at lower frequencies, approximately 10% and 5%, respectively.

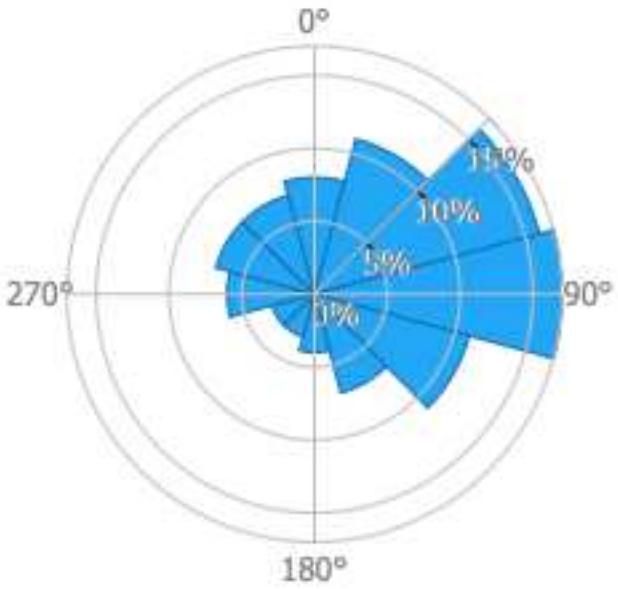


Figure 6-4 Karakalpakstan Region Wind Rose Map

Source: Global Wind Atlas

Dust & Particulate Emissions from Movement of Vehicles

In addition to vehicle movements on unpaved surfaces, dust generation from truck movements on unpaved surfaces and particulate dispersion from uncovered truckloads would only occur where mitigation measures are not effectively implemented at the site, or by contractors bringing materials torn cement bags, sand to the site.

Uncontained and/or un-sheeted trucks may be subject to losses of material where the containment is not effective (e.g. spills), or where wind or other air turbulence may disturb the contents and result in dispersion of materials. Such impacts have the potential to degrade local air quality in the immediate area of such movements.

In accordance with the UK's IAQM Guidance on the Assessment of Dust from Demolition and Construction, detailed assessment of vehicle movements should only be required where 'human' receptors are located within 50m of the route used by construction vehicles on public roads, up to 500m from the project site entrance.

In the instance of the wind farm, there are no receptors within 50m of the route to be used by construction besides the herders and their livestock. As such, there is the potential for impacts relating to dust generation or particulate emissions as a result of increase vehicle movement on this route.

At this stage the exact road to be used by construction vehicles for the construction of the OHTL is unknown. This will be confirmed in the final ESIA and potential impacts to receptors along the route will be assessed in the final ESIA.

Nonetheless, dust raised during construction activities is likely to settle in close proximity to where the activity is being carried out and impacts are expected to be temporary and contained. Dust impacts are also expected to be managed effectively with GIIP and therefore are not expected to result in significant impacts.

Dust Emission and Particulate Dispersion from Storage of Batching Plant Materials

Furthermore, the inadequate storage of sand, aggregates and other dust generating materials may lead to dust generation and particulate dispersion with the potential to degrade local air quality in the immediate area of the batching plant. However, such impact would only occur where mitigation measures are not effectively implemented at the batching plant onsite.

In accordance with the UK's Institute of Air Quality Management (IAQM) for dust, detailed assessment relating to dust generation is required where there is a 'human receptor' within 350m of the boundary of the site (in this case within 350m of the batching plant). The batching plant will be located within the Nukus 200 MW Wind Farm Project boundaries away from any local communities. Based on the above, there will be no human receptors within 350m of the batching plant. As such, there is no potential for impacts relating to dust emissions & particulate dispersion upon receptors as a storage of batching plant materials.

6.4.1.2 Gaseous Emissions

Exhaust emissions from the combustion of fossil fuels from the operation of vehicles, construction equipment and mobile plant, typically include NOx, carbon monoxide CO, sulphur dioxide SO_2, VOC, and PM. All these pollutants have a diversity of potential adverse health impacts ranging from mild headache to more serious illnesses such as cancer, particularly when exposure is chronic. The quantity of gaseous emissions from the construction equipment in addition to their numbers, will also depend on the number hours of operation and efficiency.Vehicles and equipment are likely to include, but not be limited excavators, drum rollers, standard dumps, wheel loaders, bulldozers, generators, etc. (see table below). Any emissions from these sources are not expected to result in noticeable incremental impacts to the local airshed as the relatively limited emissions will mix in ambient air close to the point of origin resulting in emissions that are not distinguishable from the background concentrations.

Table 6-5 Vehicles & Construction Equipment During the Construction of the Wind Farm and OHTL

NAME	QUANTITY
Large excavators	4~6
Single drum rollers	2~4
Standard dump truck	6~12
Medium wheel loaders	2~4
Bulldozers	1~2
Concrete mixers	8~10
Diesel generator	4~6
Batching plant	1
Heavy crawling crane	1~2
Truck crane	1~2

***Note**: The equipment/machinery listed above has only been estimated for the EPC Contractor and the sub-contractors are expected to have additional equipment/machinery depending on their area of work.*

However, where old or poorly maintained equipment is operated, there is potential for noticeable and/or cumulative impacts to occur. Such impacts are not expected to be discernible at receptor locations over 200m from the project boundary and over 50m from the site access road.

Details of the overall GHG emissions during construction are provided in the Climate Affairs chapter of this ESIA.

If improperly managed, there is a risk of nuisance and health effects to construction workers onsite. As with dust generation, impacts are expected to be reversible, temporary, contained and easily managed with GIIP.

6.4.1.3 Emissions of Volatile Organic Compounds (VOCs)

Very small quantity of fuels, paints, solvents and other volatile substances are likely to be required during the construction phase. Where necessary, these will be stored in secure areas within the temporary construction areas. In the event that these are not adequately contained/sealed, such substances have the potential to result in the dispersion of volatile emissions to the immediate air shed. The expected range of impact from Volatile Organic Compounds (VOCs) is likely to be less than 100m from source such as chemical storage areas, hazardous waste storage areas, etc.

Given that the storage of such volatile substances will be in small volumes, any potential impacts will be limited to the immediate surrounding area where the laydown down areas and/or storage yards are located. Impacts to receptors outside the project site is not

anticipated given the distance of the proposed laydown areas to receptor location (over 100m away). Any potential impact to receptors will only occur where inappropriate storage or use of substances is in close proximity to the project site boundary.

6.4.1.4 Odour

The construction phase of the project will require a number of toilet facilities (including septic tanks) on site for site staff and construction workers. There is the potential for the release of odour to the immediate surrounding areas from inappropriate containment and coverage associated with wastewater holding/septic tanks. The expected range of impact from odour is likely to be within 100m from source such as temporary toilets/septic tanks. Such impacts may therefore be limited to the immediate surrounding area.

Table 6-6 Air Quality Impact Significance, Mitigation Measures and Residual Impacts

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
Construction						
Construction Dust	**Minor Negative**	Human receptors within 350 m of the boundary of the site, and within 50 m of the route used by construction vehicles on public highway, up to 500 m from the project site entrance.	**Low**	**Negligible**	• Dust generating activities (blasting, land grading, excavations, etc.) and movement of uncovered waste/materials should be conducted during periods of low winds, in which the EPC Contractor should undertake general visual observations for dust emissions and monitor these activities if any complaints arise. • Optimize blasting design/method to minimize the generation of fine particles. • Minimise blasting to the extent possible and where feasible, consider alternatives to blasting, such as mechanical methods. • Where required, install heavy mesh blasting mats to minimize flying debris and dust. • Daily review of weather updates, to give warning of likely strong winds to assist with the management of windblown dust. • Dust generating activities will be reconsidered (or moved away or downwind of receptors) during periods of high winds conditions. • Unloading of sand and other dust generating materials at the batching plant will be avoided) during periods of high winds conditions. • All dust generating materials at the batching plant will be adequately covered and stored in enclosed or bunded containers • The EPC Contractor will obtain all the necessary permits related to the construction and operation of the batching plant. • Internal roads inside the project site will be compacted as it reduces vehicular power consumption. • Compact unpaved site roads in order to reduce dust generation and wet down key access roads and dusty areas during blasting activities if necessary. • Vehicle speeds on all non-public site access and internal site roads will be restricted to 20 km/h. • Where sand and other dusty materials are transported, trucks will not be overloaded and will be appropriately covered to avoid losses en-route. • Cement and other fine powders will be sealed or covered, stored and transported in enclosed or bunded containers. • Dusty material stockpiles (i.e., any fine sands and powders), dust generating activities (e.g., stone cutting) are to be located away from the site boundaries and be contained or covered with suitable netting to avoid dust dispersion during storage or use.	**Negligible**
	Minor Negative	Ecological receptors within 50 m of the boundary of the site, and within 50 m of the route used by construction vehicles on public highway, up to 500 m from the project site entrance.	**Medium**	**Minor**		**Negligible**

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
					• Notice will be provided to the sensitive receptors near the site as early as possible (minimum one-week notice) if there will be activities that might generate a lot of dust. • Vehicle routes will be clearly demarcated and appropriate signage displayed around the site. • Daily (or more frequent depending on conditions) wetting/damping down of demarcated unpaved site roads to reduce dust generation. • Project workers will be provided with full PPE kit including dust masks, where dust is identified as a risk to workers. • The provision of a wheel-washing facilities or high-pressure hose to ensure all vehicles leaving the site are in a satisfactory state of cleanliness, will also be provided. • Dust suppression of the concrete batching plant to be conducted regularly using recycled/treated concrete washout to minimize dust generation. • Concrete batching plant will be located away from sensitive receptors. • Wetting down of any unpaved roads used by construction vehicles in order to reduce dust generation. • No fires or burning of wastes will be allowed on-site. • Where applicable, the EPC Contractor will obtain all necessary permits required for the operation of HGV and diesel generators within emission standards.	

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
Gaseous emissions	**Minor Negative**	Receptors within 200 m of the site or access road to be considered (in regard to vehicular emissions, but considered to be appropriate for construction plant)	**Low**	**Negligible**	• Project workers will be provided with full PPE kit including face masks. • Demarcated site roads will be compacted to reduce vehicular power and related fuel consumption. • Construction roads in the site will be designated and made clear to the drivers with signage for directions and speed limits placed all along the roads. • Unnecessary usage of vehicles, plant and equipment will be minimised – No unnecessary idling. • Deliveries of equipment/plant to the site will be efficiently managed to reduce the number of trips. • Exhaust fumes and particulates emitted from trucks and vehicles will be minimised by ensuring the use of good condition vehicles (e.g. compliant to vehicle emission requirements). • Lorries and trucks engines will be turned off while waiting on site to minimize gaseous emissions. Air-conditioned or heated shelters will be provided for drivers in designated waiting, loading and unloading areas to prevent drivers waiting in vehicles. • Exhaust emissions from Project plant and vehicles will be subject to acceptance checks for authorisation of use on site. This includes a pre-requisite requirement of site vehicles to ensure no black smoke before entering site and that any identified machinery or vehicles with black smoke will require maintenance and re-assessment before it is returned. • Paved and unpaved roads along the OHTL corridor will be designated and made clear to the drivers with signage for directions and speed limits placed all along the road.	**Negligible**
Emission of VOCs and Odour	**Negligible Negative**	Receptors within a maximum of 100 m from source	**Medium**	**Negligible**	• Hazardous materials stored and used on site with potential vapour emissions (e.g. Volatile Organic Compounds) will be located in well-ventilated, but secure low-risk areas, away from key site routes and away from the site boundary (where possible). • Volatile fuels and chemicals (including hazardous wastes) will be stored in sealed containers. On site storage of large quantities of volatile fuels will be avoided, equally prolonged exposure to direct sun and heat will be avoided. • Temporary chemical and hazardous materials (and waste) storage areas will be purpose built and well maintained. A data log of all chemicals with MSDSs will be provided at the storage facility within easy access. • Adequate and sufficient sanitary facilities for site workers must be provided. • Effective cleaning and maintenance of toilets to be undertaken to avoid odour dispersion and cleaning records/inspection sheets displayed in the toilets. • All septic tanks must be sealed and fully functioning.	**Negligible**

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
					• Septic tanks must be operated and maintained according to manufacturer recommendations. • Sanitary waste will be removed from site by licensed contractors and disposed in wastewater treatment facilities approved by the applicable regulator.	

Operation

As the operation of the wind farm and OHTL will not include combustion related activities, there will be no direct emissions to the local air-shed as a result of primary project operations. The corona effect which is explained in more depth in the Noise and Vibration chapter (Section 7) of this ESIA can produce ozone and oxides of nitrogen in the air during humid conditions however, such gases will be released in small quantities and any associated impact will be negligible.

The operation and maintenance (O&M) requirements of the wind farm and OHTL will necessitate limited use of vehicles and delivery/removal vehicles along access roads to undertake inspection and maintenance activities. Emissions from these vehicles will be very minor and are unlikely to result in discernible impacts at receptors.

6.4.2 Decommissioning Phase

Potential impacts relating to decommissioning will be similar to those encountered during the construction phase. This will include the generation of dust from demobilisation and break-up of foundations and landscape restoration etc. As such, it is assumed that the risk of dust generation or gaseous emission as a result of vehicle movement associated with the construction phase will be expected for the decommissioning phase. Likewise, the mitigation & management measures outlined for the construction phase in relation to dust generation and gaseous emission will be applicable to the decommissioning phase as well, but will be re-assessed at the time to best inform a Decommissioning Management Plan, with specific relevance to working methods and nay regulations that may be applicable at this time.

6.5 Monitoring

The EPC Contractor and the O&M Company will undertake certain monitoring processes related to air quality during both the construction and operational phases of the project respectively and these are outlined in the table below. The final monitoring methodology with specific monitoring details (i.e. locations, frequencies, durations, parameters etc.) will be developed in the specific 'Environmental Monitoring Plan' by these parties. The results of air quality monitoring will be logged in the monitoring matrix and compared to the applicable regulatory and lender standards stated above. The most stringent requirements should be followed, whether they are national or international standards.

Table 6-7 Air Quality Monitoring Requirements

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION	RESPONSIBLE ENTITY
Construction				
Dust Generation	Dust	General day-to-day visual observation for dust emissions to be undertaken during dust generating activities. To be monitored quantitatively if generation is considered to be excessive or complaints are received.	Along access Road to the Project site, Construction site and laydown areas, Batching plant, OHTL Tower works, Dispersion to external receptors from point of generation.	EPC Contractor E&S Manager
Emissions from engines and plants	Vehicle Emissions	Pre-site authorisation checks on vehicle status and health, including associated emissions. General visual observations of emissions to be undertaken on a daily basis while vehicles &	All non-road vehicles and engines.	EPC Contractor E&S Manager

Monitoring	Parameter	Frequency & Durations	Monitoring Location	Responsible Entity
		equipment are in use and annual inspection of vehicles.		
Sanitary Facilities & Hazardous Material stores	Odour & VOCs	Daily olfactory observations for odour – as part of maintenance and inspection checks Daily inspection of hazardous materials storage areas for any leaks or emission of VOCs	All sanitary facilities available within the laydown areas, sub-contractor camps and work fields. All hazardous material, chemical and fuel stores.	EPC Contractor E&S Manager
Operation				
Emissions from engines	Vehicle emissions	General visual observations of emissions to be undertaken on a daily basis. Regular maintenance & servicing of project vehicles and planned annual inspection.	All road and non-road vehicles and engines belonging to the Project.	O&M Contractor E&S Manager

7 NOISE & VIBRATION

7.1 Applicable Requirements & Standards

7.1.1 National Regulations

SANPIN NO. 0267-09 relating to rules on acceptable levels for habitable areas in Uzbekistan sets out the acceptable noise levels for habitable areas both inside and outside of buildings in Uzbekistan as shown in the table below.

Table 7-1 Noise Limits under SanPiN No.0267-09

LOCATION	TIME	SANPIN NO. 0267-09
Noise levels in premises of residential, public buildings and on the territory of residential areas	7am to 11pm	55dB(A)
	11pm to 7am	45dB(A)

SANPIN NO. NO 03225-16 sanitary standards for permissible noise levels in the workplace aims to protect the health of the staff and workers in the workplace. The law represents noise levels for a variety of internal and external application as shown in the table below:

Table 7-2 Work Environment Noise Limits

TYPE OF WORK, WORKPLACE	REQUIREMENT
Performing all types of work on the permanent workplaces in industrial premises and in the enterprises	80db(A)

7.1.2 Lender Requirements

ADB, AIIB and EPFIs

ADB, AIIB and EPFIs require adherence to WHO noise standards as detailed in World Bank EHS Guidelines (2007), as shown in the following figure.

Table 7-3 World Bank Ambient Noise Level Guidelines

RECEPTOR	ONE HOUR LAEQ DB(A)	
	DAYTIME (07:00 – 22:00)	NIGHT (22:00 – 07:00)
Residential, Institutional, Educational	55	45
Industrial, Commercial	70	70

These relates to receptors and not the plant boundary. Noise impacts should not exceed the levels presented above, or result in a maximum increase in background levels of 3 dB(A) at the nearest sensitive receptor location off-site.

Furthermore, the following requirements have also been specified in the WBG EHS noise guidelines:

- No employee should be exposed to a noise level greater than 85 dB(A) for duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).
- The use of hearing protection should be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound level reaches 140 dB(C), or the average maximum sound level reaches 110 dB(A). Hearing protective devices provided should be capable of reducing sound level at the ear to at least 85 dB(A).
- For every 3 dB(A) increase in sound levels, the allowed exposure period or duration should be reduced by 50%.
- Where feasible, use of acoustic insulating materials isolations of the noise source and other engineering controls should be investigated and implemented prior to the issuance of hearing protection devices as the final control mechanism.
- Medical hearing checks on workers exposed to high noise levels should be performed periodically.

NOISE REQUIREMENTS FOR WIND PROJECTS

The World Bank/IFC EHS Guidelines for Wind Projects include information relevant to the EHS aspects of onshore and offshore wind energy facilities.

For operational phase noise, the IFC Guideline for Wind Energy include principles for the assessment of sound from wind turbines, which include the following (WBG/IFC, 2015):

- Receptors should be chosen according to their environmental sensitivity (human, livestock or wildlife);
- Preliminary modelling should be carried out to determine whether more detailed investigation is warranted. The preliminary modelling can be as simple as assuming hemispherical propagation (i.e., the radiation of sound, in all directions, from a source point). Preliminary modelling should focus on sensitive receptors within 2,000 meters (m) of any of the turbines in a wind energy facility;
- If the preliminary model suggests that turbine noise at all sensitive receptors is likely to be below an LA90 to 35 dB(A) at a wind speed of 10 meters/second (m/s) at 10m height during day and night times, then this preliminary modelling is likely to be sufficient to assess noise impact; otherwise, it is recommended that more detailed modelling be carried out, which may include background ambient noise measurements;
- All modelling should take account of the cumulative noise from all wind energy facilities in the vicinity having the potential to increase noise levels;
- If noise criteria based on ambient noise are to be used, it is necessary to measure the background noise in the absence of any wind turbines. This should be done at one or more noise-sensitive receptors. Often the critical receptors will be those

closest to the wind energy facility, but if the nearest is also close to other significant noise sources, an alternative receptor may need to be chosen; and

- The background noise should be measured over a series of 10-minute intervals using appropriate wind screens. At least five of these 10-minute measurements should be taken for each integer wind speed from cut-in speed to 12 m/s.

The above principles are referenced from the following key guidance documents:

- ETSU, Report ETSU-R-97 "The Assessment & Rating of Noise from Wind Farms" 1997.
- Institute of Acoustics (IOA) "A Good Practice Guide to the Application of ETSU-R-97 for the Assessment & Rating of Wind Turbine Noise" 2013.
- D. McLaughlin "Wind Shear and its Effect on Wind Turbine Noise Assessment" Acoustic Bulletin, July/August 2012, 39-42.

VIBRATION GOOD PRACTICE GUIDELINE

Good practice vibration exposure limits and action values are stated in guidance issued by the American Conference of Governmental Industrial Hygienists (ACGIH), which advises threshold limit values for both hand-arm vibration and whole-body vibration.

7.2 Baseline Conditions

7.2.1 Overview

There are no significant anthropogenic sources of noise and vibration within 4.5 km of the wind farm Project site. The main regional source of noise is the industrial plants along the A380. However, noise from these facilities is not expected to be discernible at wind farm site. There are no noise sensitive receptors at the wind farm site apart from herders which are nomadic.

The OHTL is approximately 1.1 km from an active mining facility. Traffic on the A380, and the mining and cement operations are the primary sources of noise and vibration.

7.2.2 Baseline Noise Survey

A noise measurement campaign was undertaken at twelve (12) locations from 23rd March 2024 to 7th April 2024. The locations of noise monitoring are shown in the following figure and further described in the following table.

Due to the lack of noise sources within the allocated boundary of the WTG, only one (1) measurement was taken from within the WTG site boundary, while eleven (11) measurements were taken at receptor locations along the OHTL alignment. The majority of the noise monitoring points are located south of the OHTL alignment to assess the noise impact in residential areas and near the asphalt road.

The noise surveys were undertaken during periods of relatively calm weather in order to obtain representative noise baseline data at each location. The noise survey was carried out with sound level meter (SLM) Class 1 (Type 1), which corresponds to IEC 61672 (Calibration certificate provided in Volume 4, Appendix C). The noise meter was arranged at a height of 1.7m above the ground level and was placed at least 5m away from any obstructing or reflecting surfaces. An anemometer was located adjacent to the SLM to measure wind speed and direction during the noise monitoring survey.

Ambient noise levels were monitored for 10-minute segments for a 24-hour period at each monitoring location, whilst taking note of noise influences from the surrounding environment (see table below for site observations).

All the surveys were conducted to make sure it was aligned with the Uzbekistan SanPin No.0267-09 timelines (Daytime-7am to 11pm and night-11pm to 7am) and those of WHO Noise standard (Daytime-7am to 10pm and Night-10pm to 7am).

The A-weighted continuous equivalent sound level (LAeq) along with LAmax, LAmin, LA10, LA 50, LA90 and LA95 were logged for 24 Hours at each location. The monitoring locations are provided in the figure below. The coordinates of the monitoring locations as well as site observations are presented in the table below.

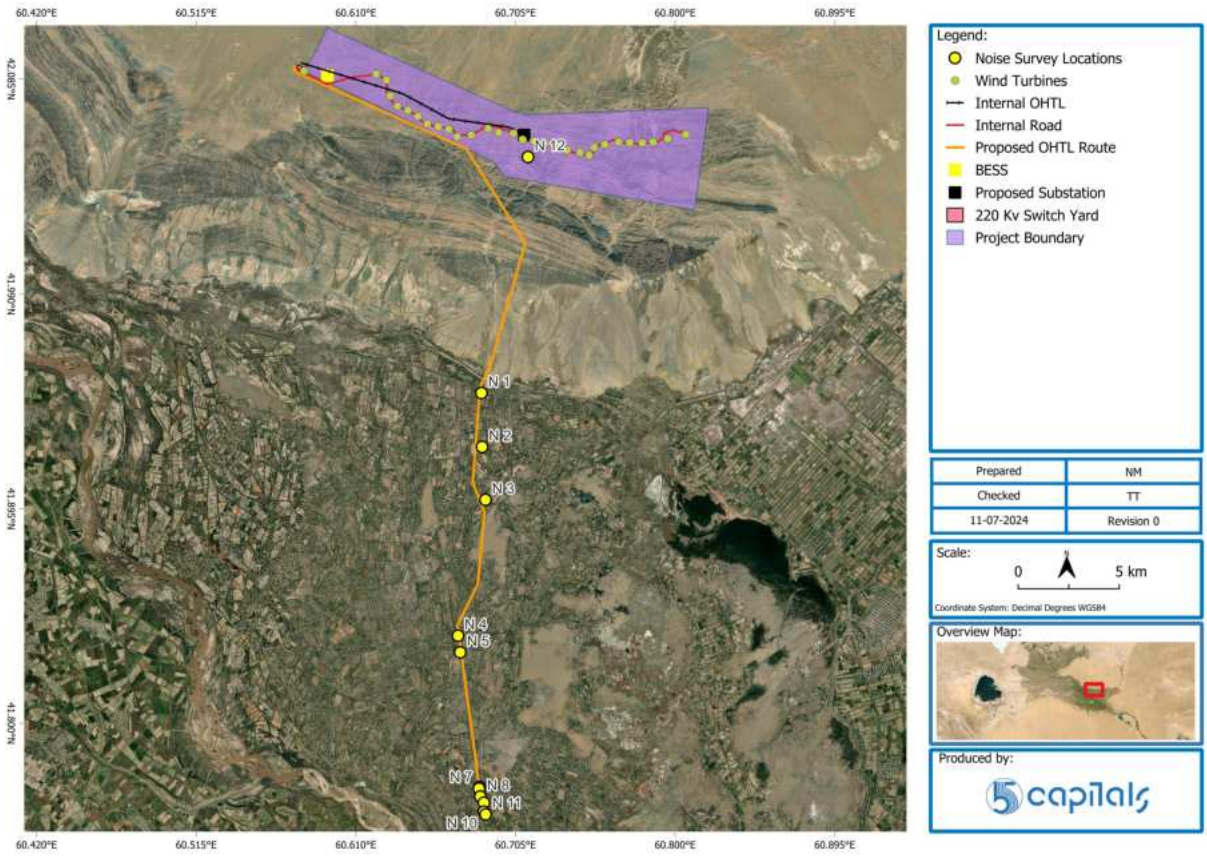


Figure 7-1 Noise Monitoring Locations

Table 7-4 Noise Monitoring Locations and Site Observations

ID	DESCRIPTION	COORDINATES		PHOTOS
		NORTHING	EASTING	
N1	Near herder settlement along the OHTL route	41.946250°	60.684725°	

ID	Description	Coordinates		Photos
		Northing	Easting	
N2	Near Residential buildings along the OHTL route	41.922411°	60.685111°	

ID	Description	Coordinates		Photos
		Northing	Easting	
N3	Near Residential building along the OHTL route	41.898991°	60.687141°	

ID	Description	Coordinates		Photos
		Northing	Easting	
N4	Near residential building in proximity to A380 asphalt road	41.838805°	60.670772°	
N5	In proximity to maintenance work being carried out near the A380 asphalt road.	41.831438°	60.672055°	

ID	DESCRIPTION	COORDINATES		PHOTOS
		NORTHING	EASTING	
N6	Near residential building along the OHTL route	41.771775°	60.683675°	

ID	DESCRIPTION	COORDINATES		PHOTOS
		NORTHING	EASTING	
				

ID	Description	Coordinates		Photos
		Northing	Easting	
N7	Near residential building in proximity to A380 asphalt road	41.771033°	60.683244°	

ID	DESCRIPTION	COORDINATES		PHOTOS
		NORTHING	EASTING	
N8	Along the A380 asphalt road	41.767497°	60.684038°	

ID	Description	Coordinates		Photos
		Northing	Easting	
N9	At a field 150 m from A380 asphalt road	41.764775°	60.686169°	

ID	Description	Coordinates		Photos
		Northing	Easting	
N10	Along the A380 asphalt road and in proximity to a gas station	41.760758°	60.686094°	
N11	Near residential building along the OHTL route	41.759588°	60.687175°	

ID	Description	Coordinates		Photos
		Northing	Easting	
N12	Within the WTG site boundary	42.050586°	60.712391°	

The following tables and figures outline the results of the noise measurement campaign.

The results at monitoring locations N1 to N5, N11, and N12 are compliant with the limits established in the WHO and national noise standards. However, exceedances were recorded at monitoring locations N6 to N8 and N10 against the daytime and nighttime WHO and national noise standards, while N9 indicated an exceedance against the nighttime standards.

The observed exceedances in noise levels at these specific locations are likely attributed to the increased population density and the corresponding rise in human activities, vehicular traffic, and commercial operations. These factors inherently contribute to elevated ambient noise levels. In particular, monitoring locations N7, N8, and N10 are located in close proximity to the A380 highway, a major transport route that experiences high traffic volumes, including heavy vehicles. This continuous traffic flow generates significant noise emissions, particularly during peak hours. Additionally, the presence of local businesses and residential areas in these locations further elevates the noise levels due to regular daily activities.

Table 7-5 Baseline Noise Monitoring Results

ID	Time (Hours)	Monitoring Period	Noise Monitoring Results				WBG EHS Guideline	National Noise Standards
			LAeq, T dB	LAmax dB	LA10, T dB	LA90, T dB		
N1	07:00 - 22:00	Daytime	29.72	46.27	31.68	23.18	55	55
	22:00 - 07:00	Night-time	25.50	37.68	27.77	20.24	45	45
N2	07:00 - 22:00	Daytime	43.96	61.53	45.39	36.16	55	55
	22:00 - 07:00	Night-time	36.93	55.98	38.66	29.10	45	45
N3	07:00 - 22:00	Daytime	37.55	51.93	39.71	31.39	55	55
	22:00 - 07:00	Night-time	30.27	45.10	31.92	25.14	45	45
N4	07:00 - 22:00	Daytime	42.61	58.86	45.67	32.82	55	55
	22:00 - 07:00	Night-time	39.36	55.43	41.92	27.17	45	45
N5	07:00 - 22:00	Daytime	45.30	60.95	48.16	35.33	55	55
	22:00 - 07:00	Night-time	41.30	57.44	43.57	29.76	45	45
N6	07:00 - 22:00	Daytime	**58.58**	76.26	61.37	45.14	55	55
	22:00 - 07:00	Night-time	**51.44**	69.55	53.06	32.17	45	45
N7	07:00 - 22:00	Daytime	**61.25**	81.35	63.23	43.48	55	55

ID	Time (Hours)	Monitoring Period	Noise Monitoring Results				WBG EHS Guideline	National Noise Standards
			LAeq, T dB	LAmax dB	LA10, T dB	LA90, T dB		
	22:00 - 07:00	Night-time	**53.25**	73.48	52.09	31.43	45	45
N8	07:00 - 22:00	Daytime	**56.06**	72.69	59.05	45.40	55	55
	22:00 - 07:00	Night-time	**48.81**	66.65	51.47	31.88	45	45
N9	07:00 - 22:00	Daytime	53.86	68.42	56.76	45.52	55	55
	22:00 - 07:00	Night-time	**48.52**	62.78	51.98	36.19	45	45
N10	07:00 - 22:00	Daytime	**58.62**	72.26	62.77	43.06	55	55
	22:00 - 07:00	Night-time	**53.91**	70.05	56.98	37.14	45	45
N11	07:00 - 22:00	Daytime	47.96	63.96	51.15	37.05	55	55
	22:00 - 07:00	Night-time	39.88	55.19	42.66	32.29	45	45
N12	07:00 - 22:00	Daytime	45.10	61.09	47.82	34.78	55	55
	22:00 - 07:00	Night-time	41.71	57.16	44.25	30.86	45	45

Notes:
The WHO standard defines daytime as 07:00 – 22:00 while the national standard defines daytime as 07:00 – 23:00.
Both the WHO and national standard limits residential noise at 55 (daytime) and 45 (nighttime) LAeq dB(A).

7.3 Area of Influence and Receptors

7.3.1 Area of Influence

Construction Phase

Propagation of sound from a source depends on a number of factors such as the level and frequency, type of terrain, distance, weather conditions and barrier effects. Under free field conditions, noise from a point source will attenuate with increased distance. Barriers and obstacles in the Project site, such as topographical features will also influence how sound is transmitted. The area of influence is anticipated to be localised and conservatively limited to within 500 m or to a maximum of 2 km in very calm and quiet ambient conditions of the construction footprint, including access roads (both Project specific and general) and the OHTL route during the construction phase.

Operation Phase

In relation to noise impacts during operation, the expected range of impacts are likely to be within 2 km of any WTG (based on WBG/IFC EHS Wind Energy recommendation). The following figure depicts a 2 km buffer from the site boundary of the land allotted for the WTGs.

No specific assessment of noise quality impacts has been conducted, as the preliminary screening assessment has shown that noise levels are expected to drop to between 35 and 40 dB(A) within 1 to 1.5 km from each WTG (Juru Energy, 2021). Additionally, there are no permanent residential receptors within 9km of the proposed WTGs, and herder's shelters were also not identified. Therefore, it is unlikely there will be any operational noise issues on permanent residential receptors and as such detailed noise monitoring is not currently required.

Additionally, the crackling/corona noise from the OHTL and electrical facilities is not expected to be significant at the Project's operational stage and is limited to 200 m from the OHTL.

Vibration impacts are not expected during the operation phase.

7.3.2 Receptors

The following figure depicts the existing noise sensitive receptors to the Project within a zone of 2km. Findings from the numerous site visits and review of satellite imagery has identified residential, cultural and industrial receptors. Construction workers have also been considered as a receptor to noise impacts, however, it is recognised that the workers will be provided with PPE during the onboarding process and/or site induction. With respect to operational noise from turbines, the following figure depicts the 2 km buffer from the boundary of the land allotted for the WTG, as is evident there are no noise sensitive receptors within the area of influence.

The identified sensitive receptors are also summarized in the following table.

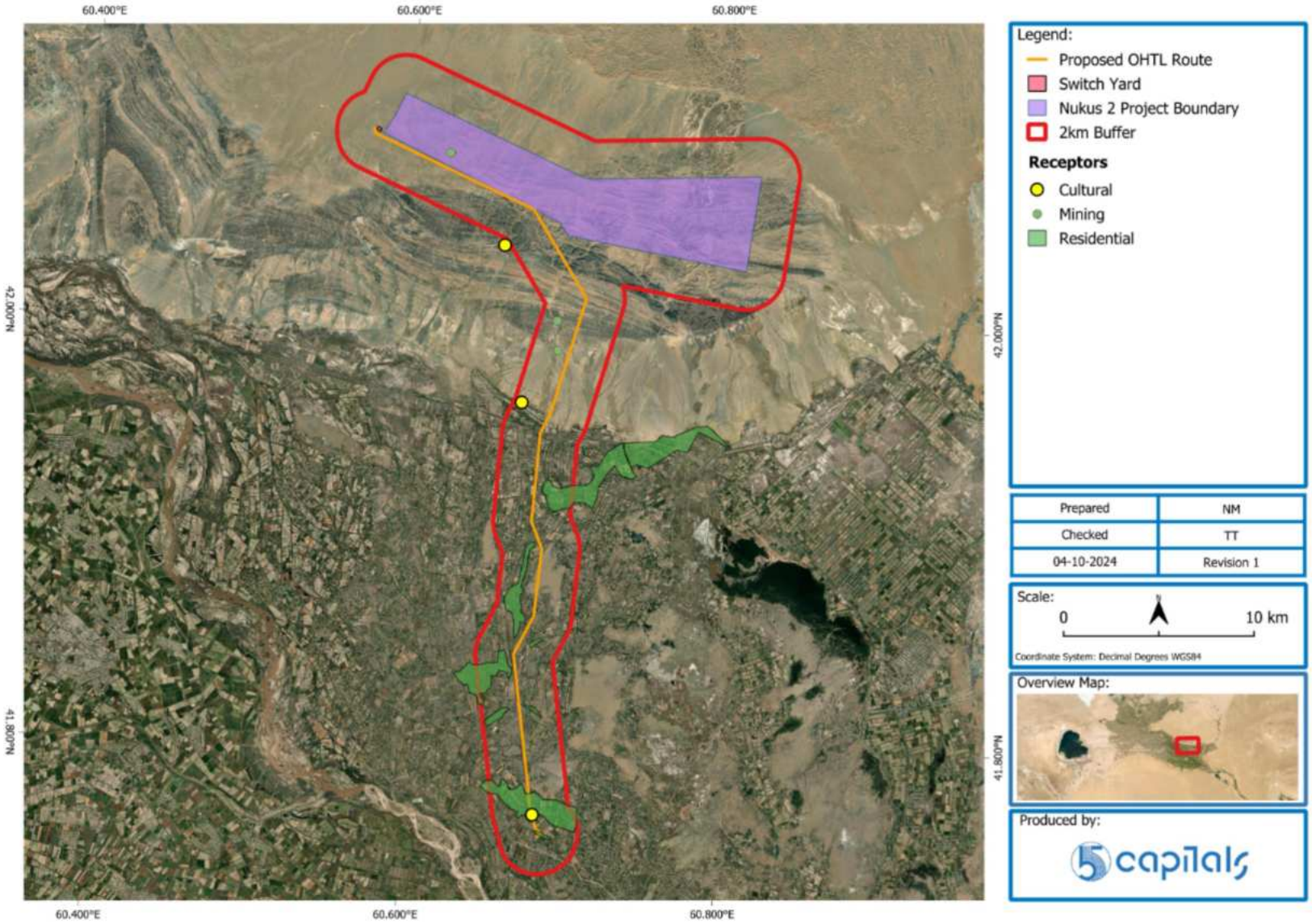


Figure 7-2 Noise Sensitive Receptors

Table 7-6 Receptor Sensitivity to Noise Impacts

RECEPTOR ID	RECEPTOR	RECEPTOR TYPE	SENSITIVITY	JUSTIFICATION
-	Wind Farm and OHTL Site Workers	Construction workforce	Low	The construction workforce will be supplied for PPE to manage potential noise impacts arising from the Project.
C-1	Munojat Mountain	Cultural	Medium	Visitor of the Munojat Mountain will be sensitive to changes in ambient noise levels.
M-2	Marmor LLC/mining area (including mine workers)	Industrial	Low	Mining activities generate noise and as such workers at the mine will unlikely be sensitive to project impacts due to the noisy nature of works they are exposed to from the mining facilities.
M-3	Active mining area (including mine workers)	Industrial	Low	Mining activities generate noise and as such workers at the mine will unlikely be sensitive to project impacts due to the noisy nature of works they are exposed to from the mining facilities.
C-5	Cemetery	Cultural	Medium	Visitor of the cemetery will be sensitive to changes in ambient noise levels.
R-3	Dustlik village	Residential	High	Residents at this household will be sensitive to changes in ambient noise levels.
R-4	Nayman village	Residential	High	Residents at this household will be sensitive to changes in ambient noise levels.
R-5	Makhtumkuli village	Residential	High	Residents at this household will be sensitive to changes in ambient noise levels.

7.4 Potential Impacts, Mitigation, Management & Residual Impacts

7.4.1 Construction Phase

7.4.1.1 Construction Site Noise and Vibration

NOISE

The spatial extent of construction noise will typically be local, and largely limited to within the immediate surroundings of the works. The duration of the impact will be short considering individual noise emission events relative to the lifespan of the project. The frequency of occurrence is high as noise emissions will likely occur daily, but noise emissions are reversible once the activity ceases.

Construction activities for the Project will result in temporary and short duration increases in noise and vibration levels. Pertinent construction activities at the project site in relation to noise are likely to include:

- Access road preparation / construction for the transport of turbines to the site;
- Site Preparation (e.g. earthworks, compaction);
- Blasting (only at WTG pad areas if hard rock will be encountered during geotechnical surveys);
- Foundation construction;
- Vehicle movements, particularly the transport of the turbines to site;
- Turbine erection; and
- Foundation works and erection of OHTL route.

The accumulation of noise from the above sources can introduce potential cumulative impacts when generated in tandem.

The anticipated construction equipment/machinery to be used at the site for various construction activities together with noise data for this equipment are presented in the following table as obtained from 'BS 5228-1:2009 - British Standards: Code of practice for noise and vibration on construction and open sites'.

Table 7-7 Noise Level of Proposed Construction Equipment

EQUIPMENT	BS 5228-1:2009 REFERENCE	SPL DB (A)
Tracked Excavator (32t)	Table C.2 – #15	76
Roller (18t)	Table C.2, #13	73
Dump Truck	Table C.2 - #30	79
Loader	Table C.2 – #28	76
Bulldozer	Table C.5 - #14	86
Concrete mixer	Table C.4 – #79	80
Diesel Generator	Table C.4 – #79	64
Crawling crane	Table C.4 - #38	78
Crane	Table C.4 - #43	70
Cumulative Total (Equipment on 50% of the Working Day)		**92.3**

Noise levels dissipate with distance and as such the potential for noise impacts from construction activities upon receptors will significantly decrease with distance from the noise sources. Calculation of distance propagation and ground absorbance have been undertaken for receptors within 1km of asset boundary. Table 7-8 below shows the anticipated noise levels within 2km of asset boundary.

Table 7-8 Construction Activities Noise Attenuation by Distance

DISTANCE FROM SOURCE (M)	PREDICTED NOISE LEVEL (DB(A))
10	92.3
50	76.8
100	69.3
250	59.3
500	51.8
750	47.4
1000	44.3
2000	36.8

Predicted noise levels for construction plant impacts at receptors have been calculated using the noise ratings for equipment (as above), in combination with distance attenuation to receptors. The predictions assume that each piece of equipment will only be operational for 50% of the working day. The predictions also work on the basis that all of the equipment is located at the same location at the boundary of the site and boundary of the site (a worst-case assumption).

In order to derive representative noise levels for the purpose of calculating the construction noise impacts, baseline daytime and night time noise levels have been calculated from the logarithmic average of all measurements obtained over a given period of time in order to obtain a single ambient noise level for each location and assessment period.

A basic modelling assessment using equations set out in Annex F of 'BS5228-1:2009 Part 1 Noise' has been used to predict the effects of distance propagation and ground absorbance. The adjustment due to ground absorbance has been made based on all nearby receptors being >25m from source and using the equation '25*LOG(10/Distance to receptor)+2'.

Note: *The relevant noise monitoring location has been selected by determining the nearest baseline monitoring location to each receptor. The cumulative impact is based on the overall noise and considers the baseline noise and the construction noise levels.*

The cumulative noise levels obtained are then compared with applicable established standards to determine the significance level of construction noise impacts.

In respect of potentially more sensitive residential receptors, BS5228 outlines criteria in Annex E.3, which considers impact significance based upon the change in ambient noise associated with construction activities. BS5228 states that this can be considered as, '*an alternative and/or additional method to determine the significance of construction noise levels*'. Paragraph E.3.2 describes Example Method 1 (The ABC Method), which considers the existing ambient noise

environment (the LAeq noise level environment) at the neighbouring sensitive receptors and identifies levels that if exceeded would be considered to result in a significant adverse effect and is noted to apply to residential receptors only.

Table E.1 of BS5228 sets out significance effect threshold values at receptors. The process for determining this requires the determination of the ambient noise level at the relevant receptor (rounded to the nearest 5dB), which is then compared to the total noise level, including the predicted construction noise level. If the combined noise level exceeds the appropriate category value, then the impact is deemed to be significant. The relevant statistics from Table E.1 are set out below:

Table 7-9 Construction Phase Noise - ABC Assessment

ASSESSMENT CATEGORY AND THRESHOLD VALUE PERIOD (L_{AEQ})	THRESHOLD VALUE, IN DECIBELS - DB(A)		
	CATEGORY A	CATEGORY B	CATEGORY C
Daytime (0700 to 1900 hrs) and Saturdays (0700 to 1300 hrs)	65	70	75
Evenings & Weekends	55	60	65
Night-time (2300 to 0700 hrs)	45	50	55
NOTE 1 *A significant effect has been deemed to occur if the total LAeq noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.*			
NOTE 2 *If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total LAeq noise level for the period increases by more than 3 dB due to construction activity.*			
NOTE 3 *Applied to residential receptors only.* *A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.* *B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.* *C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.*			

Note: *The ABC Method does not provide levels of significance, as such professional judgement has been applied to determine this within following significance tables.*

Table 7-10 Summary of Construction Works Noise Assessment

Receptor	Distance from Noise Source (m)	Relevant noise monitoring location	Baseline noise level		Anticipated Construction Noise at Receptor Location Due to Construction Works & distance attenuation (dBA)	Cumulative Noise Level at Receptor Location (dBA)		Change from Baseline	
			Day	Night		Day	Night	Day	Night
C-1 (Munojat Mountain)	2,000	N12	45.10	41.71	36.8	45.7	42.9	0.6	1.19
M-2 (Marmor LLC/mining area (including mine workers)	1,200	N12	45.10	41.71	42.3	46.9	45	1.8	3.29
M-3 (Active mining area (including mine workers)	750	N1	29.72	25.5	47.4	47.5	47.4	17.78	21.9
C-5 (Cemetery)	Adjacent to the OHTL corridor	N8	56.06	48.81	84.3	84.3	84.3	28.24	35.49
R-3 (Dustlik village)	420	N2	43.96	36.93	53.7	54.1	53.8	10.14	16.87
R-4 (Nayman village)	190	N5	45.3	41.3	62.3	62.4	62.3	17.1	21
R-5 (Makhtumkuli village)	OHTL alignment goes through the area of this village	N6	58.58	51.44	84.3	84.3	84.3	25.72	32.86

Note: *for those receptors identified to be along the OHTL route or where the OHTL route crosses, a distance of 25m is used in calculating the potential noise level from source to account for the 25m health protection zone on each side of the OHTL as required by law.*

Noise generation during construction is inevitable, and based on the calculations above, noise impacts are expected at all receptors. However, it is important to note that the above calculations do not account for any acoustic barriers between the noise source and the sensitive receptors. Any buildings, acoustic enclosures and fence lines between the Project and the receptors will act as an acoustic barrier and reduce the noise impact on the receptor. In addition, these will largely depend on the location of the activities with respect to these receptors. Further, the EPC Contractor has advised that night-shift works are not planned, but on some occasions it may be necessary to work 1 or 2 hours at the sub-station site, or for assembly or pre-fabrication in the TSF areas, which are not expected to impact external human receptors at these locations. However, following a precautionary approach both potential day and night-time impacts have been assessed as discussed below against the relevant baseline measurements.

In accordance with the ABC method, as the daytime ambient noise level at R-3 and R-4 (when rounded to the nearest 5dB(A)) is less than category A values, hence Category A threshold values are applicable to these residential receptors during day time. However, as the night time ambient noise level at R-3 and R-4 (when rounded to the nearest 5dB(A)) is higher than category A values, hence Category C values are applicable to these residential receptors during night time.

The day time noise impacts at R-3 and R-4 are below the threshold value of 65dB(A) for daytime. Additionally, the nighttime noise impacts at R-3 are below the threshold value of 55dB(A) for night time, however are higher than the threshold value at R-4. Therefore, noise impacts on R-4 are deemed significant during night time.

Meanwhile, as the daytime and night time ambient noise level at R-5 (when rounded to the nearest 5dB(A)) is higher than category A values, hence Category C threshold values are applicable to this residential receptor.

The day time and night time noise impacts at R-5 are higher than the threshold value of 75dB(A) for daytime and 55dB(A) for night time. Therefore, noise impacts on R-5 are deemed significant during day time and night time.

As C-1, C-5, M-2 and M-3 are not residential receptors, the ABC assessment is not applicable to these receptor as such, the cumulative noise level at these receptor locations is compared with established Uzbekistan noise limit of 55dB(A) for daytime and 45dB(A) for night time. Upon comparison, it is evident that construction works impacts from the Project to receptors C-1 and M-2 would not be discernible both at daytime and night time as the cumulative noise level at this receptor location is well below the established limit. Additionally, construction works impacts from the Project to receptor M-3 would not be discernible at daytime as the

cumulative noise level at this receptor location is well below the established limit, however, will be discernible at night time as the cumulative noise level at this receptor location is expected to exceed the established limit. Due to the proximity of receptor C-5 to the construction activities, construction works impacts from the Project will be discernible both at day time and night time as the cumulative noise level at this receptor location is expected to exceed the established limit. However, it is noted that impact at these locations will be dependent on the location of the OHTL towers and associated construction works.

A summary table is provided below for the receptors to which the ABC assessment methodology is applicable.

Table 7-11 Summary of Noise Impact Assessment for the Residential Receptors Compared against the ABC Assessment Methodology

Noise Receptor	Cumulative Noise Level (dB)		Noise Level Rounded to the Nearest 5 dB		Applicable Category (A/B/C)		Threshold value, in decibels - dB(A) Based on Applicable Category		Above Threshold Value (Y/N)	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
R-3 (Dustlik village)	54.1	53.8	55	55	A	C	65	55	N	Y
R-4 (Nayman village)	62.4	62.3	60	60	A	C	65	55	N	Y
R-5 (Makhtumkuli village)	84.3	84.3	85	85	C	C	75	55	Y	Y

Noise generation during construction is inevitable, and based on the calculations above, noise impacts are expected at all receptors. However, it is important to note that the above calculations do not account for any acoustic barriers between the noise source and the sensitive receptors. Any buildings, acoustic enclosures and fence lines between the Project and the receptors will act as an acoustic barrier and reduce the noise impact on the receptor. In addition, these will largely depend on the location of the activities with respect to these receptors.

Additionally, blasting (if required at WTG pad construction areas only - depending on the outcome of geotechnical surveys) generates intense, impulsive noise due to the rapid release of energy during the explosion. The noise produced can reach high decibel levels, potentially causing disturbance to receptors over a considerable distance.

Vibration

Certain construction processes, particularly those involved with site preparation and civil works, e.g. breaking, piling, vibratory rollers etc. have the potential to create vibration within

the vicinity of the works. Vibration to a lesser extent is also anticipated to occur around the construction site due to the movement of materials and equipment by vehicles.

Vibration dissipates rapidly as it spreads and loses energy radiating 360 degrees from the source, hence impacts from vibration are not expected to be discernible at receptors located over 500m away from the Project site including the tower construction site, although some vibration may be discernible at the boundaries of the Project site.

As such, vibratory impacts (if any) at C-5, R-3, R-4 and R-5 may be negligible, while impacts at receptor location over 500m are not expected to be discernible due to the large attenuation of vibration over distance.

Possible blasting would also generate ground vibrations that can be transmitted to nearby areas. While there are no residents within the wind farm site or in proximity to it, vibrations could potentially cause structural effects on buildings and infrastructure, depending on the type and size of explosives used. The threshold of perception of vibration by human beings are typically in the range between 0.14mm/s to 0.3mm/s (BS 5228). Impacts from exposure to vibration is expected to be considerable beyond these values with potential to cause disturbance, startle, cause annoyance or interfere with work activities.

The potential blasting activities at the WTG area would result in occasional loud explosion like sounds. Noise and vibration from the blast will be short and temporary, and is not expected to result in longer term issues or exceedances against the averaging periods specified in regulatory standards.

7.4.1.2 Vehicular Noise

The addition of temporary construction vehicles on local roads and within the site will likely result in temporary increases in traffic which will consequently result in an increase to noise levels at off-site receptors within close proximity to the Project boundary and close to the site access road and along key routes. Additionally, a limited number of vehicles will be required for the OHTL construction, which are expected to follow defined routes along the OHTL corridor and primarily move between works at tower locations. Impacts due to vehicular noise will vary due to the phasing of works and the timing of vehicular movements, which affect both vehicles flow and the percentage of heavy vehicles.

The flow of vehicles in the local area is not constant, but the dirt road which runs parallel to the railway line at the Project site has a very low traffic. The construction phase will result in the presence of larger vehicles (HGV's) and other more specialised equipment. As a major Project in the local area requiring hundreds of construction staff, associated equipment and deliveries, there will be a noticeable increase in vehicles at the site and along key access routes. This will

influence noise levels and impacts to users of these roads and the receptors identified along the access road connecting A380 highway. It is noted that such impacts will be limited to the construction phase only and may be more prevalent during certain period of construction which require more vehicle trips.

Internal site roads will generate a new noise source from the movement of construction vehicles. Such noises will be predominantly experienced by the Project construction worker and herders grazing their livestock in nearby lands. It is noted that much of this movement of vehicles has been captured by the predictions for construction equipment as above.

7.4.1.3 Noise Impacts to Site Workers

Site workers will be exposed to varying levels of noise depending on their specific roles and activities being conducted including noise from site preparatory, building & foundation and mechanical & installation works as described above. This may relate to exposure to noise in areas that are considered 'high' (e.g., above occupational health and safety guidelines), Without mitigation, noise impacts to the workforce could results in health impacts, for example hearing damage.

7.4.2 Operation Phase

7.4.2.1 Noise from WTG

During the operation of the WTGs, noise will be generated from mechanical and aerodynamic sources. Both mechanical and aerodynamic noise may result in propagation to areas within 2 km of the WTG. Mechanical noise is radiated by the surface of the turbine and by openings in the nacelle housing and will emanate from generator, gearbox, yaw drives etc. These components produce their own characteristic noise. Aerodynamic noise will be produced by the flow of air over the blades.

Noise from wind turbines vary with wind speed. The sound power level of wind turbines increases with higher wind speed due to the increase in rotation speed of the turbine blades.

The EHS Guidelines for Wind Energy recommends screening the potential effects within 2 km from the sound sources. A preliminary screening assessment has been performed using windPRO tool, and it shows that noise levels are expected to drop to between 35 and 40 dB(A) within 1 to 1.5 km from each WTG (Juru Energy, 2021).

There are no permanent residential receptors within 9 km of the proposed WTGs, and herder's shelters were also not identified. Therefore, it is unlikely there will be any operational noise issues on permanent residential receptors and as such detailed noise monitoring is not required.

7.4.2.2 Operational Vehicle Noise

Besides noise from the operation of WTGs, the movement of operations and maintenance vehicles and the potential low magnitude humming from the electrical transformers (which is not expected be discernible at over 50 m distance from source), there will be very few specific point noise sources from the project.

Given the minimal requirements for maintenance activities during operation, and due to the limited operational workforce, noise impacts from vehicles are also not expected to be significant and are not discussed further. Nor are potential noise impacts from electrical transforming humming.

As such, no operational noise impacts are deemed to be significant or assessed further.

7.4.2.3 Other Operational Noise

During the operation of the OHTL, transmission of electricity through the overhead lines results in the production of noise related to the 'corona discharge' effect. Such noise is in the form of buzzing and humming and reaches high levels during rain, fog, snow and other wet weather conditions. According to the IFC EHS Guideline on Electric Power Transmission and Distribution, these noise emissions from the transmission line do not pose any known health risks.

The noise intensity generated by Corona discharge depends on the number of conductors in the cable bundle and atmospheric humidity. When it's raining, the sound of rain will mask the high noise emission generated during electricity transmission. However, there is a potential for corona effect generated during other wet weather condition (e.g. snow, fog, mist) to result in nuisance to residential receptors as well as fauna species in proximity to the OHTL route.

During conditions of heavy rain, Gerasimov (2003) reports that the maximum permissible noise level outside an OHTL corridor with a width from the line's centre must be lower than 45dB(A). This noise level will decrease with distance and given the design condition of the OHTL for this Project, Corona effect is not anticipated to result in noise levels that will exceed established noise limits at the centre of the OHTL. Additionally, the OHTL right of way and health protection zone is expected to provide separation from human receptors to reduce noise impacts. The health protection zone will be in accordance with the protection zone established in San Rules & Norms No. 0236-07 for OHTL up to 220kV.

Potential noise impacts to fauna species are addressed in the Terrestrial Ecology chapter of this ESIA.

Table 7-12 Noise and Vibration Impact Significance, Mitigation & Management Measures and Residual Impacts

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
Construction						
Construction Site Noise – Noise generated from general construction activities	**Negligible Negative**	Munojat Mountain **(C-1)**	**Medium**	**Negligible to Minor**	• Where practical, additional noise barriers /attenuation will be employed to ensure that the maximum noise level at 1m distance outside of the plant fence when all equipment is running do not exceed 70dB(A) and maximum noise level at 1m from open air installations do not exceed 85dB(A). • Night-time construction works will not be undertaken. If needed these are only expected to be in the TSF area at the WTG site. • The EPC Contractor will, at all times, carry out all work in such a manner as to keep any disturbance from noise to a minimum (by phasing noisy works). • Acoustic covers on machine engines to remain closed at all times as applicable. • Where practical, electrically powered plant will be preferred to mechanically powered alternatives. • All mechanically powered plant, diesel engine vehicles and compression equipment will be fitted with noise control equipment (exhaust silencers, mufflers) as available from the manufacturer. • Where possible, the highest noise emitting activities will be undertaken in a central site area, or within an enclosed structure. For example, fabrication of materials will be carried out away from the site boundaries and or within structures. • Items of plant on site operating intermittently will be shut down in the intervening periods between use. • Dropping of metallic objects from height will be avoided as far as practicable particularly. • Ensure the permit for blasting is obtained from the relevant authorities. • The EPC contractor should consider chemical blasting where is applicable to avoid noise & vibration.	**Negligible**
		Marmor LLC/mining area (including mine workers) **(M-2)**	**Low**	**Negligible to Minor**		**Negligible**
		Active mining area ((including mine workers) **(M-3)**	**Low**	**Negligible to Minor**		**Negligible**
		Cemetery **(C-5)**	**Medium**	**Negligible to Minor**		**Negligible**
		Dustlik village **(R-3)**	**High**	**Minor**		**Negligible**
		Nayman village **(R-4)**	**High**	**Minor**		**Negligible**
		Makhtumkuli village **(R-5)**	**High**	**Minor**		**Negligible**

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
					For Blasting, implement the IFC Environmental, Health, and Safety Guidelines for Construction Materials Extraction where applicable: • Use of specific blasting plans; correct charging procedures and blasting ratios; delayed, micro delayed, or electronic detonators; and specific in situ blasting tests (the use of downhole initiation with short-delay detonators improves fragmentation and reduces ground vibrations). • Development of blast design, including a blasting-surfaces survey, to avoid over confined charges and a drill-hole survey to check for deviation and consequent blasting recalculations. • Implementation of ground vibration and overpressure control with appropriate drilling grids (e.g., grid versus hole length and diameter, orientation of blasting faces) and appropriate charging and stemming process of boreholes, to limit potential issues with fly rock and air blasts. • Hydraulic hammers or other mechanical methods should be preferred to improve rock fragmentation and minimize fly-rock risks, instead of using secondary blast (plaster blasting). • Mechanical ripping should be preferably used to avoid or minimize the use of explosives. • Blasting should be conducted according to a consistent timetable. If changes to the blasting timetable occur, nearby communities should be immediately informed of those changes. • Community awareness and emergency preparedness and response planning should be undertaken, including control of third-party access to blasting areas. • As per the BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration, the following best practice measures shall be considered: - Vibration should be controlled at source and the spread of vibration should be limited,	

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
					- Appropriate investigations of ground conditions should be made when preliminary surveys are being carried out in order that consideration can be given to methods of working which could avoid problems. - A survey of the immediate receptors surrounding the site should be undertaken to indicate the location of sensitive areas. Guidance should be sought concerning recommended vibration levels for the receptors surrounding the site. - Practical measures, including good blast design, that have been found to reduce air overpressure and/or vibration are: a) accurate setting out and drilling; b) appropriate charging; c) appropriate stemming with appropriate material such as sized gravel or stone chippings; d) using delay detonation to ensure smaller maximum instantaneous charges (MICs); e) using decked charges and in-hole delays; f) blast monitoring to enable adjustment of subsequent charges; g) designing each blast to maximize its efficiency and reduce the transmission of vibration; h) avoiding the use of exposed detonating cord on the surface in order to minimize air overpressure – if detonating cord is to be used in those cases where down-the-hole initiation techniques are not possible, it should be covered with a reasonable thickness of selected overburden. • Notice will be provided to the sensitive receptor as early as possible (minimum one-week notice) of periods of noisier works in regard to certain construction activities and for how long such activities will be likely to last in accordance with the SEP. • The impacted receptors will have access to a grievance mechanism in accordance with the Project SEP in order to make any complaints regarding noise during the construction phase	

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
Vehicular Noise- Noise from movement of construction vehicles	**Minor Negative**	Munojat Mountain **(C-1)**	**Medium**	**Minor**	• Limit unnecessary usage of vehicles/equipment – No idling – Equipment to be shut or throttled down when in intermittent use. • Delivery vehicles will be prohibited from waiting outside the site with their engines running. • Ensure any appropriate permits are in place for deliveries to the site and for any works performed outside normal working hours. • Notify residents in proximity to the access road of noisy activities or special deliveries of large equipment to be conducted nearby their dwellings with a minimum one week in advance. • Review vendor specifications and accept site plant & vehicles, in particular heavy vehicles, based on noise emissions (as far as practical). • The movement of heavy vehicles during the night will be avoided wherever practical. • Where available in country, audible reversing alarms with broadband noise (white noise) will be preferred over tone alarms (beeping), to limit external disturbance to communities. • Where construction vehicles will be operating in close proximity to the accommodation camp, the need for trucks to reverse will be minimized as far as practicable. This is so as to reduce the frequency at which disturbing but necessary reverse warnings sirens will be used. • Speed limits established in the Traffic Management Plan will be adhered to.	**Negligible**
		Marmor LLC/mining area (including mine workers) **(M-2)**	**Low**	**Negligible to Minor**		**Negligible**
		Active mining area ((including mine workers) **(M-3)**	**Low**	**Negligible to Minor**		**Negligible**
		Cemetery **(C-5)**	**Medium**	**Minor**		**Negligible**
		Dustlik village **(R-3)**	**High**	**Minor to Moderate**		**Negligible to Minor**
		Nayman village **(R-4)**	**High**	**Minor to Moderate**		**Negligible to Minor**
		Makhtumkuli village **(R-5)**	**High**	**Minor to Moderate**		**Negligible to Minor**
Construction vibration impacts (including vehicle vibration)	**Negligible Negative**	Cemetery **(C-5)**	**Medium**	**Negligible to Minor**	• The Contractors will, at all times, carry out all work in such a manner as to keep any disturbance from vibration to a minimum. • Where practical, all vibratory generating equipment and activities will be sited away from the Project boundary. • Vibrating equipment/machinery will be switched off when not in use.	**Negligible**
		Dustlik village **(R-3)**	**High**	**Minor**		**Negligible**
		Nayman village **(R-4)**	**High**	**Minor**		**Negligible**
		Makhtumkuli village **(R-5)**	**High**	**Minor**		**Negligible**

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
					• Vehicles and mechanical plant will be maintained in good condition to minimise excessive vibration.	
Impacts to Construction Workers	**Minor Negative**	Wind Farm and OHTL Site Workers	**Low**	**Negligible to Minor**	• Where noise levels exceed 80dB(A) noise protection devices will be provided to personnel on-site and the area marked as a high-noise zone where ear protection is mandatory. Note: 80dB(A) is aligned with Uzbekistan noise standards. • Operators of vibrating hand-held machinery (if any) will be provided with appropriate PPE (e.g., protective gloves and ear muffs/plugs) and be given suitable breaks from using such equipment to reduce the impacts of vibration. • Workers potentially exposed to high noise and vibration will be provided with appropriate PPE with respect to the occupational H&S risk assessment conducted for that activity. • Night-time construction works will not be undertaken. If needed these are only expected to be in the TSF area and may only last 1-2 hours. • Third parties will have access to a grievance mechanism to make any complaints regarding noise during the construction phase. • The EPC Contractor will carry out all work in such a manner as to keep any disturbance from noise to a minimum. • Acoustic covers on machine engines to remain closed at all times (as applicable). • Where practical, electrically powered plant will be preferred to mechanically powered alternatives. • All mechanically powered plant, diesel engine vehicles and compression equipment will be fitted with noise control equipment (exhaust silencers, mufflers) as available from the manufacturer. • Items of plant on site operating intermittently will be shut down in the intervening periods between use. • Workers potentially exposed to high noise and vibration will be trained to identify situation when PPE	**Negligible**

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
					is required to be worn and how to effectively utilize the PPE. • These mitigation measures will be incorporated to the applicable occupational H&S plan being developed by the EPC Contractor and implemented on-site. The OHS plan will be developed in accordance with IFC EHS Guideline in relation to OHS noise and vibration.	
Operation						
Following identification of potential operation noise impacts, it has been determined that there is unlikely to be any operational noise impacts of significance as result of the operation of the Project. Therefore, no operational noise mitigation measures are proposed.						

7.4.3 Decommissioning Phase

Potential impacts relating to decommissioning will be similar to those encountered during the construction phase. As such, it is assumed that the risk of increased noise level associated with the construction phase will be expected for the decommissioning phase at permanent receptor locations. Likewise, the mitigation & management measures outlined for the construction phase in relation to noise generation at the site, vehicle movement and vibration impacts will be applicable to the decommissioning phase as well.

7.5 Monitoring

Significant noise impacts are not expected and therefore no noise monitoring is proposed. Should any complaints or grievances be received then monitoring will be required by the EPC Contractor for a period following receipt of the complaint. When monitoring is required, noise measurements will be compared against the applicable Uzbek standards and applicable WHO ambient noise standards for the respective receptor type and day/night timing. The most stringent standards, whether national or international, will be adhered to.

No monitoring is proposed for the operation phase, besides the monitoring of any noise related grievances received.

8 GEOLOGY, SOILS, SURFACE WATER AND GROUNDWATER QUALITY

8.1 Applicable Requirements & Standards

8.1.1 National Regulations

The protection of geological formations, soil and water resources in Uzbekistan is regulated by the following laws and regulations:

SOIL QUALITY

SanPiN No.0272-09 Sanitary rules and norms for compiling hygienic justifications for soil protection schemes from pollution in Uzbekistan": The Sanitary Rules and Norms include the basic requirements for development of hygienic justification for the soil protection schemes against pollution, duties and functions of state sanitary supervision bodies in this area.

SanPiN No.0191-05 Maximum permissible concentrations (MPC) and Approximate allowable concentrations (AAC) of exogenous harmful substances in soil: This defines MPC values of chemicals and pesticides polluting the soil. MPCs and AACs are designed to ensure that there is no negative direct or indirect impact on human health, its future generations and public health through soil contact.

SanPiN No.0212-06 Sanitary rules and norms for the hygienic assessment of soil contamination of different types of land use: This document provides a unified methodology for hygienic assessment of soil pollution using a nomenclature of indicators of soil hygienic condition, which should be used both in the development of regulatory and technical documentation on the hygiene of soils, and in assessing the degree of its pollution.

WATER RESOURCES

Water resource management, allocation and use in Uzbekistan falls under the Ministry of Agriculture and Water Resources (MAWR), which oversees national authorities I.e. provisional and district departments of agriculture and water resources, and inter provincial and inter district river management authority.

Constitution of the Republic of Uzbekistan.

Article 55 states "Land, depths, water, flora and fauna and other natural resources are national wealth, should be rationally used and are under state protection."

The Law of the Republic of Uzbekistan "On water and water use" (1993 as amended on 01.12.2021).

This law enshrines the key objectives for water legislation in Uzbekistan setting the following requirements:

Article 1 requires "Regulation of water relations; effective use of water; protection of water from pollution, littering and exhaustion; prevention and liquidation of harmful impact on water resources; improvement of state water objects; and protection of the rights of enterprises, organisations, farms and citizens in the field of water relations."

Article 3 stipulates that "Water resources are the state property and wealth of the Republic of Uzbekistan, should be rationally used and is protected by the state."

The law authorises the State through authorized agencies to carry out management and control of water use and protection.

Other key legislations and standards relevant to the Project include:

SanPiN No 0255-08 which provides the criteria for hygienic assessment of the level water bodies contamination for health risks to the population in Uzbekistan.

Decree of the Cabinet of Ministers No.255 of 31.03.2018 On the approval of some administrative regulations of the provision of public services in the field of nature use (scheme for issuing permits for special water use or water consumption) as amended on 15.01.2020.

SanPiN RUz No. 0318-15. Hygienic and anti-epidemic requirements for the protection of water in reservoirs on the territory of the Republic of Uzbekistan.

The Decree № 981 of December 11 2019 "Regulation on procedure of establishing water protection zones and sanitary protection zones for water bodies on the territory of the Republic of Uzbekistan".

8.1.2 Lender Requirements

ADB

ADB Safeguard Requirements for Environment includes specific requirements to prevent pollution and to minimise or control the intensity or loads of pollutant emissions and discharge. This includes effective management of hazardous materials and wastes, which can all have an influence on soil and/or groundwater quality.

AIIB

ESS1 – Environmental and Social Assessment and Management: Point 38 relates to pollution prevention and references international good practice and internationally recognised standards such as the WBG EHS Guidelines.

EPFIs

IFC Performance Standard 3 on 'Resource Efficiency and Pollution Prevention' requires the client and/or the Project to:

- Avoid or minimise adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities; and

- Prevent the release of pollutants to water and land due to routine, non-routine, and accidental circumstances, or when not feasible, minimize and/or control the intensity and mass flow of their release.

GIIP

The Dutch Standards are environmental pollutant reference values (i.e., concentrations in environmental medium) used in environmental remediation, investigation and clean-up. The standards identify maximum allowable concentrations for contaminants in soil and groundwater. The soil intervention values indicate when the functional properties of the soil for humans, plants and animals is seriously impaired or threatened. They are representative of the level of contamination above which a serious case of soil contamination is deemed to exist. Groundwater target values provide an indication of the benchmark for environmental quality in the long term, assuming that there are negligible risks for the ecosystem.

The Dutch Standards for the most significant pollutants are presented in the table below. Where a parameter is not covered by the Dutch Standards, other appropriate international standards shall be used.

Table 8-1 Dutch Soil and Groundwater Standards

Contaminant	Soil/Sediment (mg/kg dry weight)		Groundwater (µg/L)	
	Target	Intervention	Target	Intervention
1. Metals				
Antimony	3	15	-	20
Arsenic	29	55	10	60
Barium	200	625	50	625
Cadmium	0.8	12	0.4	6
Chromium	100	380	1	30
Chromium III	-	180	-	-
Chromium VI	-	78	-	-
Cobalt	9	240	20	100
Copper	36	190	15	75
Mercury	0.3	10	0.05	0.3
Mercury (inorganic)	-	36	-	-
Mercury (Organic)	-	4	-	-
Lead	85	530	15	75
Molybdenum	3	200	5	300
Nickel	35	210	15	75
Zinc	140	720	65	800

Contaminant	Soil/Sediment (mg/kg dry weight)		Groundwater (µg/l)	
	Target	Intervention	Target	Intervention
2. Other inorganic substances				
Chloride (mg Cl/l)	-	-	100	-
Cyanide (free)	1	20	5	1500
Cyanide (complex)	5	50	10	1500
Thiocyanate	1	20	-	1500

- **Note**: The soil values are calculated for a 'Standard Soil' with 10% organic matter and 25% clay. A case of environmental contamination is defined as 'serious' if >25 m³ soil or >100 m³ groundwater is contaminated above the intervention value.
- **Source**: Soil Remediation Circular 2009, Annex 1: Groundwater target values and soil and groundwater intervention values. (*Target values for soil refer to 2000 version as they are not present in the 2009)
- Where contaminants are found to exceed 'intervention' levels, this is considered to be a case of soil contamination, which is dangerous to the health of humans and the natural environment. Such a level of contamination should prompt a need for remediation, appropriate treatment and disposal.

8.2 Baseline Conditions

8.2.1 Topography

The site terrain within the boundary of the land allocated for the WTGs is moderately undulating, with elevations ranging between 261 and 444 m above Vertical Reference Datum (Baltic Height System 1977). The digital elevation model is shown in the following figure.

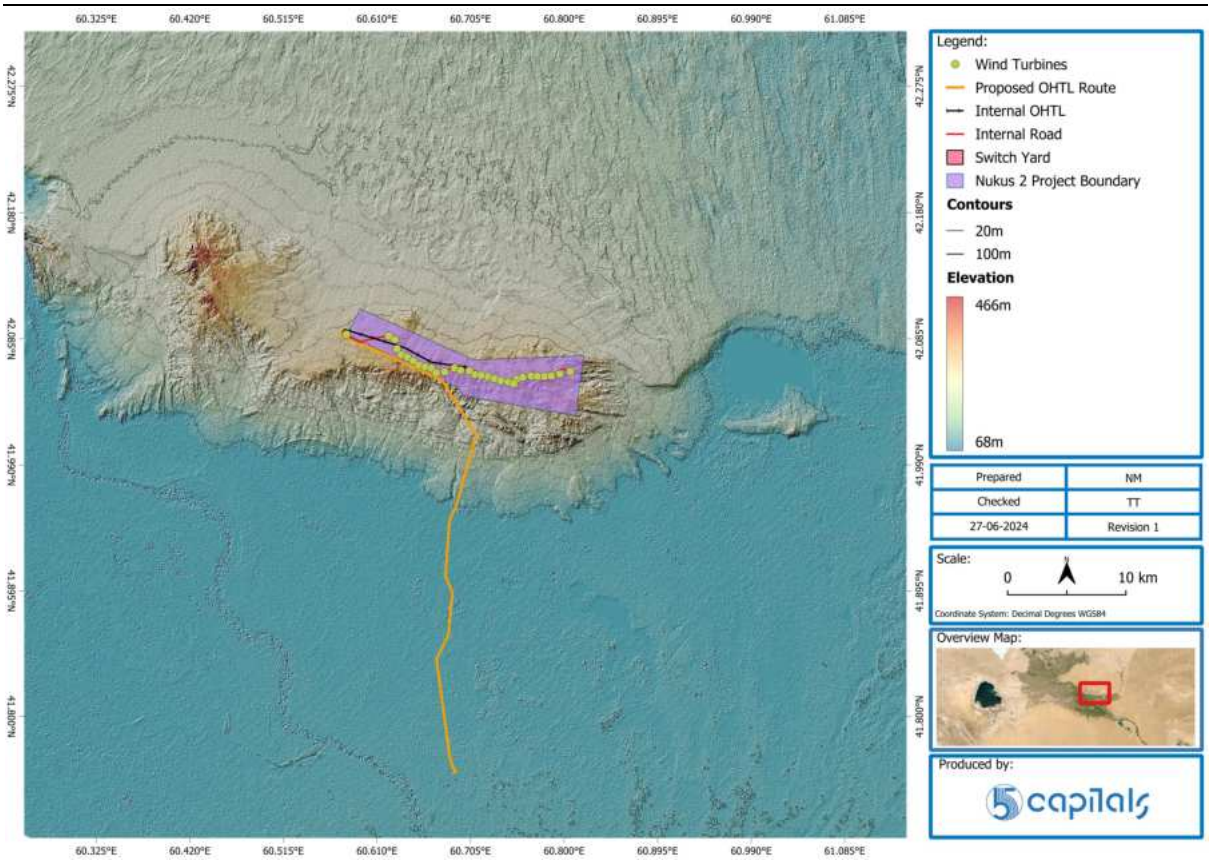


Figure 8-1 General Site Topography

The Project site is made up of semi-complex terrain composed of gentle ridges originating from a higher summit at the edge of the Karatau hills located in the west of the Project area. Sultan Uvays Complex is a mountain range in Karakalpakstan, on the right bank of the Amu Darya. The range is located in the extreme southwest of Kyzylkum, separating the desert from the valley of the Amu Darya River. The length is over 50 km, the width is up to 25 km. The ridge has an almost latitudinal stretch in the east, which is replaced by a north-westerly one in its western part. The maximum height reaches 473 m. The massif consists of ridges composed of quartzite, gneiss, marble with granodiorite intrusions. The southern and western slopes are steep, while the northern and eastern slopes are gentle.

The landscape of the OHTL route is characterised by unmodified and modified areas. The northern part goes through the mountain range and desert land, to the south, it goes through agricultural farms and living communities.

8.2.2 Geology and Soils

The Project site is located on Kyzylkum desert and Sultanuizdag mountains. North-western part of site is mainly represented by semi soil and rocky soil. North-eastern part is mountain area.

At the wind farm site there are no aboveground water sources, however, the site visit revealed the presence of dry stream beds that indicate the occurrence of high rainfall events.

The soil of the OHTL route is represented mainly by desert and rocky soil at northern part, and by agricultural area down to the south.

Along the OHTL route there are canal drainage systems (various canals for irrigation and discharge of water after irrigation).

No geotechnical or hydro-geological investigations have been performed at the Project site. However, many of these are being undertaken close to the Project boundary (the nearest ones are less than 2 km away). Existing information about the site indicates that the soil's geomorphological structure is less-like loam interbedded with sand and gravel ranging from 2 m to 40 m deep. The soil cover is represented mainly by grey-brown soils. The north-west of the site is rocky at the surface with traces of rock at about two meters in depth. Ground conditions mean the potential for soil erosion and dust generation during the Project construction phase are high.

8.2.3 Hydrology

The Project area is part of the Amu-Darya hydrographic network which passes more than 5km from the Project area, specifically the OHTL route. No permanent surface water bodies or rivers are observed in the Project site. The nearest waterbody is Akchakol lake, which is located 14 km from the wind farm site to the south and around 9.5 km from the OHTL route to the east. Akchakol lake is used for fishing, recreation, and is a possible area of importance for wintering birds. Additionally, seasonal stream beds are evident, these are typically inundated during the short rainy season, which lasts from June until the end of July. In the wider area, water supply is reliant on the Amu Darya River. Smaller villages along the north bank of the river are not connected to the main supply system. It is reported that water for agricultural purposes is scarce due to increases in upstream water consumption (Juru Energy, 2021).

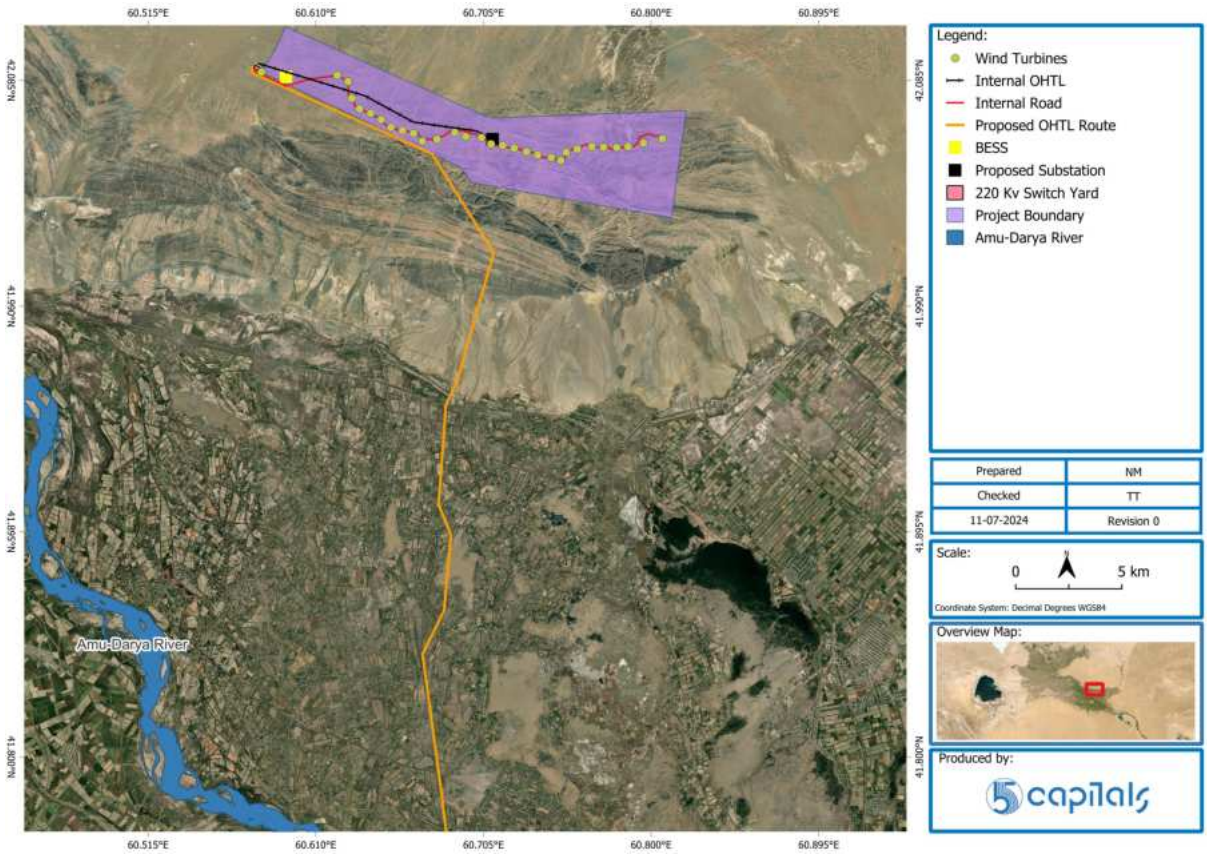


Figure 8-2 Amu-Darya River (Running Diagonally Top Left to Bottom Right)

8.2.4 Groundwater

Water boreholes located in the area are understood to have been constructed as part of a historical water pipeline project that is no longer in progress or developed to support livestock grazing. Groundwater quality is unknown but expected to be unsuitable for drinking without pre-treatment.

8.2.5 Seismic Hazard

The territory of Uzbekistan is characterized by a complex tectonic structure and a high level of seismic activity. Its eastern part belongs to the neotectonic epiplatform orogen of the Western Tien Shan; the western part, to the epi-Hercynian Turan platform. A considerable part of the territory of Uzbekistan belongs to the zone of seismic intensity VII. The Project site is located in medium to high seismic hazard level with relatively high values of Peak Ground Acceleration ("PGA").

8.3 Area of Influence and Receptors

8.3.1 Area of Influence

The scope of the geology, soil and groundwater assessment includes the construction and operation activities that may impact these parameters. The study boundaries are limited to the areas outlined in the table below.

Operation impacts for geology, soil and groundwater have been scoped out of further discussion (see Section 1.4).

Table 8-2 Geology, Soil and Groundwater Area of Influence

PHASE	PARAMETER	AREA OF INFLUENCE AND STUDY AREA
Construction	Geology, Soil & Groundwater	• Areas within the footprint of construction activities including WTG locations, access roads, OHTL and associated temporary facilities. • For groundwater this may also include areas where groundwater can migrate.

8.3.2 Receptors

For the purpose of assessing the magnitude of potential impacts to geology, soil and groundwater, the criteria provided in the following tables has been used to determine the sensitivity of receptors.

Table 8-3 Geology and Soil Receptor Sensitivity

SENSITIVITY	DESCRIPTION
High	• Highly vulnerable to physical disturbance, structurally prone to compaction or erosion and taking over 10 years to recover. • Highly leachable. • The soil provides substrate that has the physical qualities and degree of productivity to support a variety of plants including the development of important and/or indigenous species of flora and fauna. • The soil is intrinsically linked to the hydrological cycle and plays a key ecosystem role in water regulation. • Water saturated soils (Wetland soils).
Medium	• Vulnerable to physical disturbance, structurally prone to compaction or erosion but able to recover within a period of 10 years. • Moderately leachable. • The soil provides substrate that has the physical qualities and the degree of productivity to support a variety of plants including the development of flora and fauna in some abundance and levels of diversity. • The soil has some capacity for water retention and plays some role in the hydrological cycle in terms of the degree of water regulation and as a substrate for channelling run off.
Low	• Shows resilience to physical disturbance, structurally prone to compaction and erosion. • The soil constitutes no favourable substrate for the development of floral habitats and other fauna. • The soil plays little or no role in the hydrological cycle or regulation of water.

SENSITIVITY	DESCRIPTION
Very Low	• Completely resilient to physical disturbance and /or impermeable to contamination

Table 8-4 Groundwater Receptor Sensitivity

SENSITIVITY	DESCRIPTION
High	• Groundwater aquifer is used for community water supply. Water supply wells located within 1 km of the project activity areas. • Extensive groundwater dependent wetland areas. • Internationally designated biodiversity site with water dependency
Medium	• Groundwater aquifer not used as the primary source, used for individual supplies or for non-potable uses located within 1 km of the project activity areas • Nationally designated protected site with water dependency • Groundwater is shallow
Low	• Groundwater in unconsolidated aquifer. • Community or other water supply well located more than 1 km from project activity area.
Very Low	• Groundwater aquifer is non-potable use more than 1 km from project activity areas. • Non-potable quality groundwater, present at considerable depths.

Based on the above criteria, for both construction and operational phases, the following sensitivity values are assigned, with further justification for the assigned status:

Table 8-5 Geology, Soil and Groundwater Sensitive Receptors

RECEPTOR	SENSITIVITY	JUSTIFICATION
Site Soils	Low	The soil within the Project site is typical of the soil characteristics found in the project area. It is not known to be of particular significance and hence it is of low importance and rarity on a local scale.
Groundwater Quality	High	Water is a vital resource and is of high importance on a national scale with limited potential for substitution. In addition, water is scarce in Uzbekistan and the rest of the region.

8.4 Potential Impacts, Mitigation, Management & Residual Impacts

This section presents the likely impacts and effects on the site geology, soil, surface water and groundwater due to the construction of the Project.

8.4.1 Construction Phase

Construction works including site preparation, civil works such as foundations and installation of WTG and OHTL structures and associated activities will result in interactions with site geology

and may affect chemical and physical properties of the local soil and, although considered unlikely due to the depth, potentially groundwater quality.

8.4.1.1 Excavation or Removal of Soils

The Project will require excavation activities in order to establish foundations for the wind turbines, foundations for the transmission towers along the OHTL corridor, building structures etc. The construction of the access road and temporary access route to areas of tower assembly, installation and erection will also require earthworks. These activities may result in the interaction with the geology of the site which could potentially provide direct pathways for contamination of groundwater during the construction phase. On the other hand, the soil characteristics within the project site will be impacted directly through backfilling and soil compaction activities to provide structural stability for the structures.

Additionally, the Project's construction phase may entail blasting within the WTG area for pad foundation excavations. Blasting will only be required if hard rock is encountered during geotechnical surveys. Blasting and mass excavation activities could result in the destabilization of rock structures. Unlike sites with a significant soil layer, rocky hills may have limited soil cover and therefore, soil erosion is less likely, however, potential displacement of loose rocks and debris during construction activities could occur.

8.4.1.2 Spills and Leaks Associated with Construction

Soil and groundwater may be susceptible to contamination from various sources during the construction phase. Primary sources of contamination are typically those placed along the handling of products where liquid waste and hazardous liquids/materials can escape directly into the soil potentially resulting in contamination to exposed soils and potentially being transferred via the high porosity sandy soils to the groundwater. However, it is noted that there will be very few chemicals, fuels and in relatively small quantitates.

As the wind turbines will likely require deep foundation works, soil quality can be susceptible to contamination from various construction sources, for example, usage of fuels, chemicals during the construction process. The risk of accidental spillage and leakage of various chemical products, are often attributable to storage areas of the construction site as well as during the transportation of such materials on and off the site. Improper methods of storing, transferring, and handling of these products can result in spillage to the ground and result in soil contamination.

The above highlighted risk to soil and any risk to groundwater will be managed through the implementation of the project CESMP and associated Management Plans and Procedures.

8.4.1.3 Inadequate Waste and Wastewater Management

Construction of the wind farm and OHTL will involve activities that generate solid non-hazardous and hazardous waste, as well as potential liquid wastes resulting from sanitary waste streams. Waste generated during these activities poses a threat to the soils. Of particular concern is the management of hazardous waste generated during the construction phase and its handling. Although the hazardous fraction of construction waste such as used oil, machinery lubricants and paints, etc. will represent a very small proportion of the total amount of construction waste it will however require special attention for management and disposal.

Concrete washout will need to be carefully managed and only in designated washing areas, with sealed protection to soils. Concrete washout water will be highly alkaline and may contain traces of heavy metals such as chromium. Inadequate management of the concrete washout area will pose a risk of contaminating the soil and leaching into the ground leading to groundwater contamination especially during the rainy season.

If the temporary storage and handling of such waste on the construction site is inadequate prior to being removed for disposal, the risk of soil and potentially indirect effects to groundwater quality increases. Potential environmental impacts arising from the generation of hazardous wastes are covered in the Solid Waste & Wastewater Chapter of this report.

8.4.2 Operation Phase

Specific project impacts to soil, geology and groundwater are not expected during the operational phase as the site will be static and will not have direct interactions with these environmental parameters i.e. soil & groundwater. Potential risks of concern during the operational phase are expected to be limited to the management and storage of hazardous materials/wastes/wastewater, chemicals and fuels and sanitary provision.

8.4.2.1 Spills and Leaks Associated with Operation

Although there will be little or no interaction with hazardous materials or chemicals, storage and usage of any hazardous wastes during the operational phase, there remains a small potential risk associated with spills and leaks to ground.

Certain sources of contamination that can introduce risks to soil and groundwater are cleaning fluids and solvents, oils from transformers and fuels stored for use by site vehicles and back-up generators, sanitary wastewater in septic tanks , and during certain preventative and unplanned maintenance works etc. Although these materials may be present and used in small quantities, precaution must be paid to ensure proper storage, handling, transportation and adequate spill prevention. It is expected that the storage of any of these materials,

chemicals and fuels will be within designated areas, which have specific management and mitigation measures in place to prevent exposure of these pollutants to unprotected soils.

Table 8-6 Geology, Soils and Groundwater Impact Significance, Mitigation & Management Measures and Residual Impacts

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
Construction						
Cross-Contamination of soil during construction and land degradation and during blasting	**Minor Negative**	Soil Quality	Low	**Negligible to Minor**	• Training - Contractor staff to be able to identify signs of potential contamination (smell of hydrocarbons, staining). • The EPC Contractor has confirmed that vehicle washing will only take place in dedicated cleaning facilities, which are available in nearby towns. • Where concrete washout areas will be established onsite, these areas will be located away from storm drainage and water runoff areas and will be designed with adequate holding capacity. The wastewater will be contained within the designated impervious bund. • Washout of concrete trucks will be performed in designated concrete washout areas at the site. • If contaminated soils are observed during construction activity, the identified contaminated soil will be excavated separately, and stored or disposed of in accordance with the waste management plan as hazardous waste, to avoid cross-contamination. • Any imported soils brought to the site will be from accredited quarries with certificate of quality. • A Blasting Management Plan will be prepared by the EPC that will have a section prepared by an ecologist regarding provisions for sensitive locations, seasons and	**Negligible to Minor**

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
					vulnerable and endangered species. This will include buffer zones of 200m for priority plants, 500m from priority mammals, and a minimum of 500m from priority birds (750m from bustard nesting sites, and 1km from bustard lekking sites). • Optimize blasting design/method to minimize the generation of flying debris. • Geological and geotechnical studies and control programs, specifically focused on long-term land stability shall be carried out. • Minimise blasting to the extent possible and where feasible, consider alternatives to blasting, such as mechanical methods. • All loose rock or rock in danger of breaking is to be cleaned and secured. • Provide heavy mesh blasting mats for protection of persons, property and finished work. • Blasting • shall be designed and planned by experts and carried out carefully by specialists to avoid the loosening of rock surfaces that are to remain intact. • If cracks or voids are detected in rocks and on slopes that could pose a risk, the rock is to be grouted and/or sufficiently sealed.	

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
Pollution from Accidental Leaks or Spillage	**Minor Negative**	Soil Quality	Low	**Negligible to Minor**	• Temporary storage of hazardous materials such as chemicals at tower construction area will only be in designated chemical storage areas or in secondary containment bund. • Storage of all hazardous materials such as fuels and chemicals on an impermeable base with liners and/or secondary containment bund with enough capacity to hold 110% of the bulk storage container and 25% of the total volume of the multiple containers. • Store all chemicals/materials according to manufacturer's instructions and MSDS; MSDSs for all chemicals to be readily available on-site in close proximity to storage areas. • All hazardous materials must be labelled according to manufacturer's instruction and Good International Industry Practice (GIIP). • The chemical storage area will have proper ventilation and cover from the elements (i.e. rain, sun) and different storage areas to allow for segregation of incompatible chemicals. • All equipment using oils will have drip trays underneath to capture any oil leaks or drips. • Contractor will develop and implement an Emergency Response Plan (ERP) and Spill Response and Contingency. • Maintain an inventory of all potentially hazardous materials and chemicals used and stored on-site, including the OHTL laydown areas. • All spills and leaks will be reported promptly to the Construction Manager and to be investigated to	**Negligible to Minor**
	Negligible Negative	Groundwater Quality	High	**Minor**		**Negligible**

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
					confirm the cause and put in place appropriate corrective/preventative actions. • Spill kits will be made available at chemical storage areas and fully stocked with appropriate absorbent materials. • Refuelling and maintenance of mobile vehicles/equipment will be conducted on impermeable surface. • Availability of suitable containment and spill clean-up materials/equipment at specific locations within the project site and locations along the OHTL corridor (e.g. where refuelling is to take place). • Relevant personnel to be trained on emergency and spill response, containment, material handling and storage procedures. • Regular emergency drills to practice timely and effective spill response. • Fuel transport vehicles and equipment to be maintained and routinely inspected to ensure the tank, pumps, pipe work and the vehicle itself are free from leaks and fit for purpose-No equipment will be placed in service until deficiencies are corrected. • Implement regular maintenance program of vehicles and equipment to minimise leaks or mechanical failures and keep document evidence. • No storage of hazardous chemicals, oils or fuels within 100m of waterways or water flow path at the Project site. Additionally, storage facilities must not be located in close proximity to the	

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
					Lower Amu Darya Biosphere Reserve to prevent contamination risks. • The EPC Contractor will obtain relevant permits to store large quantities of hazardous materials such as diesel etc (where necessary) in accordance with Uzbek regulations. • First aid kits will be available at all hazardous and chemical storage areas. • Concrete washout is only to be disposed in designated washing areas, with protection to soils.	
Inadequate waste management	**Minor Negative**	Soil Quality	Low	**Negligible to Minor**	• The implementation of the project CESMP and associated Waste Management Plan and Procedures will ensure that spills are kept to a minimum and are cleaned up quickly using spill kits located in risk areas. • Develop and maintain a hazardous waste inventory to document and track and show chain of custody of hazardous wastes generated, and their disposal route. • All hazardous waste being temporarily stored outside of its designated storage areas will be kept in well-equipped, leak-tight containers with drip protection to avoid leaks to the ground. • Concrete washout will only be undertaken at designated and signed areas, with adequate protection to soils, to prevent leaks or spread of wastewater • Implementation of good housekeeping practices during construction activities including procedures and requirements for proper	**Negligible to Minor**
	Negligible Negative	Groundwater Quality	High	**Minor**		**Negligible**

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
					handling, storage, and transport of hazardous materials and waste. • The EPC Contractor and sub-contractors will provide induction training and Tool Box Talks (TBTs) relating to the management, transportation and handling of hazardous materials and wastes – in line with any procedures developed to guide the on-site management of such activities.	
Operation						
Accidental minor Leaks & Spillage	**Negligible Negative**	Soil Quality	Low	**Negligible to Minor**	• Operator to develop and implement an Emergency Response Plan (ERP) to include or link to a Spill Response and Contingency Plan. • Conformance with ERP procedures (preventative and response) will be monitored through routine inspections. • Appropriate training of staff in regard to the handling and response to spill/leak events. • Availability of complete spill kits in all hazardous material storage areas. • Availability of MSDS on-site for any chemicals in use (to be made available at the chemical storage area). • Availability of a chemical register for all the hazardous chemicals on site. • Storage of all hazardous materials such as fuels and chemicals on an impermeable base with liners and/or secondary containment bund with enough capacity to hold 110% of the bulk	**Negligible**

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
	Negligible Negative	Groundwater	High	**Minor**	storage container and 25% of the total volume of the multiple containers. • The chemical storage area will have proper ventilation and cover from the elements (i.e. rain, sun) and different storage areas to allow for segregation of incompatible chemicals. • O&M Company to ensure that sanitation facilities have effective leak tight plumbing systems and the manholes will be inspected regularly for any blockage. • If used in landscaped areas, the application of fertilisers and pesticides must be limited and monitored. • Use of any toxic/non-biodegradable pesticides will be prohibited in accordance with the Stockholm Convention on banned chemicals. • Only organic, chloride free and environmentally friendly fertilizers will be applied. • O&M will obtain relevant permits to transport and dispose any hazardous waste from operational processes.	**Negligible**

8.4.3 Decommissioning Phase

Potential impacts relating to decommissioning of the wind farm and OHTL will be similar to those encountered during the construction phase and operational phase. As such, it is assumed that the risk of accidental spills (such as oils, transformer oils, machinery lubricants, fluids and solvents, etc.)and waste management (such as lubricated turbine parts, machinery lubricants and paints) associated with both construction & operational phase will be expected for the decommissioning phase. Likewise, the mitigation & management measures outlined for the construction & operational phase in relation to accidental spills and waste management will be applicable to the decommissioning phase as well.

For additional information on decommissioning/demolition waste impacts & mitigation and management measures, see the Solid Waste and Wastewater Management Chapter of this ESIA.

8.5 Monitoring

The minimum expected requirements for the monitoring are outlined in the table below. The final monitoring methodology with specific monitoring details (i.e. locations, frequencies, durations, parameters etc.) will be developed in the specific 'Environmental and Social Monitoring Plan' as part of the respective construction or operational phases ESMS.

Table 8-7 Monitoring Requirements

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION	RESPONSIBLE ENTITY
Construction				
Soil Quality	Visible spills & leaks of hydrocarbons and other potentially hazardous or chemical pollution sources	Incidental siting's during day-to-day activities and as part of weekly inspections	Working areas, temporary facilities and along the access road during construction	EPC Contractor E&S Manager
Rock Stability	Inspect blasting mitigation to ensure rockfall doesn't occur	Prior to every blasting activity	At blasting areas	EPC Contractor E&S Manager
	Inspect the blasted areas to confirm stability of structures	After every blasting activity	At blasting affected areas	EPC Contractor E&S Manager
Operation				
Soil Quality	Visible spills & leaks of hydrocarbons and other potentially hazardous or chemical pollution sources	Incidental siting's during day-to-day activities and as part of periodic inspections	The entire Project area during operation	O&M Contractor E&S Manager

9 TERRESTRIAL ECOLOGY AND AVIFAUNA

9.1 Applicable Requirements & Standards

9.1.1 National Regulations

The Law of the Republic of Uzbekistan "On Nature Protection" (1992) as amended in 2021

This law is the key national environmental law for the protection of the environment and the sustainable use of resources and the right for the population to a clean healthy environment. This law states legal, economic, and organisational basis for the conservation of the environment and the rational use of natural resources. Article 25 of this law states that the State Environmental Expertise (SEE) is a mandatory measure for environmental protection, preceded to decision making process. In addition, the law prohibits the implementation of any Project without approval from SEE.

The Law of the Republic of Uzbekistan "On Protected Natural Reserves" (2004) as amended in 2020

This law regulates the use and protection of protected natural territories. The main aim is to ensure preservation of typical, unique, genetic banks of plants and animals, prevent negative impact of human activities on nature, promote the study of natural processes and monitoring of the environment including promotion of environmental education.

The Law of the Republic of Uzbekistan "On Protection and Use of the Wildlife" (1997) as amended in 2016

This law regulates the use, protection, reproduction and restoration of wildlife in order to promote conservation and ensure diversity of species in their natural habitat.

Other laws and regulations include:

- The Law of the Republic of Uzbekistan "On Protection and Use of Vegetation" (1997) as amended in 2021.
- Decree of the Cabinet of Ministers "Regulation on the procedure for using plant world objects and passing licensing procedures in the field of using plant world objects" No. 290 of 10.10.2014 as amended in 2020. The law sets out the requirements to obtain permission to cut wood and shrub plantations that are in the zone of the construction site.

Decree of The President of The Republic of Uzbekistan, Dated December 30, 2021, No. UP-46 on Measures to Accelerate Greening Works and Further Effective Organization of Tree Protection in the Republic

The Decree prohibits the following:

- Acceptance of applications for tree cutting through centers of state services and the Unified Portal of Interactive Government Services.
- Issuance of conclusions on tree and shrub cutting by territorial environmental protection authorities.
- Issuance of permits by district and city administrations for the cutting of trees and shrubs not included in the state forest fund, for which a moratorium has been introduced.
- Pruning and cutting of trees and shrubs damaged by natural factors, plant diseases, and those posing a threat to human life and health, according to the document, can only be carried out by the landscaping authorities.
- Where trees not included in the forest fund have to be cleared for development and construction purposes, compensatory replanting must be carried out at a ratio of 10 young trees for one tree cut.

9.1.2 Lender Requirements

ADB

An element of the ADB Safeguard Requirement 1: Environment includes 'Biodiversity Conservation and Sustainable Natural Resource Management'.

It is stated that, *'The borrower/client will assess the significance of project impacts and risks on biodiversity and natural resources as an integral part of the environmental assessment process... The assessment will focus on the major threats to biodiversity, which include destruction of habitat'*… Further, *'The borrower/client will need to identify measures to avoid, minimize, or mitigate potentially adverse impacts and risks*…

Concerning the proposed Project site, as the land has been used for agriculture, *'the borrower/client will exercise care to minimize any further conversion or degradation of such habitat, and will, depending on the nature and scale of the project, identify opportunities to enhance habitat and protect and conserve biodiversity as part of project operations.*

AIIB

As outlined in AIIB's ESF, the Bank "*recognises that protecting and conserving biodiversity, sustainably managing terrestrial and aquatic natural resources and maintaining core ecological functions and services are fundamental to sustainable development. The objective of biodiversity conservation and sustainable management of natural resources should be balanced with a commitment to sustainable use of the multiple economic, social and cultural values of biodiversity and natural resources in an optimized manner. Through the Projects it finances, the Bank seeks, where applicable, to: (a) avoid adverse impacts on biodiversity and ecosystem services; and (b) assist its Clients in protecting and conserving biodiversity and*

promoting the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities."

EPFI's

The assessment of impacts upon terrestrial ecology is required with due consideration to IFC Performance Standard 6 on Biodiversity Conservation and Sustainable Natural Resource Management. PS6 establishes requirements for protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources. When avoidance of impacts is not possible, measures to minimise impacts and restore biodiversity and ecosystem services should be implemented. Specifically, it is necessary to determine baseline conditions and categorise the projects habitats as 'critical', 'modified' or 'natural' to undertake the necessary assessment. The Performance Standard defines the different habitats as follows:

- Natural Habitat: "Natural habitats are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition";
- Critical Habitat: "Critical habitats are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes"; and
- Modified Habitat: "Modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition. Modified habitats may include areas managed for agriculture, forest plantations, reclaimed6 coastal zones, and reclaimed wetlands".

9.2 Baseline Conditions

The following subsections summarise the key information from ecological survey reports. Refer to Volume 4 for the reports in full.

9.2.1 KBA and LPA Proximity

Although a project's overlap with, or proximity to an internationally recognized Key Biodiversity Area (KBA) or Legally Protected Area (LPA) do not automatically result in a Critical Habitat (CH) determination, there is generally a strong correlation with KBA overlap, as the international KBA standard promulgated by the IUCN, is the same standard that has been incorporated into the CH criteria in IFC PS6 and EBRD PR6 .

Beyond the possible triggering of CH, overlap with, or close proximity to KBA and/or LPA is an important factor in ecological risk assessment for a project, as it generally connotes a measure of ecological sensitivity, as well as priority status of certain species, habitats, or other biodiversity features among international or regional biodiversity science/conservation stakeholders.

For the present analysis, the results of the proximity analyses from the Integrated Biodiversity Assessment Tool (IBAT) report are presented, in the form of map figures showing the location of the Project area in relation to KBA (Figure 9-1) and LPA (Figure 9-2).

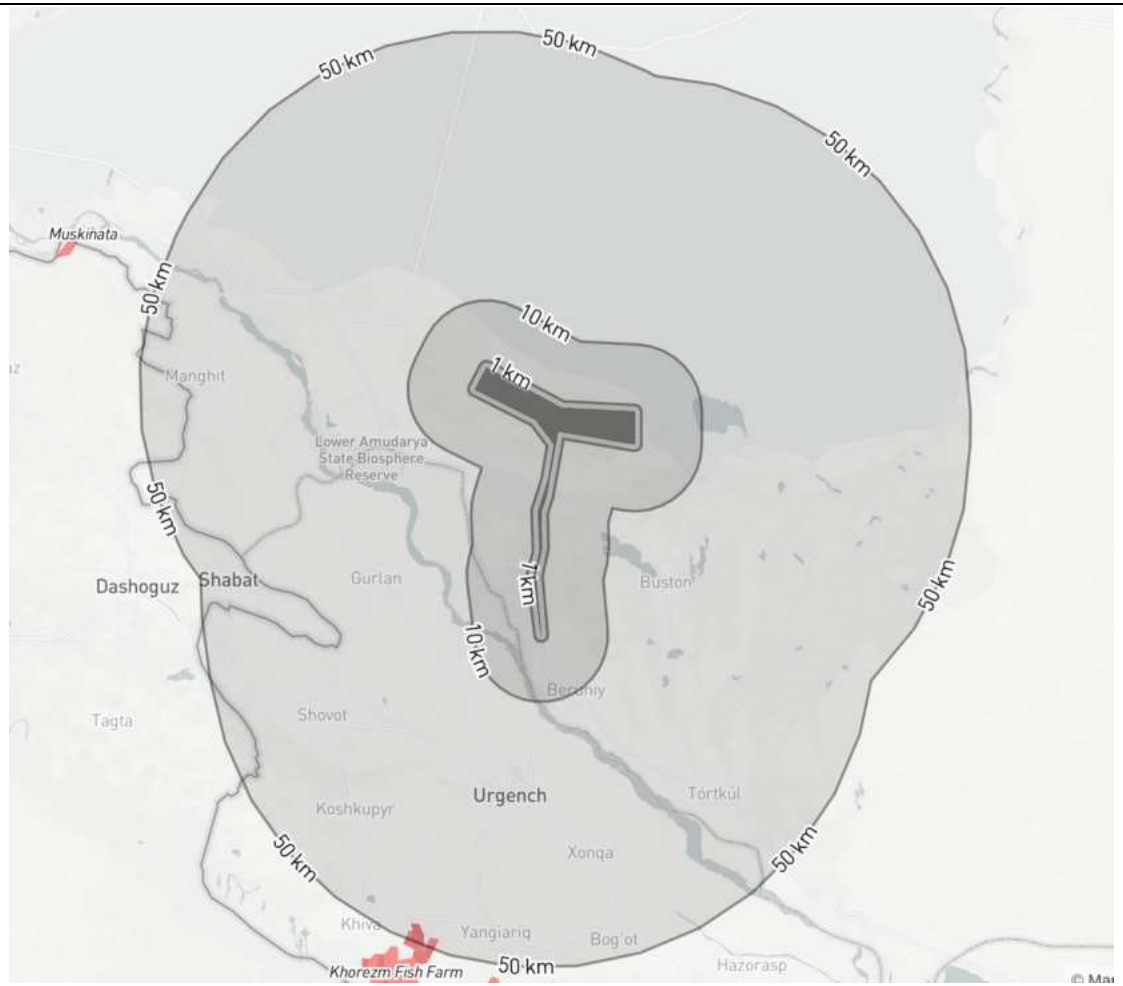


Figure 9-1 Location of the Nukus 2 wind project area plus OHTL interconnection segment (dark grey polygon) in relation to internationally recognized Key Biodiversity Areas (KBA, pink areas), according to the IBAT database (from IBAT report dated 7 March, 2024). Buffers of 1, 10, and 50km around the Project area are also shown in the figure, illustrating the conclusion that the Project is located a minimum of roughly 45 km from any KBA.

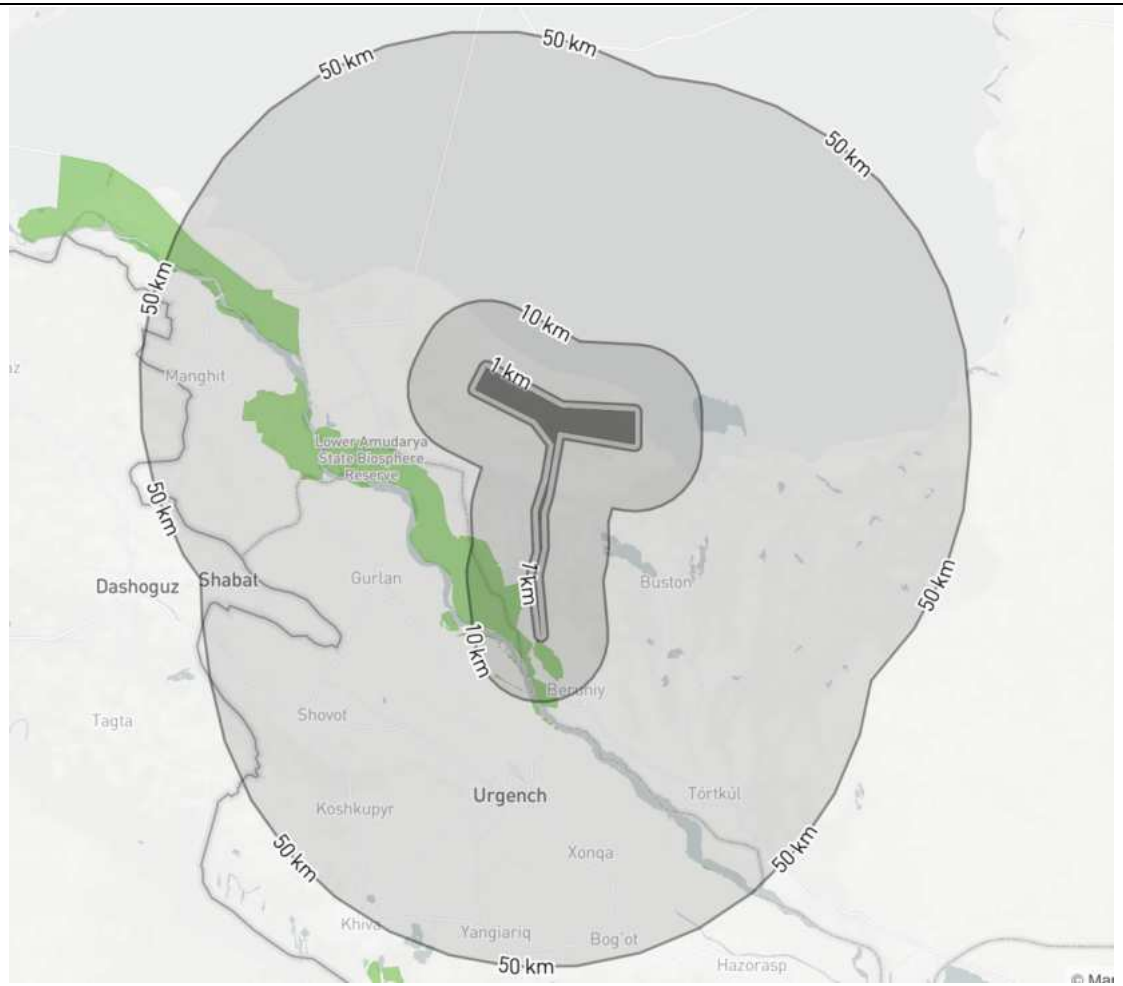


Figure 9-2 Location of the Nukus 2 wind project area plus OHTL interconnection segment (dark grey polygon) in relation to the LPA (green areas), according to the IBAT database (from IBAT report dated 7 March, 2024). Buffers of 1, 10, and 50km around the Project area are also shown in the figure, illustrating the conclusion that while the wind farm area is located a minimum of 10 km from the nearest LPA, the southern part of the OHTL segment comes within very close proximity, and actually has a slight overlap with one: the Lower Amu Darya State Biosphere Reserve.

With regard to KBA, the wind farm is located no closer than ca 45 km to any, indicating that the Project has negligible potential to impact any KBA.

With regard to LPA, Figure 9-2 shows that while the wind turbine area comes no closer than 10 km from any, the southern portion of the Project's OHTL interconnection segment comes in what appears to be very close proximity to one. This LPA is the Lower Amu Darya State Biosphere Reserve, and the Project's pre-bid E&S report indicates that the existing Beruniy substation, which is the southern terminus of the Project's OHTL, is actually located inside of this reserve. More specifically, it is located inside of what is termed the Reserve's "transition" zone, which is defined as a buffer around the Reserve's "core" zone. The buffer zone includes anthropogenic development and activity (including the Beruniy substation), but it serves the purpose of providing a buffer to the Reserve's core biodiversity values, which are associated with the riparian "Tsugai" forest that line portions of the Amu Darya. As indicated in the pre-bid E&S report, as long as the Project does not impact any of the Tsugai forest habitat, the Project is not expected to generate significant adverse impacts to this LPA or its associated biodiversity values. Additionally, spring 2024 botanical baseline surveys confirmed that the OHTL does not cross any patches of Tsugai forest.

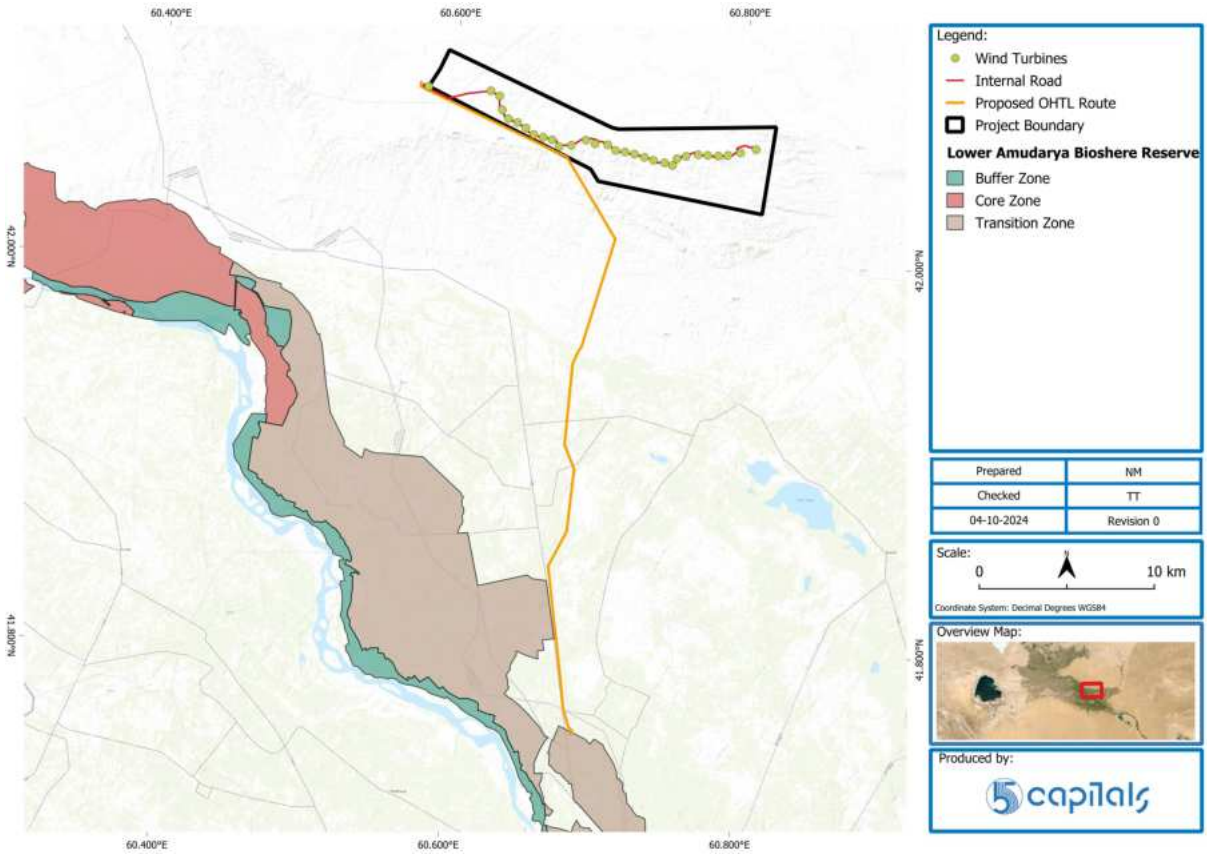


Figure 9-3 LADSBR Zoning and Overlap with the Project Layout

9.2.2 Terrestrial Ecology

9.2.2.1 Habitats and Flora

The concept of Natural Habitat (NH), as a specific biodiversity feature triggering a certain mitigation standard is applicable to IFC PS6, as well as other MFI policies, including the ADB SPS. Conversely, EBRD focuses on two tiers of important area; those with PBFs and those with critical habitat features. In essence, EBRD has removed consideration of Modified Habitat and replaced NH with PBFs. IFC PS6 defines NH as "areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition."

The NH assessment was based primarily on the floristic survey results and habitat characterizations and descriptions of regional botanist, described in the spring 2024 botanical baseline survey report. In summary, the entire wind farm area, plus the northern ca. 21.5 km of the OHTL are comprised of NH, per the IFC PS6 definition, representing a mosaic of four distinct natural vegetation associations, all within the larger Kyzylkum desert biome. As the Project's OHTL heads southeast out of the wind farm area and then southward out of the mountains, after roughly 21.5 km it crosses an abrupt ecological transition as it enters the irrigated agricultural landscape of the Amu Darya floodplain, where it continues for another ca. 21.9

km southward through a mix of four different types of Modified Habitats (MH), per the IFC PS6 definition, terminating at the Beruni substation. The eight different habitat types (4 NH, 4 MH) are summarized below and described in detail, and illustrated with photographs in the spring 2024 botanical baseline survey report, which is appended to the ESIA.

The spring botany survey was conducted mid of April 2024 by traditional methods of botanical research commonly used for sampling and mapping of native non-forest vegetation, recognition of floristic composition and spatial patterns of plant communities (Field geobotany, 1959–1976; Granitov, 1980; Kent, 2011). All proposed turbine locations within the project site were inspected, as well as the route of the planned OHTL from the Beruniy substation to the wind farm area. A total of thirty-eight 100 x 100m plots were surveyed, including one (1) at each of the proposed 29 turbine locations (revised to 26), one (1) at the BESS location, one at the substation, and seven (7) along the OHTL.

Refer to the detailed botanical survey report in Volume 4 for survey methodology, location coordinates, maps, and full datasets of results.

Results

The surveys identified four distinct natural habitat groups, as follows:

1. Gentle hilly slopes of relic low mountains with sedge-saltwort-sagebrush and sagebrush-saltwort vegetation on sabulous-loamy and loamy grey-brown desert soil. Main dominants are sagebrush (*Artemisia diffusa, Artemisia turanica*), saltworts (*Oreosalsola arbusculiformis (Salsola arbusculiformis), Caroxylon orientale (Salsola orientalis), Xylosalsola arbuscula (Salsola arbuscula)*), desert sedge (*Carex physodes*) and bulbous bluegrass (*Poa bulbosa*). The canopy cover is 20–30%. This habitat type is represented within the wind farm area along the crest of the Sultan Uvays range and on its northern slope. Proposed locations of wind turbines mostly fall into this habitat type, as well as the internal OTHL, BESS and wind farm substation and switching station. According to the IUCN Habitats Classification, ver. 3.1, this habitat belongs to the type 8 – Desert and subtype 8.2 – Temperate desert. According to EUNIS Habitats classification, this habitat corresponds to the type S – Heathland, scrub and tundra and subtype S67 Aralo-Caspian semi-desert (Zonal scrub on loamy and sandy-loamy, often subsaline soils of the semi-deserts of the Caucasus foothills, South-Eastern European Russia and Kazakhstan).

2. Steep dry stony slopes of relic low mountains with rugged terrain and sparse petrophytic vegetation composed with *Ephedra sp., Atraphaxis compacta, Artemisia turanica*, *Anabasis sp.*, *Haloxylon ammodendron*, *Salsola sp.*, *Halothamnus subaphyllus, Halimocnemis sp., Poa bulbosa* and annuals. The canopy cover is 10–20%

or less, sometimes nearly 0. According to the IUCN Habitats Classification, ver. 3.1, this habitat belongs to the type 6 Rocky Areas (e.g., inland cliffs, mountain peaks). According to the EUNIS habitat classification, this habitat corresponds to the type H - Inland unvegetated or sparsely vegetated habitats, subtype H3 - Inland cliffs, rock pavements and outcrops. This habitat type occupies the upper part of northern slope of the Sultan Uvays range (about 7 km in width), and the northern part of planned OTHL falls into this habitat type.

3. Stony desert with skeleton or loamy-skeleton, sometimes gypsaceous grey-brown desert soil, with sparse black saxaul (*Haloxylon ammodendron*), sagebrush-saltwort and saltwort vegetation dominated by *Artemisia diffusa, Artemisia turanica*, *Caroxylon gemmascens (Salsola gemmascens), Caroxylon orientale (Salsola orientalis), Caroxylon incanescens (Salsola incanescens), Halimocnemis sp., Climacoptera sp.* The canopy cover is 10–20%. This habitat is significantly disturbed due to human activities (ground roads, gravel extraction, railway, power lines, grazing, pollution with garbage). This habitat type is represented in the weakly inclined southern piedmonts of the Sultan Uvays range (about 6.6 km in width), dissected with gravelly dry beds of temporary streams, and the northern part of planned OTHL falls into this habitat type. According to the IUCN Habitats Classification, ver. 3.1, this habitat belongs to the type 8 – Desert and subtype 8.2 – Temperate desert. According to the EUNIS Habitats classification, this habitat more or less corresponds to the type S – Heathland, scrub and tundra and subtype S67 Aralo-Caspian semi-desert (Zonal scrub on loamy and sandy-loamy, often subsaline soils of the semi-deserts of the Caucasus foothills, South-Eastern European Russia and Kazakhstan).

4. Sandy desert (semi-fixed sands with psammophilous vegetation). This habitat occupies small plot of about 1.5x3.5 km between settlements, agricultural lands, railway and roads, 12 km to the north of Beruni substation. According to the IUCN Habitats Classification, ver. 3.1, this habitat belongs to the type 8 – Desert and subtype 8.2 – Temperate desert. According to the EUNIS Habitats classification, this habitat more or less corresponds to the type S – Heathland, scrub and tundra and subtype S68 Semi-desert sand dune with sparse scrub (Open perennial vegetation of halophytic shrubs, e.g. *Artemisia spp.*, *Haloxylon spp.*, *Salsola spp.* and *Tamarix spp.*, and annuals on wind-blown drifting or stabilised dunes and sandy soils in the semi-desert region of the Caspian lowlands). The vegetation of this plot of sandy desert is represented with sparse community of *Xylosalsola arbuscula, Artemisia santolina, Astragalus villosissimus, Convolvulus hamadae, C. divaricatus,* desert sedge (*Carex physodes*) and annual saltworts (*Agriophyllum sp., Caroxylon scleranthum, Salsola paulsenii*). Small saline depressions between sandy hills are occupied with Russian box thorn or wolfberry

(*Lycium ruthenicum*), tamarisk (*Tamarix laxa*) and camel thorn (*Alhagi pseudalhagi*). The canopy cover is 10–30%.

Additionally, the surveys identified four distinct modified habitat groups, as follows:

1. Arable lands with agricultural crops. According to IUCN Habitats Classification, ver. 3.1, this habitat belongs to the type 14 Artificial – Terrestrial, subtype 14.1 Arable Land. According EUNIS Habitats classification, it corresponds to the type V – Vegetated man-made habitats, and represented with a subtype V1 Arable land and market gardens (V11 Intensive unmixed crops, on some areas with V14 Inundated or inundatable croplands, including rice fields). This is main type of modified (anthropogenic) habitats along the southern half of OTHL line, between Beruni substation and piedmonts of the range Sultan Uvays. Irrigated arable lands along the planned OHTL are used mainly under cotton (*Gossypium hirsutum*), wheat (*Triticum aestivum*), rice (*Oryza sativa*) and corn (*Zea mays*).
2. Fallow lands. IUCN habitat type 14 Artificial – Terrestrial, subtypes 14.1 Arable Land and 14.2 Pasture Land. It corresponds with EUNIS habitat type V – Vegetated man-made habitats, subtype V1 Arable land and market gardens (V15 Bare tilled, fallow or recently abandoned arable land). Saline abandoned fields are occupied with secondary plant communities with domination of camel thorn (*Alhagi pseudalhagi*), saltworts (*Suaeda sp., Climacoptera sp., Salsola sp., Caroxylon sp., Ceratocarpus arenarius*), annual and perennial weeds, sometimes with reeds (*Phragmites australis*) and sparse growth of halophytic shrubs, as tamarisk (*Tamarix hispida, T. ramosissima*), salt tree (*Caragana halodendron (Halimodendron halodendron*), Russian box thorn (*Lycium ruthenicum*), *Halocnemum strobilaceum* and *Halostachys caspica*. These communities represent different stages of succession. The species composition and abundance, and density of canopy cover very much varies on different areas depending on fallow land "age", level of soil salinization, meteorological conditions of the year and other local conditions.
3. Woodland belts, boundary-strips, roadsides, canals and drainage channels. This habitat type occupies a narrow steps (10–20 m in width) between the above-mentioned agricultural lands. IUCN habitat type 14 Artificial – Terrestrial, subtype 14.1 Arable Land. This habitat type corresponds with EUNIS habitat type V – Vegetated man-made habitats, and represented with a complex of 3 subtypes V64 Lines of planted trees, V38 Dry perennial anthropogenic herbaceous vegetation and V39 Mesic perennial anthropogenic herbaceous vegetation. These subtypes are often difficult to distinguish on a map as separate polygons because of their mosaic and small scale. Woodland belts are composed of poplar (*Populus euphratica, P. pruinose, P. afghanica, P. alba*), oleaster (*Elaeagnus angustifolia*), willow (*Salix alba*), elm (Ulmus

sp.), mulberry (*Morus alba*), apricot (*Prunus armeniaca*), and other native and non-native trees. Banks of the Beruni collector channel (Kyrkkyz channel) and other smaller irrigation and drainage channels are occupied with poplar (*Populus euphratica, P. pruinosa*), oleaster (*Elaeagnus angustifolia*), tamarisk (*Tamarix ramosissima, T. hispida*), salt tree (*Caragana halodendron (Halimodendron halodendron*), Russian box thorn (*Lycium ruthenicum*), *Halostachys caspica,* and herbs, as camel thorn (*Alhagi pseudalhagi*), liquorice (*Glycyrrhiza glabra*), reeds (*Phragmites australis*), *Karelinia caspia*, *Aeluropus littoralis,* annual saltworts.

4. The southern part of the planned OTHL crosses two villages, Makhtumkuli and Khanyap. The vegetation is represented with different native and non-native fruit and ornamental trees, vegetables, alfalfa (*Medicago sativa*), corn (*Zea mays*), and weeds. It corresponds with IUCN habitat type 14 Artificial – Terrestrial, subtype 14.4 Rural Gardens, and EUNIS habitat type J1 – Buildings of cities, towns and villages, subtype J1.2 Residential buildings of villages and urban peripheries.

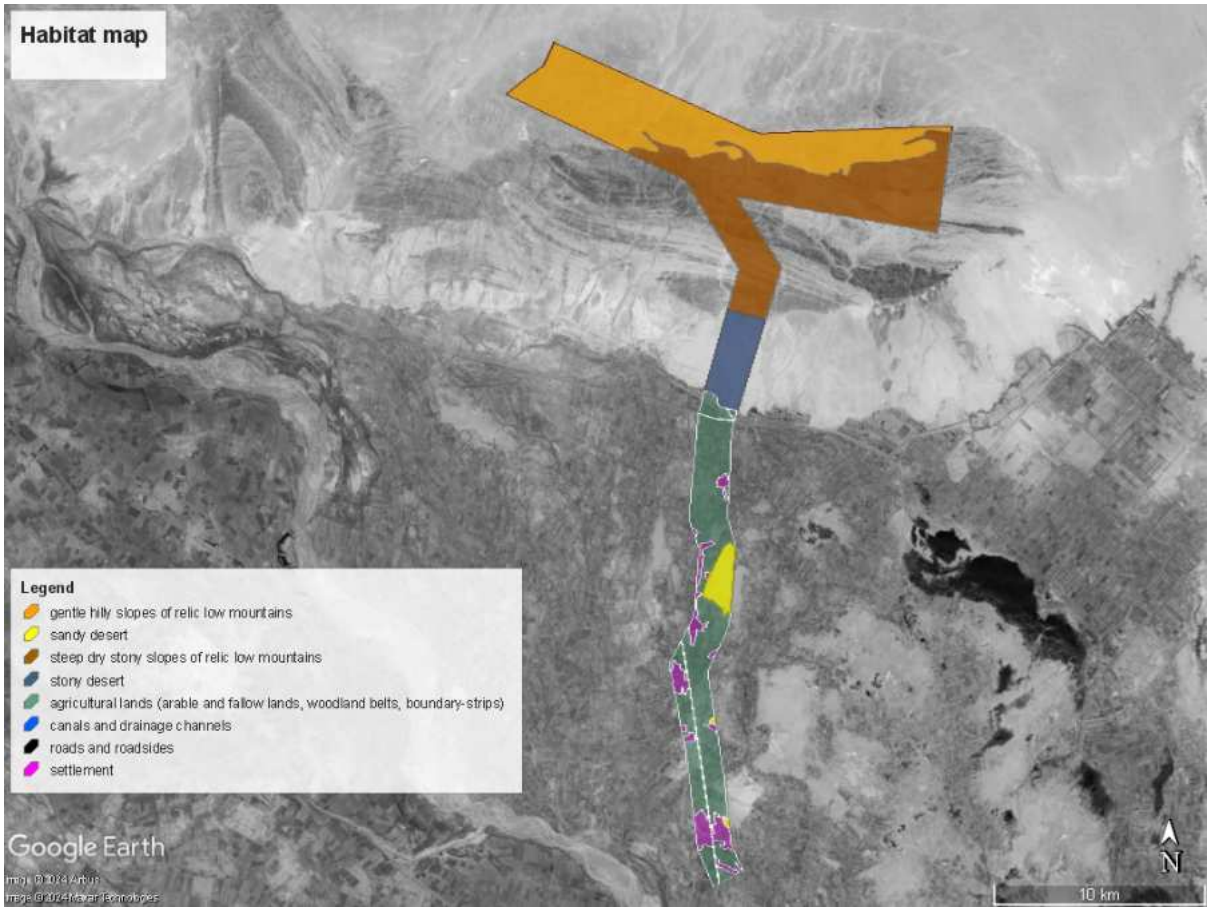


Figure 9-4 Habitat Map

In total, 89 plant species of 31 families were recorded within the project area, none of them are globally threatened, and one species is red-listed at the national level (i.e., is recorded in the Uzbekistan Red Data Book (Uz RDB).

During the spring survey, four small populations (4, 6, 7 and 8 generative specimens) of nationally endemic *Lepidium subcordatum* (Brassicaceae) assessed as a rare, endangered species (Category 2) in the Uz RDB (2019) were identified on the crest of Sultan Uvays range within the wind farm area and along the planned OTHL on the southern slope of Sultan Uvays. The following figure depicts the location relative to the Project site.

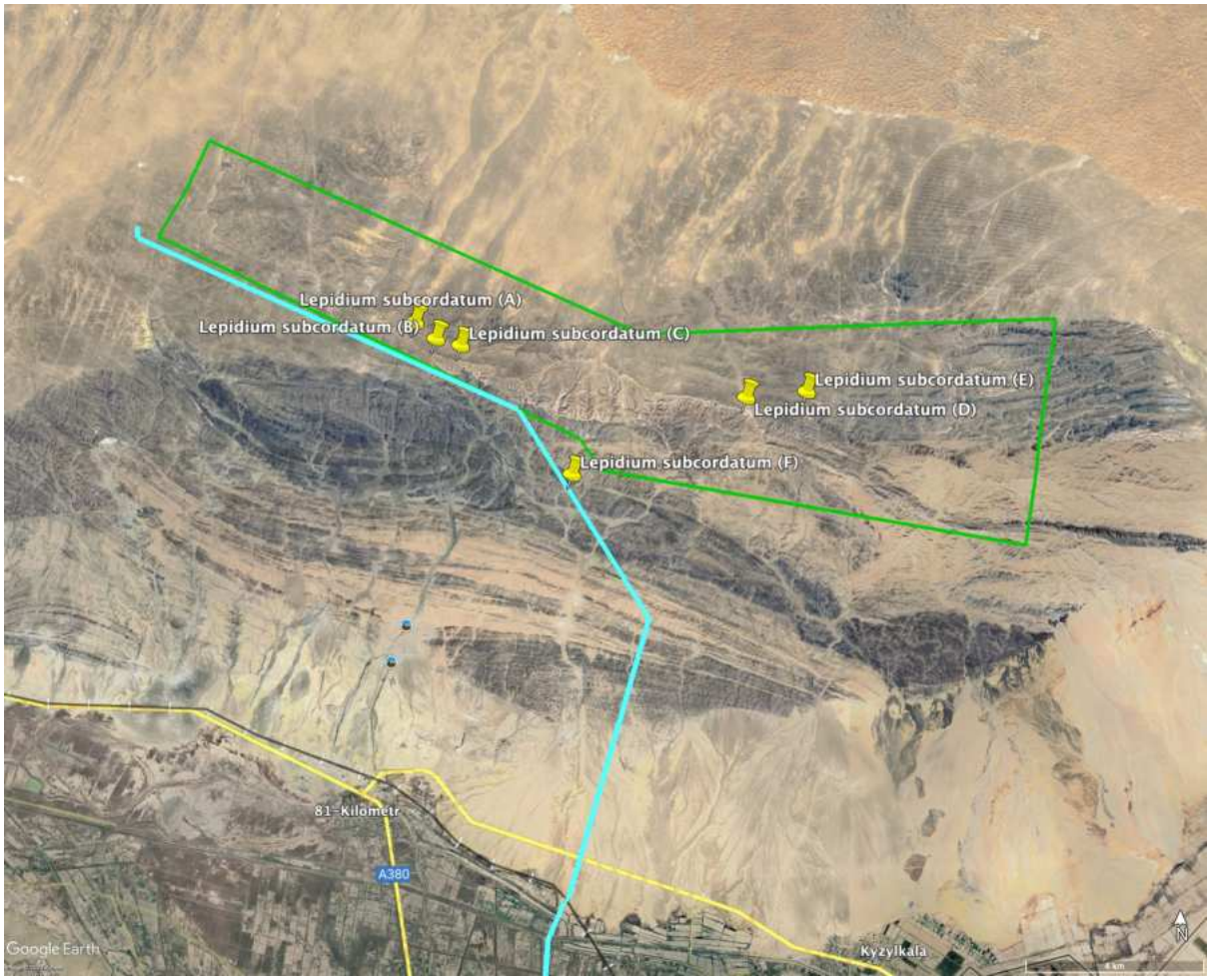


Figure 9-5 Lepidium subcordatum near Project Area. (A) is the location of the 6 specimens near WTG 06, (B) is the location of the 7 specimens near WTG 07, (C) is the location of the 6 specimens near WTG 08, (D) is the location of the 8 specimens near WTG 18, (E) is the location of the 6 specimens near WTG 20, and (F) is the location of the 4 specimens near the OHTL.

According to published and herbarium data, 22 localities of *Lepidium subcordatum* are known to date (including localities in the Nukus 2 area), one of them is situated on the Ustyurt Plateau and 21 on the relic mountains of the Kyzylkum (5 locations on the Sultan Uvays Mountains). The

following figure depicts the known locations and geographical range of *Lepidium subcordatum*.

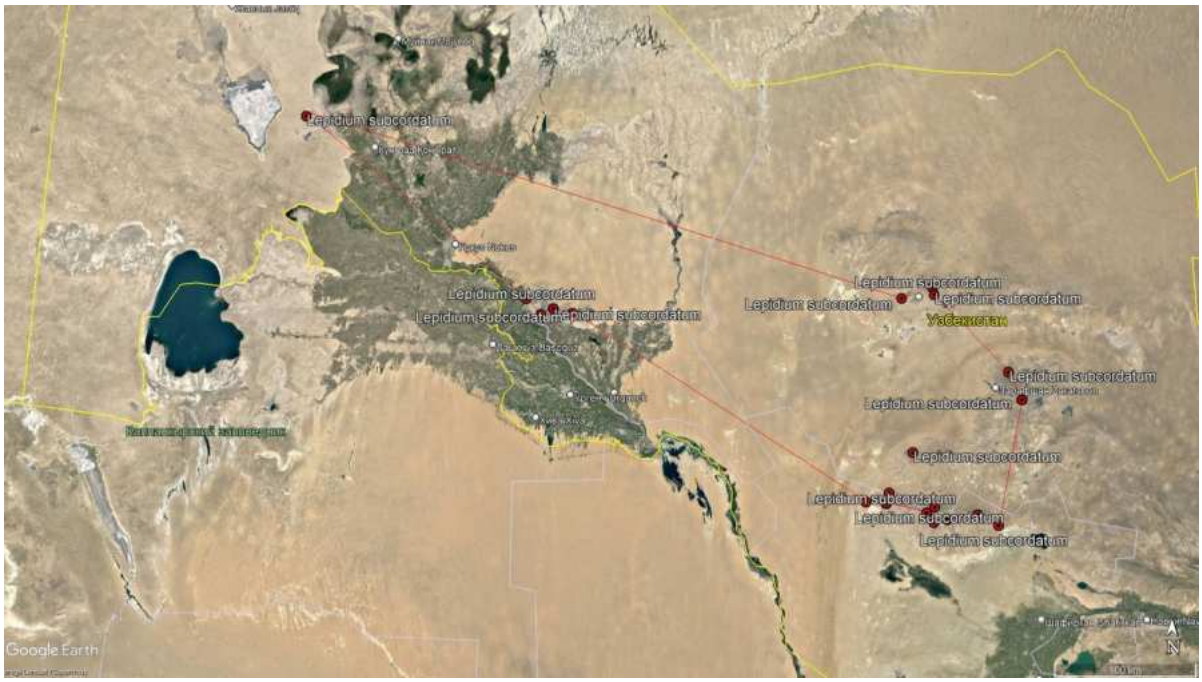


Figure 9-6 Known locations and geographical range of *Lepidium subcordatum*

In spite of the relatively small number of documented localities for this species, it is considered to be a fairly widespread spring ephemeral species in suitable habitats within broad portions of the Kyzylkum Desert and Ustyurt Plateau regions (N. Beshko, pers. comm.). Therefore, it is not considered to trigger CH under IFC CH criterion 1c, but it is considered a PBF for the Project, under EBRD PR6. The potential for the Project to impact this species is limited to the Project's temporary and permanent soil disturbance footprint. This impact will be mitigated through a pre-construction survey and rescue/relocation program.

Most of species recorded for the Project area are typical for desert zone of Central Asia and common and widespread.

9.2.2.2 Mammals (Non-volant)

Surveying for non-volant mammals was undertaken during Spring 2024 using transects and camera traps deployed over a period of 2 months. The sampling effort included thirteen (13) transects, each 1-1.5km in length, surveyed during two separate 3-day visits (between February 27-29, 2024, and April 11-13, 2024). The surveys included visual searches for live mammals, tracks, scat, burrows or other traces of mammals, as well as the examination of mammal bones and fur in owl pellets. The following figure depicts the spring mammal survey effort.

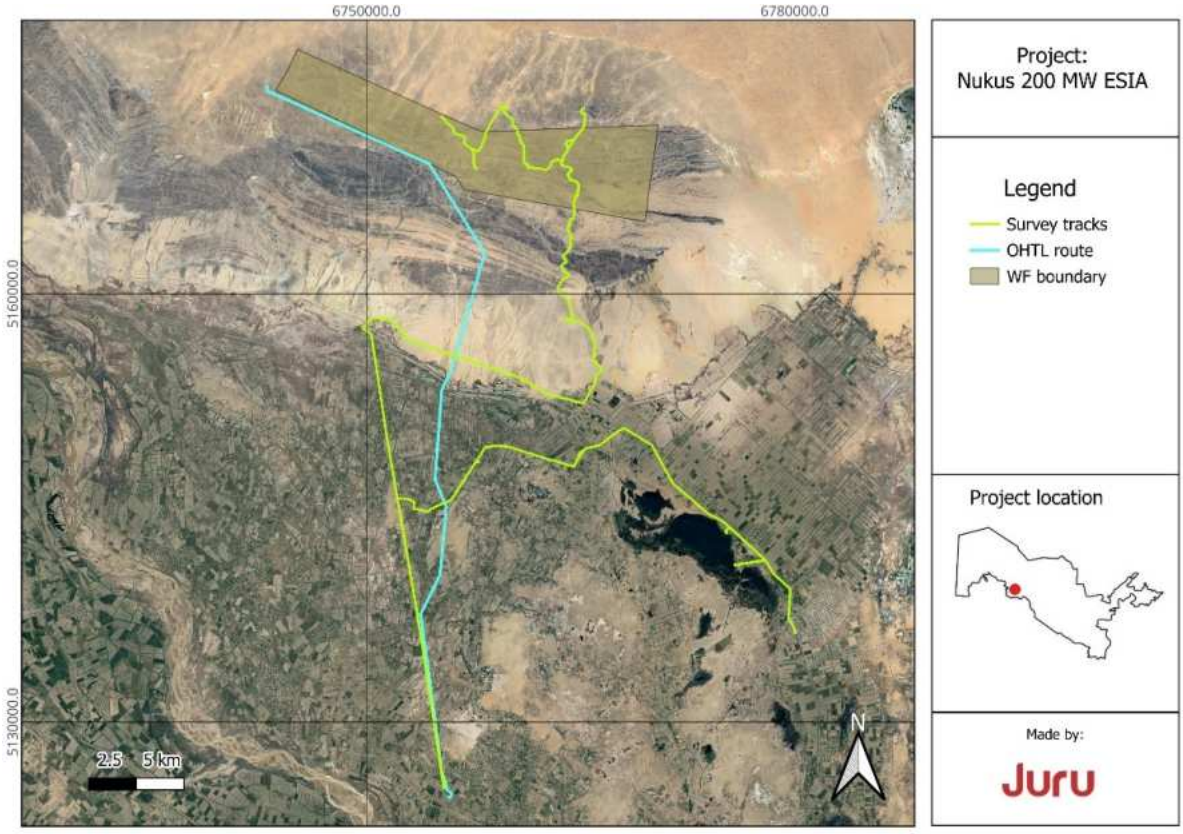


Figure 9-7 Spring Non-volant Mammal Survey Effort

Eleven (11) camera traps were installed on April 2 and April 3, 2024, located in different biotopes as shown in the following figure. The memory cards were collected on May 31, however camera traps №6 and №11were found missing.

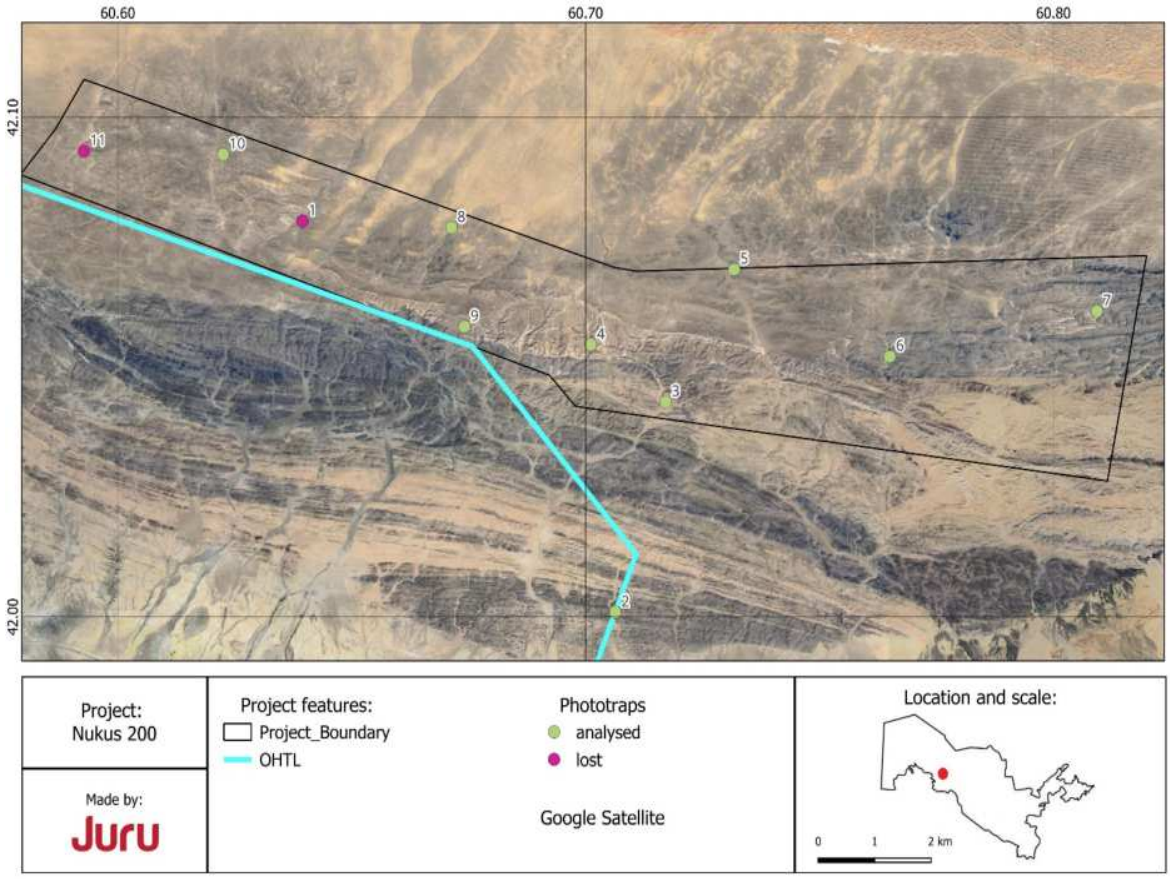


Figure 9-8 Camera Trap Locations

Results

Refer to the detailed mammal baseline survey reports in Volume 4 for methodology, location coordinates, maps, and full datasets of results.

A total of 23 species were recorded during the spring mammal survey, four of which are listed in the Uz RDB and the IUCN Red List: the Brandt's hedgehog (*Hemiechinus hypomelas)*, Corsac Fox (*Vulpes corsac*), Marbled Polecat (*Vormela peregusna)* and Goitered Gazelle (*Gazella subgutturosa*). Additionally, the African Wildcat is listed under Appendix II of the Convention on International Trade in Endangered Species (CITES), while the Goitered Gazelle is listed under both Appendix II of CITES and Appendix II of the Convention on Migratory Species (CMS).

The following table summarizes the findings of the mammal surveying effort for Nukus 200 MW WF site and OHTL route.

Table 9-1 Mammal Survey Results

Name of species		IUCN /RDB Status	Status in Conventions
Latin	English		
Hemiechinus auritus	Long-eared hedgehog	-	-
Hemiechinus hypomelas	Brandt's hedgehog	LC/3 (NT)	-
Crocidura suaveolens	Lesser white-toothed shrew	-	-
Diplomesodon pulchellum	Pie-bald shrew	-	-
Pipistrellus pipistrellus	Common pipistrelle	-	-
Lepus tolai	Tolai Hare	-	-
Spermophilus fulvus	Yellow Ground Squirrel	-	-
Allactaga elater	Small Five-toed Jerboa	-	-
Dipus sagitta	Northern Three-toed Jerboa	-	-
Cricetulus migratorius	Grey Hamster	-	-
Ellobius tancrei	Zaisan Mole Vole	-	-
Meriones tamariscinus	Tamarisk Jird	-	-
Meriones libycus	Libyan Jird	-	-
Meriones meridianus	Midday Jird	-	-
Mus musculus	House Mouse	-	-
Canis aureus	Golden Jackal	-	-
Vulpes vulpes	Red Fox	-	-
Vulpes corsac	Corsac Fox	LC/2 (VU:D)	-
Vormela peregusna	Marbled Polecat	VU/2 (VU:D)	-
Felis lybica	African Wildcat	-	Cities II
Gazella subgutturosa	Goitered Gazelle	VU/2 (VU:D)	Cites II, CMS II
Ondatra zibetica	Muskrat	-	-
Nesokia indica	Short-tailed Bandicoot Rat	-	-

CHA for the Goitered Gazelle, listed as VU on the IUCN Red List and the Uzbek RDB, shows that though this species has been established to occur in the project area, it is not at abundances high enough to trigger criticality. However, being a VU species, it is considered to be as an important sensitive receptor and a Priority Biodiversity Feature (PBF).

The Marbled Polecat, listed as VU on the IUCN Red List and the Uzbek RDB, was established to occur in the project area. However, CHA for the Marbled Polecat shows that criticality is not triggered given the very large size of its global range. Nonetheless, it is considered a PBF on

the basis of its global VU status, based on observations of this species at two of the mammal transect survey locations within the wind farm area during the baseline surveys.

The Bukhara Red Deer (*Cervus elaphus*) is listed as LC on the IUCN Red List due to its abundance at the global level, however the Bukhara subspecies (*C. e. bactrianus*) is extremely rare and is nationally listed as Endangered, therefore elevating its sensitivity ranking to High. This subspecies occur only in riparian gallery forests along major rivers, including the Amu Darya. The Lower Amu Darya State Biosphere Reserve (LADSBR) is known to hold the largest remaining concentration of this endangered subspecies. Although the Project's infrastructure overlaps this reserve only peripherally, and will not impact any of the riparian "Tsugai" forest that comprises its primary habitat for most of the year, it is concluded that the Project does trigger a CH determination under IFC criterion 1c for this species because while Bukhara Red Deer normally remain inside of the Tsugai forests for most of the year, they are also known to range into adjacent desert and piedmont habitats during spring, when they forage on spring herbaceous growth. The below figures shows a map of specific areas used by the population of the LADSBR provided by regional experts. The map indicates that the Project's OHTL passes directly through the spring foraging area of this population, though this species was not documented in the area during the spring, 2024 mammal baseline surveys in this area. Furthermore, during a site visit conducted in August, 2024, LADSBR personnel indicated that Bukhara Red Deer had not been observed within these upland desert areas in many years. Nonetheless, because the most nationally important population of this species is known to occur within the Project's EAAA, a CH determination is triggered for this species under IFC criterion 1c. We note that the occurrence of this species within the Project's EAAA is sporadic, ephemeral, and limited, as the EAAA does not include this species' primary habitat (Tsugai riparian forest). Therefore, the potential for the Project to impact this species is also highly limited, and will be further mitigated by restricting OHTL construction activities to outside of the spring season (April-May) when Goitered Gazelles may occur on the desert piedmont slopes along the northern portion of the Project's OHTL route. Additional mitigation measures intended to achieve the "net positive gain" mitigation standard required under lender policies for CH triggering species will be developed in consultation with regional stakeholders and implementation partners and described in the Project's Biodiversity Action Plan (BAP).

Figure 9-9 Location of the Nukus 2 wind project area (orange shaded polygon with red thumbtacks) plus northern portion of the OHTL interconnection segment (thick green line) in relation to the known spring foraging area (white polygon) of the population of Bukhara Red Deer that inhabit the Lower Amu Darya State Biosphere Reserve during the remainder of the year.

9.2.2.3 Herptiles

The spring reptile survey was conducted between April 27 – April 28, 2024, and completed 10 km of transects, as shown in the following figure. Transect surveying was undertaken with the aim to identify herpetofauna and record abundances and density across the project site.

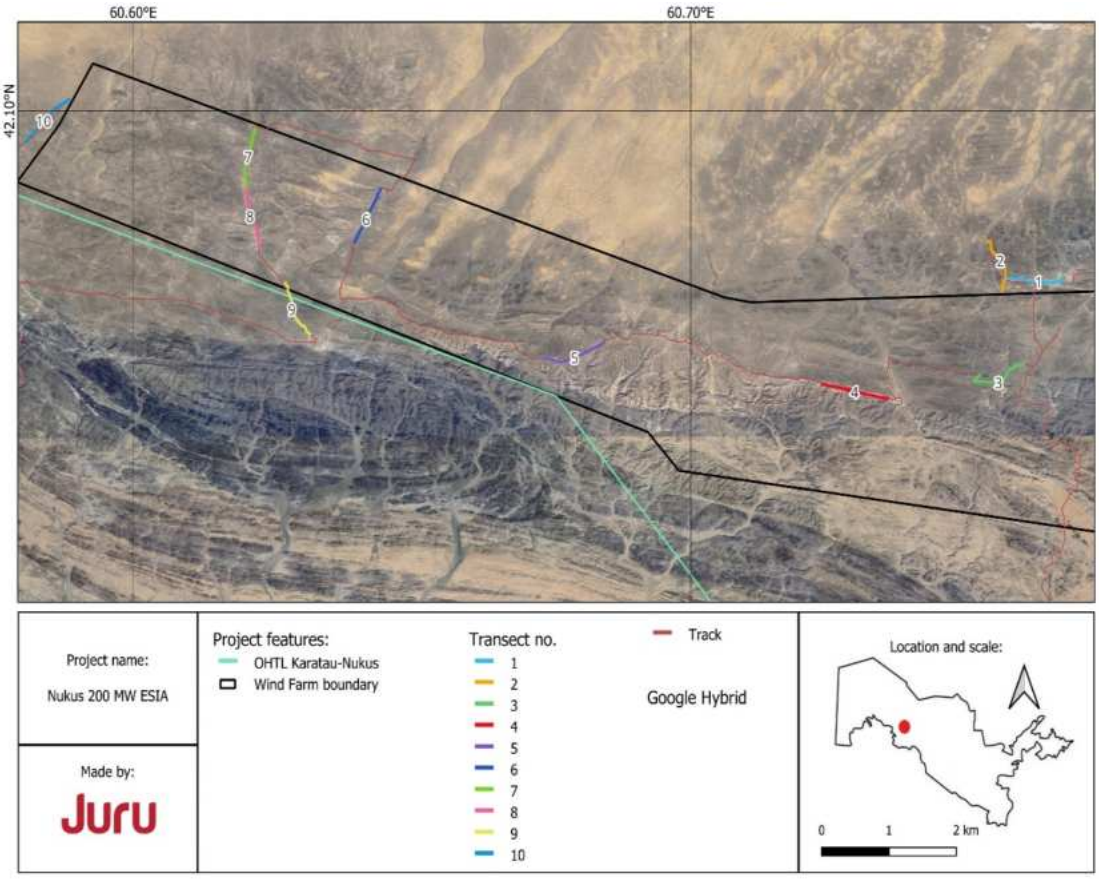


Figure 9-10 Spring Reptile Survey Effort

Results

Refer to the detailed herpetology survey reports in Volume 4 for methodology, location coordinates, maps, and full datasets of results.

The reptiles identified during the spring survey are shown in the following table.9
Table 9-2 Reptile Spring Survey Results

NAME OF SPECIES		IUCN / RDB STATUS	FURTHER CRITERIA	TOTAL NO. OBSERVED
SPECIES	COMMON NAME			
Testudo horsfieldii	Central Asian tortoise	VU/ 2 (VU)	-	40
Eremias velox	Rapid race runner	LC	-	5
Trapelus sanguinolentus	Steppe Agama	LC	-	3
Platyceps karelini	Spotted desert racer	LC	-	1

Only one (1) species of heightened concern was recorded. The Central Asian Tortoise is listed as Vulnerable on the IUCN Red List and the Uzbek RDB. While its global population size is not well known, the very large size of its global range precludes the possibility that this Project could cause the species to be globally uplisted to CR/EN, thus precluding a CH determination under IFC criterion 1b. Nonetheless, it is considered a PBF on the basis of its global VU status, and it is quite abundant at the site, with 40 individuals documented in the wind farm area during the baseline surveys.

9.2.3 Birds and Bats

9.2.3.1 Birds

The 200 MW Project site was comprehensively surveyed following the guidance of the Scottish Natural Heritage (SNH) guidelines and aligned with GIIP and the requirements of the Development Finance Institutions (DFI) for onshore wind farm bird surveys. The survey data was then included in a Collision Risk Model (CRM). Both the survey and CRM were provided as part of the tender documentation, however the CRM was updated based on the selected WTG's specifications. The CRM is further discussed in the operational impact assessment for birds.

VANTAGE POINT SURVEYS

Coverage and Timing/Dates – Vantage Point Surveys

Vantage Point (VP) surveying was undertaken for one year over four seasons from April 2020 – March 2021.

The VP surveys of the wind farm site were carried out during the following seasons:

- Spring (migration): March 16 - May 17, 2021 – 180 total VP survey hours
- Summer (breeding): May 18 - August 31, 2021 – 180 total VP survey hours
- Autumn (migration): September 1 - November 15, 2021 – 180 total VP survey hours
- Winter: November 16, 2021 - March 15, 202 – 180 total VP survey hours

Survey Protocol and Effort – VP Surveys

Five (5) VPs were surveyed which collectively covered at least 90% of the site boundary for the WTGs, plus an extension up to approximately 1 km outside of the wind turbine area on all sides. The VPs were surveyed for three hours during each effort with at least 36 survey hours undertaken at each survey point during each season. A total of 720 survey hours were undertaken over the course of one year.

The species for which CRM was conducted included all "target" and "secondary" bird species that were observed at the site within the VP survey effort. Target species were defined to include all species with conservation concern or protected status on either the national or international "red lists". Secondary species were defined to include all other raptors and vultures that could potentially occur at the site, as well as selected additional large-bodied birds that could become a significant risk concern for the Project, if seriously impacted. The list of such species was developed with input from regional bird experts and was intended to include all potentially high- or moderate- sensitivity bird species that could occur at the site.

The species included within the CRM for the Project are discussed further in the operation impact assessment.

VP Survey Results

The four-season, one year VP surveys conducted on the WTG site boundary between March 2021 – March 2022 recorded 72 species of birds, of which 2 are globally and nationally threatened species, 1 is solely a globally threatened species, and 2 are nationally threatened species. The following table summarises the results of the bird survey.

Table 9-3 Wind Farm – VP Surveys Results

Scientific Name	English Common Name	Uzbek RDB status	IUCN status	VP Observations			
				Spring 2020	Summer 2020	Autumn 2020	Winter 2021
Alectoris chukar Chukar	Alectoris chukar Chukar			72	141	168	91
Columba livia	Rock Pigeon					82	179
Streptopelia turtur	European Turtle-Dove	VU	VU			6	
Pterocles orientalis	Black-bellied Sandgrouse			134	212	345	347
Grus grus Common Crane	Grus grus Common Crane			6		1800	
Aquila nipalensis	Steppe Eagle	VU	EN	3	2	2	2
Aquila chrysaetos	Golden Eagle	VU		2		2	2
Circus aeruginosus	Eurasian Marsh-Harrier			2			
Circus cyaneus	Hen Harrier			25		11	19
Milvus migrans	Black Kite			1	1	5	
Haliaeetus albicilla	White-tailed Eagle	VU					2
Buteo lagopus	Rough-legged Hawk			4	1	26	42
Buteo buteo	Common Buzzard					22	
Buteo rufinus	Long-legged Buzzard			4	30	48	13

Scientific Name	English Common Name	Uzbek RDB status	IUCN status	VP Observations			
				Spring 2020	Summer 2020	Autumn 2020	Winter 2021
Athene noctua	Little Owl			17	28	33	36
Asio flammeus	Short-eared Owl						1
Upupa epops	Eurasian Hoopoe				3		
Merops persicus	Blue-cheeked Bee-eater			529			
Coracias garrulus	European Roller			1	7		
Falco tinnunculus	Eurasian Kestrel			20	26	40	24
Falco vespertinus	Red-footed Falcon		VU	2			
Falco columbarius	Merlin			1		3	
Lanius collurio	Red-backed Shrike				2		
Lanius excubitor	Great Gray Shrike			3	9	16	17
Pica pica	Eurasian Magpie				2		7
Podoces panderi	Turkestan Ground-Jay					13	8
Corvus monedula	Eurasian Jackdaw						19
Corvus frugilegus	Rook						83
Corvus corone	Carrion Crow					43	178
Corvus cornix	Hooded Crow					260	547
Ammomanes deserti	Desert Lark					44	80
Eremophila alpestris	Horned Lark					2	639
Calandrella brachydactyla	Greater Short-toed Lark			1402	1159	1177	85
Melanocorypha calandra	Calandra Lark					31	
Alaudala rufescens	Lesser Short-toed Lark			745	489	651	606
Alauda arvensis	Eurasian Skylark				1		
Galerida cristata	Crested Lark			564	588	579	759
Hippolais languida	Upcher's Warbler			10	39		
Hirundo rustica	Barn Swallow			7			
Phylloscopus trochilus	Willow Warbler					37	
Phylloscopus collybita	Common Chiffchaff					160	
Phylloscopus trochiloides	Greenish Warbler					156	
Sylvia nana	Asian Desert Warbler				34	201	
Sylvia curruca	Lesser Whitethroat					74	
Sylvia communis	Greater Whitethroat					178	

Scientific Name	English Common Name	Uzbek RDB status	IUCN status	VP Observations			
				Spring 2020	Summer 2020	Autumn 2020	Winter 2021
Sturnis vulgaris	European Starling						165
Acridotheres tristis	Common Myna						8
Ficedula parva	Red-breasted Flycatcher					57	
Phoenicurus phoenicurus	Common Redstart			9		38	
Phoenicurus ochruros	Black Redstart			2	1	30	
Saxicola maurus	Siberian Stonechat			17		19	
Saxicola caprata	Pied Bushchat			1	5		
Oenanthe oenanthe	Northern Wheatear			7		32	
Oenanthe isabellina	Isabelline Wheatear			673	610	900	35
Oenanthe deserti	Desert Wheatear			82	130	396	
Oenanthe melanoleuca	Eastern Black-eared Wheatear			19	36		
Oenanthe pleschanka	Pied Wheatear			294	330		
Oenanthe finschii	Finsch's Wheatear			16	77		
Passer domesticus	House Sparrow			880	1739		4
Passer hispaniolensis	Spanish Sparrow						503
Passer montanus	Eurasian Tree Sparrow					57	50
Petronia petronia	Rock Sparrow					127	273
Motacilla alba50	White Wagtail			121	41	173	140
Anthus campestris	Tawny Pipit			74	158	10	
Fringilla coelebs	Common Chaffinch					64	755
Fringilla montifringilla	Brambling					72	206
Coccothraustes coccothraustes	Hawfinch					14	
Bucanetes githagineus	Trumpeter Finch			14	62	20	
Rhodospiza obsoleta	Desert Finch			6	27		20
Linaria cannabina	Eurasian Linnet						2
Spinus spinus	Eurasian Siskin					38	38

The following figure provides the locations of the VPs along the OHTL alignment.

Figure 9-11 VP Survey Locations for the OHTL alignment

The following table summarises the target and secondary bird species recorded during the OHTL survey undertaken from March 1 – April 25, 2024 at 6 VP locations, and each for 12 hours.. Target species for the survey were identified during baseline survey conducted on the project site. As a result of the observations, species of high concern were categorised as 'target species' or 'secondary species'. Refer to Volume 4 for the list of target and secondary species and the other species identified during the OHTL surveys.

Large migratory flocks of the Common Crane (*Grus grus*) species were reported flying over the wind farm site during Autumn migration in 2021, amounting to a total of 1,800 total observations of this species during that season, all of which could have been different individuals. This species was not observed during the spring, 2024 VP surveys conducted along the Project's OHTL route. Furthermore, a total of 2800 individuals, all observed during the autumn 2020 migration season, were observed during VP surveys conducted in for the Nukus 1 wind farm, adjacent the Nukus 2 wind farm to the west. The minimum estimated global population of this species is 491,000, thus requiring at least 4,910 individuals to be present within the Project's EAAA to trigger a CH determination under IFC CH criterion 3. The repeated observations of thousands of individuals migrating in large flocks through the Project area in successive autumn migration seasons suggests that the area is located within a concentrated autumn migration route for this species. Observations of up to 2,800 individuals in a single autumn migration season suggest that the CH threshold of 4,910 individuals was likely exceeded, when extrapolating to account for additional migratory flocks that may have passed through the area at times during the autumn migration when observers were not present on-site

conducting VP surveys. Therefore, although the exceedance of the threshold is not certain and relies on extrapolation, we precautionarily conclude that this species triggers a CH determination under IFC CH criterion #3.

Regarding the potential for the Project to impact this species due to collisions either with wind turbines or with the Project's OHTL segment, such impacts are assessed as moderate. Such impacts are almost entirely limited to the autumn migration period, and it is noted that while large flocks of cranes may fly over the wind farm area, the only portion of the Project area that contains potentially suitable migratory stopover habitat for this species is the 21.9 km southern portion of the Project's OHTL interconnection segment, which passes through irrigated crop agricultural fields lining the Amu Darya floodplain. Powerline collision risk for Common Crane will be minimized by the installation of Bird Flight Diverters (BFD) along the entire length of the Project's associated OHTL. Additional mitigation measures intended to achieve the "net positive gain" mitigation standard required under lender policies for CH triggering species will be developed in consultation with regional stakeholders and implementation partners and described in the Project's Biodiversity Action Plan (BAP).

Table 9-4 OHTL Bird Survey Results

Species	Common Name	IUCN	UzRDB	VP 1	VP 2	VP 3	VP4	VP5	VP6	Total
Priority 1 target species										
Aquila nipalensis	Steppe Eagle	EN	2 (VU:D)			1	1			2
Aquila heliaca	Eastern Imperial Eagle	VU	2 (VU:D)				1			1
Aquila chrysaetos	Golden Eagle	LC	2 (VU:R)	1		1				2
Priority 2 target species										
Pterocles orientalis	Black-bellied Sandgrouse	LC	-			3				3
Circus aeruginosus	Marsh-Harrier	LC	-				1	3	1	5
Circus cyaneus	Northern Hen Harrier	LC	-		1			1		2
Accipiter nisus	Eurasian Sparrowhawk	LC	-			2				2
Buteo rufinus	Long-legged Buzzard	LC	-	1	1				1	3
Otus brucei	Pallid Scops-owl	LC	-				1			1
Buteo buteo	Common Buzzard	LC	-	1						1
Bubo bubo	Northern Eagle Owl	LC	-	1						1
Athene noctua	Little Owl	LC	-		1				6	7
Falco tinnunculus	Common Kestrel	LC	-		2		1	1		4
Falco columbarius	Merling	LC	-				1			1
Other species										
Egretta alba	Great White Egret	LC	-						1	1
Phasianus colchicus	Common Pheasant	LC	-					2		2
Alectorius kakelik	Chukar Partridge	LC	-			5				5
Columba livia	Rock Dove	LC	-					43	22	65
Streptopelia decaocto	Eurasian Collared Dove	LC	-					15	2	17
Dendrocopus leucopterus	White-winged Woodpecker	LC	-					3		3

Species	Common Name	IUCN	UzRDB	VP 1	VP 2	VP 3	VP4	VP5	VP6	Total
Galerida cristata	Crested Lark	LC	-	8	4	3	4	2		21
Calandrella brachidactyla	Greater Short-toed Lark	LC	-				13			13
Oenanthe isabellina	Isabelline Wheatear	LC	-	2	1		1			4
Oenanthe pleschanka	Pied Wheatear	LC	-		1	2				3
Turdus atrogularis	Black-throated Thrush	LC	-					22		22
Turdus viscivorus	Mistle Thrush	LC	-					2		2
Parus bokharensis	Turkestan Tit	LC	-					6		6
Acridotheres tristis	Common Myna	LC	-				2	28	14	44
Sturnus vulgaris	European Starling	LC	-					250	11	261
Corvus frugilegus	Rook	LC	-					89		89
Corvus corone	Carrion Crow	LC	-					2	2	4
Corvus cornix	Hooded Crow	LC	-					10		10
Pica pica	Eurasian Magpie	LC	-					4	2	6
Bucanetos mongolicus	Mongolian Finch	LC	-			7				7

HOUBARA BUSTARD SURVEYS

Coverage and Timing/Dates – Houbara Surveys

Specialised Houbara surveys were carried out in the study area during the following seasons:

- 3 days in April 2021 at 10 points during peak breading season.
- 1 day in March 2024 at 5 points and covering transects within potentially suitable habitat.
- 2 days in April 2024 at 5 points and covering transects within potentially suitable habitat.

Survey Protocol and Effort – Houbara Surveys

To obtain the population density of Houbara Bustard, ten (10) VPs were surveyed during the peak breeding season within the site boundary of the WTGs and wider study area which includes a 2 km buffer zone. The VPs were surveyed for 30 minutes conducted once at each point during peak breading season and during peak display hours.

In addition, specialised Houbara Bustard surveys were conducted during the peak breeding display season in March and April taking advantage of the visual and acoustic observability of males' courtship displays, as Houbara are intensively secretive and shy and difficult to see at other times of the year. The survey covered the site boundary of the WTGs and north portion of the OHTL and wider study area which includes a 2 km buffer zone. The survey included 30-minute specialized Houbara Bustard survey point counts conducted twice at each of 5 points. Additionally, the survey included driven transects within potentially suitable habitat. The following figure provides the location of the 5 additional Houbara survey points and transect survey locations.

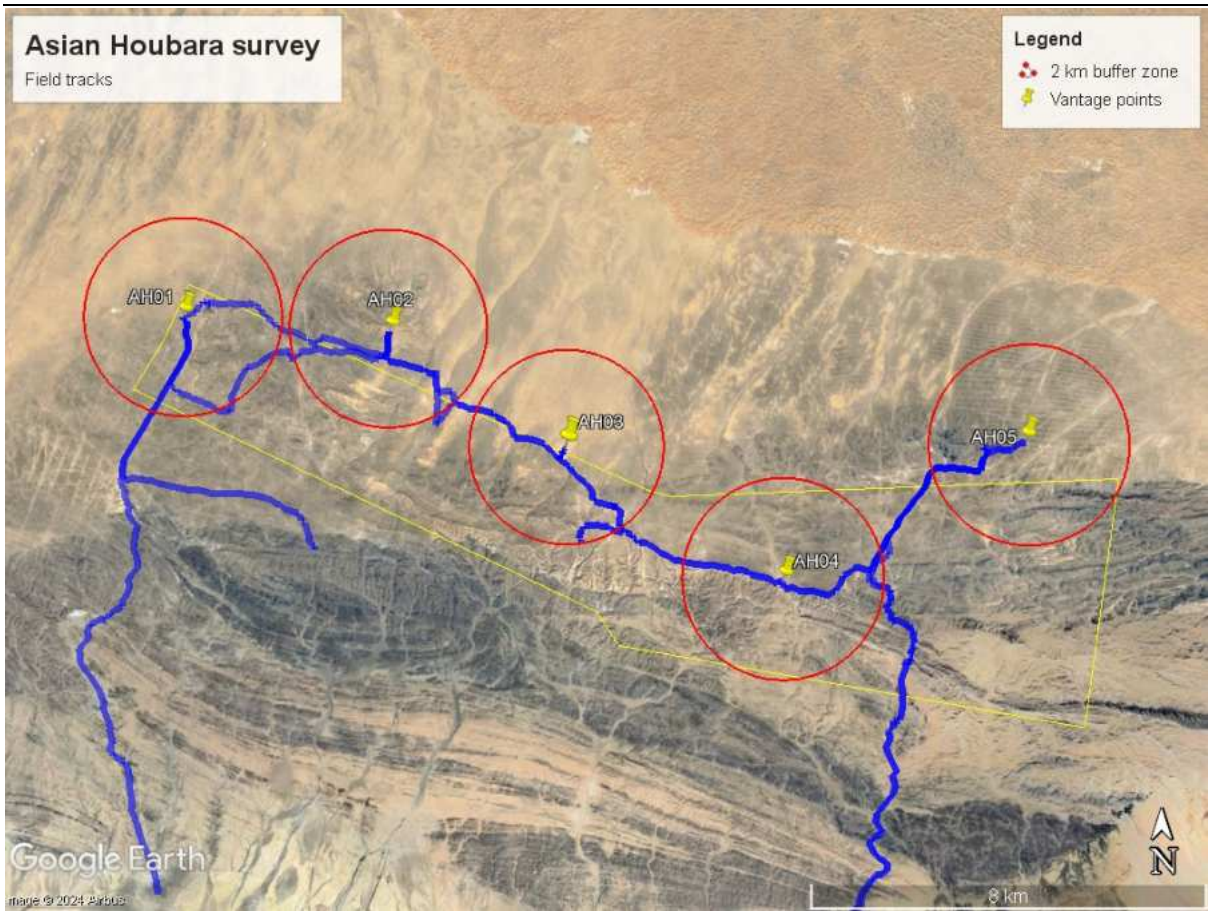


Figure 9-12 Houbara Bustard VP and Transect Survey Locations

Houbara Bustard Survey Results

No individuals of the Asian Houbara species were seen during any of the surveys at the Project site, nor were they observed incidentally during any of the other surveys performed at the Project site.

Given that the survey effort was conducted during its peak courtship season when displaying males are most conspicuous and readily observed, the Project baseline survey provides a reasonably strong indication that the site boundary of the WTGs and OHTL component of the Project does not have a high risk of impacting this protected species.

RAPTOR NEST SEARCHES

Specialised nest-searching surveys were undertaken, particularly in the known breeding seasons, with the aim to identify any raptor breeding behaviour taking place. The survey area was carefully inspected for suitable nesting habitats such as cliffs, rocky outcrops, trees, and man-made structures like powerline poles, which may be used as nest sites for many raptor species, including the Golden Eagle and other raptors known to occur in the region.

Coverage and Timing/Dates

Raptor nesting surveys were conducted during the following seasons:

- 37 days in April – August 2021 covering transects collectively covering wind turbine area plus 5 km buffer
- 6 days in March – April 2024 covering transects collectively covering wind turbine area and OHTL plus 5 km buffer

Survey Protocol and Effort

The raptor nesting survey was conducted in accordance with the raptor/vulture nesting (RVN) methodology, which was developed based on Good International Industry Practice. This methodology is oriented toward the objective of characterizing the potential for the Projects to adversely impact the nesting/breeding activity of target species. The RVN protocol does not focus on collecting a certain number of hours of survey data at a certain number of points. Instead, it is more flexible and strategic, focusing on the final objective of discovering and documenting the locations of all active nests of potentially sensitive species within a certain proximity to the wind farms.

The following figures depict the tracks taken during the nest searching survey.

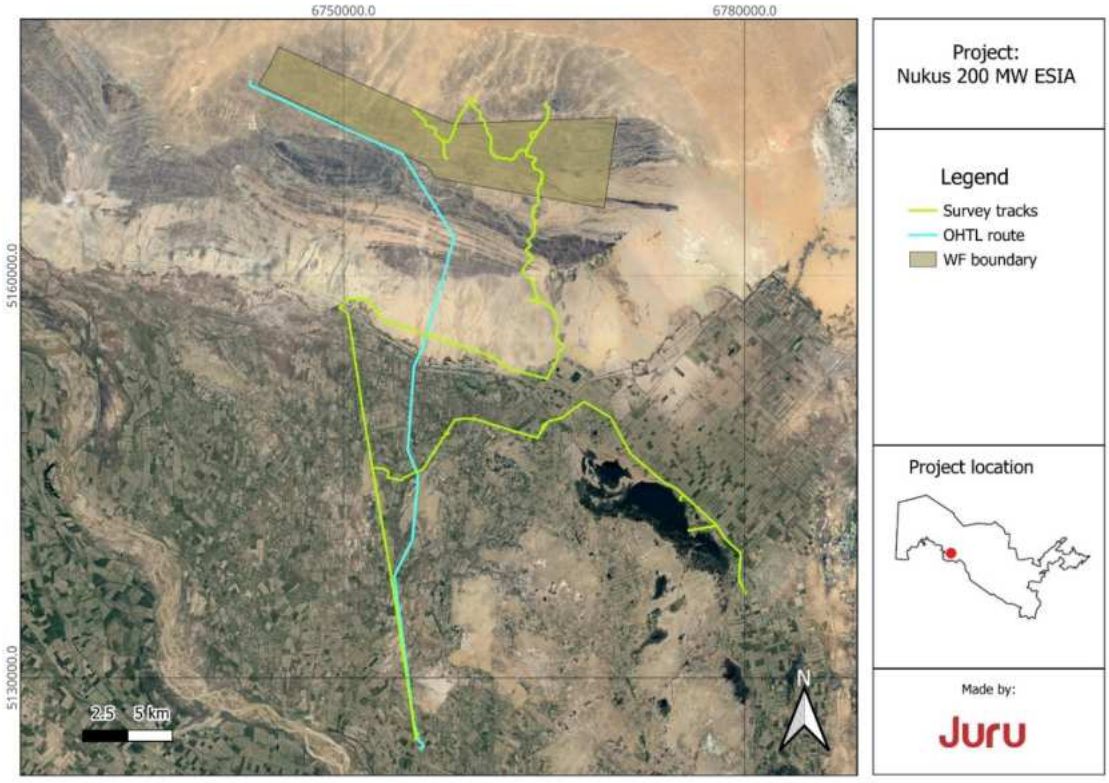


Figure 9-13 Raptor Nest Searching Survey Tracks

Nest Search Survey Results

No active raptor nests were discovered during the nest surveys in 2021. The only nest observed during this survey element was an unoccupied, inactive nest, believed to possibly be a

formerly used Golden Eagle nest. Neither were there any observations of behaviours indicative of possible breeding activity collected during the raptor nesting survey effort.

The following table provides the species recorded during the nest surveys in 2024.

Table 9-5 Species Observed During Nest Search Survey Results

Date	Time	Coordinates	Latin name	English name	Breeding Status	Notes
6/03/2024 10/04/2024	10:00 08:00	42.061714 60.638857	*Aquila chrysaetos*	Golden Eagle	Probably active	In March and April, male and female birds flew around the nesting area
6/03/2024 10/04/2024	09:00 11:00	42.058947 60.653087	*Falco cherrug*	Saker Falcon	Active	In March and April, male and female birds flew around the nesting area
6/03/2024 10/04/2024	14:00 16:00	41.765182 60.685634	*Athene noctua*	Little Owls	Active	In March and April, male and female birds flew around the nesting area

Refer to the detailed reports in Volume 4 for methodology, location coordinates, maps, and full datasets of results.

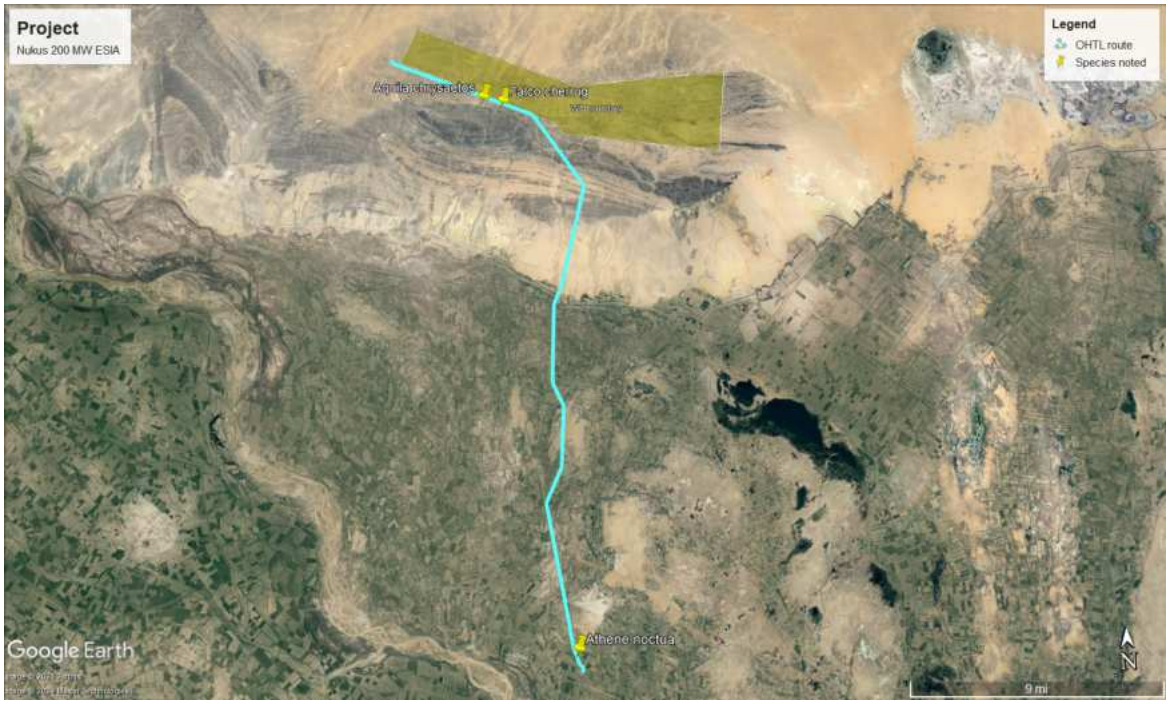


Figure 9-14 Location of Species Observed During Nest Search

9.2.3.2 Bats

A total of 37 detector nights of passive acoustic recordings were gathered at 4 locations distributed evenly across the wind farm site, between May and October 2021. Each of the four locations was sampled for at least two complete nights during each of the months of May, June, September, and October of year 2021 and subsequently during the months of July and August of the following year. This was supplemented by acoustic transect surveys (active surveys) along two transects of roughly 10 km in length, with each transect sampled two times in each of the 4 months in which surveys were conducted (16 total transect surveys spanning May-October). Additional 17 detector x nights of passive acoustic recordings were gathered between July and August 2022.

The recordings were gathered with ground-based Songmeter SM4 recorder from Wildlife Acoustics, and the ultrasound data were analyzed using a combination of automated algorithms (Kaleidoscope Pro software for European bat species) and manual expert review using BatSound 4 for non-European species.

Since the previous surveys did not fully align with the South African best practice guidelines for pre-construction bat monitoring at wind energy facilities, particularly as they did not cover the entire warm season, additional surveys were commissioned in April 2024 and are ongoing until the end of October 2024.

Since meteorological masts are not available on stie, two (2) Wildlife Acoustics Song Meter SM4 static bat detectors have been and are being deployed for every night from April to October 2024 to record bat activity through the bat active season. Data obtained has been and will be analysed using Kaleidoscope Pro Auto Analysis with "preloaded" parameters of ultrasonic calls from "European" bats found in Uzbekistan for the primary processing of audio recordings. Following this, the BatSound 4 program was used to measure the call parameters and check the identification of bat calls made by the Kaleidoscope Pro Auto Analysis program. Bat calls parameters known for European bat populations (Barataud, 2015) and bat species from neighbouring countries for Uzbekistan (Benda et al., 2012) were used.

The locations of the bat detectors and transects are shown in the following figure.

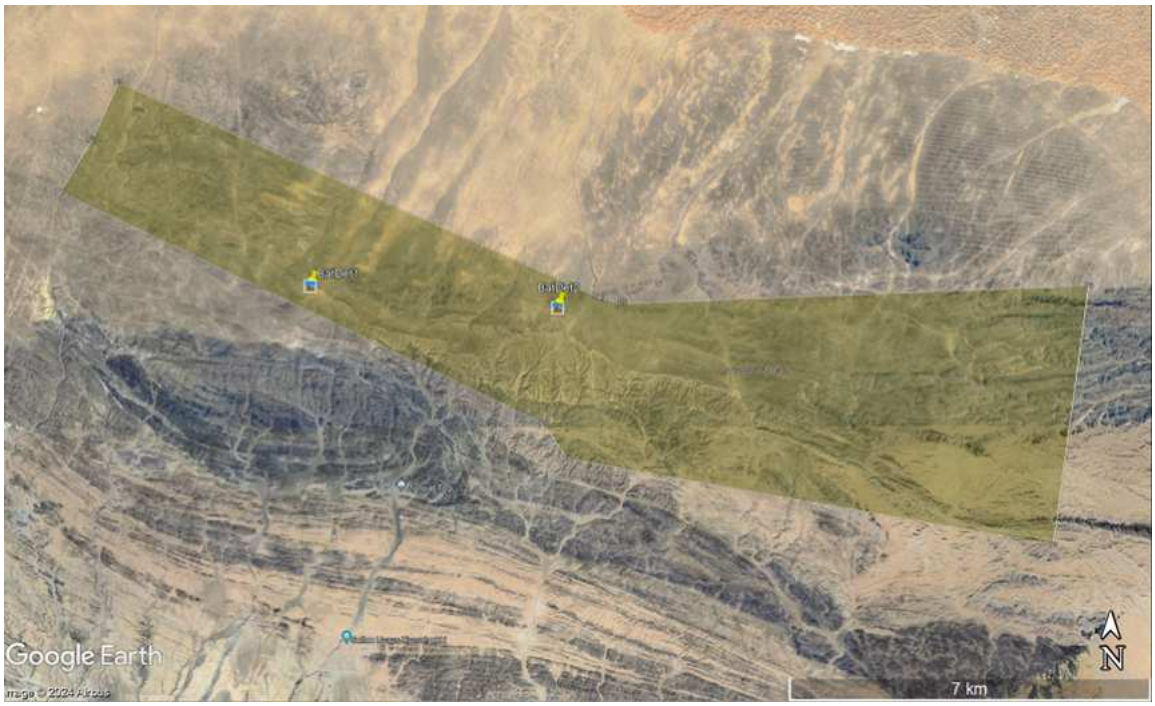


Figure 9-15 Locations of Bat Static Detectors (SD)

The following table provides a list of species identified during the bat surveys undertaken to date, alongside their respective level of conservation status and their collision risk (as per Rodrigues et al., 2015). The 2024 survey results include data collected from April to the end of October 2024 (the last full month of data collection).

The analysis report of the bat specialist is included to the ESIA Volume 4 appendices.

Calls of 2 species of bats have been recorded in the Project area during the 2021 and 2022 surveys: *Eptesicus* sp. and *Pipistrellus pipistrellus*. However, calls of 4 additional species of bats have been recorded during the 2024 surveys.

Six bat species were recorded across the study sites. *Eptesicus ognevi* and *Pipistrellus pipistrellus* were the most common, followed by *Eptesicus turcomanus* and *Vespertilio murinus* while *Pipistrellus kuhlii* and *Plecotus sp.* were recorded infrequently.

Table 9-6 Identified Bat Species in the Project Area

Species	IUCN Red List	Red Book of the Republic of Uzbekistan (2019)	Level of Collision Risk
2021 and 2022 surveys			
Eptesicus sp.51	-	Absent	Medium
Pipistrellus pipistrellus	LC	Absent	High
2024 surveys			
Eptesicus ognevi	LC	Absent	Medium
Eptesicus turcomanus (formerly Eptesicus serotinus)	-	Absent	Medium
Pipistrellus kuhlii	LC	Absent	Low
Pipistrellus pipistrellus	LC	Absent	High
Plecotus sp.	LC	Absent	Low
Vespertilio murinus	LC	Absent	Medium

Total observe bat calls per species per bat detector location is presented below.

Note: *Species abundance cannot be reliably inferred from call sequence numbers, as individual bats may produce multiple recordings in a single night.*

Table 9-7 Overall Bat Activity 2024

Species	Bat Detector 1	Bat Detector 2
Eptesicus ognevi	927	1881
Eptesicus turcomanus *(formerly Eptesicus serotinus)*	325	604
Pipistrellus kuhlii	2	2
Pipistrellus pipistrellus	2428	3531
Plecotus sp.	4	2
Vespertilio murinus	383	459

Monthly bat calls for 2024 observed bat species is presented below.

Table 9-8 Bat Activity 2024 Surveys

Species	April*	May	June	July	August	Sept'	October
Eptesicus ognevi	104	133	157	536	456	1332	90
Eptesicus turcomanus *(formerly Eptesicus serotinus)*	43	62	107	286	320	92	16
Pipistrellus kuhlii	0	0	0	0	2	1	1
Pipistrellus pipistrellus	153	299	8	413	1392	3496	195
Plecotus sp.	1	2	1	0	1	1	0
Vespertilio murinus	92	102	34	194	133	255	31

**monitoring commenced on 15th April 2024.*

Overall seasonal patterns suggest low activity during the breeding season during June and the first half of July. In June in particular, the activity is very low. This would be when the females are lactating and activity tends to be more local and closer to the maternity roosts. There is an increase in activity in August (although the data on activity is lower than it should be due to a malfunction with one of the detectors up to 21st August) with a peak of activity in September. Activity is low in October and almost negligible in November although November was only a partial month of monitoring.

All bat species identified are classified as LC by IUCN and are not included in the Uz RDB. The UZ RDB 2019 includes four bat species: *Rhinolophus hipposideros* (VU), *Tadarida teniotis* (VU), *Otonycteris hemprichi* (VU) and *Myotis bucharensis* (CR), none of which were identified. According to IUCN, the Turkestan Pipistrelle (DD) may be present, however, this species was also not identified during the survey effort.

The *Tadarida teniotis* was not detected at the project site during acoustic ultrasound monitoring conducted as part of the baseline studies. It is possible that this species went undetected, as the microphones were positioned near ground level, whereas this species typically flies at higher altitudes. Additionally, several other bat species are likely to occur within the project area, though they are considered to have low conservation sensitivity (e.g. Vespertilio, Hypsugo spp.). These species vary in their susceptibility to wind turbine collisions, ranging from low (e.g. Myotis, Rhinolophus spp.) to high (e.g. Tadarida, Vespertilio, Pipistrellus spp.).

9.3 Critical Habitat and Priority Biodiversity Feature Assessment

Refer to **Appendix E of Volume 4** for the full CHA.

Preliminary screening for any triggers of a CH or PBF determination was conducted following the most recent guidance for such issued by IFC[4] and EBRD[5].

The Project area does not have any highly unique or threatened ecosystem types or distinctive evolutionary processes that could result in a CH determination under IFC CH criteria 4 or 5 (roughly equivalent to EBRD CH criteria 1 and 5, respectively), hence the CH/PBF screening was then accordingly limited to species, and multi-species groupings of biological taxa.

[4] IFC, 2019. Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. June 27, 2019, World Bank Group, Washington, DC.

[5] EBRD, 2022. EBRD Performance Requirement 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources: Guidance Note. September, 2022.

A master list of potential CH/PBF trigger species was first compiled by reviewing the IBAT report, the IUCN red list of threatened species, the eBird database, and the national redlist for animals. From this master list, species falling into the following categories were considered to have negligible likelihood of being affected by the Project, and were eliminated:

- species that are extinct from the country/region;
- species that occur in the Project region only as extreme rarities (i.e. vagrants or accidentals);
- species with no geographic and/or ecological overlap with the Project area (including river-dwelling fish, as the Project does not cross, or come within 2km of any rivers).

Following typical practice, and the CH and PBF criteria articulated in IFC PS6 and EBRD PR6, redlisted species were only considered potential CH CR/EN species triggers (IFC CH criterion 1, EBRD CH criterion 2) or potential PBF "threatened species" triggers if they had status of VU or higher on the IUCN global redlist of threatened species, or they had national redlist status of CR or EN. This produced a list of species that were considered possible CH/PBF triggers, and subjected to additional screening against the IFC and EBRD CH/PBF criteria. For the final CHA, the list of potential CH/PBF trigger species was revised and updated, based on the results of baseline biodiversity surveys and additional research (Table 9-1). Then, a set of distinct Ecologically Appropriate Area of Analyses (EAAA) were developed for different potential CH/PBF trigger species, based on their ecology, movement patterns, and use of space, per IFC guidance. These EAAA are described in Table 9-7, and Table 9-6 includes a column indicating which EAAA were used for which taxa.

With the EAAA defined, all of the pertinent data from baseline surveys and desk-based materials was reviewed against the specific CH and PBF definitions and criteria in IFC PS6 and EBRD PR6, including the most recent Guidance Notes, to make final determinations of which species or other biodiversity features triggered a CH or PBF determination under IFC or EBRD biodiversity policies.

The results of this assessment are presented in the following table, and further detail/justification to support these conclusions is provided in the text sections that follow.

Table 9-9 Results of Critical Habitat and Priority Biodiversity Feature Assessment for the Nukus 2 Wind Farm Project. Red list categories for the IUCN and national redlists are abbreviated as follows: LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered, DD = Data Deficient.

Feature	Higher taxon	IUCN global status[6]	Uzbekistan status[7]	Applicable CH/PBF criterion			EAAA (see Table 9-7)	Total # observations in baseline studies	IUCN minimum global population estimate	Determination	Rationale
				Threatened/ Vulnerable Species	Range-restricted Species	Migratory/ Congregatory Species					
				CH criterion II, PBF criterion II	CH criterion III, PBF criterion II	CH criterion IV, PBF criterion II					
Lesser White-fronted Goose *(Anser erythropus)*	Bird	VU	VU	X		X	1		16,000	PBF	EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle. Project not likely to result in the species' uplisting to globally EN/CR
Red-breasted Goose *(Branta ruficollis)*	Bird	VU	VU	X		X	1		56,000	PBF	EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle. Project not likely to result in the species' uplisting to globally EN/CR
Common Pochard (*Aythya ferina*)	Bird	VU	Not listed	X		X	1		760,000	PBF	EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle. Project not likely to result in the species' uplisting to globally EN/CR
White-headed Duck (*Oxyura leucocephala*)	Bird	EN	EN	X		X	1		5,300	PBF	EAAA not likely to contain ≥ 0.5% of the global population and

6 https://www.iucnredlist.org/ accessed 23 June, 2024

7 Republic of Uzbekistan, 2019. Republic Uzbekistan Red Data Book

Feature	Higher taxon	IUCN global status[6]	Uzbekistan status[7]	Applicable CH/PBF criterion			EAAA (see Table 9-7)	Total # observations in baseline studies	IUCN minimum global population estimate	Determination	Rationale
				Threatened/ Vulnerable Species	Range-restricted Species	Migratory/ Congregatory Species					
				CH criterion II, PBF criterion II	CH criterion III, PBF criterion II	CH criterion IV, PBF criterion II					
											5 pairs, nor to contain a nationally important concentration of the species
European Turtle Dove (*Streptopelia turtur*)	Bird	VU	VU	X		X	2	6	12,800,000	PBF	Project not likely to result in species' up-listing to globally CR/EN, and EAAA not likely to contain at least 1% of the global population.
Yellow-eyed Pigeon (*Columba eversmanni)*	Bird	VU	VU	X		X	2		10,000	PBF	Project not likely to result in species' up-listing to globally CR/EN, and EAAA not likely to contain at least 1% of the global population.
Great Bustard (*Otis tarda*)	Bird	EN	CR	X		X	1		29,600	PBF	EAAA not likely to contain ≥ 0.5% of the global population and 5 pairs, nor to contain a nationally important concentration of the species
MacQueen's Bustard (*Chlamydotis macqueenii*)	Bird	VU	VU	X		X	2		33,000	PBF	EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle. Project not likely to result in the species' uplisting to globally EN/CR
Little Bustard (*Tetrax tetrax*)	Bird	NT	VU			X	1		260,000	PBF	EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle

Feature	Higher taxon	IUCN global status[6]	Uzbekistan status[7]	Applicable CH/PBF criterion			EAAA (see Table 9-7)	Total # observations in baseline studies	IUCN minimum global population estimate	Determination	Rationale
				Threatened/ Vulnerable Species	Range-restricted Species	Migratory/ Congregatory Species					
				CH criterion II, PBF criterion II	CH criterion III, PBF criterion II	CH criterion IV, PBF criterion II					
Common Crane (*Grus grus*)	Bird	LC	unlisted			X	1	1806 + 2850 observations at Nukus 1 WF	491,000	CH	EAAA may contain ≥ 1% of the global population at any point in species' life cycle (autumn migration)
Sociable Lapwing (*Vanellus gregarius*)	Bird	CR	VU	X		X	1		11,200	PBF	EAAA not likely to contain 0.5% of global population and ≥ 5 pairs, and is not likely to contain ≥ 1% of the global population at any point in species' life cycle
Dalmatian Pelican (*Pelecanus crispus*)	Bird	NT	EN	X		X	1		11,400	PBF	EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle, nor a nationally important concentration
Egyptian Vulture *(Neophron percnopterus)*	Bird	EN	VU	X		X	3		12,400	PBF	EAAA not likely to contain 0.5% of global population and ≥ 5 pairs, and is not likely to contain ≥ 1% of the global population at any point in species' life cycle
Cinereous Vulture *(Aegypius monachus)*	Bird	NT	NT			X	1		16,800	PBF	EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle
Eurasian Griffon *(Gyps fulvus)*	Bird	LC	VU			X	1		80,000	PBF	EAAA not likely to contain ≥ 1% of the global population at

Feature	Higher taxon	IUCN global status[6]	Uzbekistan status[7]	Applicable CH/PBF criterion			EAAA (see Table 9-7)	Total # observations in baseline studies	IUCN minimum global population estimate	Determination	Rationale
				Threatened/ Vulnerable Species	Range-restricted Species	Migratory/ Congregatory Species					
				CH criterion II, PBF criterion II	CH criterion III, PBF criterion II	CH criterion IV, PBF criterion II					
											any point in species' life cycle
Short-toed Snake-eagle *(Circaetus gallicus)*	Bird	LC	VU			X	1	1	50,000	PBF	EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle
Greater Spotted Eagle *(Clanga clanga)*	Bird	VU	VU	X		X	1		3,900	PBF	Project not likely to result in species' up-listing to globally CR/EN. EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle
Booted Eagle (*Hieraaetus pennatus*)	Bird	LC	VU			X	1		150,000	PBF	EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle
Steppe Eagle *(Aquila nipalensis)*	Bird	EN	VU	X		X	1	25	50,000	PBF	EAAA not likely to contain 0.5% of global population and ≥ 5 pairs, and is not likely to contain ≥ 1% of the global population at any point in species' life cycle
Imperial Eagle *(Aquila heliacal)*	Bird	VU	VU	X		X	1	1	2,500	PBF	Project not likely to result in species' up-listing to globally CR/EN, and EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle

Feature	Higher taxon	IUCN global status[6]	Uzbekistan status[7]	Applicable CH/PBF criterion			EAAA (see Table 9-7)	Total # observations in baseline studies	IUCN minimum global population estimate	Determination	Rationale
				Threatened/ Vulnerable Species	Range-restricted Species	Migratory/ Congregatory Species					
				CH criterion ii, PBF criterion ii	CH criterion iii, PBF criterion ii	CH criterion iv, PBF criterion ii					
Golden Eagle *(Aquila chrysaetos)*	Bird	LC	VU			X	3	20 + likely active nest	85,000	PBF	EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle
Pallas's Fish-Eagle (*Haliaeetus leucoryphus*)	Bird	EN	EN	X		X	1		1,000	PBF	EAAA not likely to support ≥ 0.5% of the global population and ≥ 5 pairs, nor to contain ≥ 1% of the global population at any point in species' life cycle, or a nationally important concentration
White-tailed Eagle (*Haliaeetus albicilla*)	Bird	LC	VU			X	1	2	20,000	PBF	EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle
Red-footed Falcon (*Falco vespertinus*)	Bird	VU	Not listed	X		X	1	2	287,500	PBF	Project not likely to result in species' up-listing to globally CR/EN, and EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle
Saker Falcon *(Falco cherrug)*	Bird	EN	NT	X		X	3	4 + active nest	12,200	PBF	EAAA not likely to support ≥ 0.5% of the global population and ≥ 5 pairs, nor to contain ≥ 1% of the global population at any point in species' life cycle.
Peregrine Falcon (*Falco peregrinus*)	Bird	LC	VU	X		X	1		100,000	PBF	EAAA not likely to contain ≥ 1% of the

Feature	Higher taxon	IUCN global status[6]	Uzbekistan status[7]	Applicable CH/PBF criterion			EAAA (see Table 9-7)	Total # observations in baseline studies	IUCN minimum global population estimate	Determination	Rationale
				Threatened/ Vulnerable Species	Range-restricted Species	Migratory/ Congregatory Species					
				CH criterion II, PBF criterion II	CH criterion III, PBF criterion II	CH criterion IV, PBF criterion II					
											global population at any point in species' life cycle.
Other migratory waterbird species	Bird	variable	variable			X	1	1 species observed, 2 observations	≥100,000 (per species)	PBF	No species for which EAAA likely to contain ≥ 1% of the global population at any point in species' life cycle.
Other upland bird species	Bird	variable	variable			X	1	72 species, many observations	≥100,000 (per species)	PBF	No species for which EAAA likely to contain ≥ 1% of the global population at any point in species' life cycle.
European Free-tailed Bat (*Tadarida teniotis*)	Bat	LC	VU			X	4		Unknown	PBF	EAAA not likely to contain ≥ 1% of the global population at any point in species' life cycle
Other bats	Bat	NT or lower	variable			X	3	2 spp, 1272 calls recorded	Population sizes for most species poorly known	PBF	No species for which EAAA likely to contain ≥ 1% of the global population at any point in species' life cycle.
Marbled Polecat *(Vormela peregusna)*	Mammal	VU	VU	X			2	2	unknown	PBF	Project not likely to result in species' up-listing to globally CR/EN
Bukhara Red Deer (*Cervus elaphus bactrianus*)	Mammal	LC	EN	X			5		800	CH	EAAA includes a nationally important population
Goitered Gazelle (*Gazella subgutturosa*)	Mammal	VU	VU	X		X	4	9	42,000	PBF	Project not likely to result in species' up-listing to globally CR/EN, and EAAA does not contain ≥ 1% of global population

Feature	Higher taxon	IUCN global status[6]	Uzbekistan status[7]	Applicable CH/PBF criterion			EAAA (see Table 9-7)	Total # observations in baseline studies	IUCN minimum global population estimate	Determination	Rationale
				Threatened/ Vulnerable Species	Range-restricted Species	Migratory/ Congregatory Species					
				CH criterion II, PBF criterion II	CH criterion III, PBF criterion II	CH criterion IV, PBF criterion II					
Salpingotus heptneri	Mammal	DD	VU		X		1		Unknown	PBF	EAAA not likely to contain ≥ 10% of global population[8]
Central Asian Tortoise *(Testudo horsfieldii)*	Turtle	VU	VU	X			2	40	unknown	PBF	Project not likely to result in species' up-listing to globally CR/EN
Uzbekistan Toadhead Agama *(Phrynocephalus rossikowi)*	Lizard	EN	EN	X	X		1		unknown	PBF	EAAA not likely to support ≥ 0.5% of the global population and ≥ 5 reproductive units
Szczerbak's Even-fingered Gecko *(Alsophylax szczerbaki)*	Lizard	VU	EN	X	X		1		unknown	PBF	Project not likely to result in species' up-listing to globally CR/EN and EAAA not likely to contain a nationally important concentration
Lepidium subcordatum	Plant	Threatened[9]	EN (cat 2)	X			1	6 localities, 37 individuals	Unknown	PBF	EAAA not likely to contain a nationally important population

[8] According to the Uzbekistan Red Data Book (2019), all known localities of this species are at least 75km north of the Project site.

[9] Lepidium subcordatum is not listed on the IUCN global redlist, but it is classified as "threatened" in the Kew Gardens Plants of the World database https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:978255-1/general-information#source-AERP accessed 22 June, 2024

Table 9-10 Description and justification of the different Ecologically Appropriate Areas of Analysis applied to the different potential CH and PBF triggers in the CH/PBF assessment

EAAA #	Applicable Species	Description	Rationale
1	Lesser White-fronted Goose, Red-breasted Goose, Common Pochard, White-headed Duck, Great Bustard, Little Bustard, Common Crane, Sociable Lapwing, Dalmatian Pelican, Cinereous Vulture, Eurasian Griffon, Short-toed Snake-Eagle, Greater Spotted Eagle, Booted Eagle, Steppe Eagle, Imperial Eagle, Pallas's Fish-Eagle, White-tailed Eagle, Red-footed Falcon, Peregrine Falcon, other migratory waterbird species, other upland bird species, Salpingotus heptneri, Uzbekistan Toadhead Agama, Szczerbak's Even-fingered Gecko, Lepidium subcordatum	Windfarm + OHTL buffered by 1km	Used for all long-distance migrant bird species expected to occur in the Project area only during migration (e.g. many water birds, bustards, raptors, vultures, and others), for which the EAAA is defined as a project-specific local area, rather than encompassing their entire migratory routes or year-round ranges, following typical practice for CHA. Among bird species that may inhabit the Project area for longer periods during breeding season, wintering season, or both, this EAAA is also used for species with relatively small-scale home ranges or limited dispersal (e.g. most songbirds and similar birds). This EAAA is used for terrestrial vertebrates with limited home range size, including lizards and small mammals. Finally, this EAAA is also used for sessile species, in this case a single species of herbaceous plant.
2	MacQueen's Bustard, European Turtle-Dove, Yellow-eyed Pigeon, Central Asian Tortoise, Marbled Polecat	Wind farm + OHTL buffered by 5 km	The 5 km buffer was selected for MacQueen's Bustard and two pigeon/dove species on the basis of their general patterns of dispersal and movements while on their breeding grounds in Uzbekistan. This EAAA was also used for Central Asian Tortoise and Marbled Polecat, as the upland habitat association and 5km buffer are also suited to these species' ecology and dispersiveness
3	Golden Eagle, Saker Falcon, other bats	Wind farm + OHTL buffered by 10 km	This EAAA reflects the home range size of raptor species that are expected to breed and/or overwinter in the vicinity of the Project area. It is also used for bat species other than Tadarida teniotis, reflecting the smaller scale of local dispersal and foraging movements of the other bat species that potentially occur in the area.

EAAA #	Applicable Species	Description	Rationale
4	European Free-tailed Bat, Caracal, Goitered Gazelle	Wind Farm + OHTL buffered by 50 km	This EAAA reflects the highly dispersive nature of Free-tailed Bats in the genus Tadarida, who may regularly travel on the order of 50km from their colonies to feed, as well as the large scale of movements expected for larger, wide-ranging terrestrial mammal species (Caracal, Goitered Gazelle).
5	Bukhara Red Deer	Tsugai forest protected within the Lower Amu Darya State Biosphere Reserve, plus known spring foraging area in adjacent desert mountain slopes	In the Project region, Bukhara Red Deer are highly associated with, and for most of the year remain almost entirely confined within, the Tsugai riparian forests of the Lower Amu Darya State Biosphere Reserve. However, they are also known to emerge from the riparian area to forage on green spring herbaceous growth in the adjacent desert piedmont area that lies directly to the south of the wind farm area. This EAAA is equivalent to the combination of the green polygon in Figure 9-2 plus the white polygon in Figure 9-9.

The following figures showcase the EAAA based on the justification and reasoning behind the selection of the associated EAAA.

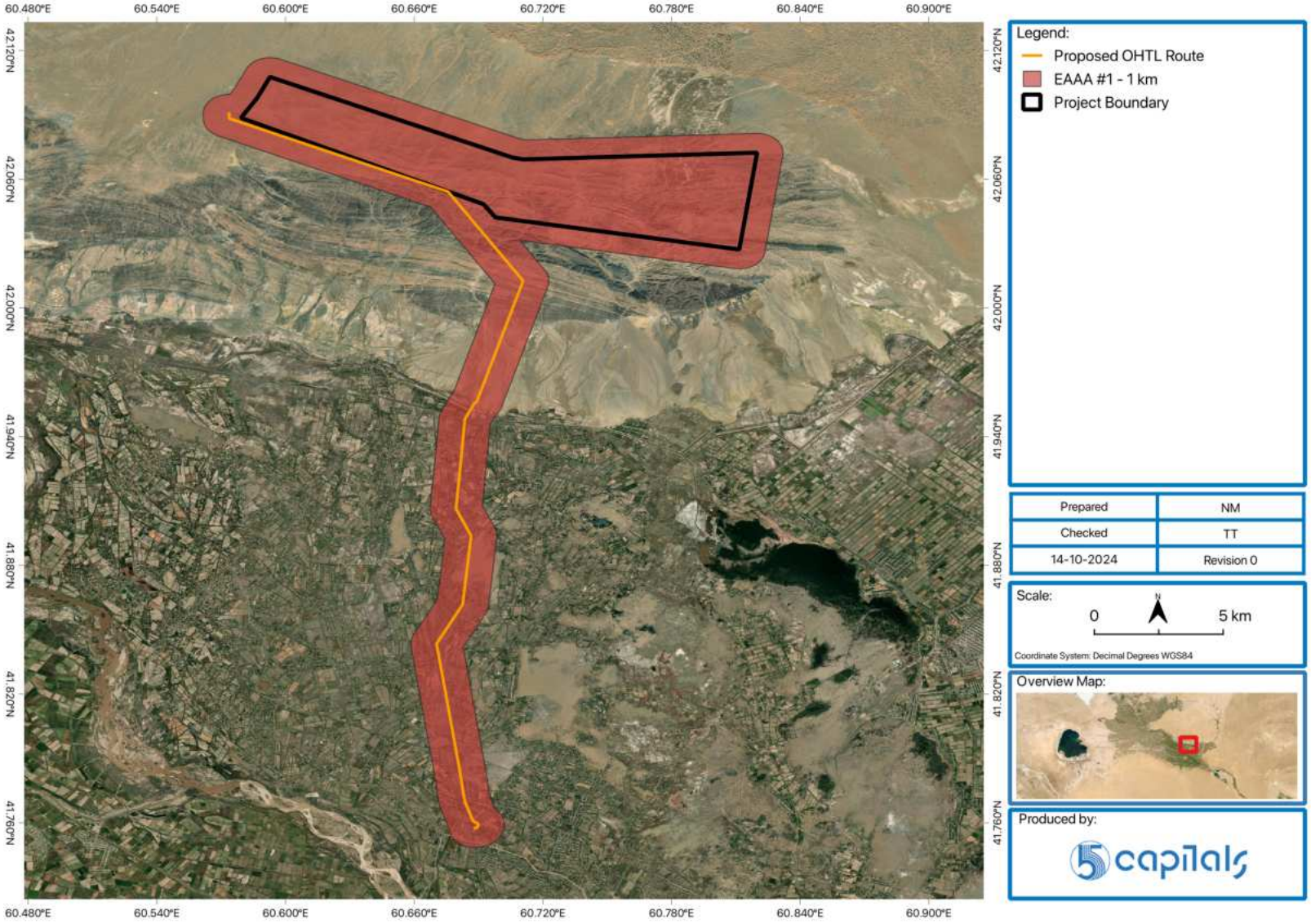


Figure 9-16 EAAA - Windfarm + OHTL buffered by 1km

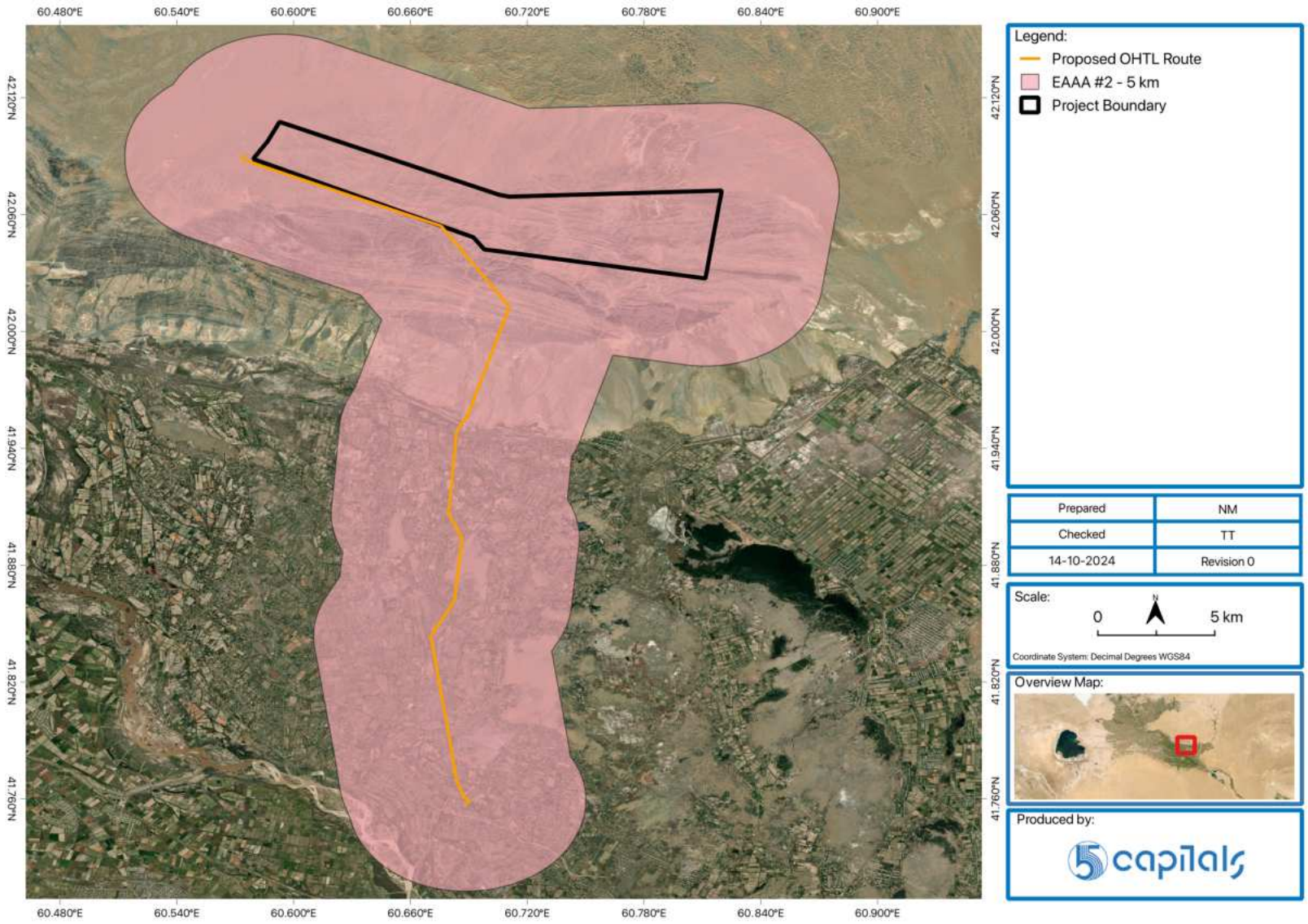


Figure 9-17 EAAA - Wind farm + OHTL buffered by 5 km

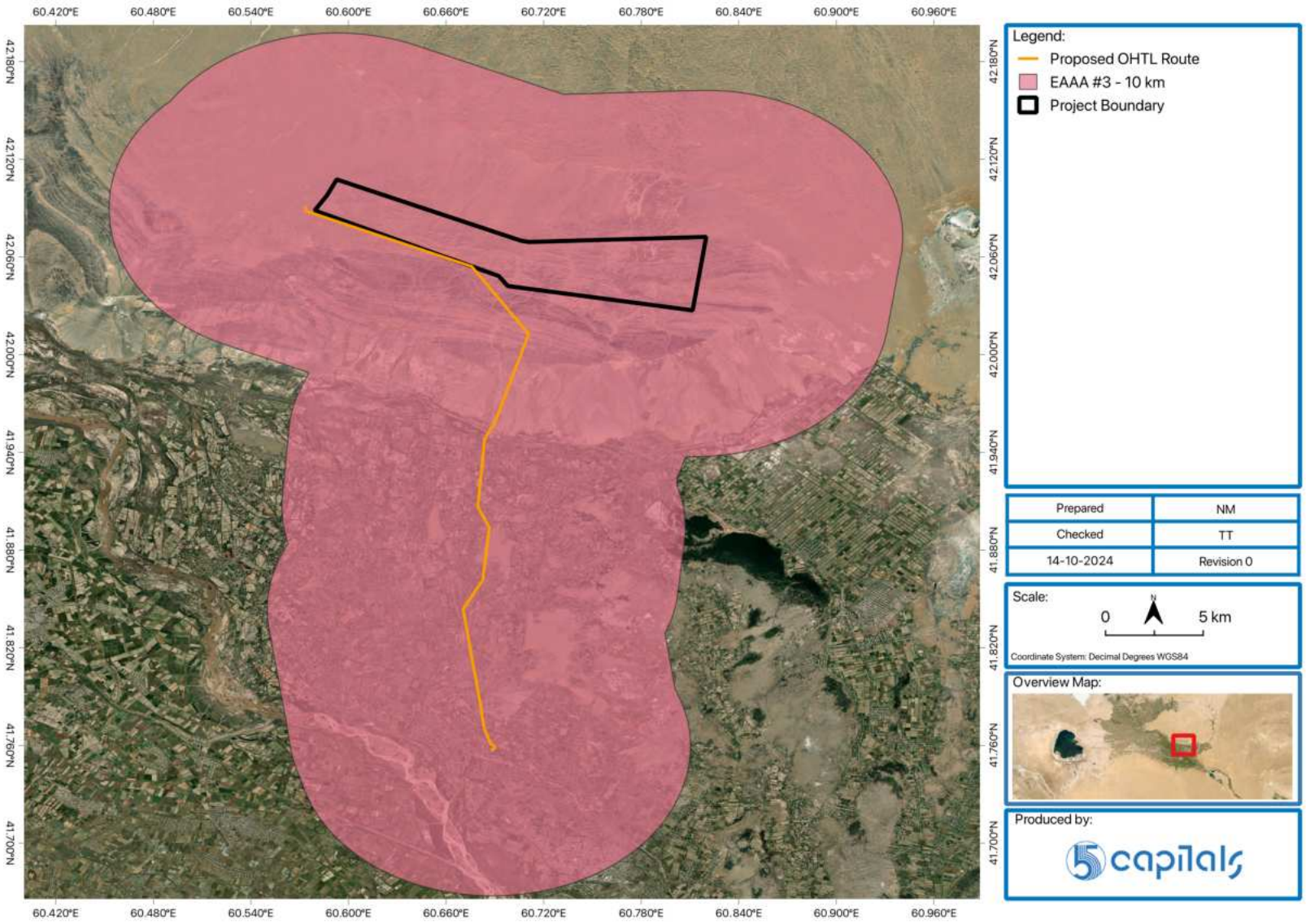


Figure 9-18 EAAA - Wind farm + OHTL buffered by 10 km

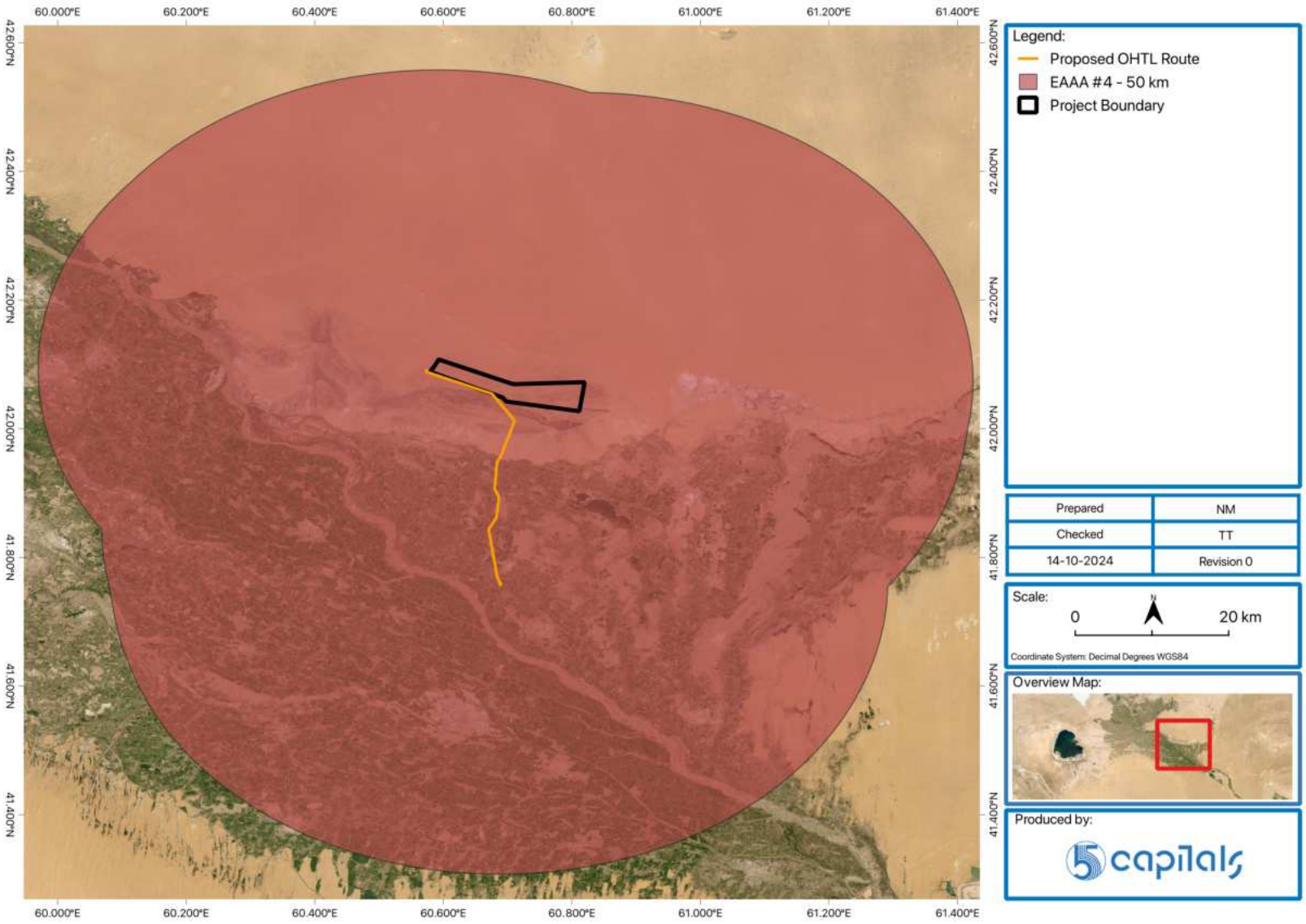


Figure 9-19 EAAA - Wind Farm + OHTL buffered by 50 km

9.4 Area of Influence and Receptors

The area of influence is the area within which Project activities may impact receptors. As different aspects carry differing spatial extents, the AoI varies considerably. The paragraphs below provide the AoI that was considered for each type of predicted potential impact.

9.4.1 Area of Influence

The area of influence for 'Habitat Loss' impacts is inclusive of the full Project construction and operation footprint, including access road and OHTL, laydown areas etc.

The area of influence for 'Direct Mortality' impacts is inclusive of the full Project construction and operation footprint, including access road and OHTL, laydown areas, as well as the airspace of the wind farm and OHTL corridor.

The area of influence for 'Habitat Degradation' impacts extends beyond the footprint of the Project inclusive of a 1 km buffer, to account for the phenomenon of edge effect.

The area of influence for 'Habitat Fragmentation' and 'Disturbance' impacts extends beyond the footprint of the Project inclusive of a 5 km buffer, to account for the phenomenon of barrier effect.

The area of influence for 'Displacement' impacts extends beyond the footprint of the Project inclusive of up to a 100 km buffer, to account for the secondary impacts of displaced wildlife into adjacent territories.

The area of influence for 'Introduced Species / Proliferation of Species' impacts extends beyond the footprint of the project inclusive of a 100 km buffer, to account for (1) potential major invasive spread and (2) secondary impacts caused by displacement of less competitive fauna into adjacent areas.

9.4.2 Receptors

The sensitivity rating for biodiversity receptors has been assigned as per the relative value of the receptor, a function of its global and regional status and sensitivity to possible adverse impacts and change. Certain surveys are still ongoing, namely bat surveys and therefore this table will be finalised in an ESIA addendum, however, significant changes are not anticipated.

Table 9-11 Potential Ecological Sensitive Receptors

Receptor Group	Receptor(s) (Feature or Species)	Justification	Value of Receptor (AKA Sensitivity)
Habitats	"Transformed" (disturbed/developed)	Anthropogenically influenced developed and disturbed land, including the following: • arable lands with agricultural crops • fallow lands • woodland belts, boundary-strips, roadsides, canals and drainage • settlements.	Low
	Gentle hilly slopes of relic low mountains	The main plants found in this area are sagebrush, saltworts, desert sedge, and bulbous bluegrass. This habitat type is found in the wind farm area along the Sultan Uvays mountain range crest and its northern slope. Planned locations for wind turbines, as well as infrastructure like the OTHL, BESS, and wind farm substations, fall within this habitat type. The canopy cover is 20–30%.	Medium
	Steep dry stony slopes of relic low mountains	This terrain has sparse vegetation, inlcuding the following plant species: Ephedra, Atraphaxis compacta, Artemisia turanica, Anabasis, Haloxylon ammodendron, Salsola, Halothamnus subaphyllus, Halimocnemis, Poa bulbosa, and various annuals. This habitat type is found on the upper part of the northern slope of the Sultan Uvays range, covering about 7 km. The northern part of the planned OTHL falls into this habitat. The canopy cover is 10–20%.	Medium
	Stony desert with skeleton or loamy-skeleton	This terrain has sparse vegetation. Dominant plants include black saxaul, sagebrush, and saltwort species like Artemisia diffusa, Artemisia turanica, Caroxylon gemmascens, Caroxylon orientale, Caroxylon incanescens, Halimocnemis, and Climacoptera. This area is significantly disturbed by human activities such as roads, gravel extraction, railways, power lines, grazing, and pollution. This habitat is found in the southern piedmonts of the Sultan Uvays range, about 6.6 km wide, with dry stream beds. The northern part of the planned OTHL falls into this habitat type.	Medium

Receptor Group		Receptor(s) (Feature or Species)	Justification	Value of Receptor (AKA Sensitivity)
			The canopy cover is 10–20%.	
		Sandy desert	This area is located between settlements, agricultural lands, railway, and roads, 12 km north of the Beruni substation. The vegetation includes sparse communities of Xylosalsola arbuscula, Artemisia santolina, Astragalus villosissimus, Convolvulus hamadae, Convolvulus divaricatus, desert sedge (Carex physodes), and annual saltworts (Agriophyllum, Caroxylon scleranthum, Salsola paulsenii). Low salty areas between sand hillshave Russian box thorn (Lycium ruthenicum), tamarisk (Tamarix laxa), and camel thorn (Alhagi pseudalhagi). The canopy cover is 10–30%.	Medium
Flora	**Nationally Important**	*Lepidium subcordatum*	National endemic, endemic to relic mountains of Kyzylkum and plateau Ustyurt, listed in the Red Data Book of Uzbekistan (2019) with the Category 2 (rare)	Medium
	Other Flora	All other species	Common species	Low
Threatened Mammals		Goitered Gazelle	VU, IUCN	High
		Marbled Polecat	VU, IUCN	High
Nationally Important Mammals		Brandt's hedgehog	Nationally listed on RDB	Medium
		Corsac Fox	Nationally listed on RDB	Medium
		Bukhara Red Deer	Nationally listed on RDB	High
Other Mammals		Long-eared hedgehog	Common species	Low
		Lesser white-toothed shrew	Common species	Low

Receptor Group	Receptor(s) (Feature or Species)	Justification	Value of Receptor (AKA Sensitivity)
	Pie-bald shrew	Common species	Low
	Common pipistrelle	Common species	Low
	Tolai Hare	Common species	Low
	Yellow Ground Squirrel	Common species	Low
	Small Five-toed Jerboa	Common species	Low
	Severtzov's Jerboa	Common species	Low
	Northern Three-toed Jerboa	Common species	Low
	Grey Hamster	Common species	Low
	Zaisan Mole Vole	Common species	Low
	Bukharan Vole	Common species	Low
	Tamarisk Jird	Common species	Low
	Libyan Jird	Common species	Low
	Midday Jird	Common species	Low
	Great Gerbil	Common species	Low
	House Mouse	Common species	Low
	Golden Jackal	Common species	Low
	Red Fox	Common species	Low

Receptor Group		Receptor(s) (Feature or Species)	Justification	Value of Receptor (AKA Sensitivity)
		African Wildcat	Common species	Low
Endangered Reptiles		Uzbekistan Toadhead Agama	EN, IUCN	Very High
Threatened Reptiles		Central Asian tortoise	VU, IUCN	High
		Szczerbak's Even-fingered Gecko	VU, IUCN	High
Other Reptiles/Amphibians		Rapid race runner *Eremias velox*	Common species	Low
		Steppe agama *Trapelus sanguinolentus*	Common species	Low
		Spotted desert racer *Platyceps karelini*	Common species	Low
Endangered Birds	**Raptors**	Steppe Eagle	EN, IUCN	Very High
		Pallas's Fish-Eagle	EN, IUCN	Very High
		Saker Falcon	EN, IUCN	Very High
	Waterbirds	White-headed Duck	EN, IUCN	Very High
	Groundbirds	Sociable Lapwing	CR, IUCN	Very High
		Great Bustard	EN, IUCN	Very High
	Songbirds/ Allies	Egyptian Vulture	EN, IUCN	Very High
Threatened Birds	**Raptors**	Imperial Eagle	VU, IUCN	High
		Greater Spotted Eagle	VU, IUCN	High
	Waterbirds	Lesser White-fronted Goose	VU, IUCN	High

Receptor Group		Receptor(s) (Feature or Species)	Justification	Value of Receptor (AKA Sensitivity)
		Red-breasted Goose	VU, IUCN	High
		Common Pochard	VU, IUCN	High
		European Turtle Dove	VU, IUCN	High
		Yellow-eyed Pigeon	VU, IUCN	High
		Dalmatian Pelican	NT, IUCN	High
	Groundbirds	MacQueen's Bustard	VU, IUCN	High
		Little Bustard	NT, IUCN	High
	Songbirds/ Allies	Cinereous Vulture	NT, IUCN	High
		Red-footed Falcon	VU, IUCN	High
Nationally Important Birds	**Raptors**	Short-toed Snake-eagle	Nationally listed on RDB	Medium
		Booted Eagle	Nationally listed on RDB	Medium
		Golden Eagle	Nationally listed on RDB	Medium
		White-tailed Eagle	Nationally listed on RDB	Medium
		Peregrine Falcon	Nationally listed on RDB	Medium
	Songbirds/ Allies	Eurasian Griffon	Nationally listed on RDB	Medium
Other Birds	**Waterbirds**	Common Crane	Common Species	Low
Bats	**Confirmed via roost and/or acoustic monitoring surveys**	*Eptesicus ognevi* *Eptesicus turcomanus (formerly Eptesicus serotinus)* *Pipistrellus kuhlii* *Pipistrellus pipistrellus* *Plecotus sp.* *Vespertilio murinus*	Common Species	Low

Receptor Group		Receptor(s) (Feature or Species)	Justification	Value of Receptor (AKA Sensitivity)
	Possible but not identified	*Tadarida teniotis*	Common Species	Low

9.5 Potential Impacts, Mitigation, Management & Residual Impacts

9.5.1 Construction Phase

9.5.1.1 Ecosystem Function

HABITAT LOSS

Clearing, grading, excavation and other earthworks during early construction stages results in direct habitat loss over the construction footprint of the project, including temporary structures, lay-down areas, and access road.

Habitat loss is a high intensity impact which affects both vegetation and wildlife species that currently use the affected areas as well as overarching ecosystem function on a wider regional scale. Vegetation cannot re-establish in impermeable paving or compacted soils, and wildlife dependent upon natural features and resources cannot utilise the converted land which restricts available habitat regionally. Ecosystem function will be degraded as a result.

The habitat loss will mainly impact the 'gentle hilly slopes of relic low mountains' and 'steep dry stony slopes of relic low mountains' habitats as this is where the access road, WTGs, temporary facilities and substations will be. The habitat along the OHTL will not be as impacted due to the limited land take required.

Table 9-12 Extent of Habitat Loss

HABITAT	HABITAT LOSS BASED ON 50 M BUFFER FOR ALL WF COMPONENTS (WORST CASE SCENARIO)	HABITAT LOSS BASED ON 30 M FOR WTGS AND SUBSTATION, AND 5 M FOR BOP AND ACCESS ROADS (REALISTIC SCENARIO)
Gentle hilly slopes of relic low mountains	2.85 km^2	1.11 km^2
Steep dry stony slopes of relic low mountains	1.03 km^2	0.32 km^2
Stony desert with skeleton or loamy-skeleton	0.22 km^2	0.1 km^2
Sandy desert	0.11 km^2	0.05 km^2

Habitat loss within the footprint of the structures will be permanent or at least until the project is eventually decommissioned. Habitat loss is certain to occur; the extent of which is presented in the following table. The Magnitude of loss of each type of habitat has been based on the overall amount of loss, as calculated in the previous table.

Table 9-13 Unmitigated Significance of Habitat Loss

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Gentle hilly slopes of relic low mountains	Medium	Moderate	**Moderate**
Steep dry stony slopes of relic low mountains	Medium	Minor	**Minor**
Stony desert with skeleton or loamy-skeleton	Medium	Minor	**Minor**
Sandy desert	Medium	Minor	**Minor**

However, maintaining strict requirements to minimise the construction buffer as much as practicable will reduce the magnitude of habitat loss impact. Further, habitat loss in areas disturbed during construction but falling outside of the physical footprint of the infrastructure is reversible.

No project materials will be sourced from quarries or borrow pits in or near Amu Darya river. The footprint of the 26 WTGs is insignificant compared with the overall Project area and surrounding habitat and will not result in habitat fragmentation or loss of wildlife corridors. There will be post-construction restoration of affected construction buffer areas to enhance existing quality of natural habitat conditions. This will improve the overall quality of natural habitat with restoration via seeding, re-planting, and landscaping with native species in naturally occurring assemblages and communities. The Habitat Restoration Plan will outline the methods and requirements for post-construction restoration of the buffer areas and after mitigation the habitat impacts will be negligible.

The Habitat Restoration Plan will outline the methods and requirements for post-construction restoration.

Table 9-14 Residual Significance of Habitat Loss

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Gentle hilly slopes of relic low mountains	Medium	Minor	**Minor**
Steep dry stony slopes of relic low mountains	Medium	Negligible	**Negligible**
Stony desert with skeleton or loamy-skeleton	Medium	Negligible	**Negligible**
Sandy desert	Medium	Negligible	**Negligible**

9.5.1.2 Biodiversity Loss

EARTHWORKS CLEARING / EXCAVATION

Clearing of existing vegetation will result in direct loss and mortality of removed specimens. Further, burrowing wildlife such as rodents and reptiles may be directly crushed during earthworks or may suffer stress-induced mortality. This impact covers the full spatial extent of the construction footprint and is irreversible and permanent. For vegetation it is certain to occur while for burrowing fauna it is probable to occur. Thus, the magnitude of impact is considered as Moderate for impacted species. The magnitude and unmitigated significance calculations are presented in the following table.

Table 9-15 Unmitigated Significance of Vegetation Removal

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Nationally Important Flora (*Lepidium subcordatum)*	High	Moderate	**Moderate**
Other Flora	Low	Moderate	**Minor**

Table 9-16 Unmitigated Significance of Earthworks Mortality

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Negligible	**Minor**
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Negligible	**Minor**
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Moderate	**Minor**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Moderate	**Major**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Moderate	**Moderate**
Other Reptiles	Low	Moderate	**Minor**

The following mitigation measures will be implemented:

- Avoid known locations of *Lepidium subcordatum* on site as much as possible with micro siting of turbines and other soil-disturbing activities.
- Conduct preconstruction *Lepidium subcordatum* surveys of all of the areas in which soil will be disturbed for construction of the Project, both temporary and permanent, and implement a rescue/relocation program for this species. A pre-construction Survey is required to take place during the active season for *Lepidium subcordatum* in order

to identify all specimens within the full construction footprint. These specimens shall either be retained in-situ or translocated. The specimens identified in the baseline survey (on the crest of Sultan Uvays range within the wind farm area and along the planned OTHL on the southern slope of Sultan Uvays) will be retained in-situ and clearly demarcated. In addition, training will be provided to contractors on the conservation importance of this species.

- A Reptile Relocation Plan is required for the Uzbekistan Toadhead Agama, Central Asian Tortoise, and Szczerbak's Even-fingered Gecko. The Plan will outline the methodology and results of the identification of release sites, erection of fencing to exclude relocated tortoises in the construction footprint, designation and erection of livestock exclusion fencing gecko release sites, monitoring and reporting requirements as well as assigned roles and responsibilities. Full-time Ecologist as part of EPC contractor team to be on site throughout all construction works from the time of LNTP, inclusive of all early site preparation works, and throughout the entirety of the construction period. The Project clearance timeline will allow for relocation of all stated reptiles in their active seasons, prior to any clearance needing to take place.
- The reintroduction of reptiles back onto the windfarm site will be undertaken post construction in accordance with technical advice from the local office representative of the Institute of Zoology.
- Restricting OHTL construction activities to outside of the spring season (April-May) within areas where Bukhara Red Deer may occur on the desert piedmont slopes along the northern portion of the Project's OHTL route.
- For other species, chance-find procedures with individual relocations as deemed necessary is sufficient. Chance Find Procedure will be included within the CESMP to provide general guidance on potential ecological triggers for work stoppage.
- The Biodiversity Action Plan (BAP) provides the strategy designed to achieve No Net Gain (NG) for the Bukhara Red Deer.

These measures reduce the spatial extent, intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-17 Residual Significance of Vegetation Removal

RECEPTOR	SENSITIVITY	REDUCED MAGNITUDE	RESIDUAL SIGNIFICANCE
Nationally Important Flora (*Lepidium subcordatum)*	High	Minor	**Minor**
Other Flora	Low	Minor	**Negligible**

Table 9-18 Residual Significance of Earthworks Mortality

RECEPTOR	SENSITIVITY	REDUCED MAGNITUDE	RESIDUAL SIGNIFICANCE
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Negligible	**Minor**

Receptor	Sensitivity	Reduced Magnitude	Residual Significance
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Negligible	**Minor**
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Minor	**Negligible**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Minor	**Moderate**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Minor	**Minor**
Other Reptiles	Low	Minor	**Negligible**

Vehicular Collision

Wildlife can be runover or collide with, motorised vehicles and equipment.

Vehicle-related death from construction trucks and machinery are less of a concern for larger mammals such as gazelle and fox which are more likely to disperse in time to avoid collision (as the site vehicles will be traveling under speed restrictions and large equipment movement such as cranes and turbine parts will be very slow).

Small to medium sized wildlife such as to hare, hedgehog and rodents, tortoise, lizards, snakes and amphibians have a higher chance of mortality from construction vehicular and machinery collisions. This could also apply to raptors and other opportunistic birds which may scavenge from roadkill.

This impact is direct, a low intensity of change, with a spatial extent covering the construction footprint; it is irreversible with a long-term duration. It is considered as possible to occur. Thus, the magnitude of impact is considered as Minor to Moderate, depending on the species. The magnitude and unmitigated significance calculations are presented in the following table.

Table 9-19 Unmitigated Significance of Vehicular Collision

Receptor	Sensitivity	Impact Magnitude	Unmitigated Significance
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Minor	**Moderate**
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Minor	**Minor**

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Moderate	**Minor**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Moderate	**Major**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Moderate	**Moderate**
Other Reptiles	Low	Moderate	**Minor**
Endangered Raptors (Steppe Eagle, Pallas's Fish-Eagle, Saker Falcon)	Very High	Moderate	**Major**
Endangered Groundbirds (Sociable Lapwing, Great Bustard)	Very High	Moderate	**Major**
Threatened Raptors (Imperial Eagle, Greater Spotted Eagle)	High	Moderate	**Moderate**
Threatened Groundbirds (MacQueen's Bustard, Little Bustard)	High	Moderate	**Moderate**
Nationally Important Birds	High	Moderate	**Moderate**
Other Birds	Low	Moderate	**Minor**

However, the following mitigation measures will be implemented to reduce the risk from these potential impacts:

- Strict speed controls which will be enforced by EPC HSE and Security teams;
- Ban against driving outside of delineated access roads and restricting driving and machinery operation to daylight hours;
- Protocol for removal of any road-kill carcasses immediately upon observation to at least 10 m away from the access roads.

These measures shall be captured in the CESMP and shall be implemented and monitored.

These measures reduce the intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-20 Residual Significance of Vehicular Collision

Receptor	Sensitivity	Impact Magnitude	Unmitigated Significance
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Negligible	**Minor**
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Negligible	**Minor**
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Minor	**Negligible**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Minor	**Moderate**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Minor	**Minor**
Other Reptiles	Low	Minor	**Negligible**
Endangered Raptors (Steppe Eagle, Pallas's Fish-Eagle, Saker Falcon)	Very High	Minor	**Moderate**
Endangered Groundbirds (Sociable Lapwing, Great Bustard)	Very High	Minor	**Moderate**
Threatened Raptors (Imperial Eagle, Greater Spotted Eagle)	High	Minor	**Minor**
Threatened Groundbirds (MacQueen's Bustard, Little Bustard)	High	Minor	**Minor**
Nationally Important Birds	High	Minor	**Minor**
Other Birds	Low	Minor	**Negligible**

"Take" Poaching, Hunting and Gathering

The presence of site workers can lead to increased hunting, poaching, or gathering on site. Flora and vegetative matter might be gathered for consumption or for fuel; eggs taken from breeding bird nests; poaching of hare, ground birds or tortoise for consumption or for domestic trade; and persecution of raptors, snakes, and carnivores could potentially take place.

This direct impact has low intensity, with a spatial extent of the full construction footprint, is long-term and irreversible, with a possible likelihood. Thus, the magnitude of impact is considered as Minor to Moderate, depending on the species.

Table 9-21 Unmitigated Significance of "Take"

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Nationally Important Flora (*Lepidium subcordatum)*	High	Moderate	**Moderate**
Other Flora	Low	Moderate	**Minor**
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Minor	**Moderate**
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Minor	**Moderate**
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Moderate	**Minor**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Moderate	**Major**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Moderate	**Moderate**
Other Reptiles	Low	Moderate	**Minor**
Endangered Raptors (Steppe Eagle, Pallas's Fish-Eagle, Saker Falcon)	Very High	Minor	**Moderate**
Endangered Groundbirds (Sociable Lapwing, Great Bustard)	Very High	Moderate	**Major**
Threatened Raptors (Imperial Eagle, Greater Spotted Eagle)	High	Minor	**Moderate**
Threatened Groundbirds (MacQueen's Bustard, Little Bustard)	High	Moderate	**Moderate**
Nationally Important Birds	High	Minor	**Minor**
Other Birds	Low	Minor	**Minor**

However, the following mitigation measures will be implemented to reduce the risk of these potential impacts occurring:

- Strict controls forbidding the gathering, poaching or otherwise disturbance of any flora or fauna on site, included in induction training. Collection or poaching of flora or fauna will result in immediate dismissal.
- Staff training such as toolbox talks on the importance of ecosystem integrity, especially focused on species of importance.
- It should be noted that any illegal hunting is punishable by the regulator SCEEP via the issuance of fines.

These measures shall be captured in the CESMP and shall be implemented and monitored.

These measures reduce the likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-22 Residual Significance of "Take"

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Nationally Important Flora (*Lepidium subcordatum)*	High	Negligible	**Minor**
Other Flora	Low	Negligible	**Negligible**
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Negligible	**Minor**
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Negligible	**Minor**
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Negligible	**Negligible**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Negligible	**Minor**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Negligible	**Minor**
Other Reptiles	Low	Negligible	**Negligible**
Endangered Raptors (Steppe Eagle, Pallas's Fish-Eagle, Saker Falcon)	Very High	Negligible	**Minor**
Endangered Groundbirds (Sociable Lapwing, Great Bustard)	Very High	Negligible	**Minor**
Threatened Raptors (Imperial Eagle, Greater Spotted Eagle)	High	Negligible	**Minor**
Threatened Groundbirds (MacQueen's Bustard, Little Bustard)	High	Negligible	**Minor**
Nationally Important Birds	High	Negligible	**Minor**
Other Birds	Low	Negligible	**Negligible**

LITTERING

Improper management of solid waste such as plastic containers and plastic bags, may result in wind-blown litter, which are a danger to wildlife due to entanglement or ingestion.

This direct impact has low intensity, with a spatial extent that could extend to regional, is reversible and short-term, with a possible likelihood. Thus, the magnitude of impact is considered as Minor.

Table 9-23 Unmitigated Significance of Littering

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Minor	**Moderate**
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Minor	**Minor**
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Minor	**Minor**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Minor	**Moderate**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Minor	**Moderate**
Other Reptiles	Low	Minor	**Minor**
Endangered Raptors (Steppe Eagle, Pallas's Fish-Eagle, Saker Falcon)	Very High	Minor	**Moderate**
Endangered Groundbirds (Sociable Lapwing, Great Bustard)	Very High	Minor	**Moderate**
Threatened Raptors (Imperial Eagle, Greater Spotted Eagle)	High	Minor	**Moderate**
Threatened Groundbirds (MacQueen's Bustard, Little Bustard)	High	Minor	**Moderate**
Nationally Important Birds	High	Minor	**Minor**
Other Birds	Low	Minor	**Minor**

However, the following mitigation measures will be implemented to reduce the risk of these potential impacts:

- Preparation of a Waste Management Plan as one of the supplementary plans to the CESMP;
- Strict waste management supervision and controls under the HSE Team;
- Zero tolerance for littering on site;
- Daily inspections and clean-up of litter by EPC/sub-contractor(s) responsible

These measures shall be captured in the CESMP.

These measures reduce the intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-24 Residual Significance of Littering

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Negligible	**Minor**
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Negligible	**Minor**
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Negligible	**Negligible**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Negligible	**Minor**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Negligible	**Minor**
Other Reptiles	Low	Negligible	**Negligible**
Endangered Raptors (Steppe Eagle, Pallas's Fish-Eagle, Saker Falcon)	Very High	Negligible	**Minor**
Endangered Groundbirds (Sociable Lapwing, Great Bustard)	Very High	Negligible	**Minor**
Threatened Raptors (Imperial Eagle, Greater Spotted Eagle)	High	Negligible	**Minor**
Threatened Groundbirds (MacQueen's Bustard, Little Bustard)	High	Negligible	**Minor**
Nationally Important Birds	High	Negligible	**Minor**
Other Birds	Low	Negligible	**Negligible**

DISTURBANCE

The presence of anthropogenic activity is disturbing to many sensitive species, which can result in reduced survivorship, reproductive success, and ultimately, population decline.

Wildlife which is not already habituated to anthropogenic disturbance is anticipated to be negatively affected.

Disturbance especially impacts the reproductive success of breeding birds, which may abandon breeding attempts, or desert nests or colonies if disturbance levels are unacceptable.

This direct impact has low intensity, with a spatial extent of the full construction footprint and a 1 km buffer, is short-term and reversible, with a possible likelihood.

Thus, the magnitude of impact is considered as Minor. The magnitude and unmitigated significance calculations are presented in the following table.

Table 9-25 Unmitigated Significance of Disturbance

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Minor	**Moderate**
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Minor	**Minor**
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Minor	**Minor**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Minor	**Moderate**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Minor	**Moderate**
Other Reptiles	Low	Minor	**Minor**
Endangered Raptors (Steppe Eagle, Pallas's Fish-Eagle, Saker Falcon)	Very High	Minor	**Moderate**
Endangered Groundbirds (Sociable Lapwing, Great Bustard)	Very High	Minor	**Moderate**
Threatened Raptors (Imperial Eagle, Greater Spotted Eagle)	High	Minor	**Moderate**

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Threatened Groundbirds (MacQueen's Bustard, Little Bustard)	High	Minor	**Moderate**
Nationally Important Birds	High	Minor	**Minor**
Other Birds	Low	Minor	**Minor**

However, the following mitigation measures will be implemented to minimise the magnitude of these potential impacts:

- Minimise construction footprint and temporary laydown areas.

These measures shall be captured in the CESMP.

These measures reduce the duration, spatial extent, intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-26 Residual Significance of Disturbance

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Negligible	**Minor**
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Negligible	**Minor**
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Negligible	**Minor**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Negligible	**Minor**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Negligible	**Minor**
Other Reptiles	Low	Negligible	**Negligible**
Endangered Raptors (Steppe Eagle, Pallas's Fish-Eagle, Saker Falcon)	Very High	Negligible	**Minor**
Endangered Groundbirds (Sociable Lapwing, Great Bustard)	Very High	Negligible	**Minor**
Threatened Raptors (Imperial Eagle, Greater Spotted Eagle)	High	Negligible	**Minor**

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Threatened Groundbirds (MacQueen's Bustard, Little Bustard)	High	Negligible	**Minor**
Nationally Important Birds	High	Negligible	**Minor**
Other Birds	Low	Negligible	**Negligible**

9.5.1.3 Biodiversity Displacement

DISPERSAL

Shyer species may be displaced away from the Project area as a result of construction disturbance, having indirect secondary impacts on adjacent territories via increased competition for resources compromising population stability, causing ecosystem imbalances.

This indirect impact has major intensity, with a regional spatial extent, is long-term but reversible, with a probable likelihood. Thus, the magnitude of impact is considered as Moderate.

Table 9-27 Unmitigated Significance of Displacement

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Moderate	**Moderate**
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Moderate	**Moderate**
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Moderate	**Minor**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Moderate	**Major**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Moderate	**Moderate**

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Other Reptiles	Low	Moderate	**Minor**
Houbara Bustard, Turtle-dove	High	Moderate	**Moderate**
Other birds	Low	Moderate	**Minor**

However, the following mitigation measures will be implemented to minimise the magnitude of these potential impacts:

- Minimise, where possible, construction footprint and temporary laydown areas.

These measures shall be captured in the CESMP.

Rehabilitation post-construction to restore as much habitat as possible.

These measures reduce the duration, spatial extent, intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-28 Residual Significance of Displacement

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Negligible	**Minor**
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Negligible	**Minor**
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Negligible	**Negligible**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Negligible	**Minor**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Negligible	**Minor**
Other Reptiles	Low	Negligible	**Negligible**
Houbara Bustard, Turtle-dove	High	Negligible	**Minor**
Other birds	Low	Negligible	**Negligible**

PROLIFERATION OF GENERALIST SPECIES

The dispersal of shyer species away from disturbed areas can lead to an increase in generalist species such as Red Fox which are well adapted to anthropogenic habitats.

Further, poor management of solid waste can result in the proliferation of pest species, such as feral dog, cat, rats, and other urban-adapted species. This can cause further competition and displacement of native fauna.

This direct impact has low intensity, with a spatial extent of the full construction footprint, is long-term and reversible, with a possible likelihood. Thus, the magnitude of impact is considered as Moderate.

Table 9-29 Unmitigated Significance of Proliferation

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Goitered Gazelle (competition with domestic/feral grazers)	High	Moderate	**Moderate**
Corsac Fox, Bukhara Red Deer (competition with domestic/feral grazers, feral dogs/cats and Red Fox)	High	Moderate	**Moderate**
Wild Cat (competition with feral cats)	Low	Moderate	**Minor**
Gerbils and Jerboas (competition with feral rodents)	Low	Moderate	**Minor**

However, the following mitigation measures will be implemented to minimize the magnitude of these potential impacts:

- Development of a solid waste management strategy.
- Preparation of a Waste Management Plan as one of the supplementary plans to the CESMP.
- Strict waste management supervision and controls under the HSE Team.
- Zero tolerance for littering on site.
- Daily inspections and clean-up of litter by EPC/sub-contractor(s) responsible.
- No provision of food waste for feral cats and dogs.

These measures shall be captured in the CESMP and shall be implemented and monitored.

These measures reduce the intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-30 Residual Significance of Proliferation

Receptor	Sensitivity	Reduced Magnitude	Residual Significance
Goitered Gazelle (competition with domestic/feral grazers)	High	Minor	**Minor**
Corsac Fox, Bukhara Red Deer (competition with domestic/feral grazers, feral dogs/cats and Red Fox)	High	Minor	**Minor**
Wild Cat (competition with feral cats)	Low	Minor	**Negligible**
Gerbils and Jerboas (competition with feral rodents)	Low	Minor	**Negligible**

9.5.1.4 Biosecurity

Introduction of Invasive Pathogens

Soil imports, intentional or via previously used excavation and earthworks equipment, may contain pathogens that can spread and infect native vegetation and fauna that do not have natural defence mechanisms.

Exotic seeds in soil imports can allow the spread of invasive, weedy species which outcompete native species. Secondary impacts may occur on wildlife which utilise the reduced native vegetation for foraging or shelter.

This direct impact has low intensity, with a regional spatial extent, is long-term and irreversible, with a possible likelihood. Thus, the magnitude of impact is considered as Moderate.

Table 9-31 Unmitigated Significance of Introduced Species

Receptor	Sensitivity	Impact Magnitude	Unmitigated Significance
Nationally Important Flora (*Lepidium subcordatum)*	High	Moderate	**Moderate**
Other Flora	Low	Moderate	**Minor**

However, the following mitigation measures will be implemented to minimise the magnitude of these potential impacts:

- Soil imports will be taken from local quarry or borrow pit as close to the site as reasonably practical to avoid risk of foreign seeds and invasive species.
- Soil imports from outside of the area will undergo checks to prevent accidental introduction of exotic species / pathogens.

- Plant and machinery will require an HSE certificate of inspection, issued by the EPC, before coming onto site and this will include necessary cleaning / washing to reduce risks of importing invasive species in mud taken from urban sites. The EPC Contractor has confirmed that vehicle washing will only take place in dedicated cleaning facilities, which are available in nearby towns.

These measures shall be captured in the CESMP and shall be implemented and monitored.

These measures reduce the likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-32 Residual Significance of Introduced Species

RECEPTOR	SENSITIVITY	REDUCED MAGNITUDE	RESIDUAL SIGNIFICANCE
Nationally Important Flora *(Lepidium subcordatum)*	High	Minor	**Minor**
Other Flora	Low	Minor	**Negligible**

9.5.1.5 Environmental Quality

AIR

Dust can coat vegetation, reducing photosynthesis and respiration ability, causing desiccation. Emissions of pollutants such as NOx, SOx, PM and CO can lower survivorship and increase susceptibility of affected wildlife to disease. Similarly, blasting activities (if required) generate ground vibrations, which can cause structural damage to habitats, disturb wildlife, and produce additional dust, further exacerbating the impacts on flora and fauna. Vibration from blasting could also cause stress to wildlife, especially to more sensitive species like mammals, birds, and reptiles.

Dust emissions impact has low intensity, with a spatial extent of the full construction footprint, is temporary and reversible, with a possible likelihood. Thus, the magnitude of impact is considered as Minor.

Table 9-33 Unmitigated Significance of Fugitive Dust

Receptor	Sensitivity	Impact Magnitude	Unmitigated Significance
Nationally Important Flora (*Lepidium subcordatum*)	High	Minor	**Moderate**
Other Flora	Low	Minor	**Negligible**

Table 9-34 Unmitigated Significance of Air Pollution

Receptor	Sensitivity	Impact Magnitude	Unmitigated Significance
Threatened Mammals	High	Minor	**Moderate**
Nationally Important Mammals	High	Minor	**Moderate**
Other Mammals	Low	Minor	**Negligible**
Endangered Reptiles	Very High	Minor	**Moderate**
Threatened Reptiles	High	Minor	**Moderate**
Other Reptiles	Low	Minor	**Negligible**
Endangered Birds	Very High	Minor	**Moderate**
Threatened Birds	High	Minor	**Minor**
Nationally Important Birds	High	Minor	**Moderate**
Other Birds	Low	Minor	**Negligible**

However, the following mitigation measures will be implemented to minimise the magnitude of these potential impacts:

- Refer to air quality control measures.
- All tracks will be damped down to reduce risk of dust and this will be checked daily.
- Implement specific blast timing and buffer zones to minimize disturbance to sensitive species and structures.
- Conduct pre-blast wildlife surveys and consider adjusting blasting schedules to avoid critical wildlife periods.
- A Blasting Management Plan will be prepared by the EPC that will have a section prepared by an ecologist regarding provisions for sensitive locations, seasons and vulnerable and endangered species. This will include buffer zones of 200m for priority plants, 500m from priority mammals, and a minimum of 500m from priority birds (750m from bustard nesting sites, and 1km from bustard lekking sites).
- Where lizard & small mammal burrows are encountered on the project site the contractor will make efforts to ensure that they vacate their burrows prior to blasting and excavation works.

These measures shall be captured in the CESMP and shall be implemented and monitored.

These measures reduce the spatial extent, intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-35 Residual Significance of Fugitive Dust

RECEPTOR	SENSITIVITY	REDUCED MAGNITUDE	RESIDUAL SIGNIFICANCE
Nationally Important Flora *(Lepidium subcordatum)*	High	Negligible	**Negligible**
Other Flora	Low	Negligible	**Negligible**

Table 9-36 Residual Significance of Air Pollution

RECEPTOR	SENSITIVITY	REDUCED MAGNITUDE	RESIDUAL SIGNIFICANCE
Threatened Mammals	High	Negligible	**Minor**
Nationally Important Mammals	High	Negligible	**Negligible**
Other Mammals	Low	Negligible	**Negligible**
Endangered Reptiles	Very High	Negligible	**Minor**
Threatened Reptiles	High	Negligible	**Minor**
Other Reptiles	Low	Negligible	**Negligible**
Endangered Birds	Very High	Negligible	**Minor**
Threatened Birds	High	Negligible	**Minor**
Nationally Important Birds	High	Negligible	**Negligible**
Other Birds	Low	Negligible	**Negligible**

NOISE AND VIBRATION

Construction noise can cause acoustic masking, disturbance and displacement, and general reduction in survivorship and reproductive success in a variety of fauna. Most impacted are acoustic communicators such as bird and bat species.

Vibration can cause disturbance but also result in collapse of underground burrows and tunnels, particularly impacting burrowing mammals and reptiles as well as invertebrates.

This direct impact has moderate-high intensity, with a regional spatial extent, is temporary and reversible, with a certain likelihood. Thus, the magnitude of impact is considered as Minor.

Table 9-37 Unmitigated Significance of Noise Impacts

RECEPTOR	SENSITIVITY	REDUCED MAGNITUDE	RESIDUAL SIGNIFICANCE
Threatened Mammals	High	Minor	**Moderate**
Nationally Important Mammals	High	Minor	**Minor**
Other Mammals	Low	Minor	**Negligible**
Endangered Reptiles	Very High	Minor	**Moderate**
Threatened Reptiles	High	Minor	**Moderate**
Other Reptiles	Low	Minor	**Negligible**
Endangered Birds	Very High	Minor	**Moderate**
Threatened Birds	High	Minor	**Moderate**
Nationally Important Birds	High	Minor	**Minor**
Other Birds	Low	Minor	**Negligible**

However, the following mitigation measures will be implemented to minimise the magnitude of these potential impacts:

- Refer to noise control measures.
- Restrict construction activities to daytime hours wherever feasible, particularly to minimise disturbance to nocturnal species. In addition, pre-construction ecological surveys will be undertaken by an ecologist to identify any breeding species of conservation concern (IUCN Vulnerable or above) within the project site. If species of conservation concern or active nests are identified, appropriate exclusion zones will be established to minimize human and noise disturbance. These will be a minimum 500m from priority mammals, and a minimum of 500m from priority birds (750m from bustard nesting sites, and 1km from bustard lekking sites).
- Use of acoustic barriers, dampening, best available technology within construction methodology to reduce noise and vibration as much as possible. Intermittent noise is less desirable than continuous noise as it does not allow for habituation.

These measures shall be captured in the CESMP and shall be implemented and monitored.

These measures reduce the spatial extent, intensity, duration and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-38 Residual Significance of Noise Impacts

RECEPTOR	SENSITIVITY	REDUCED MAGNITUDE	RESIDUAL SIGNIFICANCE
Threatened Mammals	High	Negligible	**Minor**
Nationally Important Mammals	High	Negligible	**Minor**

Receptor	Sensitivity	Reduced Magnitude	Residual Significance
Other Mammals	Low	Negligible	**Negligible**
Endangered Reptiles	Very High	Negligible	**Minor**
Threatened Reptiles	High	Negligible	**Minor**
Other Reptiles	Low	Negligible	**Negligible**
Endangered Birds	Very High	Negligible	**Minor**
Threatened Birds	High	Negligible	**Minor**
Nationally Important Birds	High	Negligible	**Minor**
Other Birds	Low	Negligible	**Negligible**

Light Pollution

Night-time lighting can impact nocturnal wildlife behaviour. It can act as an attractant, which can cause congregation and higher predation rates / change movement and migration behaviour; act as a repellent which causes displacement; or interfere with the circadian cycle and cause lower survivorship and reproductive success. However, lighting will be required only at specific areas (i.e. TSF and accommodation areas) and not across the wider area or along access roads, thereby limiting lighting to relatively isolated areas. This direct impact has moderate intensity, with a spatial extent of the full construction footprint, is long-term and reversible, with a probable likelihood. Thus, the magnitude of impact is considered as Minor.

Table 9-39 Unmitigated Significance of Light Pollution

Receptor	Sensitivity	Reduced Magnitude	Residual Significance
Threatened Mammals	High	Minor	**Moderate**
Nationally Important Mammals	High	Minor	**Minor**
Other Mammals	Low	Minor	**Negligible**
Endangered Reptiles	Very High	Minor	**Moderate**
Threatened Reptiles	High	Minor	**Moderate**
Other Reptiles	Low	Minor	**Negligible**
Endangered Birds	Very High	Minor	**Moderate**

RECEPTOR	SENSITIVITY	REDUCED MAGNITUDE	RESIDUAL SIGNIFICANCE
Threatened Birds	High	Minor	**Moderate**
Nationally Important Birds	High	Minor	**Minor**
Other Birds	Low	Minor	**Negligible**

However, the following mitigation measures will be in place, to minimise the magnitude of potential impact:

- Ensure lighting is fit for purpose and duration of lighting to be controlled and minimized as much as possible.
- Lights will be shielded to prevent skyglow, spill and glare.
- Lighting will be designed to minimize environmental impact by utilizing low UV intensity fixtures, installed with timers in non-continuous work areas, and directed downward to reduce light pollution and minimize disturbance to local wildlife.

These measures shall be captured in the CESMP and shall be implemented and monitored.

These measures reduce the spatial extent, intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-40 Residual Significance of Light Pollution

RECEPTOR	SENSITIVITY	REDUCED MAGNITUDE	RESIDUAL SIGNIFICANCE
Threatened Mammals	High	Negligible	**Minor**
Nationally Important Mammals	High	Negligible	**Minor**
Other Mammals	Low	Negligible	**Negligible**
Endangered Reptiles	Very High	Negligible	**Minor**
Threatened Reptiles	High	Negligible	**Minor**
Other Reptiles	Low	Negligible	**Negligible**
Endangered Birds	Very High	Negligible	**Minor**
Threatened Birds	High	Negligible	**Minor**
Nationally Important Birds	High	Negligible	**Minor**
Other Birds	Low	Negligible	**Negligible**

CONTAMINATION

Fuels and solvents will be used during construction activities and maintenance. Improper use, storage and handling can result in chemical spills and contamination of the soil and

groundwater. Flora and fauna that come into contact may become ill or die. This direct impact has high intensity, with a spatial extent of the full construction footprint, is long-term and irreversible, although unlikely. Thus, the magnitude of unmitigated impact is considered as Minor.

Table 9-41 Unmitigated Significance of Contamination

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Threatened Mammals	High	Minor	**Minor**
Nationally Important Mammals	High	Minor	**Minor**
Other Mammals	Low	Minor	**Negligible**
Endangered Reptiles	Very High	Minor	**Moderate**
Threatened Reptiles	High	Minor	**Minor**
Other Reptiles	Low	Minor	**Negligible**
Endangered Birds	Very High	Minor	**Moderate**
Threatened Birds	High	Minor	**Minor**
Nationally Important Birds	High	Minor	**Minor**
Other Birds	Low	Minor	**Negligible**

However, the following mitigation measures will be in place, to minimise the magnitude of potential impact:

- Refer to hazardous materials control measures, emergency action plan and spill prevention and clean up measures.

These measures shall be captured in the CESMP and shall be implemented and monitored.

These measures reduce the likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-42 Residual Significance of Contamination

RECEPTOR	SENSITIVITY	REDUCED MAGNITUDE	RESIDUAL SIGNIFICANCE
Threatened Mammals	High	Negligible	**Minor**
Nationally Important Mammals	High	Negligible	**Negligible**
Other Mammals	Low	Negligible	**Negligible**
Endangered Reptiles	Very High	Negligible	**Minor**

RECEPTOR	SENSITIVITY	REDUCED MAGNITUDE	RESIDUAL SIGNIFICANCE
Threatened Reptiles	High	Negligible	**Minor**
Other Reptiles	Low	Negligible	**Negligible**
Endangered Birds	Very High	Negligible	**Minor**
Threatened Birds	High	Negligible	**Minor**
Nationally Important Birds	High	Negligible	**Negligible**
Other Birds	Low	Negligible	**Negligible**

SOILS

During construction earthworks and vehicle movement, soils may become compacted, which prohibits vegetation regrowth and use for burrowing. Further, removal of vegetation may cause an increase in wind-driven soil erosion, leading to loss of native soils.

This direct impact has low intensity, with a spatial extent of the full construction footprint, is long-term and reversible, with a possible likelihood. Thus, the magnitude of impact is considered as Moderate.

Table 9-43 Unmitigated Significance of Soil Impacts

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
"Transformed" (disturbed/developed) Habitats	Low	Moderate	**Minor**
Natural Habitats (Gentle hilly slopes of relic low mountains)	Medium	Moderate	**Moderate**
Natural Habitats (Steep dry stony slopes of relic low mountains)	Medium	Moderate	**Moderate**
Natural Habitats (Stony desert with skeleton or loamy-skeleton)	Medium	Moderate	**Moderate**
Natural Habitats (Sandy desert	Medium	Moderate	**Moderate**
Nationally Important Flora (*Lepidium subcordatum)*	High	Moderate	**Moderate**
Other Flora	Low	Moderate	**Minor**

However, the following mitigation measures will be in place, to minimise the magnitude of potential impact:

- Minimise construction footprint and strict controls to prevent driving out of designated corridors.

- Habitat restoration post-construction inclusive of topsoil replacement if beneficial or soil tilling where deemed necessary to promote regrowth.

There will be post-construction restoration of all affected areas to natural habitat conditions. The exact scope and methodology will be detailed in a Habitat Restoration Plan.

These measures reduce the spatial extent, intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-44 Residual Significance of Soil Impacts

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
"Transformed" (disturbed/developed) Habitats	Low	Negligible	**Negligible**
Natural Habitats (Gentle hilly slopes of relic low mountains)	Medium	Minor	**Minor**
Natural Habitats (Steep dry stony slopes of relic low mountains)	Medium	Minor	**Minor**
Natural Habitats (Stony desert with skeleton or loamy-skeleton)	Medium	Negligible	**Negligible**
Natural Habitats (Sandy desert)	Medium	Negligible	**Negligible**
Nationally Important Flora *(Lepidium subcordatum)*	High	Negligible	**Negligible**
Other Flora	Low	Negligible	**Negligible**

9.5.2 Operation Phase

9.5.2.1 Ecosystem Function

HABITAT FRAGMENTATION

Development and operation of large-scale and linear alignment projects will fragment the landscape's existing habitats, reducing overall ecosystem connectivity and function. This in turn reduces the ability for vegetation recruitment and wildlife movement between habitat patches. Species with large home range requirements and migratory species in particular may be affected by fragmented habitat. Long-term fragmentation caused by physical barriers may also lead to a reduction in genetic exchange which is a concern for r-selected species with rapid generation turnover.

The Project will not be fenced; therefore, there will be no physical barriers to movement. However, turbines may deter avifauna who exhibit macro-scale avoidance behaviour, such as waterbirds; longer migratory movements can increase stress and lower survivorship of migrants that expend more energy to navigate around wind farms.

Bustards have general preference for open habitats that lack tall structures, and as such may experience habitat fragmentation due to turbines and associated structures. Additionally, the Goitered Gazelles and Bukhara Red are sensitive to disturbances from tall structures, and may avoid these areas, further reducing available habitat.

Migratory raptors do not exhibit macro-avoidance behaviour; (in fact, this is the reason that migratory raptors are at high risk for turbine collision)[10]; thus habitat fragmentation from the presence of migratory movement barriers is not considered to apply to raptors.

The magnitude and **unmitigated** significance calculations are presented in the table below.

Table 9-45 Significance of Habitat Fragmentation

RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Birds (Waterbirds)	Very High	Minor	**Moderate**
Threatened Birds (Waterbirds)	High	Minor	**Moderate**
Other Birds (Waterbirds)	Medium	Minor	**Minor**
Great Bustard	Very High	Minor	**Moderate**
MacQueen's Bustard	High	Minor	**Moderate**
Little Bustard	High	Minor	**Moderate**
Goitered Gazelles	High	Minor	**Moderate**
Bukhara Red Deer	High	Minor	**Moderate**

9.5.2.2 Biodiversity Loss

TURBINE COLLISION – BIRDS

Wind Farms pose a unique threat to birds due to the potential for collision with moving turbines. It has been well documented at existing wind farm developments that turbine collisions result in mortality of birds. However, the magnitude of risk and significance of the potential impact is highly dependent upon the location of the wind farm and landscape context, spatial layout, height and length of turbines, and the types and numbers of birds present. In order to assess

10 Machado, R., Nabo, P., Cardia, P., Moreira, P., Nicolau, P., & Repas-Goncalves, M. (2024). Bird Curtailment in Offshore Wind Farms: Application of curtailment in offshore wind farms at a sea basin level to mitigate collision risk for birds. Birdlife Europe and Central Asia and STRIX, Brussels, Belgium.

the potential impacts, separate assessments are undertaken which are species-specific, location specific and season specific.

- Generally, larger soaring birds and 'poor fliers' with high wing-loading are thought to be at higher risk.
- Migratory individuals are at higher risk than residents, yet resident individuals are also at risk due to repeated exposure.
- Raptors have restricted forward field of view that may reduce visibility of turbines and avoidance ability.
- Research indicates that many migratory birds, particularly waterfowl, potentially avoid wind farms at macro scales.

A quantitative assessment was undertaken by utilising a Collision Risk Model (CRM) developed as per SNH Guidelines, using Band et al. predictive modelling. Refer to Volume 4 for the full CRM report, including the methodology for deriving bird density values from the VP survey data.

It is important to note that avoidance rates are predicted and have a large weight on the final collision risk predictions. Further, avoidance behaviour is not only species-specific but may also be influenced by (1) turbine locations and (2) weather conditions (visibility / flight ability). Therefore, even low predicted collision rates do not exclude the need for adaptive mitigation approaches (detailed subsequently).

The species for which CRM was conducted included all "target" and "secondary" bird species that were observed at the site within the VP survey effort. Target species were defined to include all species with elevated conservation concern or protected status on either the national[11] or international[12] "red lists." Secondary species were defined to include all additional raptors and vultures that could potentially occur at the site, as well as selected additional large-bodied birds that could become a significant risk concern for the Project, if seriously impacted. The list of such species was developed with input from regional bird experts, and was intended to include all potentially high- or moderate- sensitivity bird species that could occur at the site.

The CRM for the species of concern is presented in the following table.

11 Uzbekistan Federal Government, 2019. Uzbekistan Red List of Threatened Species

12 IUCN Red List of Threatened Species, accessed June 6, 2024

Table 9-46 Estimated Rates of Collisions per Year for Bird Species

Common Name	Using lower bound CA value		Using most realistic CA value		Using upper bound CA value	
	Collisions/year	Years to 1 collision	Collisions/year	Years to 1 collision	Collisions/year	Years to 1 collision
Target Species						
Steppe Eagle	0.102	9	0.0226	44	0.00539	185
Golden Eagle	0.0210	47	0.00464	215	0.00110	906
White-tailed Eagle	0.0841	11	0.0421	23	0.00379	264
Red-footed Falcon	0.308	3	0.0752	13	0.00243	412
Secondary Species						
Common Crane	21.1	<1	4.21	<1	2.11	<1
Eurasian Marsh-Harrier	0.0853	11	0.0171	58	0.00171	586
Hen Harrier	4.44	<1	0.888	1	0.0888	11
Black Kite	0.0998	10	0.0399	25	0.00748	133
Rough-legged Hawk	1.56	<1	0.354	2	0.0708	14
Long-legged Buzzard	1.85	<1	0.421	2	0.0842	11
Eurasian Kestrel	35.7	<1	8.72	<1	0.281	3
Merlin	0.514	1	0.257	3	0.128	7

Overall, the results of the final, full-year CRM analysis indicate that the Nukus 2 Wind Farm has a low-moderate level of collision risk for sensitive bird species.

Among tier 1 target species, a category that includes all bird species with elevated national and/or international conservation/protected status that potentially occur at the site, only four species have been detected within the specified maximum reliable observation radius during the VP survey effort, to date, and none are predicted to experience annual collision frequency greater than one fatality per 13 years under the most realistic collision avoidance rate parameters modelled. This reflects the extremely low abundance of tier 1 target species recorded at the site during the VP surveys.

Among tier 2 target species, a category that includes all other raptors and selected additional large bird species that could potentially be sensitive issues for the Project, if impacted, only eight species were detected at the site during the VP survey effort. Of these, the Eurasian Kestrel (Falco tinnunculus) was predicted to experience the highest collision rates, with 8.72 collisions predicted per year, followed by the Common Crane (Grus grus), for which 4.21 collisions per year are predicted under the most realistic collision avoidance scenario. None of the other tier 2 target species were predicted to experience collisions more frequently than once per year under the most realistic collision avoidance scenarios modelled. Based on these results, no serious bird collision risk concerns are apparent for the Project.

The magnitude of impact has been determined on a species-specific basis based on the results of the CRM.

Table 9-47 Magnitude of Predicted Turbine Collision Impact – Birds

SPECIES	JUSTIFICATION	IMPACT MAGNITUDE
Steppe Eagle	The predicted collision risk is so low that no individuals are anticipated to be lost. The Steppe Eagle, a species of global conservation concern, is present in the project area primarily during migration. Based on site-specific collision risk modelling, its flight patterns are generally at altitudes above or below turbine blade height. This reduces collision likelihood.	**No change**
Golden Eagle	The predicted collision risk is so low that no individuals are anticipated to be lost. Golden Eagles are known to inhabit the project area throughout the year. However, baseline studies indicate low densities, and flight paths are primarily over highland areas not in proximity to turbines.	**No change**

Species	Justification	Impact Magnitude
White-tailed Eagle	The predicted collision risk is so low that only a single individual is anticipated to be lost.	**Negligible**
Red-footed Falcon	The predicted collision risk is so low that only two individuals are anticipated to be lost.	**Negligible**
Common Crane	This species is extremely common; the global population comprises of 491,000 birds. It is not considered that the loss of 4 individuals per year will have an impact on the regional population.	**Moderate**
Eurasian Marsh-Harrier	The predicted collision risk is so low that no individuals are anticipated to be lost.	**No change**
Hen Harrier	A total of 22 individuals are predicted to collide throughout the entirety of the project lifetime. Given the robust population size globally, this is not considered to be of any concern on the population level.	**Moderate**
Black Kite	The predicted collision risk is so low that only a single individual is anticipated to be lost.	**Negligible**
Rough-legged Hawk	Only a total of 9 individuals are predicted to collide throughout the entirety of the project lifetime. Given the robust population size globally, this is not considered to be of any concern on the population level.	**Minor**
Long-legged Buzzard	Only a total of 11 individuals maximum are predicted to collide throughout the entirety of the project lifetime. Given the robust population size globally, this is not considered to be of any concern on the population level.	**Minor**
Eurasian Kestrel	This species is extremely common; the global population comprises of 4-6 million birds. It is not considered that the loss of 9 individuals per year will have an impact on the regional population.	**Moderate**
Merlin	Only a total of 6 individuals maximum are predicted to collide throughout the entirety of the project lifetime. Given the robust population size globally, this is not considered to be of any concern on the population level.	**Minor**

The magnitude and unmitigated significance calculations are presented in the table below.

Table 9-48 Unmitigated Significance of Turbine Collision – Birds

Receptor	Sensitivity	Impact Magnitude	Unmitigated Significance
Steppe Eagle	Very High	No change	**Neutral**
Golden Eagle	Medium	No change	**Neutral**
White-tailed Eagle	Medium	Negligible	**Negligible**
Red-footed Falcon	Medium	Negligible	**Negligible**
Common Crane	Low	Moderate	**Minor**

Receptor	Sensitivity	Impact Magnitude	Unmitigated Significance
Eurasian Marsh-Harrier	Low	No change	**Neutral**
Hen Harrier	Low	Moderate	**Minor**
Black Kite	Low	Negligible	**Negligible**
Rough-legged Hawk	Low	Minor	**Negligible**
Long-legged Buzzard	Low	Minor	**Negligible**
Eurasian Kestrel	Low	Moderate	**Minor**
Merlin	Low	Minor	**Negligible**

The following mitigation measures will be implemented to further reduce collision risk:

- Planned infrastructure within the wind farm shall not include elements attractive for birds, such as lattice towers that provide perching possibilities
- Collision Risk Management Plan will be formulated which includes the following:
    - Acceptable Mortality Thresholds for all priority species, which are calculated on the basis of Potential Biological Removal;
    - 3 years of Fatality Monitoring, which includes carcass searches, searcher bias trials, and persistence trials, and correction factors to be applied for estimating fatalities;
    - Adaptive management program which indicates how anti-collision mitigation shall be applied and upscaled in the event that fatality monitoring indicates that mortality thresholds are being exceeded. An example of mitigation should the mortality thresholds be exceeded is the potential use of curtailment during peak migration periods or in areas where endangered species like the Steppe Eagle or Golden Eagle are frequently observed.
- Upfront curtailment in the form of shutdown is not required in light of the low predicted collision rates.
- The Biodiversity Action Plan (BAP) provides the strategy designed to achieve No Net Loss (NNL) for the Common Crane.

These measures reduce the intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-49 Residual Significance of Turbine Collision – Birds

Receptor	Sensitivity	Reduced Magnitude	Residual Significance
Steppe Eagle	Very High	No change	Neutral
Golden Eagle	Medium	No change	Neutral

RECEPTOR	SENSITIVITY	REDUCED MAGNITUDE	RESIDUAL SIGNIFICANCE
White-tailed Eagle	Medium	No change	Neutral
Red-footed Falcon	Medium	No change	Neutral
Common Crane	Low	Minor	Negligible
Eurasian Marsh-Harrier	Low	No change	Neutral
Hen Harrier	Low	Minor	Negligible
Black Kite	Low	No change	Neutral
Rough-legged Hawk	Low	Negligible	Negligible
Long-legged Buzzard	Low	Negligible	Negligible
Eurasian Kestrel	Low	Minor	Negligible
Merlin	Low	Negligible	Negligible

TURBINE COLLISION – BATS

Bat fatalities from wind turbine collisions are documented world-wide. However, the driving impetus behind this (when considering that bats rarely collide with other man-made structures) is still unknown and being researched. The patterns that have been observed thus far include:

- Migratory bats making long-distance movements are at higher risk of collision than resident "sedentary" bats. Additionally, migratory bats often have higher tolerance for high wind speeds, further increasing risk.
- "Tree" bats, those that roost in trees, are at higher risk of collision fatalities.
- The majority of fatalities occur during late summer and autumn, which coincides with breeding, increased foraging, and migration.
- Collision Risk is higher for species adapted for foraging insects in open spaces.
- Wind turbines may be acting as an attractant to specific bat species. A recent study undertaken in England found that P. pipistrellus activity was 37% higher at turbines than at control locations, whereas P. pygmaeus activity was consistent with no attraction or repulsion by turbines. This may be due to the attraction of aerial insects to lights and heat associated with turbines.
- Fatalities increase at low wind speeds, and before and after the passage of storm fronts.
- Mortality increases with turbine tower height and rotor diameter.
- Barotrauma does not appear to be a significant contributing factor to mortality.
- Sensitivity to wind turbine collision is strongly influenced by preferred flight altitudes. The rotor swept area altitude for the Project is 30 m to 250 m.

The magnitude of impact has been determined on a species-specific basis based on the results of baseline and known species-specific interactions.

Table 9-50 Magnitude of Predicted Turbine Collision Impact – Bats

SPECIES	FLIGHT ALTITUDE	JUSTIFICATION	IMPACT MAGNITUDE
Eptesicus ognevi	25 – 50 m	Within risk zone of rotor-swept area	Moderate
Eptesicus turcomanus *(formerly Eptesicus serotinus)*	Up to 50 m	Within risk zone of rotor-swept area	Moderate
Pipistrellus kuhlii	5 – 50 m	Within risk zone of rotor-swept area	Moderate
Pipistrellus pipistrellus	25 – 50 m	Within risk zone of rotor-swept area	Moderate
Plecotus sp.	Up to 10 m	Outside risk zone of rotor swept area	Minor
Vespertilio murinus	10 – 100 m	Within risk zone of rotor-swept area	Moderate
Tadarida teniotis	50 – 100 m	Within risk zone of rotor-swept area	Moderate

The magnitude and unmitigated significance calculations are presented in the table below.

Table 9-51 Unmitigated Significance of Turbine Collision (Bats)

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Eptesicus ognevi	Low	Moderate	**Minor**
Eptesicus turcomanus *(formerly Eptesicus serotinus)*	Low	Moderate	**Minor**
Pipistrellus kuhlii	Low	Moderate	**Minor**
Pipistrellus pipistrellus	Low	Moderate	**Minor**
Plecotus sp.	Low	Minor	**Minor**
Vespertilio murinus	Low	Moderate	**Minor**
Tadarida teniotis	Low	Moderate	**Minor**

The following mitigation measures will be implemented to reduce collision risk:

- Prevention of elements that may attract bats, or insects and therefore bats:
  - All WTGs, particularly the nacelles, will be designed, constructed and maintained in such a manner that they minimise the support for roosting bats (to the extent possible as per wind turbine design);
  - Use lighting only as needed and use wavelengths and designs that do not attract insects or bats;
  - Bright white or bluish lights (mercury vapor, white incandescent and white florescent) are the most attractive to insects. Yellowish, pinkish, or orange

(sodium vapor, halogen, dichroic yellow) are the least attractive to most insects. LED bulbs are less attractive because they produce low heat and long wavelengths of light as well as little or no ultraviolet radiation.

- Prevent retention of water and growth of weeds/shrub as well as hedges and shrubs that may attract insects in the immediate vicinity.

- A Collision Risk Management Plan will be formulated which includes the following:
  - Acceptable Mortality Thresholds for all priority species, which are calculated on the basis of Potential Biological Removal;
  - 3 years of Fatality Monitoring, which includes carcass searches, searcher bias trials, and persistence trials, and correction factors to be applied for estimating fatalities;
  - Acoustic monitoring to understand how species composition and bat activity indices relate to meteorological conditions. On the one met mast (to be installed) two detectors will be installed at differing heights and detectors will be placed at approximately 2 m ABGL on two of the turbines. Further details will be provided in the Collision Risk Management Plan; and
  - Adaptive management program which indicates how anti-collision mitigation shall be applied and upscaled in the event that fatality monitoring indicates that mortality thresholds are being exceeded. An example of mitigation should the mortality thresholds be exceeded is the potential use of cut-in curtailment during times when acoustic monitoring shows higher levels, which can be seasonal, specific timings, or correlated to specific wind speeds and meteorological conditions.

These measures reduce the intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-52 Residual Significance of Turbine Collision (Bats)

RECEPTOR	SENSITIVITY	REDUCED MAGNITUDE	RESIDUAL SIGNIFICANCE
Eptesicus ognevi	Low	Minor	**Negligible**
Eptesicus turcomanus *(formerly Eptesicus serotinus)*	Low	Minor	**Negligible**
Pipistrellus kuhlii	Low	Negligible	**Negligible**
Pipistrellus pipistrellus	Low	Minor	**Negligible**
Plecotus sp.	Low	Negligible	**Negligible**
Vespertilio murinus	Low	Minor	**Negligible**
Tadarida teniotis	Low	Minor	**Negligible**

OHTL COLLISIONS - BIRDS

Thin, dark wires used in overhead transmission lines are visually difficult to detect. Bird mortality by collisions with these wires have been documented for a variety of species.

In the case of power lines, the bird collides with one of the wires, generally the earth wire, which is less visible. Particularly at risk are birds migrating between 20 – 50 m altitude, birds flying at night, birds flying in flocks, and / or large and heavy birds of limited manoeuvrability.

The magnitude of impact has been determined on a species-specific basis based on the prevalence of the species in the area combined with collision risk (which takes into account body size, manoeuvrability, vision, flight timing and behaviour).

Table 9-53 Magnitude of Predicted OHTL Collision Impact – Birds

SPECIES	IMPACT MAGNITUDE
Steppe Eagle	Moderate
Pallas's Fish-Eagle	Moderate
Saker Falcon	Moderate
White-headed Duck	Moderate
Sociable Lapwing	Moderate
Great Bustard	Minor
Egyptian Vulture	Moderate
Imperial Eagle	Moderate
Greater Spotted Eagle	Moderate
Lesser White-fronted Goose	Moderate
Red-breasted Goose	Moderate
Common Pochard	Moderate
European Turtle Dove	Minor
Yellow-eyed Pigeon	Minor
Dalmatian Pelican	Moderate
MacQueen's Bustard	Major
Little Bustard	Major

SPECIES	IMPACT MAGNITUDE
Cinereous Vulture	Minor
Red-footed Falcon	Moderate
Short-toed Snake-eagle	Moderate
Booted Eagle	Moderate
Golden Eagle	Moderate
White-tailed Eagle	Moderate
Peregrine Falcon	Moderate
Eurasian Griffon	Minor
Common Crane	Major
Other migratory waterbirds	Major

The following table outlines the unmitigated significance for OHTL Collision – Birds.

Table 9-54 Unmitigated Significance of OHTL Collision – Birds

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Steppe Eagle	Very High	Moderate	**Major**
Pallas's Fish-Eagle	Very High	Moderate	**Major**
Saker Falcon	Very High	Moderate	**Major**
White-headed Duck	Very High	Moderate	**Major**
Sociable Lapwing	Very High	Moderate	**Major**
Great Bustard	Very High	Minor	**Moderate**
Egyptian Vulture	Very High	Moderate	**Major**
Imperial Eagle	High	Moderate	**Moderate**
Greater Spotted Eagle	High	Moderate	**Moderate**
Lesser White-fronted Goose	High	Moderate	**Moderate**
Red-breasted Goose	High	Moderate	**Moderate**
Common Pochard	High	Moderate	**Moderate**

Receptor	Sensitivity	Impact Magnitude	Unmitigated Significance
European Turtle Dove	High	Minor	**Moderate**
Yellow-eyed Pigeon	High	Minor	**Moderate**
Dalmatian Pelican	High	Moderate	**Moderate**
MacQueen's Bustard	High	Major	**Major**
Little Bustard	High	Major	**Major**
Cinereous Vulture	High	Minor	**Moderate**
Red-footed Falcon	High	Moderate	**Moderate**
Short-toed Snake-eagle	Medium	Moderate	**Moderate**
Booted Eagle	Medium	Moderate	**Moderate**
Golden Eagle	Medium	Moderate	**Moderate**
White-tailed Eagle	Medium	Moderate	**Moderate**
Peregrine Falcon	Medium	Moderate	**Moderate**
Eurasian Griffon	Medium	Minor	**Minor**
Common Crane	Low	Major	**Moderate**
Other migratory waterbirds	Low	Major	**Moderate**

The following mitigation measures will be implemented to further reduce collision risk:

- Removing the thin neutral or earth (shield) wire above the high voltage transmission lines where feasible, and where this is not possible, marking the line to make it more visible;
- Bundling high voltage wires, and using spacers to increase visibility;
- Minimising the vertical spread of power lines. Having lines in a horizontal plane reduces collision risk;
- Using existing infrastructure corridors such as road and railway RoW; existing powerline transmission corridors; and other areas with existing disturbances that deter bird activity.
- Using bird deflectors to increase line visibility by thickening the appearance of the line by a minimum of 20 cm over a length of 10-20cm; or using markers that are moveable, of contrasting colours (e.g. black and white), contrast with the background, protrude above and below the line.
- Any markers must be robust to allow long-term durability for the environmental conditions of exposure; maintenance plans for the OHTL should include inspections of marker devices and replacements as needed.
- A Collision Risk Management Plan will be formulated which will include the following:

- Acceptable Mortality Thresholds for all priority species (including the Common Crane), which are to be calculated on the basis of Potential Biological Removal;
- 3 years of Fatality Monitoring, which includes carcass searches, searcher bias trials, and persistence trials, and correction factors to be applied for estimating fatalities;
- Adaptive management program which indicates how anti-collision mitigation shall be applied and upscaled in the event that fatality monitoring indicates that mortality thresholds are being exceeded. An example of mitigation should the mortality thresholds be exceeded include the following:
    - Potential increase in the number of bird diverters on OHTL sections where fatalities are concentrated, in which additional diverters will be installed at closer intervals to further enhance line visibility for large bird species.

- The Biodiversity Action Plan (BAP) provides the strategy designed to achieve No Net Loss (NNL) for the Common Crane.
- Great Bustard population monitoring will further support the suite of mitigation measures already being put in place during design and operation of the OHTL, as OHTL collision is a leading issue for large bustard species including Great Bustard.

These measures reduce the intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-55 Residual Significance of OHTL Collision – Birds

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	MITIGATED SIGNIFICANCE
Steppe Eagle	Very High	Negligible	**Minor**
Pallas's Fish-Eagle	Very High	Negligible	**Minor**
Saker Falcon	Very High	Negligible	**Minor**
White-headed Duck	Very High	Negligible	**Minor**
Sociable Lapwing	Very High	Negligible	**Minor**
Great Bustard	Very High	Minor	**Moderate**
Egyptian Vulture	Very High	Negligible	**Minor**
Imperial Eagle	High	Negligible	**Minor**
Greater Spotted Eagle	High	Negligible	**Minor**
Lesser White-fronted Goose	High	Negligible	**Minor**
Red-breasted Goose	High	Negligible	**Minor**
Common Pochard	High	Negligible	**Minor**

Receptor	Sensitivity	Impact Magnitude	Mitigated Significance
European Turtle Dove	High	Negligible	**Minor**
Yellow-eyed Pigeon	High	Negligible	**Minor**
Dalmatian Pelican	High	Negligible	**Minor**
MacQueen's Bustard	High	Negligible	**Minor**
Little Bustard	High	Negligible	**Minor**
Cinereous Vulture	High	Negligible	**Minor**
Red-footed Falcon	High	Negligible	**Minor**
Short-toed Snake-eagle	Medium	Negligible	**Minor**
Booted Eagle	Medium	Negligible	**Minor**
Golden Eagle	Medium	Negligible	**Minor**
White-tailed Eagle	Medium	Negligible	**Minor**
Peregrine Falcon	Medium	Negligible	**Minor**
Eurasian Griffon	Medium	Negligible	**Minor**
Common Crane	Low	Negligible	**Negligible**
Other migratory waterbirds	Low	Negligible	**Negligible**

OHTL Electrocution – Birds

Power transmission lines present potential electrocution risk to birds. In particular, larger-bodied birds which tend to prefer perching at high altitudes such as raptors, including eagles and vultures, have the highest risk for electrocution, as larger wingspans create the opportunity for span the distance between energised and ground components of power lines. Further compounding the impact is the fact that many of these species are K-selected with low reproductive rates, so additive mortality is of significance. For many endangered species worldwide, electrocution by powerlines is considered to be the number one conservation threat contributing to population decline.

The magnitude of impact has been determined on a species-specific basis based on the prevalence of the species in the area combined with electrocution risk.

Table 9-56 Unmitigated Significance of OHTL Electrocution – Birds

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Steppe Eagle	Very High	Major	**Major**
Pallas's Fish-Eagle	Very High	Moderate	**Major**
Saker Falcon	Very High	Moderate	**Major**
White-headed Duck	Very High	Minor	**Moderate**
Sociable Lapwing	Very High	Moderate	**Major**
Great Bustard	Very High	Major	**Major**
Egyptian Vulture	Very High	Major	**Major**
Imperial Eagle	High	Major	**Major**
Greater Spotted Eagle	High	Moderate	**Moderate**
Lesser White-fronted Goose	High	Minor	**Minor**
Red-breasted Goose	High	Minor	**Minor**
Common Pochard	High	Minor	**Minor**
European Turtle Dove	High	Minor	**Minor**
Yellow-eyed Pigeon	High	Minor	**Minor**
Dalmatian Pelican	High	Moderate	**Moderate**
MacQueen's Bustard	High	Moderate	**Moderate**
Little Bustard	High	Moderate	**Moderate**
Cinereous Vulture	High	Minor	**Minor**
Red-footed Falcon	High	Moderate	**Moderate**
Short-toed Snake-eagle	Medium	Major	**Moderate**
Booted Eagle	Medium	Moderate	**Moderate**
Golden Eagle	Medium	Major	**Moderate**
White-tailed Eagle	Medium	Major	**Moderate**
Peregrine Falcon	Medium	Moderate	**Moderate**
Eurasian Griffon	Medium	Minor	**Minor**
Common Crane	Low	Minor	**Negligible**
Other migratory waterbirds	Low	Major	**Minor**

The following mitigation measures will be implemented to further reduce electrocution risk:

- Ensure a safe design of the cross arm and related equipment (separate energised conductors and grounded hardware distances by more than largest species wingspan)
- Use suspended insulators and avoid pin and dead-end/strain insulators
- Ensure safe distance (minimum 2 m) between suspended conductor/jumper wire and lower branch in the cross arm.
- In the configurations with high electrocution risk (derivations, tap, transformer and switch poles and its connected grounded wires and jumpers) all grounded elements should be insulated, and grounded wires and jumpers should be sheathed wires.
- Design will be as per recommendations provided in Reference Note: Quick Guidance for Preventing Electrocution Impacts on Birds, Initiated by International Association for Falconry and Conservation of Birds of Prey.
- Provide safe perching and nesting opportunities via the erection of perching poles and/or nesting platforms or boxes; they should be the highest elements of the structure to attract birds away from perching on potentially dangerous components.
- A Collision Risk Management Plan will be formulated which includes the following:
    - Acceptable Mortality Thresholds for all priority species, which are calculated on the basis of Potential Biological Removal;
    - 3 years of Fatality Monitoring, which includes carcass searches, searcher bias trials, and persistence trials, and correction factors to be applied for estimating fatalities;
    - Adaptive management program which indicates how anti-collision mitigation shall be applied and upscaled in the event that fatality monitoring indicates that mortality thresholds are being exceeded. An example of mitigation should the mortality thresholds be exceeded include the following:
        - Potential increase in the number of bird diverters on OHTL sections where fatalities are concentrated, in which additional diverters will be installed at closer intervals to further enhance line visibility for large bird species.
        - Implement further insulation of grounded elements and energized components in areas where bird electrocution occurs. This includes insulating jumpers, conductors, and other high-risk components to reduce the likelihood of birds making contact with energized parts of the infrastructure.

These measures significantly reduce the intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 9-57 Residual Significance of OHTL Electrocution (Birds)

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Steppe Eagle	Very High	Negligible	**Minor**
Pallas's Fish-Eagle	Very High	Negligible	**Minor**
Saker Falcon	Very High	Negligible	**Minor**
White-headed Duck	Very High	Negligible	**Minor**
Sociable Lapwing	Very High	Negligible	**Minor**
Great Bustard	Very High	Negligible	**Minor**
Egyptian Vulture	Very High	Negligible	**Minor**
Imperial Eagle	High	Negligible	**Minor**
Greater Spotted Eagle	High	Negligible	**Minor**
Lesser White-fronted Goose	High	Negligible	**Minor**
Red-breasted Goose	High	Negligible	**Minor**
Common Pochard	High	Negligible	**Minor**
European Turtle Dove	High	Negligible	**Minor**
Yellow-eyed Pigeon	High	Negligible	**Minor**
Dalmatian Pelican	High	Negligible	**Minor**
MacQueen's Bustard	High	Negligible	**Minor**
Little Bustard	High	Negligible	**Minor**
Cinereous Vulture	High	Negligible	**Minor**
Red-footed Falcon	High	Negligible	**Minor**
Short-toed Snake-eagle	Medium	Negligible	**Minor**
Booted Eagle	Medium	Negligible	**Minor**
Golden Eagle	Medium	Negligible	**Minor**
White-tailed Eagle	Medium	Negligible	**Minor**
Peregrine Falcon	Medium	Negligible	**Minor**
Eurasian Griffon	Medium	Negligible	**Minor**
Common Crane	Low	Negligible	**Negligible**
Other migratory waterbirds	Low	Negligible	**Negligible**

DISTURBANCE

The presence of anthropogenic activity is disturbing to many sensitive species, which can result in reduced survivorship, reproductive success, and ultimately, population decline.

Disturbance especially impacts the reproductive success of breeding birds, which may abandon breeding attempts, or desert nests or colonies if disturbance levels are unacceptable. Although no evidence of nesting was found during the breeding bird surveys conducted, there remains the possibility that nesting could occur.

Other species that may be displaced due to disturbance include particularly sensitive such as the shy Houbara Bustard, although most wildlife which is not already habituated to anthropogenic disturbance is anticipated to be negatively affected.

This direct impact has low intensity, with a spatial extent of the full construction footprint and a 1 km buffer, is long-term and reversible, with a possible likelihood. Thus, the magnitude of impact is considered as Minor.

Table 9-58 Unmitigated Significance of Disturbance

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Minor	**Moderate**
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Minor	**Moderate**
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Minor	**Minor**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Minor	**Moderate**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Minor	**Moderate**
Other Reptiles	Low	Minor	**Minor**
Endangered Raptors (Steppe Eagle, Pallas's Fish-Eagle, Saker Falcon)	Very High	Minor	**Moderate**
Endangered Groundbirds (Sociable Lapwing, Great Bustard)	Very High	Minor	**Moderate**
Threatened Raptors (Imperial Eagle, Greater Spotted Eagle)	High	Minor	**Moderate**

Receptor	Sensitivity	Impact Magnitude	Unmitigated Significance
Threatened Groundbirds (MacQueen's Bustard, Little Bustard)	High	Minor	**Moderate**
Nationally Important Birds	High	Minor	**Minor**
Other Birds	Low	Minor	**Minor**

9.5.2.3 Biodiversity Displacement

Dispersal

Shyer species may be displaced away from the project area as a result of operational disturbance, having indirect secondary impacts on adjacent territories via increased competition for resources compromising population stability, causing ecosystem imbalances. However, due to the nature of the Project and the fact it will not be fenced, the magnitude of operational disturbance is expected to be negligible.

Table 9-59 Unmitigated Significance of Displacement

Receptor	Sensitivity	Impact Magnitude	Unmitigated Significance
Threatened Mammals (Goitered Gazelle, Marbled Polecat)	High	Negligible	**Minor**
Nationally Important Mammals (Brandt's hedgehog, Corsac Fox, Bukhara Red Deer)	High	Negligible	**Minor**
Other Mammals (Long-eared hedgehog, Lesser white-toothed shrew, Pie-bald shrew, etc.)	Low	Negligible	**Negligible**
Endangered Reptiles (Uzbekistan Toadhead Agama)	Very High	Negligible	**Minor**
Threatened Reptiles (Central Asian Tortoise, Szczerbak's Even-fingered Gecko)	High	Negligible	**Minor**
Other Reptiles	Low	Negligible	**Negligible**
Houbara Bustard, Turtle-dove	High	Negligible	**Minor**
Other birds	Low	Negligible	**Negligible**

9.5.2.4 Environmental Quality

Noise and Vibration

Operational noise created by the operation of WTGs can cause acoustic masking, disturbance and displacement, and general reduction in survivorship and reproductive success in a variety of fauna. Most impacted are typically acoustic communicators such as bird and bat species. Vibration can cause elevated stress response in reptiles and could potentially cause collapse of burrows.

A preliminary screening assessment has been performed using windPRO tool, and it shows that noise levels are expected to drop to between 35 and 40 dB(A) within 1 to 1.5 km from each WTG. Although wildlife has been studied to exhibit deterrence behaviour at levels of dB 40 (in particular next to roads), the existing windy conditions at the site already regularly incur sound levels of 40+ dB. Therefore, as the introduced noise will be related to wind speed and changes will be gradual (not sudden/intermittent) it is likely that fauna will be able to habituate to the additional sound. Therefore, the magnitude of impact has been determined to be Negligible.

Table 9-60 Unmitigated Significance of Noise Impacts

Receptor	Sensitivity	Impact Magnitude	Unmitigated Significance
Threatened Mammals	High	Negligible	**Minor**
Nationally Important Mammals	High	Negligible	**Negligible**
Other Mammals	Low	Negligible	**Negligible**
Endangered Reptiles	Very High	Negligible	**Minor**
Threatened Reptiles	High	Negligible	**Minor**
Other Reptiles	Low	Negligible	**Negligible**
Endangered Birds	Very High	Negligible	**Minor**
Threatened Birds	High	Negligible	**Minor**
Nationally Important Birds	High	Negligible	**Negligible**
Other Birds	Low	Negligible	**Negligible**

Light Pollution

Night-time lighting can impact nocturnal wildlife behaviour. It can act as an attractant, which can cause congregation and higher predation rates / change movement and migration behaviour; act as a repellent which causes displacement; or interfere with the circadian cycle and cause lower survivorship and reproductive success.

However, the only lights that will be used during operation are a motion-automated light at the location of the sub-station, and airplane safety warning lights at the hubs of the turbines.

This direct impact has low intensity, with a spatial extent of the full construction footprint, is long-term and reversible, with a possible likelihood. Thus, the magnitude of impact is considered as Negligible.

Table 9-61 Unmitigated Significance of Lighting Impacts

RECEPTOR	SENSITIVITY	IMPACT MAGNITUDE	UNMITIGATED SIGNIFICANCE
Threatened Mammals	High	Negligible	**Minor**
Nationally Important Mammals	High	Negligible	**Negligible**
Other Mammals	Low	Negligible	**Negligible**
Endangered Reptiles	Very High	Negligible	**Minor**
Threatened Reptiles	High	Negligible	**Minor**
Other Reptiles	Low	Negligible	**Negligible**
Endangered Birds	Very High	Negligible	**Minor**
Threatened Birds	High	Negligible	**Minor**
Nationally Important Birds	High	Negligible	**Negligible**
Other Birds	Low	Negligible	**Negligible**

9.6 Management and Monitoring

The mitigation measures applied to reduce significant impacts will require a number of management plans to detail the implementation and action items needed, as well as monitoring and reporting requirements to ensure compliance and measure performance.

DESIGN PHASE

The following outline the mitigation requirements to be implemented by the EPC Contractor during design phase:

- Integration of design mitigation into lighting design and OHTL specifications, and exclusion of roosting and perching opportunities within WTGs.

PRE-CONSTRUCTION

The following outline the mitigation requirements to be implemented by the EPC Contractor pre-construction:

- Implementation of pre-construction surveys
  - Flora for translocation or demarcating
  - Reptile relocation
  - To ensure that impacts on the terrestrial ecology within the wind farm and along the OHTL alignment is managed, a Terrestrial Ecology Chance Find procedure will be developed to include the management required in the event sensitive species were encountered during construction.
- Review of Construction Methodology:
  - Site Clearance and Layout
  - Timing and method of works
  - Lighting Strategy
  - Solid Waste Management Strategy
- Preparation of CESMP, inclusive of:
  - General Site Controls
  - Solid Waste Control Plan
  - Chance Find Procedure
  - Air Quality Control Plan
  - Dust Control Plan
  - Noise Control Plan
  - Lighting Control Plan
  - Hazardous Materials Control Plan
  - Emergency Action Plans
  - Spill Prevention and Clean-up Procedures

CONSTRUCTION

The following outline the mitigation requirements to be implemented by the EPC Contractor during construction:

- Implementation of CESMP
  - Daily Checklist
  - Weekly Inspection
  - Monthly Reporting
  - Quarterly Auditing

POST-CONSTRUCTION

The following outline the mitigation requirements to be implemented by the EPC Contractor post-construction:

- Preparation of Habitat Restoration Action Plan
  - Carrying out restoration works
  - Post-restoration survey

OPERATION

The following outline the mitigation requirements to be implemented by the O&M company during operation:

- Preparation and Implementation of OESMP, inclusive of:
  - General Site Controls
  - Noise Control Plan
  - Lighting Control Plan
- Collision Risk Management Plan

Fatality Monitoring Plan

10 LANDSCAPE AND VISUAL IMPACTS

10.1 Applicable Requirements & Standards

10.1.1 National Regulations

There are no regulations or standards in Uzbekistan that provide requirements for assessing landscape character, visual impacts and shadow flicker from wind turbines.

10.1.2 Lender Requirements

The EHS Guidelines for Wind Energy (2015) outline that *'preparing zones of visual influence maps and preparing wire-frame images and photomontages from key viewpoints is recommended to inform both the assessment and the consultation processes.'*

'Consideration should also be given to the proximity of turbines to settlements, residential areas, and other visual receptors to minimize visual impacts and impacts on residential amenity, where possible. All relevant viewing angles should be considered when considering turbine locations, including viewpoints from nearby settlements.'

10.2 Baseline Conditions, Zone of Theoretical Visibility and Receptors

10.2.1 Study Area

Guidance developed by Scottish Natural Heritage (SNH) (Visual Representation of Windfarms Version 2.2, February 2017) indicates that an area with a radius of 45 km from the nearest WTG is appropriate for WTGs of the size proposed for the Project and therefore a radius of 50 km from the centre of site has been used.

10.2.2 Desktop Survey

Baseline information of the site and 50 km radius study area was initially gathered via a desktop study. This study identified aspects of the landscape and visual resources that were considered in the landscape and visual impact assessment, including:

- topography and landform, land cover, distribution and type of land use;
- development / settlement patterns and scale,
- vegetation;
- transport routes;

- heritage features of local or international importance;
- touristic/recreational destinations; and
- landscape character typology and specific viewpoints.

10.2.3 Fieldwork Survey

An initial fieldwork survey was undertaken in April 2024. This included taking a photographic record of the landscape and visual baseline, visiting locations determined through the initial desktop study, as well as travel throughout the study area to consider potential effects on landscape character and on the experience of views seen from routes through the landscape. The landscape was analysed for particular features that contribute to the landscape character of the site and its wider setting.

10.2.4 Landscape Character Baseline

10.2.4.1 Land Use

The Project land allocated for the WTG site boundary comprises an area of uninhabited and featureless desert with no human influence. Within the 50 km study area the northern section primarily comprises desert, with isolated examples of human activity except for limited herding activity, the Karatau hills separate the Project site from pockets of industrial activity, and further south on the other side of the Amu Darya River there is land used for agriculture.

10.2.4.2 Settlements

There are no settlements within the WTG Project site boundary. The nearest community is approximately 9 km away. However, the Project area is used by 6 seasonal herders for grazing from spring to mid-summer. They utilize temporary structures such as fences, watering facilities, and movable vans. These herders are informal, mostly coming from nearby communities, and do not have formal agreements with either SWID or Beruniy Karakul LLC.

There are five residential communities along the OHTL route. The OHTL passes through the Makhtumkulu village, while Nayman village is situated within 190 meters of the route, and the furthest, Kyzyl Kala, is 4.4 km away. These communities primarily focus on agriculture and livestock breeding.

10.2.4.3 Landform and Topography

The WTG Project site boundary is located on the Sultan Uvaiz plateau, at an altitude of 320-380 m asl. The plateau features low-mountain plains with hills and traces of temporary watercourses. The area is primarily a gravel desert with sandy patches. Throughout the territory,

there are geological pits ranging in length from several tens of meters to several kilometres, with a depth of up to 1 m.

The southern slope of the plateau is heavily dissected, characterized by outcrops of bedrock and gorges, with road slopes reaching up to 300 m in some places. The foothills are composed of an alluvial cone with large clastic material at the foot of the plateau and gravel further away, creating a rocky desert. To the south, the landscape transitions to a gently sloping plain with slight elevation differences of 89-98 m, mainly occupied by agricultural fields with irrigation canals.

The landscape of the OHTL route is characterised by both unmodified and modified areas. The northern part traverses the mountain range and desert land, while the southern part passes through agricultural farms and residential communities.

10.2.4.4 Vegetation

The vegetation within the WTG Project site boundary exhibits a uniform and sparse distribution, characterized by low species diversity. The same plant species, with minor variations, were consistently recorded in each turbine location, BESS and substation areas.

The majority of species identified in the project area are typical of the Central Asian desert zone, being both common and widespread. Species richness within the wind farm area varies from 11 to 24 species per sample plot. Along the OHTL route, species richness ranges from 11 to 44 species per sample plot.

10.2.4.5 Access

The closest primary road is the A380 that runs in a northwest/south-east direction west of the Project site that connects the cities of Nukus and Bukhara. The roadway leading to the Project site is in poor condition with numerous potholes and cut-outs. The road will require substantial rehabilitation and maintenance. The road is also frequently used by HGVs passing to and from the industrial facilities in the area.

The site will be connected to main roads by the same access road for the Phase 1 Project site and then continuing along an existing dirt track that runs along the main ridge to the East of the Phase 2 Project site.

10.2.4.6 Heritage and Culture

There is nothing of known cultural or historic significance recorded or identified within the Project site, however, Munojat mountain and the Sultan Uvays Complex, located approximately 2.5 km and 8.2 km respectively from the wind farm site boundary, is within the wider study area.

10.2.4.7 Recreation

There are no known recreational sites in the surrounding area.

10.2.5 Landscape Character Areas

Through a combination of desktop review and site visits, the study area has been classified into four units of broadly homogenous characteristics referred to as landscape character areas (LCAs). The three LCAs are described in further detail below and shown in the following figure.

The landscape receptors were selected following guidance within the 'Guidelines for Landscape and Visual Impact Assessment' (2013).

10.2.5.1 LCA 1 – Desert

This LCA is gently undulating but has no features of topographical interest.

It is generally sandy / dusty with low desert shrub vegetation.

The A380 passes through this LCA and there are frequent HGV travelling on this road.

Pockets of anthropogenic activity exist close to the A380 such as a fuel station.

SUSCEPTIBILITY TO CHANGE

It is a relatively featureless desert landscape marked only by the presence of pockets of anthropogenic disturbance (e.g., the A380), but these are isolated sites within the much broader, large-scale landscape. It is a landscape of low susceptibility in this context.

VALUE

The area lacks any recognised features of local or national value and has few distinctive characteristics. The busy road is a notable detracting feature. It is considered to be of low value.

SENSITIVITY

LCA is considered to have a low sensitivity.

10.2.5.2 LCA 2 – Karatau Hills

The hills are a topographical feature of interest in contrast to the surrounding desert. Due to the flat surroundings, it is possible to see the Karatau hills from some distance.

The hills are unsettled and undisturbed and there is a resultant sense of isolation, however seasonal herders use the area for grazing, and have temporary structures. Additionally, there are pockets of industrial activity at the foot of the hills.

SUSCEPTIBILITY TO CHANGE

This LCA is undisturbed, however the introduction of turbines and OHTL towers will be out of character relative to the existing pattern. Therefore is a landscape of high susceptibility in this context.

VALUE

The only feature of note is the topography, and therefore it is considered to be of medium value.

SENSITIVITY

LCA is considered to have a medium sensitivity.

10.2.5.3 LCA 3 – Industrial

LCA 3 is the pockets of industrial activity within the other landscape character areas, the industrial activities relate to cement production and mining facilities. This human activity is apparent against the wider featureless landscape.

SUSCEPTIBILITY TO CHANGE

This landscape character area has significant human disturbance and is considered to be of very low susceptibility to change.

VALUE

This LCA has only detracting features and is highly disturbed and is considered to be of very low value.

SENSITIVITY

The sensitivity of this LCA is very low.

10.2.5.4 LCA 4 – Agricultural

South of the Amu Darya River the land use typically relates to agriculture with settlements, from review of satellite imagery the land appears to be well organised with distinct plots.

SUSCEPTIBILITY TO CHANGE

Being a largely settled area disturbed by agriculture, it is a landscape capable of tolerating substantial change. It is a landscape of low susceptibility in this context.

VALUE

This LCA has only detracting features and is highly disturbed and is considered to be of very low value.

SENSITIVITY

The area lacks any recognised features of value and has few distinctive characteristics. It is considered to be of low value.

The locations of the LCAs are shown in the following figure.

Table 10-1 Landscape Receptors

RECEPTOR	SENSITIVITY
LCA 1 – Desert	Low
LCA 2 – Karatau Hills	Medium
LCA 3 – Industrial	Very Low
LCA 4 - Agricultural	Low

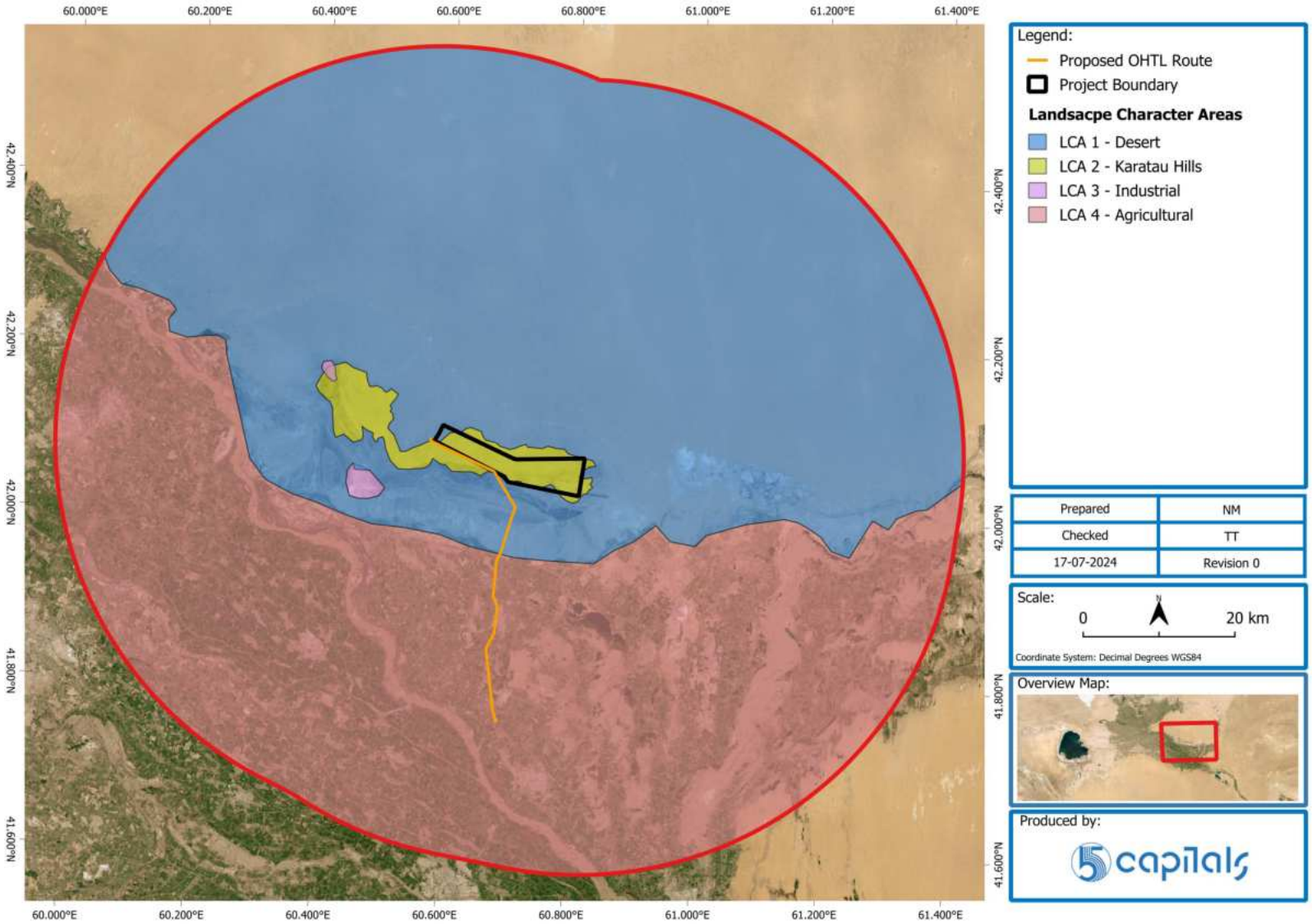


Figure 10-1 Landscape Character Areas

10.2.6 Visual Amenity Baseline

10.2.6.1 Zone of Theoretical Visibility and Receptors

The Zone of Theoretical Visibility (ZTV) represents the area over which a development can theoretically be seen, The ZTV was prepared using the specialist WindFarm software and Shuttle Radar Topography Mission (SRTM) elevation data.

The ZTV presents a 'bare ground' scenario, i.e., the visibility of the Project in a landscape without screening structures such as buildings, ground-surface features or vegetation. The ZTV also does not take into account the effects of weather and atmospheric conditions, and therefore can be said to represent a 'worst-case' scenario, that is where the wind farm could potentially be seen given no intervening obstructions and favourable weather conditions.

The ZTV indicates areas from where a wind farm may be visible, but cannot show how it will look, nor indicate the nature or magnitude of visual impacts. The visibility of the turbines will decrease with the distance from which they are viewed, but this is not accounted for in the ZTV.

ZTV calculations have been run for the height of the turbine to its hub (representing the nacelle). *The ZTV will also be helpful for proposals involving turbine lighting, as lights are usually sited on the nacelle*.

The following figure depicts the 50 km ZTV of the Project, determined using turbine locations and specifications.

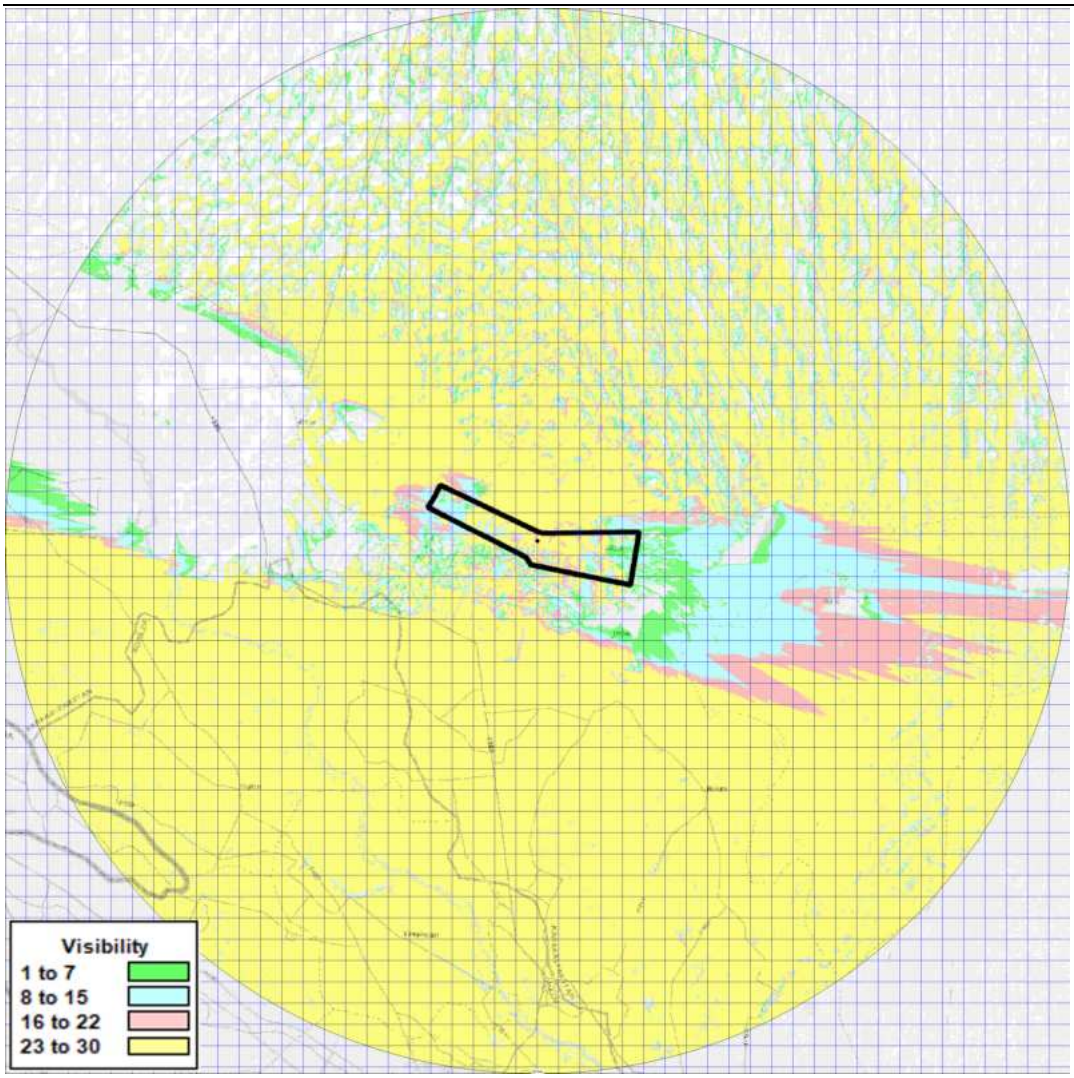


Figure 10-2 Hub Height Zone of Theoretical Visibility

As is evident from the figures, the Karatau hills to a certain extent block the view of the Project from the immediate surrounding areas apart from towards the north, where there are no receptors. Further from the Project, towards the south in the agricultural areas, there are locations in which all turbines would potentially be visible by the farmers and the residential receptors, however, it is noted that these locations are >9 km from the nearest turbine. Road users will also have views toward the Project at certain locations on the nearby roads. Due to proximity to the Project and the unobstructed views, herders utilizing areas within the WTG Project site boundaries will have an unobstructed view towards the turbines.

With the data collected by the ZTV, it is possible to highlight the areas from which the wind turbines are most likely to be visible. Using the ZTV data, four (4) locations, were chosen for a landscape and visual assessment as shown in the figure below. The chosen locations represent the view of the proposed site as seen from potential receptors in the area.

The visual amenity of the study area was surveyed from the selected locations (LV1 to LV4) determined using ZTV data to be representative of the varying views and receptor types likely to be impacted by the Project. Views from a variety of distances, aspects, elevations, and extents were considered. Receptor types include individual properties and settlements; main transport routes; and the range of landscape character types within the study area.

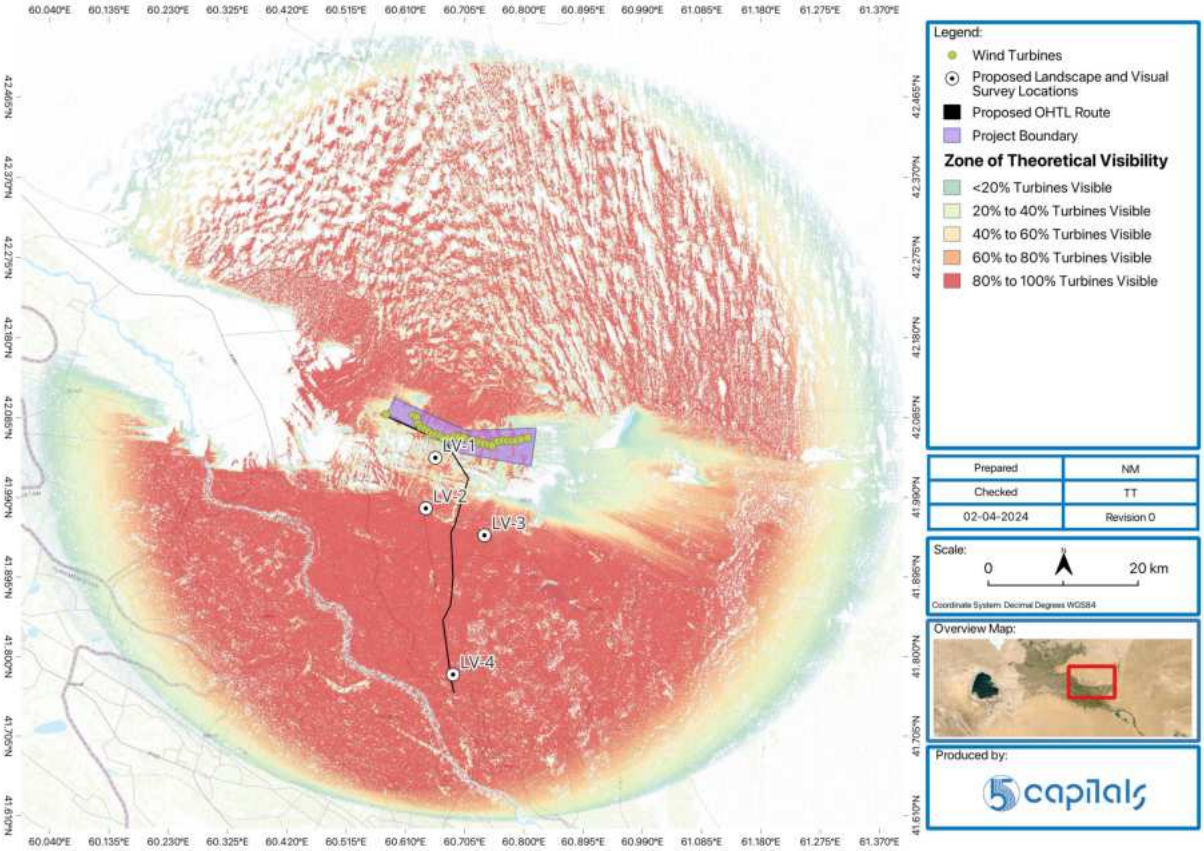


Figure 10-3 Selected Visual Receptors

Photographs from the chosen Viewpoints was taken during periods of good weather and clear atmospheric conditions to capture the optimal scenario of the best visibility towards the Project.

The construction and establishment of the OHTL will also result in landscape character changes and visual amenity impacts. Views across the OHTL route will be predominantly unobstructed, and will be visible to receptors. Nonetheless, receptors in proximity to the industrial sites are considered to be of low sensitivity and the landscape in these locations is considered to be disturbed due to the proliferation of industrial activities.

The following are considered visual receptors to the Project.

Table 10-2 Visual Receptors

RECEPTOR ID	RECEPTOR	SENSITIVITY	JUSTIFICATION
R 1-5	Local communities/villages	Medium	Receptors will have an obstructed view towards the Project site.
C-2	Sultan Uvays Complex	Medium	
C-3	Cemetery of Sultan Uvays Complex	Medium	
C-4	Local cemetery	Medium	
M-2	Marmor LLC active mining area	Low	These visual receptors are considered to be of low sensitivity as they are expected to be engaged in activities that either distract from the view or require concentration on the foreground, resulting in minimal interest or appreciation of the view, or have an obstructed view.
M-3	Active mining area	Low	
C-1	Munojat Mountain	Low	
I-1	Karakalpak Cement LLC Facility	Low	
-	Road users	Low	
-	Farmers	Low	
-	Herders	Low	

10.2.7 Shadow Flicker

An initial shadow flicker calculation was carried out by Juru (2021). The model calculation showed the expected yearly shadow (flickering) hours at 2 km from the WTG will be less than 10 hours per year. No permanent residential receptors are located within 9 km of the nearest WTG, and therefore shadow flicker impacts are unlikely to be an issue for the Project.

10.3 Potential Impacts

10.3.1 Construction Phase

During the construction phase, the Project is likely to give rise to a number of changes to the landscape character and visual amenity, arising from site preparation and construction activities.

The construction phase is predominantly a period of temporary change; however any earthmoving, recontouring or building work can result in long lasting changes to the landscape.

In addition, the construction activities in themselves may also be a source of disruption and visual intrusion. The principal construction operations likely to have temporary effects on landscape character and visual amenity include:

- fixed and mobile construction plant;
- site compounds, utilities and protective hoardings;

- earthworks and construction of substructures (e.g. excavations, foundations and perimeter walls);
- construction of the vertical structures (the proposed turbines, OHTL towers);
- construction of the access road and internal road, and
- increase in movement and disturbance associated with construction works and the operation of construction plant.

The assessment of the potential effects of the Project on landscape character and views and visual amenity during construction is provided in the following tables.

Table 10-3 Landscape Character Impacts – Construction

Landscape receptor	Sensitivity to Change	Description of Impact During Construction	Impact Magnitude	Potential Impact Significance
LCA 1 – Desert	Low	Part of the OHTL will be constructed within this LCA. Construction activities will be out of character in this remote and undeveloped LCA. Construction traffic would use the existing road network including Phase 1 access road and subseuqently taking an exisitng dirt track that runs along the main ridge of the East of the Phase 2 Project site This would bring increased noise and activity levels directly affecting this LCA, although the movement of HGVs on the A380 would not be unusual. Such effects will be temporary and the erection of the OHTL towers would occur sequentially across the site, concentrating construction activities in localised areas. Construction of the Project would not affect any positive character features within this LCA or compromise its integrity.	Minor	Minor
LCA 2 – Karatau Hills	Medium	All turbines and part of the OHTL will be located within this LCA as would, therefore, most of the construction activities. Construction traffic would use the existing road network including Phase 1 access road and subseuqently taking an exisitng dirt track that runs along the main ridge of the East of the Phase 2 Project site to access individual turbine locations. This would bring increased noise and activity levels directly affecting this LCA, although the movement of HGVs on the A380 would not be unusual. Such effects will be temporary and the erection of turbines would occur sequentially across the site, concentrating construction activities in localised areas.	Minor	Minor
LCA 3 – Industrial	Very Low	No construction activities would occur within this LCA, with a strong degree of separation due to the relative distance.	Neutral	Neutral
LCA 4 – Agricultural	Low	Part of the OHTL will be constructed within this LCA. This would bring increased noise and activity levels directly affecting this LCA, although the movement of HGVs on the A380 would not be unusual. Such effects will be temporary and the erection of the OHTL towers would occur sequentially across the site, concentrating construction activities in localised areas. Construction of the Project would not affect any positive character features within this LCA or compromise its integrity.	Minor	Minor

Table 10-4 Visual Amenity Impacts - Construction

Visual Receptor	Sensitivity	Description of Impact During Construction	Impact Magnitude	Significance of Effect
Local communities/villages (R1-5)	Medium	During construction and assembly of the WTGs and OHTL, the emergence of taller plant or structures as part of the Project would be very evident in the receptors' view over a widespread area. Construction activities would include the presence of construction traffic on the access road and this presence is out of keeping of the baseline situation. Effects relating to visibility of construction plant or partially erected structures on site, and the movement of construction traffic will be temporary.	Minor	Minor
Sultan Uvays Complex (C-2)	Medium		Minor	Minor
Cemetery of Sultan Uvays Complex (C-3)	Medium		Minor	Minor
Local cemetery (C-4)	Medium		Minor	Minor
Marmor LLC active mining area (M-2)	Low		Minor	Minor
Active mining area (M-3)	Low		Minor	Minor
Munojat Mountain (C-1)	Low		Minor	Minor
Karakalpak Cement LLC Facility (I-1)	Low		Minor	Minor
Road users	Low		Minor	Minor
Farmers	Low		Minor	Minor
Herders	Low		Minor	Minor

10.3.2 Operation Phase

It is important to note that there are few landscapes in which a wind farm will introduce a new and distinctive feature. Wind turbines are typically required to be tall and are frequently located in open or elevated landscapes, this means that they are often highly visible and incongruent with existing landscape character.

Principal aspects of the Project during operation which are likely to have permanent effects on the landscape character and visual amenity of the site and its surroundings are:

- the removal of open landscape and the introduction of WTGs;
- the establishment of access road and internal road; and
- establishment of the OHTL and substation.

The impact of the completed works would persist during the operational life of the Project. The Project will remain fundamentally unchanged throughout the duration of its operational life. No changes in this period would be expected from mitigation or normal operation.

Operational visual effects are generally considered to be partially reversible / long-term temporary as, if decommissioned and not transferred, the turbines can be removed alongside the infrastructure at the end of the operational phase, and the land is restored to similar condition as to pre-construction.

Wireframes of the Project from the aforementioned visual receptors are shown in the following figures and further discussed in the following table.

Note: *The following wireframe images were prepared on the basis of up to 29 WTGs. Recent information from the EPC Contractor has advised that only 26 WTGs will now be required and hence the below visualisations in relation to landscape and visual impacts are considered a worst-case with the inclusion of an additional 3 WTGs.*

Table 10-5 Viewpoint 1 Wireframe

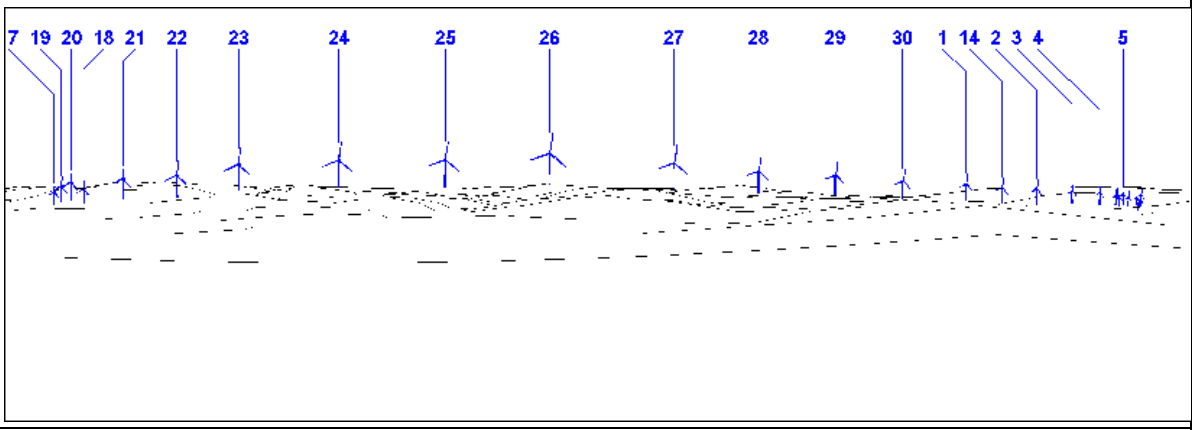
VIEWPOINT 1
WIREFRAME

DESCRIPTION
Visitors of Munojat Mountain could feasibly see 19 blade tips and 12 nacelles. The magnitude is considered to be moderate.

Table 10-6 Viewpoint 2 Wireframe

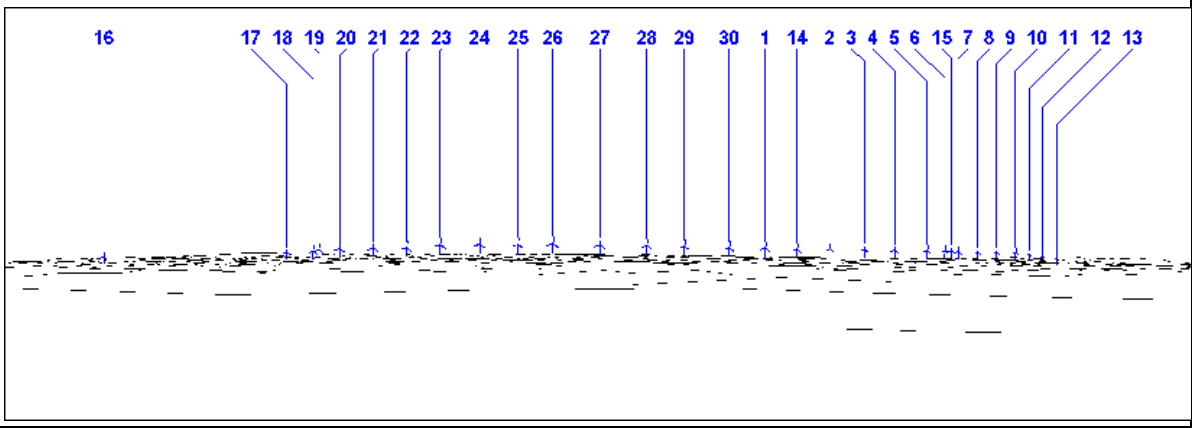
VIEWPOINT 2
WIREFRAME

DESCRIPTION
Receptors could feasibly see 29 blade tips and 27 nacelles. The view from LV2 towards the site would be unobsstructed and and therefore the turbines would be prominent across the landscape, and the magnitude is considered to be moderate.

Table 10-7 Viewpoint 3 Wireframe

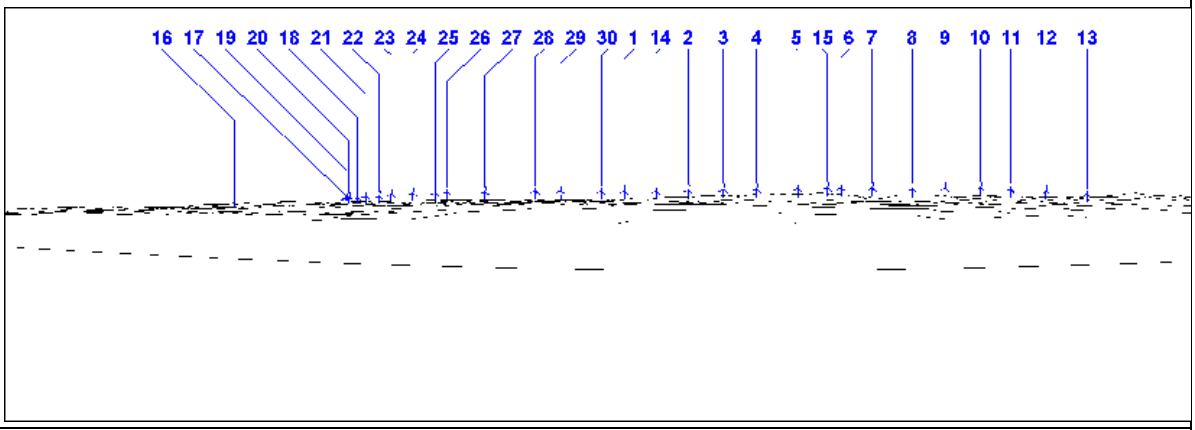
VIEWPOINT 3
WIREFRAME

DESCRIPTION
Receptors could feasibly see 29 blade tips and 28 nacelles. The view from LV3 towards the site would be unobsstructed and and therefore the turbines would be prominent across the landscape, and the magnitude is considered to be moderate.

Table 10-8 Viewpoint 4 Wireframe

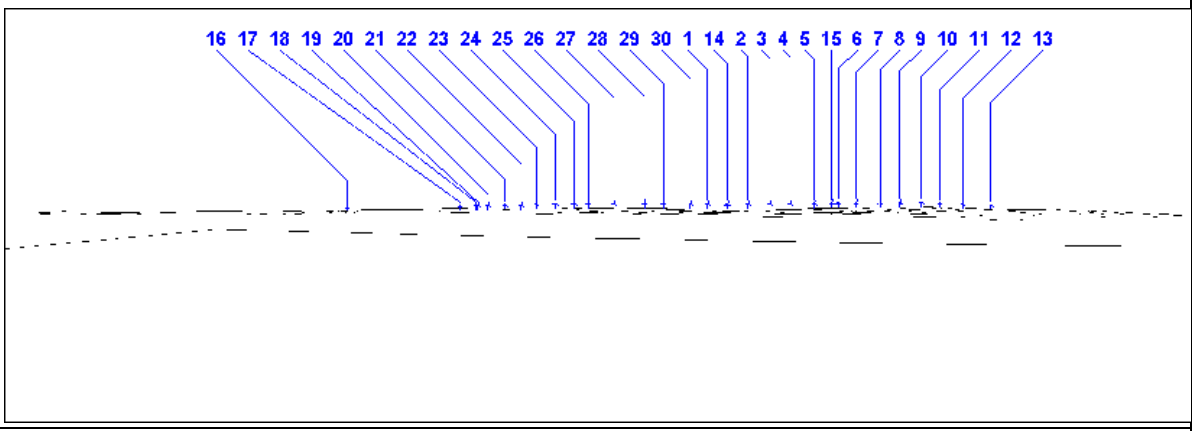
VIEWPOINT 4
WIREFRAME

DESCRIPTION
Receptors could feasibly see all blade tips and nacelles. The view from LV4 towards the site would be unobsstructed and and therefore the turbines would be prominent across the landscape, and the magnitude is considered to be moderate.

Table 10-9 Summary of Visual Amenity Impacts - Operation

Visual Receptor	Sensitivity	Impact Magnitude	Significance of Effect
Local communities/villages (R1-5)	Medium	Moderate	Moderate
Sultan Uvays Complex (C-2)	Medium	Minor	Minor
Cemetery of Sultan Uvays Complex (C-3)	Medium	Minor	Moderate
Local cemetery (C-4)	Medium	Moderate	Minor
Marmor LLC active mining area (M-2)	Low	Minor	Minor
Active mining area (M-3)	Low	Minor	Minor
Munojat Mountain (C-1)	High	Moderate	Moderate
Karakalpak Cement LLC Facility (I-1)	Low	Minor	Minor
Road users	Low	Minor	Minor
Farmers	Low	Moderate	Minor
Herders	Low	Moderate	Minor

Impacts to landscape character are discussed in the following table.

Table 10-10 Landscape Character Impacts - Operation

Landscape receptor	Sensitivity to Change	Description of Impact During Operation	Impact Magnitude	Potential Impact Significance
LCA 1 – Desert	Low	Part of the OHTL will be located within this LCA. This LCA is a featureless landscape, and the presence of the OHTL will be consistent with the existing pattern and land use of the prevailing character, although the presence of the OHTL in previously undisturbed and tranquil parts would be very apparent and less compatible	Minor	Minor
LCA 2 – Karatau Hills	Medium	All the turbines and part of the OHTL will be located within this LCA. The presence of turbines and OHTL in this remote and undeveloped LCA will be out of character and highly visible.	Moderate	Moderate
LCA 3 – Industrial	Very Low	No turbines or operational activities will be located in this LCA, with a strong degree of separation due to the relative distance.	Neutral	Neutral
LCA 4 – Agricultural	Low	Part of the OHTL will fall within this LCA. No turbines or other operational activities will be located in this LCA, but the presence of the OHTL will be visible and out of character.	Minor	Minor

10.4 Mitigation, Management & Residual Impacts

10.4.1 Mitigation and Management Measures

Visibility of a wind farm is inevitable and the efficacy of landscape and visual mitigation measures beyond the site selection and layout is extremely limited.

During both the construction and operation phase, good housekeeping will be implemented to ensure that there are no landscape and visual impacts relating to wastes and litter. In addition, during the construction phase, construction activities will be limited to the areas required and works will not be allowed to spill out unnecessarily.

10.4.2 Residual Impacts

Residual impacts will be the same as the initial significance due to the fact that no major mitigation and management measures have been proposed besides the GIIP stated previously.

10.5 Monitoring

No monitoring is proposed for landscape and visual impacts.

11 SOLID WASTE AND WASTEWATER MANAGEMENT

This chapter assesses the Project's expected generation of solid waste and wastewater during the construction and operational phases. It does not consider the significance of impacts with respect to a specific receptor (e.g., soil or groundwater quality); impacts to soil or groundwater quality with respect to solid and liquid waste management have been assessed in the Geology, Soils, Surface Water and Groundwater Chapter of this ESIA.

The primary purpose of this chapter is to identify specific management measures in regard to solid waste and wastewater generation that can be adopted in the construction & operational phase ESMS in order to ensure alignment with GIIP and compliance with applicable regulations and standards.

11.1 Applicable Requirements & Standards

11.1.1 National Regulations

THE LAW OF THE REPUBLIC OF UZBEKISTAN "ON WASTES" (2002) AMENDED IN 2019

The principle objective of this law is to prevent the negative impacts of solid wastes on human lives and health as well as the environment, reduce waste generation and encourage rational use of waste reduction techniques.

Article 19 Provided generated waste is subject to export and import operations, or hazardous waste is subject to transportation, an environmental certification procedure shall be completed by the Project to confirm compliance with sanitary and environmental norms and standards associated with waste management.

Article 20 states that transportation of hazardous waste shall be in specially designated types of vehicles with a waste certificate and permit. The responsibility for safe transportation of hazardous waste shall be with the transporting organisation.

Article 22 of the Law on Wastes specifies the general requirements for waste storage and disposal. Waste disposal of recyclable waste is prohibited in Uzbekistan. In addition, storage and disposal of waste in the environment including in nature conservation and protected areas, settlements, health and recreational areas or historical and cultural facilities is prohibited.

SANPIN NO 0127-02 – "SANITARY PROCEDURES FOR INVENTORY, CLASSIFICATION, STORAGE AND DISPOSAL OF INDUSTRIAL WASTE"

This regulation and norm ensure optimal hygienic accounting and inventory of industrial wastes, determination of toxicity index and classification of industrial waste by hazard classes with optimal selection of ways to neutralise and utilise them.

SanPiN of the Republic of Uzbekistan dated 29/7/2002 No 0128-02 – "Hygienic classifier of toxic industrial wastes in the Republic of Uzbekistan. Hazardous waste is classified into four groups known as "hazard classes". Waste hazards are assessed based on this law. Hygienic classifier of industrial hazardous waste and SanPiN No 0127-02-Sanitary procedures for industrial waste inventory, classification, storage and disposal. Waste hazard classes include:

- Class I: Extremely hazardous waste;
- Class II: Highly hazardous waste;
- Class III: Moderately hazardous waste;
- Class IV: Low hazardous waste; and

Other relevant regulations and standards include:

- SanPiN № 0157-04 "Sanitary requirements to the storage and neutralization of solid domestic waste on special grounds in Uzbekistan"
- SanPiN of the Republic of Uzbekistan dated 16/11/2011 No 0300-11 "Sanitary Rules and Standards for managing collection, inventory, classification, treatment, storage and disposal of industrial waste in the context of Uzbekistan
- Regulation "On the Procedure for the Disposal, Collection, Pay Settlement, Storage and Removal of Waste Industrial Oils" annexed to the Decree of the Cabinet of Ministers dated 04/09/2012 No.258
- Regulation on the Procedure for Handling Coloured and Black Metal Scrap" annexed to the Decree of Cabinet of Ministers dated 06/06/2018 No. 425
- SanPiN No. 0158-04 - Sanitarian Rules and Norms on collection, transportation and disposal of wastes containing asbestos in Uzbekistan

11.1.2 Lender Requirements

SOLID WASTE

ADB

The Environmental Safeguard requires the borrower/client to avoid, or where avoidance is not possible, to minimise or control the generation of hazardous and non-hazardous wastes and the release of hazardous materials resulting from project activities. Where waste cannot be recovered or reused, it will be treated, destroyed, and disposed of in an environmentally sound manner.

Where the waste disposal is conducted by third parties, the borrower/client is required to use reputable and legitimate enterprises licensed by the relevant regulatory agencies.

AIIB

ESS1 – Environmental and Social Assessment and Management: Point 38 states the need to '*Minimize and manage waste generation, including through waste reduction and recycling, and release of hazardous materials from production, transportation, handling and storage.*'

EPFIs

Section 1.6 of "the IFC General EHS Guidelines" is entitled Waste Management and is applicable to all projects that generate, store or handle any quantity of waste; whilst Section 1.5 of the IFC EHS Guidelines covers Hazardous Materials Management. The waste management guidelines state that facilities that generate and store wastes should practice the following:

- Establish waste management priorities at the outset of activities;
- Identify EHS risks and impacts and consider waste generation and its consequences;
- Establish a waste management hierarchy that considers prevention, reduction, reuse, recovery, recycling, removal and finally disposal of wastes;
- Avoid or minimize the generation of waste materials, as far as practicable;
- Identify where waste generation cannot be avoided but can be minimized or where opportunities exist for, recovering and reusing waste; and
- Where waste cannot be recovered or reused, identify means of treating, destroying, and disposing of it in an environmentally sound manner.

WASTEWATER

EPFIs

The IFC/WBG General EHS Guidelines (2007) establish general requirements for direct or indirect discharge of wastewater from utility operations or storm water to the environment.

'*Projects with the potential to generate process wastewater, sanitary (domestic) sewage, or storm water should incorporate the necessary precautions to avoid, minimize, and control adverse impacts to human health, safety, or the environment*'.

However, wastewater effluent pollutant limits are only established for sanitary wastewater for discharge to the sanitary sewer systems. World Bank General EHS Guidelines (2007) (ref. Table 1.3.1 of IFC EHS Guidelines), provides indicative values for treated sanitary wastewater effluent.

11.2 Baseline Conditions

11.2.1 Solid Waste

Waste management in Uzbekistan is an issue as waste is being collected and disposed in dump sites in the absence of proper management practices and infrastructures including sorting facilities or landfills. In 2019, a Solid Waste Management Strategy for the period of 2019 – 2028 was put in force. According to the Resolution of the President of The Republic of Uzbekistan Of April 17, 2019 No. Pp-4291 "*In the absence of sufficient waste management services only 40 - 50% of the municipal solid waste generated in rural settlements is being collected while these services are almost absent in the remote rural areas*". The objective of the strategy is to enhance the waste management services including transportation, storage, disposal and recycling.

The State Unitary Enterprise (Toza hudud translated to "Clean area") and its district/city branches are in charge of collecting, transporting, and disposing MSW in Karakalpakstan. EBRD have recently announced that they are extending long-term sovereign loans of up to US$120 million for the benefit of Toza Hudud, the regional utility company responsible for solid waste management in Horezm and Karakalpakstan (Usov, 2022).

EBRD state that Karakalpakstan occupies more than one-third of Uzbekistan's total territory and the almost 2 million inhabitants generate around 187,000 tonnes of solid waste a year. Half the region's population lives in rural areas and only a third of local residents are covered by waste collection services.

The US$70 million loan will enable a new EU standards-compliant sanitary landfill to be built in Nukus and the reconstruction of three existing waste disposal sites, located in the Turtkul, Kungrad and Karauzyak districts. The Project also includes the construction of eight transfer stations (in the Amydarya, Khodjeyli, Beruniy, Ellikkala, Kanlykul, Muynak, Chimbay and Takhtakupyr districts (which are planned to be located at the sites of the existing district landfills).

The locations of existing and planned waste management infrastructure relative to the Project are shown on the following figure. The approximate Project location is shown by the circle with a white dash outline.

As is evident from the figure, the site is located between the Karauzyak and Turtkul District Landfills, while the proposed Nukus City Landfill will be closer to the site. The Amydarya waste transfer station is the closest transfer station.

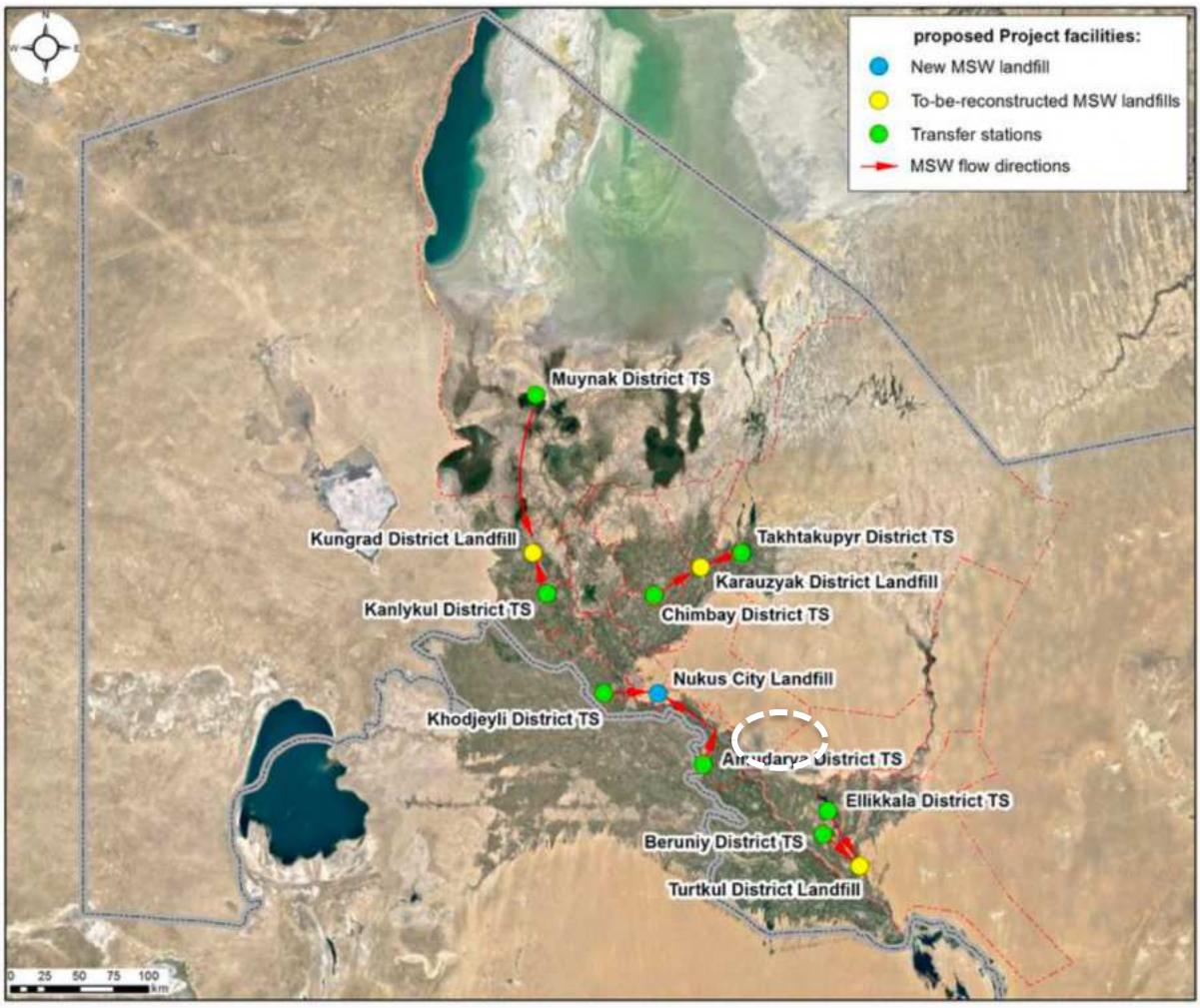


Figure 11-1 Scope of the Karakalpakstan Solid Waste Project (CECT, 2022)

11.2.2 Wastewater

In Uzbekistan in 2016 roughly 3.7 million people (12 percent of the total population) were reported to be served by a centralised sewerage system, most of them in Tashkent city and Tashkent region. In other regions, on average only five percent of the population is connected to a centralized sewerage system (World Bank Group, 2020). The status of rural sanitation is not well documented and has largely been left to the initiative of households and communities. Most households in rural areas rely on self-built, onsite sanitation such as dry pit latrines or, for households with indoor bathroom facilities, septic tanks with on-site disposal. Where households have septic tanks, emptying / servicing them is the responsibility of the Suvokova (or water utility provider), on a demand basis.

The World Bank currently have an active project titled 'Uzbekistan – Water Services and Institutional Support Project' of which one component includes the reconstruction and expansion of sewerage systems in selected subproject areas within Nukus, Takhiatash and Khodjeyli of Karakalpakstan.

In addition, the Asian Infrastructure Investment Bank (AIIB) have a project listed on their website titled 'Uzbekistan: Karakalpakstan and Khorezm Water Supply and Sanitation Project.' Component 2 of the project includes the "*Construction of centralized sewage systems in 10 district centers in the Republic of Karakalpakstan and 8 district centers in Khorezm Region consisting of collectors, pumping stations, new construction of sewerage system and sewage treatment plants as well as discharge and optional reuse facilities*."

It is therefore understood that projects are underway to improve the existing wastewater management facilities in the region, and the nearest facility is expected to be in Nukus.

11.2.3 Site Specific Information

Consultations were conducted in order to understand waste and wastewater management in the Project area, and it was determined that waste is incinerated or buried in four communities, while "Toza Hudud" collects waste only in Mahtumkuli community.

11.3 Potential Impacts

11.3.1 Construction Phase

The construction phase will produce significantly more waste than the operation phase and, if not managed in line with GIIP, can result in environment and social impacts.

11.3.1.1 Solid Waste

Waste will be generated from the construction of the wind farm, access road, OHTL and substation and will be generated in all stages of construction. Typical construction wastes include concrete, asphalt, scrap metal, glass, plastic, wood, packaging materials, excess cables, and domestic waste from construction workers (i.e., relating to food consumption).

Solid waste generated during the construction phase will include the following:

- Non-hazardous wastes such as:

  Wastes related to construction processes, including earthworks (such as rubble, soils and potentially rock) and installation (such as bolts, rebar, etc.);

  Paper/cardboard, plastics, packaging, plastic bottles, glass, scrap metal, excess fill materials, sand, gravel, excess construction materials, concrete, subsoil and rock; and

  Domestic waste generated by the construction workforce (e.g., food/organic waste, paper, cardboard, aluminium, plastic), including wastes generated in accommodation facilities.

- Hazardous wastes such as:

Batteries (unused), chemical drums, aerosol cans, contaminated metals, expired and unused chemicals, adhesives, lubricants, clean-up materials such as rags, containers and tins with remains of hazardous substances, used spill kits and clean-up materials;

Replacement parts from vehicles, plant and equipment; and

Residual materials from electrical equipment installation such as Waste Electrical Equipment (WEE).

Inappropriate handling of hazardous waste streams through lack of personnel training on site may lead to accidental release of hazardous waste contaminating soil or groundwater. Contamination may also arise as a result of poor-quality waste transporters and waste management facilities, or lacking capacity of these services locally. These risks may consequently result in illicit waste disposals (e.g. fly-tipping, or waste disposal at unlicensed locations), or the engagement of unlicensed contractors/facilities.

As there are only 26 WTGs, and construction locations will be discrete, it is considered unlikely that considerable amounts of waste will be generated. In addition, construction of both the wind farm and the OHTL will comprise primarily of the assembly of prefabricated structures, and therefore, the amount of solid waste that will be generated along the OHTL route will not be significant. However, inappropriate handling, storage, transport and/or disposal of these solid wastes may pose the potential to pollute the surrounding environment (i.e. soil and groundwater resources), cause odour and visual nuisance, encourage pests or result in occupational health and safety issues.

Note: Maintenance of construction machinery and vehicles is not anticipated to be undertaken within the OHTL construction area as such the generation of associated vehicle related waste such as oil filters, spend filtration cartridges, machinery lubricants is not expected along the OHTL route.

NON-HAZARDOUS SOLID WASTE

Non-hazardous construction waste is typically inert and does not readily pose a threat to human health or the environment (apart from certain scenarios e.g., ingested by fauna). However, proper management is required in order to reduce associated secondary impacts such as unnecessary resource use, dust emissions, etc.

HAZARDOUS SOLID WASTE

Due to the nature of the Project and the construction works being undertaken, there will be limited hazardous materials used. Such materials may result in fuel containers waste, oily residues, paints, paint cans and wastes from chemical cleaning products.

Although the hazardous fraction of construction waste is expected to represent a relatively small portion of the total amount of construction waste likely to be generated, its management requires careful consideration as the impacts associated with hazardous waste can potentially

result in contamination to soils and groundwater, as assessed in the Geology, Soils, Surface Water and Groundwater Chapter of this ESIA.

Inappropriate management, storage, handling, transfer or transportation of hazardous wastes through lack of personnel training on site may lead to accidental spills or leaks, resulting in environmental impacts and potential health risk to workers. Contamination events may also arise as a result of transportation by unlicensed waste contractors or disposal to unlicensed/unauthorised landfills. Waste management planning is therefore critical in order to minimise potential significant impacts.

At this stage it is not known if the landfills in the region (Turtkul and Karauyzak) accept hazardous wastes, and this will need to be confirmed by the EPC Contractor. Hazardous waste generated by the Project will most likely be transported by road vehicles to a licensed hazardous waste facility, either one of these two landfills or a location outside the region. Therefore, it will be particularly important to properly store the waste in designated and secured hazardous waste storage areas at the site until collection for final disposal. These areas will include secondary containment and drip trays to contain spillages, secure fencing to control access, proper safety signage and a roof structure to prevent rain water entering and dispersing hazardous substances.

The EPC Contractor has confirmed that they intend to contract the same government licensed waste management services contractor that they are currently using for the Nukus I WF project.

Solid waste streams likely to be associated with the construction phase of the project are listed in the table below.

Table 11-1 Anticipated Solid Waste Types Associated with the Construction Phase

TYPE	WASTE STREAM
Inert	Subsoil and Rock
	Glass
Non-Hazardous	Concrete and cement
	Asphalt
	Scrap metal
	Wood
	Plastic
	Packaging
	Municipal waste from construction workers
Hazardous	Contaminated soil/asphalt
	Resins and paints
	Waste oils
	Waste solvents and thinners

Type	Waste Stream
	Waste fuel and chemicals.
	Batteries
	Used spill kits and clean up materials.
	Waste Electrical Equipment (WEE)

11.3.1.2 Wastewater

Wastewater generated from the Project's construction activities includes the following:

- Sanitary and domestic wastewater generation;
- Wastewater from any vehicles or equipment washing/cleaning. Note: The EPC Contractor has confirmed that vehicle washing will only take place in dedicated cleaning facilities, which are available in nearby towns.
- Liquid hazardous waste such as fuels, chemicals, paints, lubricants, solvents, waste oil, hydraulic fluid, resins, waste solvents and thinners, etc.; and
- Concrete washout.

For sanitary and domestic wastewater, it is anticipated that there will be 200 workers at the peak period of construction.

The quantities of sanitary & domestic wastewater can be estimated as an average of 0.1 m^3/person/day (100 litres). Therefore, wastewater is estimated to total 20 m^3 at peak periods of construction. It should be noted that the figure of 0.1 m^3/person/day relates to overall water consumption including at accommodation areas and includes any use of water for washing, cleaning purposes etc.

Wastewater will be stored within septic tanks on-site, prior to removal by a licensed contractor. It is expected that wastewater will be taken to a facility in Nukus, although this will be confirmed by the EPC Contractor. Improper handling, storage and transportation of sanitary and domestic wastewater could potentially cause contamination to soil or groundwater resources; as assessed in the Geology, Soils, Surface Water and Groundwater Chapter of this ESIA.

11.3.2 Operation Phase

The operational phase of the Project will result in the generation of limited waste streams from operation & maintenance activities, with the vast majority of waste likely to be non-hazardous.

Nevertheless, if these waste streams are not managed and disposed of effectively, they could result in significant impacts upon the surrounding environment (e.g., soil and groundwater resources, attraction of pests, nuisance odour etc.).

11.3.2.1 Solid Waste

Solid waste is not expected to be generated in significant quantities during the operational phase of the wind farm besides maintenance for transformers, and general day-to-day maintenance activities of administration facilities.

NON-HAZARDOUS SOLID WASTE

The operation of the Project will generate small amounts of non-hazardous domestic waste from the operation of the administration facilities and from activities of the employees.

This waste can be classified as both recyclable and non-recyclable. Recyclable waste includes paper, tin cans, plastics, cartons, rubber, and glass, while non-recyclables will consist mainly of food residues and other organic wastes.

The quantity of domestic waste will be small given the few anticipated personnel required to operate the Project. Other solid non-hazardous waste generated during operation will be any landscaping wastes and uncontaminated replacement parts and packaging. Replacement of significant component of the wind turbines such as blades, nacelle and associated electrical components may be required in the event of major failure. However, such components are expected to be returned to the turbine supplier for repair or recycling.

The type of non-hazardous solid waste that will be generated by O&M personnel include packaging waste (plastics, cardboard) and domestic wastes mainly food residues and other organic wastes

HAZARDOUS SOLID WASTE

This fraction of the waste streams can potentially cause significant adverse impacts on human health and the environment if inadequately managed. However, only very small quantities of hazardous materials (and waste) are expected during the operational phase of the Project.

Examples of possible hazardous waste streams that may arise during the operation of the Project include the following:

- Electronic waste such as battery units;
- Used chemical containers and drums;
- Soil contaminated by potential spills and leaks of hazardous materials/liquids and used spill kits and clean up materials;
- Miscellaneous wastes such as waste cables, oily rags, etc.;
- General clean-up materials and solvents from general maintenance of on-site plant and machinery; and
- Electrical waste (spare parts, obsolete equipment) – specific to the OHTL

Inappropriate handling of hazardous waste streams through lack of personnel training on site may lead to accidental release of hazardous waste contaminating soil or groundwater, and associated impacts on human health and sensitive biodiversity within receiving environments. Contamination may also arise as a result of poor-quality waste transporters and waste management facilities, or lacking capacity of these services locally. These risks may consequently result in illicit waste disposals (e.g., fly-tipping, or waste disposal at unlicensed locations), or the engagement of unlicensed contractors/facilities).

11.3.2.2 Wastewater

Liquid waste generated from operational activities will include the following:

- Sanitary and domestic wastewater generation from operation and maintenance staff;
- Oily Water (to collect spills/leaks from transformer areas) will be in very small quantities; and
- Liquid hazardous waste (if any) such as fuels, chemicals, paints, lubricants, solvents, waste oil, hydraulic fluid, resins, waste solvents and thinners, etc.

Sanitary and domestic wastewater will be generated directly from site toilets and kitchen facilities and will make up the majority of operational wastewater. All sanitary streams will be directed to the septic tank for collection and disposal by a licensed contractor, likely to a facility in Nukus.

Any oily wastes from the transformer area, or other floor drains in oily areas, will collect oily water in a sump and will be treated in an oil separator for settlement of solids. The residual oil and solids will be collected for recycling and/or disposal by a licensed contractor.

The improper handling, transport and disposal of hazardous wastes could lead to potential localised contamination of soil and groundwater resources, which have been assessed for significance in the Geology, Soils , Surface Water and Groundwater Chapter of this report.

11.3.3 Decommissioning Phase

During decommissioning of the wind farm, there is a potential for inert demolition waste and materials such as steel reinforced bars, broken concrete, cabling, transformer oils etc. to contaminate soils.

Prior to decommissioning, it is expected that all oils will be drained. This will minimize the risk for accidental spills and leaks during removal from equipment from the site. As transformer oil & other oils are classified as hazardous liquid waste they will be collected for recycling and/or disposal by a licensed contractor.

The decommissioning of the wind farm provides significant opportunity for resource efficiency and material re-use/recycling. All demolition work will be carried out with reference to IFC EHS Guidelines 1.6 Waste Management, IFC EHS Guidelines 1.5 Hazardous Materials Management, IFC PS3 on Resource Efficiency and Pollution Prevention and EBRD PR3 on Resource Efficiency and Pollution Prevention and Control.

11.4 Mitigation and Management Measures

11.4.1 Waste Characterisation

Waste can exhibit certain characteristics according to the process stream from which it is generated and any pre-treatment processes that are undertaken. Different types of waste require different management and disposal techniques according to the potential risk that the material poses to human health or the environment. For this Project, waste has been classified into the three (3) main categories in the following table.

Table 11-2 Waste Characterisation

WASTE CLASSIFICATION	DESCRIPTION
Domestic Waste	Wastes such as organic wastes, paper, cardboard, plastic, cans, etc. Disposal of such waste can generally be routed to municipal recycling or disposal facilities.
Industrial Waste	Non-hazardous wastes that have physical and chemical characteristics that are different from domestic wastes such as construction waste, glass, scrap metal, wood, used containers, tyres etc. This waste generally poses little risk to the environment and can be disposed to normal municipal facilities after waste minimisation options are exhausted and before obtaining approval.
Hazardous Waste	Waste is classified as being hazardous because of its concentration; physical, chemical or infectious characteristics, which may pose a present or potential threat to human health or the environment and/or may cause an increase in serious irreversible or incapacitating reversible illness or contribute to an increase in mortality. Under the Basel Convention, hazardous waste is as any waste (i.e. solid, liquid or gaseous) having the following properties: Explosive; Radioactive (which includes NORM (LSA) scale); Ignitable or flammable substances; Poisons with acute and chronic (delayed) toxicity; or Substances that by interaction with water might become spontaneously flammable or give off flammable gases. Hazardous wastes must be segregated, stored, transported and ultimately treated and disposed of by an approved waste services provider.

11.4.2 Waste Management Hierarchy

The waste management hierarchy illustrates good practice for waste management considerations by ensuring consideration of the most sustainable available application for

waste management in preference of disposal and eventual contribution to adverse environmental and economic impacts associated with landfill. The hierarchy, as illustrated in the following graphic, should form a key element of any waste management strategy and if implemented effectively will achieve maximum reductions on waste quantities combined with the limited use of resources and fill space. The waste management hierarchy also has the potential to reduce costs that may be incurred by the EPC Contractor or the proponent for handling, transportation and the disposal of waste.

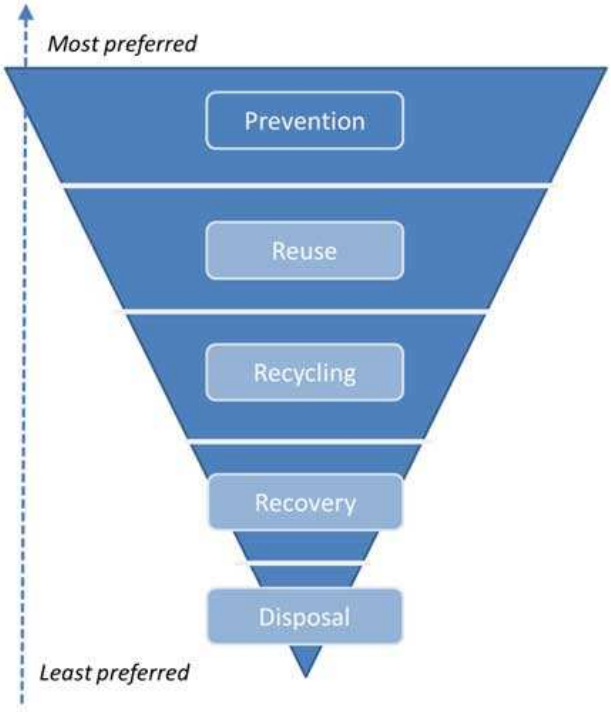


Figure 11-2 Waste Management Hierarchy (UNEP, 2011)

Initially, options to prevent or reduce waste should be considered. Where waste generation cannot be avoided or further reduced at source, opportunities for reuse of materials should be explored, either for use for the same or a different purpose. Disposal to landfill is the least favoured option in the waste hierarchy and is the last resort after all other options have been considered.

Such an approach is also used in other areas of the world. US-EPA's Waste Minimisation Program presents the following objectives:

- Complete elimination of, or substitution for priority chemicals, wherever possible;
- Minimising the number of priority chemicals used whenever elimination or substitution is not possible;
- Maximising recycling whenever elimination, substitution, or minimisation is not possible, creating closed-loop materials management systems that eliminate or constrict release pathways;

- Promoting cradle-to-cradle waste management instead of cradle-to-grave waste management.

11.4.3 Construction Phase

Table 11-3 Waste and Wastewater Construction Phase Mitigation and Management Measures

IMPACT/SOURCE	MITIGATION AND MANAGEMENT MEASURES
Inappropriate handling, storage, transport and disposal of solid non-hazardous waste	• The EPC Contractor will develop and implement a Project-specific Construction Waste Management Plan (CWMP) in line with committed mitigation measures in this ESIA report and the provisions of the CESMP. • The EPC Contractor will identify the most suitable waste management facility to dispose of the generated wastes. • The EPC Contractor will identify recycling companies in the region in order to promote the recycling of waste especially packaging materials, wood and metal waste etc. • Domestic solid waste will be segregated and identified from the other waste streams into separate waste containers/skips clearly to facilitate recycling and reuse. • Waste containers/skips will be clearly labeled and placed in designated waste storage locations. Labels will be waterproof, securely attached, and written in English and other languages (such as Uzbek and Russian) as required for the workforce. • For litter (food waste, domestic waste), an adequate number of covered bins will be strategically placed throughout the site at locations where construction workers and staff consume food. These will be regularly collected and taken to the main waste storage area. • Food waste will be stored within a sealed metal or plastic skip or bin, in order to prevent pests gaining access. • On-going housekeeping training will be provided to all staff on the importance of the need to avoid littering. • Heavy waste may be contained within an open skip, provided that segregation occurs effectively enough to remove all lightweight material that could be blown away. • Waste generated during construction will be recycled and reused until reduced to as low as practicable prior to collection for disposal by an appropriately licensed waste contractor. • Only licensed waste transporters and waste management facilities will be engaged. • A waste inventory will be developed and maintained to document and track domestic solid wastes generated, segregated, reused and consignments • Completed waste manifests will be required to show the chain of custody of the waste generated on site, its transportation and treatment/disposal. All records will be maintained on site. • All employees will attend a mandatory training program to increase their awareness of waste management protocols including proper handling and storage of waste, recycling waste, reusing plastics, rebar, wood & other reusable non-hazardous materials.
Inappropriate/un controlled handling, storage, transport and/or	• The EPC Contractor will identify a suitable facility to handle the hazardous wastes.

IMPACT/SOURCE	MITIGATION AND MANAGEMENT MEASURES
disposal of solid hazardous waste	• A hazardous waste inventory will be developed and maintained to document and track hazardous wastes generated, segregated, reused and consignments. • Hazardous wastes will be identified and segregated from the other waste streams into separate labeled waste containers/skips. • Hazardous wastes will be stored in allocated impervious hard standing areas in sealed containers stored with impermeable bases, sufficient containment and separation capacity, sun/rain shelter, separate drainage system, good ventilation and equipped with spill kits & spill response procedures. This area must be placed away from any sources of ignition. • Hazardous waste storage areas will be constructed away from drainage system and a rain shelter will be provided to avoid any potential instance of runoff, or leakage of runoff. • Waste containers will be clearly marked with appropriate warning labels to accurately describe their contents and detailed safety precautions. Labels will be waterproof, securely attached, and written in English and other languages as required for the workforce (such as Uzbek and Russian). Wherever possible, chemicals will be kept in their original container. • Hazardous waste storage areas will be located away from any ignition sources or fire hazards. • Used face masks will be stored in designated bins and disposed of as medical waste.
Inappropriate/un controlled handling, storage, transport and/or disposal of sanitary wastewater	• The EPC Contractor will develop and implement a Project-specific Construction Waste Management Plan (CWMP) in accordance with committed mitigations measures in this ESIA report and provisions of the CESMP. • The EPC Contractor will identify a suitable wastewater treatment facility for disposal of wastewater and identify a licensed wastewater contractor for the periodic removal of wastewater. • A hazardous waste inventory will be developed and maintained to document and track sanitary waste generated and segregated. • Sanitary wastewater tanks will be placed in allocated impervious hard standing areas with bonding capacity to hold 110% volume of the maximum volume stored. • Sanitary wastewater tanks to be properly maintained and inspected to ensure tanks do not overflow. • Site inspections will be carried out regularly by the EPC contractor to ensure that all wastewater generated is properly managed, and no leakages or spill occur. In the event of a spill or overflow, immediate action will be taken in accordance with spill containment procedures and clean up procedures (to be developed in line with the CESMP). • In common with the IFC EHS Guidelines, effort will be made in training construction personnel to minimise water consumption for ablutions and to ensure an understanding of water resource and wastewater issues.
Inappropriate handling and disposal of contaminated soil from clearing and excavation works causing cross-	• The construction workforce will receive training enabling them to be able to identify signs of potential contamination (e.g., smell of hydrocarbons, staining). • If contamination is found, a Contaminated Soil Management Plan will be developed and implemented to ensure appropriate handling, treatment and disposal of soil

IMPACT/SOURCE	MITIGATION AND MANAGEMENT MEASURES
contamination of soils	
Inappropriate handling of concrete washout	• Concrete washout will only be undertaken in designated and signed areas to prevent leaks or spread of wastewater. • The concrete washout area will be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations. • The concrete washout area will have an impermeable surface with dedicated drainage systems that lead to separate sumps or treatment facility. • The removal of any sludge residues as solid hazardous waste will be undertaken by a licensed waste contractor and handled as a hazardous waste.
Medical Waste	• Any generated medical waste (e.g., from on-site clinics) shall be stored in appropriate medical waste containers. • All medical waste shall only be handled by trained personnel. • The removal of any medical waste from the site for appropriate treatment, disposal/incineration will only be conducted by a licensed contractor.

11.4.4 Operation Phase

Table 11-4 Waste and Wastewater Operation Phase Mitigation and Management Measures

SOURCE	MITIGATION AND MANAGEMENT MEASURES
Inappropriate handling, storage, transport and disposal of non-hazardous solid waste	• The O&M Company will develop and implement a Project-specific Operational Waste Management Plan (OWMP) in line with committed mitigation measures in this ESIA report and the provisions of the OESMP. • Domestic solid wastes to be segregated and identified from the other waste streams into separate waste containers/skips clearly to facilitate recycling. • Waste containers/skips should be clearly labeled and placed in designated waste storage locations. Labels will be waterproof, securely attached, and written in English and other languages as required for the workforce such as Uzbek and Russian. • For litter (food waste, domestic waste), an adequate number of covered bins should be strategically placed throughout the site at locations where construction workers and staff consume food. These will be regularly collected and taken to the main waste storage area. • Food waste must be stored within a sealed metal or plastic skip or bin, in order to prevent pests gaining access. • Heavy waste may be contained within an open skip, provided that segregation occurs effectively enough to remove all lightweight material that could be blown away. • Paper cardboard, metal cans, plastic, glass to be collected for recycling by a licensed waste contractor. • Only licensed waste transporters and waste management facilities will be engaged. • The Contractor will maintain copies of the waste management licensed on site.

SOURCE	MITIGATION AND MANAGEMENT MEASURES
	• Develop and maintain a waste inventory to document and track domestic solid wastes generated, segregated, reused and consignments • Completed waste manifests are required to show the chain of custody of the waste generated on site, its transportation and treatment/disposal. All records will be maintained on site.
Inappropriate/uncontrolled handling, storage, transport and/or disposal of sanitary wastewater	• Sanitary facilities should be provided with adequately designed underground storage tanks. • Sanitary wastewater tanks to be properly maintained and inspected to ensure tanks do not overflow. • Sanitary wastewater tanks in allocated impervious hard standing areas with bunding capacity of 110% volume of the maximum volume stored. • Sanitary wastewater treated at the onsite sewage treatment plant must meet established limit for landscaping. • Where there are no onsite sewage treatment plant, a licensed waste contractor will be engaged for the periodic removal of tank.
Inappropriate/uncontrolled handling, storage, transport and/or disposal of solid hazardous waste	• Develop and maintain a hazardous waste inventory to document and track hazardous wastes generated, segregated, reused and consignments. • Segregate and identify hazardous waste from the other waste streams into separate waste containers/skips clearly signed and labelled. • Store hazardous waste in allocated impervious hard standing areas in sealed containers stored with impermeable bases, sufficient containment and separation capacity, sun/rain shelter, separate drainage system, good ventilation and equipped with spill kits & spill response procedures. This area must be placed away from any sources of ignition. • The O&M Company will establish an on-site storage facility (i.e., designated holding area) where electronic O&M refuse, including spent batteries, will be kept prior to scheduled transportation to specialized recycling facilities in or out of Uzbekistan (in accordance with the Hazardous Waste Management Plan). • Waste containers should be clearly marked with appropriate warning labels to accurately describe their contents and detailed safety precautions. Labels will be waterproof, securely attached, and written in English and other languages as required by the workforce such Uzbek & Russian. Wherever possible, chemicals will be kept in their original container. • Used face masks shall be stored in designated bins and disposed of as medical waste. • A Hazardous Materials and Waste Management Plan will be developed prior to COD and implemented for the Project's O&M phase. The Plan will include arrangements and provisions (i.e., storage area/capacity, frequency of collection, distance of nearest disposal facilities) for various streams of waste, in consideration of the location of their respective management/ disposal facilities.

11.5 Monitoring

The following table outlines the proposed monitoring for waste and wastewater impacts.

Table 11-5 Waste and Wastewater Monitoring Requirements

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION	RESPONSIBLE ENTITY
Inspect and monitor proper handling and storing of waste materials	Check storage areas containment and control procedures as per CESMP/OESMP	Daily	Storage areas at the site	- EPC Contractor E&S Manager during the Construction Phase - O&M Contractor E&S Manager during the Operation Phase
Inspect and monitor third party waste contractors and disposal facilities	Ensuring engaged contractors, their vehicles and waste management facilities have applicable registrations/licenses at time of procurement	At procurement and annually thereafter	Contractors, transport vehicles and waste management facilities	- EPC Contractor E&S Manager during the Construction Phase - O&M Contractor E&S Manager during the Operation Phase
Waste Transfers	Record keeping of waste transfer notes	On-going	As waste is transferred during construction and operational phases.	- EPC Contractor E&S Manager during the Construction Phase - O&M Contractor E&S Manager during the Operation Phase

12 TRAFFIC AND TRANSPORTATION

12.1 Applicable Requirements & Standards

12.1.1 National Regulations

The Ministry of Transportation is responsible for all transport related activities and their requirements should be fully complied with in terms of routing of HGVs and site vehicles, licensing, road diversions, heavy/wide loads etc. Some of the relevant national requirements for the Project include:

- Law "About traffic safety" of the Republic of Uzbekistan August 19, 1999 No. 818-I (as amended on 29-12-2015): The main objective of this law is to ensure protection of life and health of citizens and their protection.
- Regulations on road safety during transportation of large and heavy loads by road transport (Annex No.2 to the Decree of Cabinet of Ministers No. 342 of December 26, 2011): This law determines the requirements of ensuring and coordinating traffic safety during the transportation of large size and heavy loads on public roads on the territory of Uzbekistan. It also details the basic requirements for the technical condition equipment and furnishing of vehicles used for the transport of large and heavy loads as well as safety.
- Criteria and Procedure for Determining International Road Transportation of Loads (approved by the Decree of Ministry of Transport of the Republic of Uzbekistan and State Customs Committee of the Republic of Uzbekistan dated October 31, 2019, No. 6).
- Regulations on transport of loads by road in the Republic of Uzbekistan (Annex to Decree of Cabinet of Ministers No. 213 of 01.08.2014)

12.1.2 Lender Requirements

ADB, AIIB and EPFIs

The assessment will be undertaken with due consideration of the recommendations set out within the IFC/World Bank General EHS Guidelines (2007) Section 3.4 Traffic Safety, within Section 3: Community Health and Safety.

Separate considerations regarding Community Health and Safety are also provided in the IFC EHS Guideline for Wind Energy (2015). This includes relevant items for 'Abnormal Load Transportation'.

12.1.3 Transportation of WTG Components to Site

Transportation route surveys were undertaken by ACWA Power in August 2021 for the transportation of the heavy project components (blade, nacelle, hub etc.).

The survey was undertaken between sites in China (Bayannaoer, Eerduosi, Jiuquan, Wulumuqi and others) to Khorgos borders in China and from Khorgos border to custom points on the China – Kazakhstan border. From the custom points, project components will be transported to custom points at Yallama (on the Kazakhstan – Uzbekistan border) and onwards towards the Project site.

Figure 12-2 shows the transportation route surveyed from Yallama to Karatau, a distance of approximately 1,010 km.

The M39 road will be used for the initial stage of the journey toward Karmana, the route then continues along the A380 via Bukhara, Gazli, Turtkul and Beruni.

The A380 that runs in a northwest/south-east direction west of the Project site is an international road that runs between the cities of Nukus and Bukhara. The roadway along the section that runs parallel to the site is in poor condition with numerous potholes and cut-outs. The road will require substantial rehabilitation and maintenance. The road is also frequently used by HGVs passing to and from the industrial facilities in the area. There is also a freight railway line that runs adjacent to sections of the A380 closest to the site. There are no airfields or airports within 50 km of the site, however, there are two (2) helipads next to the vermiculite mining facilities, as shown in the following figure.

Figure 12-1 Helipads next to Mining Facility

The EPC Contractor and the different suppliers will be required to adhere to the custom procedures in the countries of origin, transit (Kazakhstan) and in Uzbekistan as applicable. Additional road surveys are expected to be undertaken before the commencement of delivery of Project equipment, machinery and materials.

CONSULTATIONS

Based on 5 Capitals' experience on wind projects in Uzbekistan and previous consultation with the Ministry of Transportation it is understood that the Project will be required to secure a special permit for the transportation of bulky and heavy cargo in accordance with the regulation *"Ensuring traffic safety during the transportation of bulky and heavy cargo"*, approved by the Cabinet of Ministers of the Republic of Uzbekistan No.342 dated December 26, 2011.

In addition, a consultation letter was sent to the Main Department of Highways of The Republic of Karakalpakstan, who responded on 04 April 2022 and stated that they had no objections.

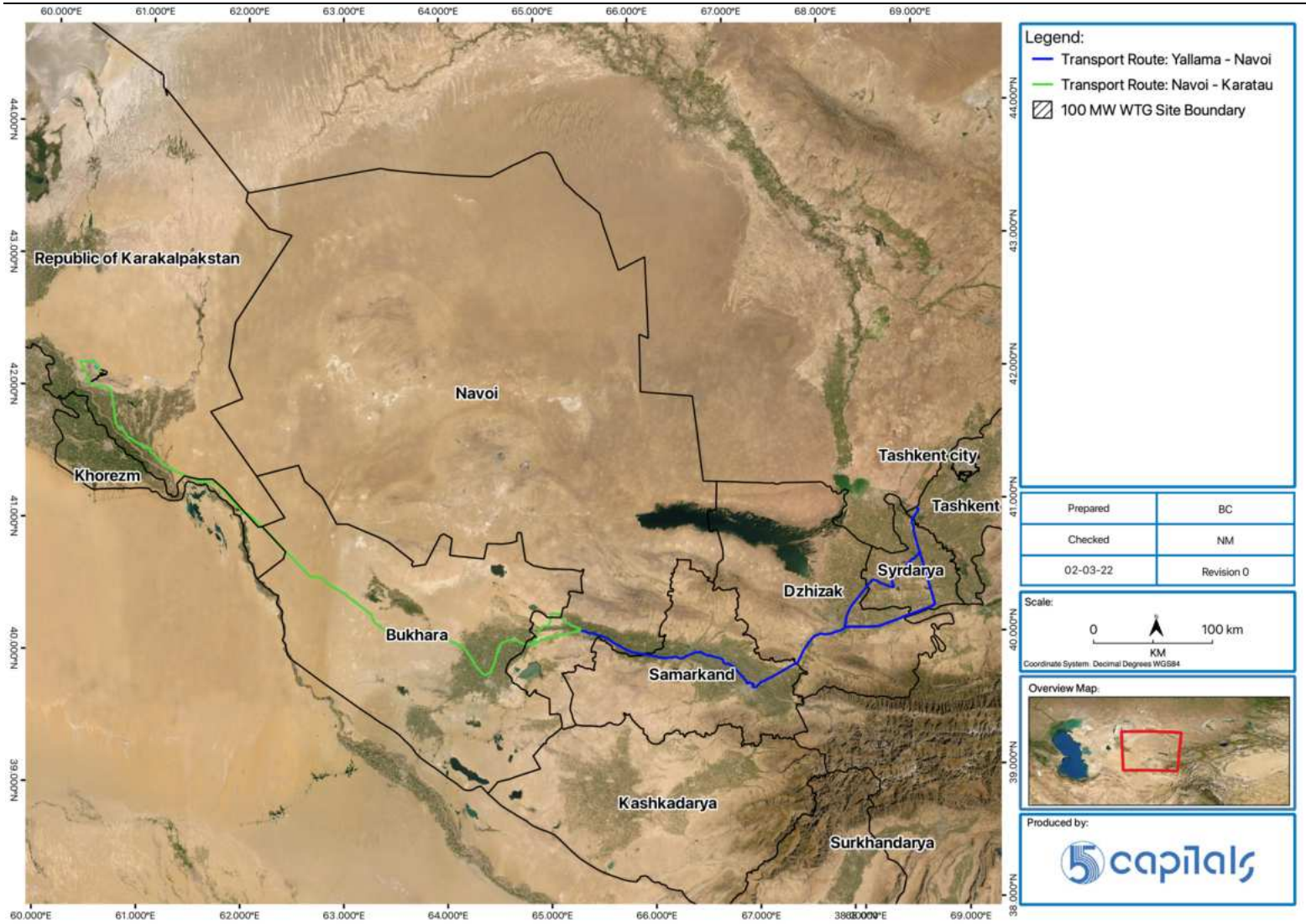


Figure 12-2 Transport Survey Route

12.2 Area of Influence and Receptors

12.2.1 Area of Influence

The area of influence for traffic and transportation impacts is along the whole route from WTG component/equipment manufacture to the site.

12.2.2 Receptors

Table 12-1 Receptor Sensitivity to Traffic and Transportation Impacts

RECEPTOR	SENSITIVITY	JUSTIFICATION
Road users along transport route of WTG components	Low	As per the transport route survey report, the components will typically travel on highways and any interaction with residential areas will be rare. Traffic impacts were not reported in the route survey, nor were they noted on the site visit and therefore the roads are determined to have adequate carrying capacity.

12.3 Potential Impacts, Mitigation, Management & Residual Impacts

12.3.1 Construction Phase

The major components for the construction of the wind farm are the turbine components (blades, heavy turbine tower sections, transformers, nacelle, etc.) that can only be assembled at the site and as such they have to be transported to the site individually. Such turbine components are likely to be transported by specialised turbine transportation vehicles.

It is understood from the route survey that all turbine components will be transported by road from China, through Kazakhstan and then across the Kazakhstan – Uzbekistan border and to the site. The transportation route survey report indicates that the current road infrastructure has limitations which may hinder the transportation of the Project materials.

If the routes are not carefully planned, the trailers hauling heavy components may potentially damage or cause structural damage on the existing highways, on bridges, signage, or on utilities such as electricity and drainage infrastructure.

The transportation route surveys had identified sections of roads which will require upgrades and maintenance in order to be suitable for the transportation of the WTG components.

A detailed assessment of impact upon road and transport infrastructure is not within the scope of this ESIA, nor is assigning a sensitivity to the existing road infrastructure, however, further details are available within the transport route surveys.

The primary traffic and transportation impact assessed within this ESIA relates to traffic impacts to local populations and road users. Impacts are to community safety are assessed within Chapter 15 – Community Health, Safety and Security.

12.3.1.1 Traffic Impacts

Construction activities including the transportation of WTG components, construction materials and project staff will require an increase in vehicular flow on roads and highways and this will likely result in road traffic increases.

Findings from the transport survey and numerous site visits undertaken till date indicates that the highways and local road infrastructure are operating below their respective design capacity and as such have sufficient capacity for increase in traffic flow and will not be significantly impacted by vehicles carrying normal loads.

Although the highway infrastructure has sufficient capacity for increase in traffic flow, the movement of specialised turbine transportation vehicles will likely require temporary road closures and diversions and this will result in disruption, delay and in some instances traffic congestion to road users.

There are numerous industrial facilities close to the Project site and therefore movements of HGV are common in the area, if traffic is not managed and if there is not clear communication with the industrial facilities then there is the potential for congestion issues. In addition, there is a railway line that requires crossing to access the site and therefore timings of train movements need to be known.

It is important to note that the route survey report indicates that the route does not pass residential areas but rather is limited to along major highways.

A final Route Survey Report and an associated Traffic and Transportation Management Plan will be required. The plan will be prepared in accordance with IFC General EHS Guidelines, and will outline how turbine components will be delivered to the site and how construction traffic will be managed to limit impacts upon other road users, construction personnel and any local communities.

The plan will include information on the permits required for transport, the designated access routes, site entrance points, speed limits, waiting, parking areas and map out accident and traffic hotspots for project access vehicles.

Prior to mitigation impacts are expected to be temporary, localised and reversible and therefore of minor magnitude. Following implementation of the proposed mitigation and the implementation of a site-specific Traffic and Transportation Management Plan impacts are not deemed to be significant.

12.3.2 Operation Phase

12.3.2.1 Increased Vehicle Flows

Transportation impacts during operations are not expected to be significant, as the operation of the wind farm will not require continuous delivery of materials, or other equipment in order to operate. Operation & maintenance of the wind farm will require vehicle movement however, this will be restricted to security and maintenance teams using light-vehicles, pick-ups, small vans, etc. As such, such limited vehicle movement for maintenance or waste removals are not expected to result in noticeable impact on existing road infrastructure.

Additionally, it is expected that the movement of vehicles along the OHTL during the operational phase will only be for inspection and preventative and unplanned maintenance purposes. As such, there will not be any vehicle movement during day-to-day operational conditions.

Staff movements will also contribute to a minimal additional vehicle flows on the local roads and internal site roads.

Table 12-2 Traffic and Transportation Impact Significance, Mitigation Measures and Residual Impacts

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
Construction						
Traffic Impacts	**Minor Negative**	Road users along transport route of WTG components	**Low**	**Minor**	• A final route survey report will be completed. • The conclusions and recommendations of the Route Survey report such as sections of the road that will require to be upgraded, need for electricity shutdown etc. will be implemented • Preparation and implementation of a Traffic and Transportation Management Plan. The plan will be prepared in accordance with IFC General EHS Guidelines, and will outline how turbine components will be delivered to the site and how construction traffic will be managed to limit impacts upon other road users, construction personnel and any local communities. • The Plan will include information on the permits required for transport, the designated access routes, site entrance points, speed limits, waiting, parking areas and map out accident and traffic hotspots for project access vehicles. • The local police and other relevant authorities will be consulted during the development of the Plan. • Transportation of materials over railroad crossing must be organised according to the train schedule and coordinated with relevant authorities as required by law. • Final road condition of the selected transportation route will be checked before transportation of any oversized loads to determine that the required improvements have been put in place. • Where transportation of equipment/materials is to be undertaken during the winter season or on wet or windy periods, additional safety and precaution measures will be implemented in order to ensure the safety of other road users and integrity of the road infrastructure and materials being transported. • Ensure that any equipment/materials transported across border crossings meet all the legal requirements including those relating to customs. • Construction access road into the site will be clearly signposted. • Buses will be used to transport the construction workforce and carpooling among staff will be encouraged. • Route directions and speeds limit will be placed along the access road into the project site in relevant local languages. • Deliveries of construction materials will be coordinated to reduce congestion on local roads and to reduce the waiting time for the drivers. • Where applicable, the EPC Contractor will obtain the relevant permits to transport heavy loads into the project site and adhere to the stipulated conditions (i.e. delivery routes and timings).	**Negligible**

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
					• Where applicable, the EPC Contractor will notify the local communities on delivery of wide/heavy loads and how it could potentially impact their road use. • Road closures and diversions as a result of project component transportation will be kept to a minimum and wherever practicable peak transportation hours must be avoided to reduce impacts on commuters & road user. • Oversize & heavy load vehicle's drivers will be competent and legally authorised to operate such vehicles in the Uzbekistan and across borders where applicable. • The EPC Contractor will provide awareness training on traffic safety to the local people in collaboration with local police office. • All traffic incidents and near misses will be recorded and investigated with any necessary corrective actions taken including reporting to local police. • A grievance mechanism will be established to allow local road users and communities to make complaints relating to Project traffic and transportation. • Compensation of any livestock injured by Project vehicles will be conducted in coordination with community leaders and local officials. • Project drivers will not be permitted to transport any unauthorised personnel or goods.	
Operation						
Increased vehicle flows local roads	**Negligible Negative**	Local roads	**High**	**Minor**	• Operational phase workers will be encouraged to carpool wherever possible to limit the number of vehicles along the local roads.	**Negligible**

12.3.3 Decommissioning Phase

Potential impacts during decommissioning phase of the wind farm and the OHTL are anticipated to be similar to those encountered during construction. As such, it is assumed that risk of transportation of turbine components and OHTL components associated with the construction phase will be expected for the decommissioning phase. Likewise, the mitigation & management measures outlined for the construction phase in relation to transportation of project components, increase in vehicle flow on highway and increased risk of road traffic accidents will be applicable to the decommissioning phase as well. It is also expected that consultations will be undertaken with relevant authorities i.e., Ministry of Transport, Railway Authority etc and relevant permits obtained before any materials/equipment can be transported, stored or disposed out of the Project site.

12.4 Monitoring

The final monitoring methodology with specific monitoring details (i.e. locations etc.) will be developed in the specific 'Environmental and Social Monitoring Plan'. The monitoring requirements below relate to construction phase and no specific monitoring requirements are proposed for the operational phase.

Table 12-3 Traffic and Transportation Monitoring Requirements

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION	RESPONSIBLE ENTITY
Safety of drivers, residents and local herders in the Project area	Record keeping in case of accidents or incidents. Incidents involving livestock and wildlife will also be recorded.	Daily	Roads used by the Project vehicles	EPC Contractor HSE Manager
Grievances received	Record of grievances received, response period, close-outs	On-going	Roads used by Project vehicles	EPC Contractor CLOs
Permits & licenses	Validity and renewal of permits & licenses	As required by law	Document control office – EPC Contractor	EPC Contractor HSE Manager

13 ARCHAEOLOGY AND CULTURAL HERITAGE

13.1 Applicable Requirements & Standards

13.1.1 National Regulations

Relevant legislation in Uzbekistan relating to archaeology and cultural heritage include:

- Law No. LRU-229 "On protection and use of the objects of archaeological heritage" (13 October 2009).
- Law No. 269-II "On the Protection and Use of Cultural Heritage Sites (30 August 2001, as amended).
- Presidential Decree No. R-5181 "On improving the protection and use of objects of tangible cultural and archaeological heritage" (16 January 2018).
- Resolution of the President of the Republic of Uzbekistan № RP-4068 dated December 19, 2018 "On measures for improving actions for protection of material cultural heritage objects".
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan № 846 dated October 4 2019 "On approval of the national list of real state sites and objects of material cultural heritage".

The above laws seek to protect and sites and objects of cultural heritage which are considered as part of the national heritage for all the people in Uzbekistan.

In addition, the Criminal Code of the Republic of Uzbekistan includes provisions that prohibit the intentional destruction or damage of objects of tangible cultural heritage under state protection, with further protections in place to protect cultural property in PAs, in particular protected historical and cultural territories, without first obtaining permission.

13.1.2 Lender Requirements

ADB

ADB's Safeguard Policy Statement and related Safeguards, include various requirements for cultural resources of importance locally, provincially, nationally, and internationally. Where such resources are identified the ADB safeguards highlight the importance of consulting with the communities who use such facilities, as well as the regulatory agencies entrusted with protecting such resources.

When a project is located in areas where physical cultural resources are expected, the ADB Safeguard Policy Statement requires the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation.

AIIB

AIIB's ESF outlines the requirement to conserve and avoid impacts on cultural resources. The Framework further states "*when avoidance of impacts on cultural resources is not feasible, prepare a cultural resources management plan to mitigate and monitor these impacts*."

EPFI's

In accordance with the Equator Principles, the assessment will refer to applicable IFC Performance Standards on Social and Environmental Sustainability, specifically with due consideration of Performance Standard 8 – Cultural Heritage. PS8 aims to protect the adverse impacts of project activities and support its preservation and to promote equitable sharing of benefits from the use of cultural heritage. Cultural heritage in this standard refers to:

- Tangible forms of cultural heritage, such as tangible moveable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values;
- Unique natural features or tangible objects that embody cultural values, such as sacred groves, rocks, lakes, and waterfalls; and
- Certain instances of intangible forms of culture that are proposed to be used for commercial purposes, such as cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.

13.2 Baseline Conditions

13.2.1 Cultural Heritage

Wind Farm

No cultural heritage sites have been observed within the Project boundaries of the Wind Farm. The nearest cultural site – Munojat mountain is located within 2.5 km of the wind farm site boundary. Another site - the Sultan Uwais Baba Complex is a collection of buildings and graveyards about 8.2 km from the wind farm Project site. The shrine to Sultan Uwais Baba is one of the most sacred places in Karakalpakstan and is a popular place of pilgrimage amongst the people of Karakalpakstan and Khorezm. A cemetery, which is a part of Sultan Uvays complex, is located at distance of 6 km from WF area.

Figure 13-1 Munojat mountain and the Sultan Uwais Baba Complex (from left to right)

OHTL

The OHTL route begins on a land adjacent to the WF area and therefore shares the same cultural heritage sites. The distances to these heritage sites are as follows: Munojat Mountain: 2.8 km, Sultan Uvays Complex: 5.3 km, Cemetery of the Sultan Uvays Complex: 5.4 km.

Additionally, a tangible cultural heritage object was found 1.6 km west of the OHTL. This structure appears to be part of an ancient castle. Consultations with the Cultural Heritage Agency indicated that this object holds no international or national significance.

Furthermore, there is a local cemetery situated close to the existing power station, covering 2.7 hectares. This cemetery includes memorials dedicated to ancient philosophers and scientists who specialized in Islamic studies.

Figure 13-2 Remnant of the Tower and Cemetery (from left to right)

13.2.2 Intangible Cultural Heritage

In Uzbekistan, the Ministry of Cultural Heritage incorporates elements of intangible cultural heritage based on suggestions from local governmental bodies, legal entities, and individuals. Currently, Uzbekistan has 10 intangible cultural heritage elements recognized by UNESCO, across the country. Customs and traditions related to Project region are listed in the following table.

Table 13-1 Intangible Cultural Heritage of Uzbekistan

ELEMENT	DESCRIPTION (SUMMARY)	REGION WHERE IT IS COMMONLY PRACTICED
Bakshi art (2021)	Bashki refers to the performance of traditional centuries old poems based on myths, legends, folk tales and legendary chants with the accompaniment of musical instruments including dombra and kobuz. The practice is passed on within families of through formal bakhshi schools.	Republic of Karakalpakstan, Surkhandarya region
Nawrouz, Novruz, Nowrouz, Nowrouz, Nawrouz, Nauryz, Nooruz, Nowruz, Navruz, Nevruz, Nowruz, Navruz (2016)	This marks the beginning of new year on 21st March when a variety of rituals, ceremonies and other cultural events take place for a period of about two weeks. It includes spending time with family, friends, exchanging gifts, street performances, public rituals, traditional sports etc. These practices are transmitted from older to younger generations through observation and participation.	Across Uzbekistan
Palov culture and tradition (2016)	Polav is a traditional dish made and shared throughout rural and urban communities across Uzbekistan. It is served as a gesture of hospitality, to celebrate special occasions such as weddings and new year. Knowledge and skills associated with the practice are handed down from older to younger generations formally and informally using a master-apprentice model or by demonstration within families, peer groups or community organisations.	Across Uzbekistan

It is not expected that the Project will have any impact, or result in the dilution of any intangible cultural heritage practices, this is due to the relatively low requirement for Project workforce (during both the construction and operation phases) and the distances between the Project and the practice of the aforementioned intangible heritage.

13.2.3 Archaeology

Consultations conducted with Cultural Heritage Agency and the Institute of Archaeology of Uzbekistan Academy of Sciences over March - April 2024 (through business correspondence and phone calls) revealed the need for further archaeological research at the WF area and OHTL route, i.e., for WTG and tower locations, access road, and substations.

The survey was conducted between 10th and 30th May 2024 by the Archaeology faculty of Karakalpak State University. No sites with signs of cultural or archaeological importance were identified.

The conclusion from the survey was that no buffer zones or micro-siting of WTG/OHTL towers is required. However, the report stated that potential artifacts may be in a depth of 3 meters from topsoil. As such, construction work (specifically excavations) must take place under the supervision of an archaeologist.

Refer to Volume 4 for the full survey report and the conclusion.

13.3 Area of Influence and Receptors

13.3.1 Area of Influence

The area of influence for archaeological impacts is focused on the physical footprints of each WTG, OHTL tower, access road and any temporary construction areas or facilities required to support construction activities. Impacts on cultural heritage are considered on a wider scale in terms of cultural practices that may be tangible or intangible and defined to a particular culture, specific location, area or region.

13.3.2 Receptors

The following table outlines the receptors for archaeology and cultural heritage receptors. Impacts on cultural heritage sites are not anticipated due to the distance between construction activities and sites.

Table 13-2 Archaeology and Cultural Heritage Sensitive Receptors

RECEPTOR	SENSITIVITY	JUSTIFICATION
Unknown buried artefacts	Medium	Unknown buried artefacts can be disturbed and damaged during construction works, specifically works involving excavation. From review of baseline information, it is reasonable to assume that any archaeological discoveries could be of national importance, but it is considered unlikely that discoveries would be of international importance.

13.4 Potential Impacts, Mitigation, Management & Residual Impacts

13.4.1 Construction Phase

13.4.1.1 Direct Impacts to Unknown Buried Archaeology

No archaeological findings were discovered at the Wind Farm area or along the OHTL route during the archaeological surveys. However, the report suggests that potential artifacts might be located up to 3 meters below the surface. Cultural heritage sites identified within the AoI of the Wind Farm and OHTL are situated at a safe distance, so no direct impact is expected.

The construction phase will involve groundworks, and excavations (possibly including blasting) to install the WTG, which could disturb the ground and potentially affect any unknown historical sites, graves, or archaeological artifacts below the surface, possibly causing damage or degradation. These excavation activities will be confined to the WTG footprint, access road, internal road, and OHTL tower footprint and are likely to be concentrated in the early stages of construction.

To mitigate the risk of damage, a Chance Find Procedure (CFP) should be implemented before starting work. This procedure educates construction workers on the proper actions to be taken if they encounter unexpected cultural heritage resources during land clearance or earthworks. The CFP includes steps for record-keeping, expert verification, chain of custody for movable finds, and criteria for potential temporary work stoppages.

If present, such artifacts could be of significant value and national importance. While the potential impacts from accidental damage to archaeological artifacts could be severe and irreversible, a survey will be conducted in construction areas, and with the application of good international industry practice (GIIP) mitigations, the likelihood of significant impacts is minimal.

Table 13-3 Cultural Heritage and Archaeology Impact Significance, Mitigation Measures and Residual Impacts

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impact
Construction						
Direct Impacts to Unknown Buried Archaeology	**Negligible Negative**	Unknown buried artefacts	**Medium**	**Minor**	• An archaeological 'Chance Find Procedure' will be developed prior to construction and the start of site earthworks, as part of / or alongside the CESMP. This will include protocols and procedures to stop work and methods to preserve potential finds, as well as reporting requirements and co-ordination with the Institute of Archaeology. • The Chance Find Procedure will include a (i) generic guide for the identification of cultural heritage finds, (ii) requirement for work stoppage in the event of chance finds, (iii) protocols for temporary demarcation and avoidance of further disturbance of chance finds, (iv) notification of designated archaeological experts, (v) watching brief for in-situ protection and/or subsequent expert extraction of cultural heritage finds for off-site preservation, (vi) increased vigilance and expert supervision upon confirmation of archaeological chance finds, and (vii) related reporting requirements. • Construction work (specifically excavations) must take place under the supervision of an archaeologist. • Where artefacts or archaeological remains are encountered, the site will be clearly signed/delineated with high visibility flagging to impede access and prevent any damage or loss of the artefacts which have been found. • All direction concerning the management of potential archaeological finds must only be taken from the Institute of Archaeology. • The EPC Contractor will receive training from the Institute of Archaeology about the Chance Finds Procedure and key processes to follow concerning any suspected archaeological finds to avoid disturbance. • The removal of any archaeological artefacts from the site is strictly prohibited.	**Negligible**

13.5 Monitoring

The following monitoring requirements are proposed for Archaeology and Cultural Heritage.

Table 13-4 Archaeological & Cultural Heritage - Monitoring Requirements

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION	RESPONSIBLE ENTITY
Construction				
Archaeological Resources & Artefacts	Any archaeological remains within the Project site (based on requirements of the Project's approved Chance Find procedure	Daily continued visual observations by site staff involved in excavations.	All Project locations requiring excavations, earthworks or grading.	- Designated Archaeologist (from Institute of Archaeology) - EPC Contractor E&S Manager

14 SOCIOECONOMICS

14.1 Applicable Requirements & Standards

14.1.1 National Regulations

CONSTITUTION OF UZBEKISTAN (1992, AS AMENDED IN 2023)

The Constitution of Uzbekistan guarantees fundamental rights and freedoms in various domains:

SOCIAL INFRASTRUCTURE:

Articles 48, 49, and 50 ensure:

- The right to health care and education.
- The right to a favourable environment and access to reliable environmental information.

LAND TENURE:

- Article 41 affirms the right to property ownership.
- Article 47 guarantees the right to housing and compensation in case of deprivation.
- Article 65 protects private property and ensures its legal equality.

LIVELIHOODS AND POVERTY ALLEVIATION:

- Article 43 mandates government measures for employment, protection against unemployment, and poverty reduction.
- Article 57 directs improvements in the quality of life for vulnerable groups to enhance their social participation and self-sufficiency.
- Article 67 grants entrepreneurs the right to conduct business activities independently.

HUMAN RIGHTS:

- Article 4 promotes respect for languages, customs, and traditions of all ethnic groups.
- Article 19 ensures equal rights and freedoms for all citizens without discrimination.
- Articles 25 and 26 protect the right to life and prohibit torture and cruel treatment.
- Article 27 specifies conditions for lawful restriction of freedom.
- Article 34 guarantees access to information related to rights and legitimate interests.
- Article 55 guarantees access to a competent, independent court.
- Article 58 mandates gender equality.

These provisions establish a comprehensive framework for rights, liberties, and duties in Uzbekistan.

THE LAND CODE (1998, AMENDED IN 2022)

The Land Code outlines land classification, allocation, use, and protection in Uzbekistan, including individual and collective land tenure and various land categories.

Key Provisions:

Article 16: States all land is a national treasure and must be managed sustainably to support life, economy, and welfare.

Article 19: Grants lifelong inheritable rights for dekhan/peasant farms, individual residences, and collective gardening.

Article 24: Allows short-term and long-term (up to 50 years) leaseholds for agricultural and foreign investment enterprises, prohibiting sub-leases.

Article 28: Requires initial and annual rent payments for leased land, based on its quality, location, and water supply.

Article 33: Identifies legal tenure documents as state certificates and land-use agreements.

Articles 59 & 60: Categorize land use for urban building, common use, agriculture, forestry, industry, transport, military, restricted use (wildlife, hazardous, cultural, recreational), water supply, and reserves.

Land administration framework

In addition, the Land Code establishes the institutional framework for the administration of land in Uzbekistan. The main governmental entities involved in the management of land resources include (but are not limited to):

- The Cabinet of Ministers of the Republic of Uzbekistan (as relevant)
- Council of Ministers of the Republic of Karakalpakstan (as relevant)
- State Assets Management Agency
- State Tax Committee
- Chamber of State Cadastres of the Cadastre Agency
- Regional Khokimiyats

THE CIVIL CODE (1996, AMENDED IN 2022)

The Civil Code comprehensively addresses civil relations, property rights, and contractual obligations in Uzbekistan:

- It defines the legal status of participants in civil relations, outlines procedures for property rights, and regulates contractual obligations.

- The code establishes rules for property withdrawal, value determination, compensation rights, and conditions for rights deprivation.
- It ensures full compensation for losses incurred due to rights violations, covering expenses to restore rights, property damage (real damage), and lost profits from normal civil activity.
- Article 8 stipulates that property rights subject to state registration arise upon registration, unless specified otherwise by law.
- Article 14 allows for compensation, including lost profits, if rights are violated and income is lost as a result.
- Article 83 defines immovable property as land, subsoil, buildings, and other fixtures firmly connected to the land.
- Article 84 mandates state registration for ownership and real property rights, making them legally effective only upon registration.

PRESIDENTIAL DECREE № DP-6243, DATED JUNE 8, 2021 "ON MEASURES TO ENSURE EQUALITY AND TRANSPARENCY IN LAND RELATIONS, RELIABLE PROTECTION OF RIGHTS TO LAND AND THEIR TRANSFORMATION INTO MARKET ASSETS"

Changes in procedure of land allocation were made on June 8th, 2021 through the Presidential Decree "On measures to ensure equality and transparency in land relations, reliable protection of rights to land and their transformation into market assets". Based on this PD, the authority of district governors to allocate land directly is abolished. It is also prohibited to seize, reserve, or transfer land with any document. This means, from August 1, 2021, some rights on land of local governors were restricted, and such restrictions will also affect the process of purchasing and leasing land. This is now forbidden for local governors to transfer land to citizens, businesses, organizations through immediate decision.

Instead, all types of land, including agricultural, commercial as well as for residential purposes will be allocated through an open electronic tender to winning bidder granting lease or ownership rights (depending on type of land and tender conditions).

The "E-AUCTION" is the platform that uses a software for online auctions, allowing participation via the internet and ensuring no interference during processing and the selection process of the winner. Initially, from September 1, 2017, it was used for property sales related to court documents. Due to its success, the platform was expanded to other sectors by government decisions.

The platform enables citizens to participate in fair and transparent auctions for a range of assets, including state properties, real estate, vehicles, land plots, mineral extraction rights, cleaning services, advertising installation rights, and more.

The aim is to ensure legality, transparency, and fairness in auctions, prevent price manipulation, and protect the integrity and confidentiality of information. The organization of

these auctions is managed by JSC "Organization of electronic online auctions" for individuals and legal entities. All land acquisition for private leasehold is managed through State Asset Management Agency via an online auction process. Locally these auctions are managed by regional/district departments of cadastral agencies.

The process of obtaining Land Lease Agreement is as follows:

- UZSAMA posts notification on e-auction website indicating tender with details on the size, location, leasehold or freehold allocation, rent and/or initial prices of the plots.
- Candidates select and submit application suitable lot with type of land needed published at e-auction. Application must be submitted before the deadline indicted for selected lot/tender.
- Summitted applications are reviewed separately before auction take place. Selected candidates for auction process make pre-payment established for biding tender.
- Winning bidder is selected at auction process with a participation of selected candidates.
- Once auction is completed, winning bidder is awarded with certificate which will be a basis for issuing and signing LLA with relevant local municipalities (depending on location of land plot).
- Pre-payment done for tender is returned to all unsuccessful candidates.

These auctions are open to public bidders nationwide and are highly competitive, with land awarded based on the best price and performance on income-related criteria (e.g., agricultural performance and liabilities history). There is no fixed auction schedule, and land parcels of various sizes are auctioned as they become available, making it difficult to predict the availability and location of land. To participate, bidders must pay a bidding fee equivalent to 15% of the starting price, and depending on the leasehold type, the full cost of the land may need to be settled upfront.

LAW NO 781 ON PROCEDURES FOR THE WITHDRAWAL OF LAND PLOTS FOR PUBLIC NEEDS WITH COMPENSATION (2022)

This law outlines the expropriation of private land for public purposes, specifying conditions, procedures, and compensation for legally registered landholders.

Land Withdrawal Provisions:

Article 4: Defines 'public need' developments justifying land withdrawal, including infrastructure projects like roads, railways, airports, bridges, energy lines, and irrigation systems.

Article 13: Requires project initiators to identify the most suitable land with minimal pre-existing priority assets and present documentation to the Regional Khokimiyat.

Article 14: Stipulates that land expropriation initiatives and supporting materials must be reviewed by the Cabinet of Ministers, resulting in a resolution for the project. The relevant khokimiyat is responsible for fulfilling obligations related to land withdrawal as per the resolution.

Compensation Provisions:

Article 23: Specifies compensation for legal landholders, including market value for immovable property, compensation for lifelong/inheritable ownership, perennial plantations, and transitional expenses.

Articles 24 & 25: Legalize monetary and in-kind compensation, requiring replacement assets of equal value and compensation for immovable assets within 24 months of eviction.

Article 25: States that compensation for common property must be distributed according to ownership shares and paid within six months of the agreement or one month if monetary. Compensation amounts are subject to inflation indexation.

OTHER LEGISLATION

The following legislation provides for relevant socioeconomic aspects, including land access:

- Law of the Republic of Uzbekistan on State Land Cadastre No.666-I of 28.08.1998
- Urban Planning Code of the Republic of Uzbekistan (2021)
- Presidential Decree No. UP-5495 on measures on cardinal improvement of investment climate in the republic of Uzbekistan
- Resolution of the Cabinet of Ministers No.146 (2011), Appendix No. 2 to the regulation on the procedure for compensation for losses of landowners, users, tenants, and owners, as well as losses of agricultural and forestry production
- Resolution No. 911 of the Cabinet of Ministers (2019) on the procedure for withdrawal of land plots and compensation to owners of immovable property located on the land plot
- Law on Guarantees with Respect to Equal Rights and Opportunities for Women and Men (2019).

14.1.2 Lender Requirements

ADB

The ADB Environmental Safeguards include the need to assess socio-economic project impacts in ESIA (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues).

Specifically, 'The borrower/client will identify and assess the risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the project, and will establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts.'

ADB's Safeguard Requirement 2 on Involuntary Resettlement safeguard requires socio-economic surveys and census to be undertaken to identify all persons who will be displaced by the project and to assess the project's socioeconomic impacts on them.

ADB SPS Safeguard Requirement on Involuntary Resettlement requires meaningful consultation to be undertaken with affected persons, their host communities and civil society for every project with the potential for involuntary resettlement impacts. Consultation should be undertaken in a manner commensurate with the impacts on affected communities paying particular attention to the need of disadvantaged or vulnerable groups. This Safeguard Requirement also requires the establishment of a grievance redress mechanism to receive and facilitate the resolution of concerns and grievances from affected persons about physical and economic displacement and other project impacts, paying particular attention to the impacts on vulnerable groups.

ADB's SR2 also aims to avoid involuntary resettlement where possible; to minimise involuntary resettlement by exploring project and design alternatives; to enhance at least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and to improve the standards of living of the displaced poor and other vulnerable groups.

The safeguard also requires adverse economic, social, or environmental impacts from project activities other than land acquisition such as loss of access to assets or resources or restrictions on land use to be avoided, or at least minimized, mitigated or compensated for through the environmental assessment process. Where such impacts are found to be adverse, the borrower/client is required to develop and implement a management plan to restore the livelihood of affected persons to at least pre-project level or better.

AIIB

ESS2 addresses impacts of Project-related land acquisition, including restrictions on land use and access to assets and natural resources, which may cause physical displacement (relocation, loss of land or shelter), and/or economic displacement (loss of land or assets, or restrictions on land use, assets and natural resources leading to loss of income sources or other means of livelihood).

Section D 'Social Coverage' outlines the requirement for social assessment, including, but not limited to, vulnerable groups and discrimination, gender, gender-based violence, land and natural resource access, loss of access to assets or resources or restrictions on land use.

EPFI's

Several of the IFC Performance Standards have elements that relate to socio-economics. Key requirements for the assessment of socio-economic impacts are outlined in PS1, whilst PS5 on

Land Acquisition and Involuntary Resettlement has important requirements relating to projects that acquire land or will necessitate physical or economic displacement to PAPs, including compensatory measures.

14.2 Baseline

14.2.1 Political and Administrative Structure

The Republic of Karakalpakstan is a sovereign democratic republic, being a structural part of the Republic of Uzbekistan. Karakalpakstan's administrative centre is Nukus City, with the republic itself consisting of 15 districts.

The constitution and the laws of Karakalpakstan were drafted in line with the constitution and the laws of Uzbekistan. The republic has its own flag, emblem and anthem. The Jokargy Kenes (Parliament) of Karakalpakstan, represented by the Chairman of Jokargy Kenes, offers overall guidance for the republic. The highest executive body of Karakalpakstan is the Council of Ministers approved by the Jokargy Kenes. The chairman of the Council of Ministers of Karakalpakstan is also a member of the Cabinet of Ministers of Uzbekistan.

The Wind Farm and OHTL are located in the Beruniy district. Wind Farm as well as half of OHTL route are located in obsolete land plot, the distance to the nearest residential area is 9 km. Meanwhile, the remaining part of OHTL route goes through highly modified area represented by agricultural fields and residential areas.

There are 5 residential communities located in the AoI of the OHTL: Abay, Kyzyl Kala, Dustlik, Nayman and Makhtumkuli.

The table below demonstrates distance of WF and OHTL with regards to nearest communities.

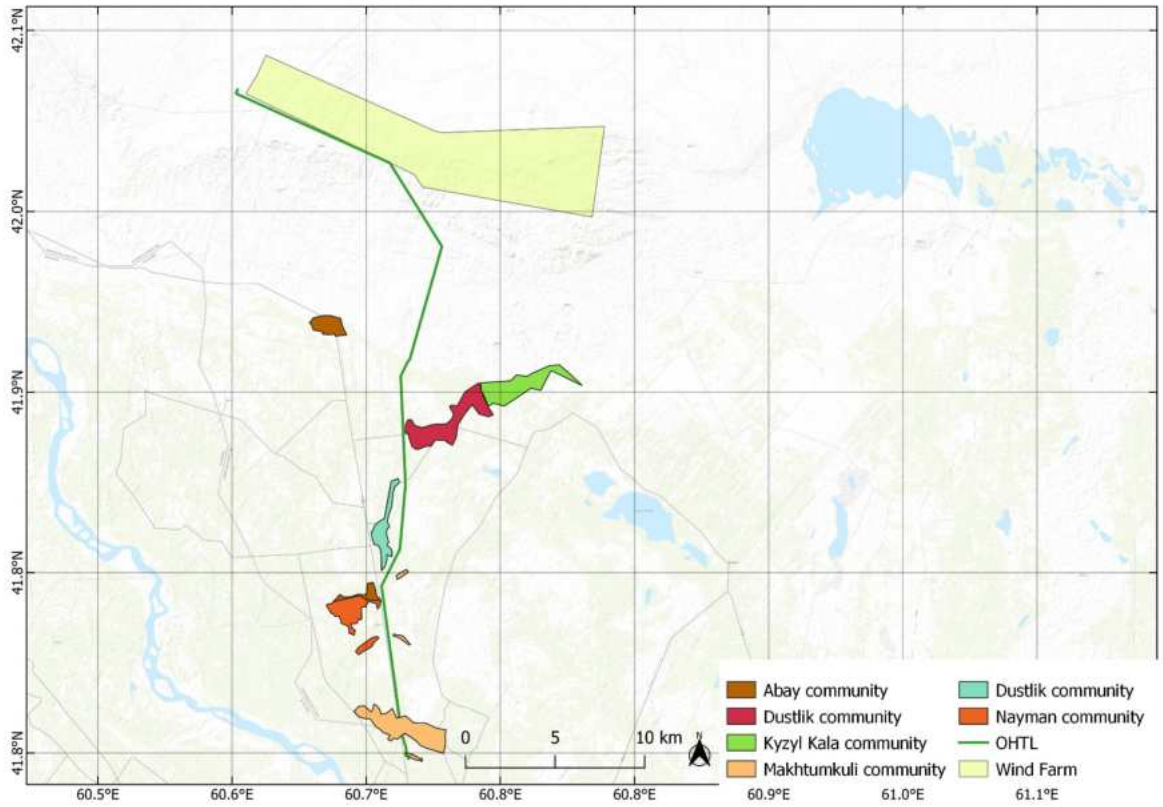


Figure 14-1 Residential areas in AoI of Project

Following the ESIA scoping, comprehensive ESIA-stage socioeconomic surveys were conducted, which included literature reviews, site visits, data collection from the Beruniy district khokimiyat and Statistics Department, key informant interviews (KIIs) with community leaders, and focus group discussions (FGDs) with residents of project-affected communities. The FGDs, held on March 15, 2024, aimed to assess the demographic and socioeconomic conditions of the communities, inform them about the project, and gather feedback on potential impacts and mitigations. The objectives of these meetings were to:

- Provide community members with details about the proposed project.
- Inform them about expected impacts and mitigation strategies.
- Explain the project grievance mechanism.
- Allow residents to share their feedback on the proposed project.

The FGDs involved a total of 88 community residents: 15 from Abay, 19 from Nayman, 12 from Makhtumkuli, 18 from Dustlik, and 24 from Kyzyl Kala.

14.2.2 Population and Demographics

As of State Statistics Committee of Uzbekistan (2024), the population of the Republic of Karakalpakstan is approximately 1,976,200 people. The demographics of the region indicate

that Beruniy district, a predominantly rural area within Karakalpakstan, has a total population of 201,200 individuals. Within Beruniy district, around 35.2% of the population resides in urban areas, amounting to 71,000 people, while approximately 64.8% of the population lives in rural areas, totalling 130,200 people. These statistics reflect the distribution of urban and rural populations within Karakalpakstan as of early 2023.

Data collected from affected communities' administrative centres (makhallas) shows that as of January 1st 2024, overall number of population in affected communities totalled 23,846, with women comprising 49.7% and men 50.3% of the population. The table below lists the population numbers for five communities within the district.

Table 14-1 Breakdown of population in affected communities

NO	NAME OF COMMUNITY	TOTAL POPULATION	ESTIMATED NO. OF FAMILIES
1	Abay	5,124	1,561
2	Nayman	6,294	1,051
3	Mahtumkuli	6,705	1,475
4	Dustlik	4,979	1,505
5	Kizil kala	4,685	1,524
Total		**27,787**	**7,116**

During the Focus Group Discussions, residents indicated that all community members live in single-story private houses. In most families, the male is the head of the household, but some families with deceased breadwinners are led by females. Community leaders reported that there are approximately 25-30% female-headed families in Abay, 30-35% in Nayman, about 40% in Mahtumkuli, and 45-50% each in Dustlik and Kyzyl Kala.

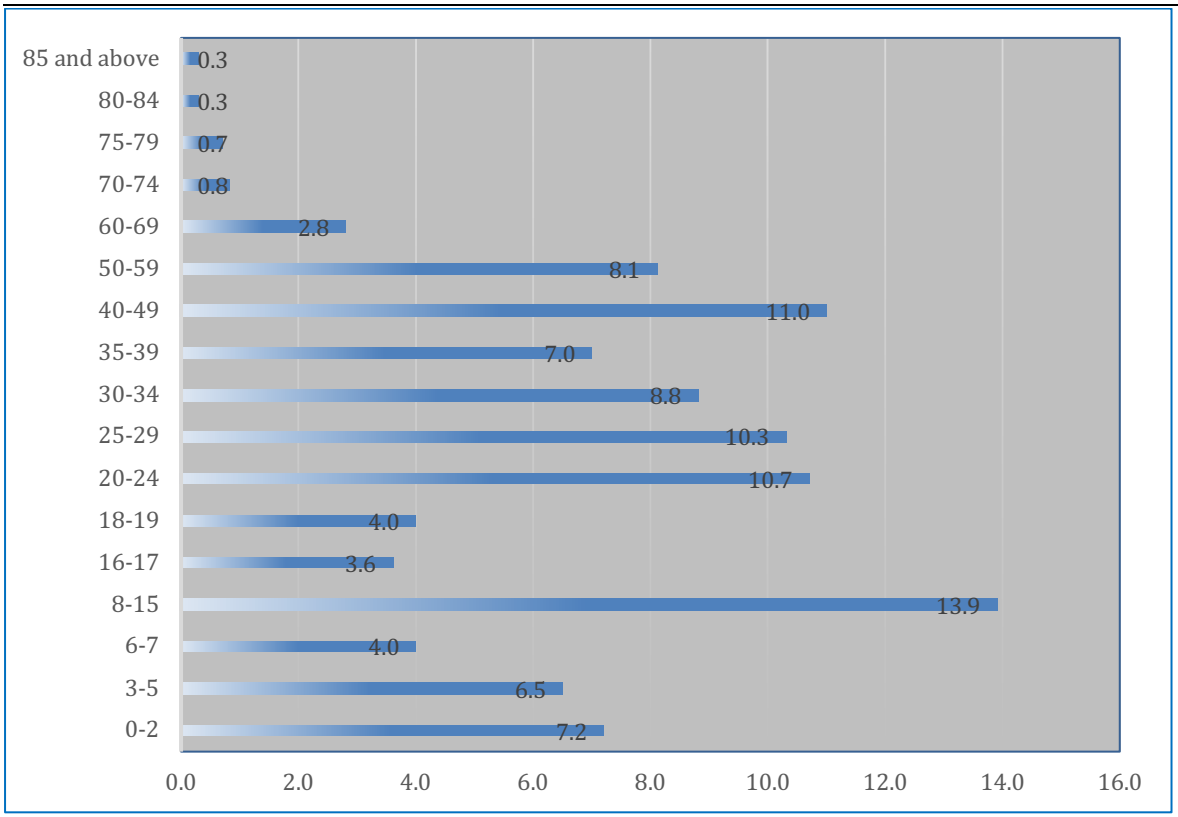


Figure 14-2 Age composition of Beruniy district

Age breakdown of residents in affected communities is described in the table below.

Table 14-2 Age categories at affected communities

AGE GROUP / NAME OF COMMUNITY	0-2	3-6	7-13	14-17	18-30	31-45	46-60	61-70	71-80	81-90	91-100	ABOVE 100	TOTAL
Abay	411	537	735	342	1,091	986	661	254	88	18	1	0	5,124
Nayman	354	345	964	363	1,059	1,321	1,229	634	19	4	2	0	6,294
Mahtumkuli	417	541	919	442	1,227	1,478	1,265	251	145	19	1	0	6,705
Dustlik	227	470	741	391	1,181	1,121	465	325	38	15	4	1	4,979
Kyzyl Kala	298	416	607	375	887	974	801	266	32	27	2	0	4,685
Total	**1,707**	**2,309**	**3,966**	**1,913**	**5,445**	**5,880**	**4,421**	**1,730**	**322**	**83**	**10**	**1**	**2,7787**

14.2.3 Accommodation, Living Conditions and Household Amenities

All residents in the five communities live in private houses, indicating that there are no multi-story apartment dwellings.

Table 14-3 Number of owned houses in project affected communities.

	ABAY	NAYMAN	MAHTUMKULI	DUSTLIK	KYZYL KALA	TOTAL
Households	1,077	1,051	1,353	1,022	1,024	5,527

As per FGD outcomes, all households in the five communities are connected to central electricity grids. Residents of Makhtumkuli and Dustlik communities reported that electricity supply is stable, meanwhile in Abay, Nayman and Kyzyl Kala communities residents reported their dissatisfaction with the electricity supply. All FGD participants stated that frequent interruptions in electricity is experienced during winter period. Sometimes electricity is off up to two days.

Potable water supply doesn't cover all houses in affected communities. For instance, FGD participants from Abay, Dustlik, and Kyzyl Kala communities mentioned that they have access to centralised water supply, while residents from Makhtumkuli and Nayman communities stated absence of access to water supply. It was revealed that houses without water supply install wells to pump underground water or purchase water in bottles.

Consultation with local branch of JSC "Uzsuvtaminot" informed the ESIA team on numbers of houses supplied with water. These numbers are as follows: 548 (out of 1,077) in Abay, 4 (out of 1,051) in Nayman, 292 (out of 1,353) in Makhtumkuli, 329 (out of 1,022) in Dustlik, and 404 (1,024) in Kyzyl Kala.

For residential houses without water supply, potable water is delivered through local water supply branch of Uzsuvtaminot in tanks.

Regarding gas supply, about one-third of houses in affected communities have access to centralized gas supply. However, participants of FGD from Dustlik and Kyzyl Kala communities were stating that their villages have gas supply for all houses. Houses without gas supply usually purchase gas cylinders, coal, and firewood for cooking and heating.

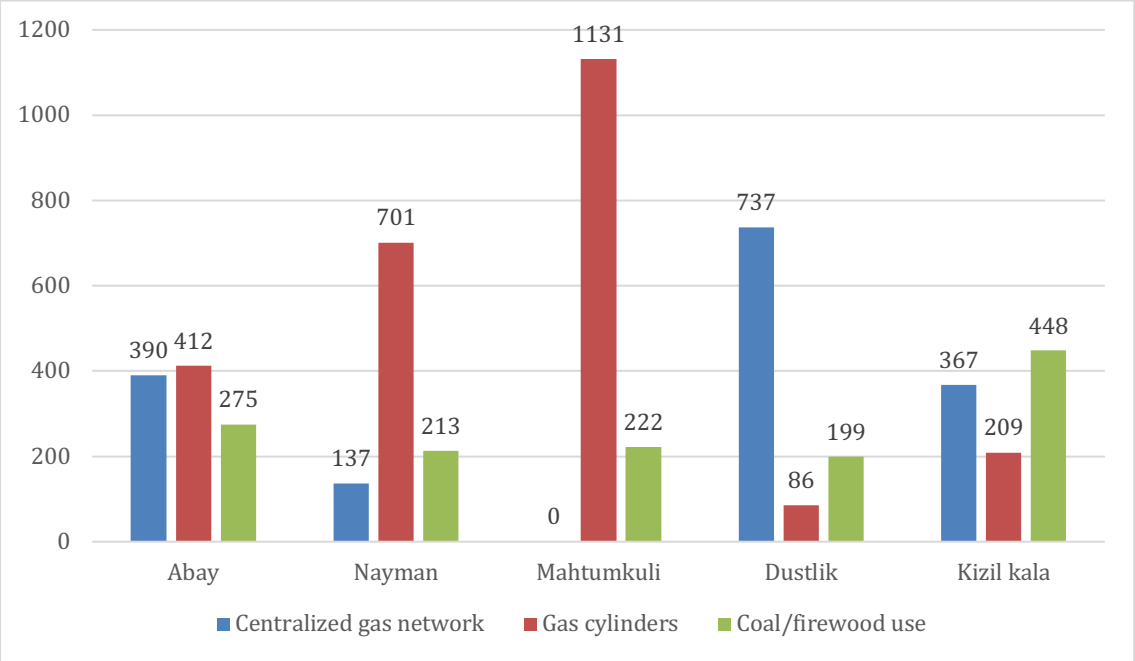


Figure 14-3 Gas supply in affected communities

For waste disposal, most communities incinerate or bury their waste, except in Mahtumkuli where the State Unitary Enterprise "Toza Hudud" handles waste collection.

Community leaders mentioned that there is no centralized heating system in these areas; residents use electricity, coal, and dried manure for heating.

Additionally, there is no central sewerage system, with nearly all households using individual pits for sanitation.

14.2.4 Education

The Constitution of the Republic of Uzbekistan guarantees the right to education for all citizens, stating that every person has a right to education." The State ensures free education up to the secondary level, and nearly 100% of the population achieves at least a secondary education, with women and men having equal participation rates of 99.9%.

According to the Statistics Agency, there were 10 universities in the Republic of Karakalpakstan during the 2022-2023 academic year, all located in Nukus city, with a total enrollment of 57,503 students. During the same period, the republic had 746 schools and 546 kindergartens.

In the Beruniy district, there were 72 schools and 61 kindergartens, with 39,390 students attending the schools and 7,150 children enrolled in the kindergartens.

There is no higher education institution within project affected communities, only secondary schools and kindergartens.

Table 14-4 Breakdown of population in affected communities

TYPE OF FACILITY	ABAY	NAYMAN	MAHTUMKULI	DUSTLIK	KYZYL KALA
Kindergartens					
The number of kindergartens	4	11	3	6	3
The number of children	220	290	154	317	300
Schools					
The number of schools	3	4	3	4	4
The number of pupils	988	1,214	1,554	1,601	977

Consultations with community leaders revealed that 70% of residents from all 5 villages graduated from school, 20% have secondary specialised education (graduates from colleges) and only 10% have higher education.

14.2.5 Healthcare

As of 2022, the Republic of Karakalpakstan had 421 health clinics, with 29 located in Beruniy district. Generally, healthcare services are limited in local communities across Uzbekistan, particularly in district areas. Villages typically have only one clinic to provide first aid and general medical consultations. For specialized medical services, villagers must visit district or regional medical centers.

In Abay and Nayman communities, there is one health clinic each, while Mahtumkuli and Kyzyl Kala communities each have one village family medical point. However, Dustlik community initially appeared to lack medical services. During the focus group discussions, it was revealed that Dustlik also has a family medical point. All respondents across the AOI communities feel that the health clinics and family medical points are adequately equipped. For more specialized medical assistance, residents go to Beruniy city.

14.2.6 Language and ethnicity

Article 4 of the Constitution of the Republic of Karakalpakstan designates both Karakalpak and Uzbek as the state languages. According to the latest data from the Open Data Portal of the Republic of Uzbekistan, as of December 27, 2023, Uzbeks constitute 40.4% of the population, while Karakalpaks account for 37% of the total population in the Republic of Karakalpakstan. The pie chart below depicts the ethnic composition of the region.

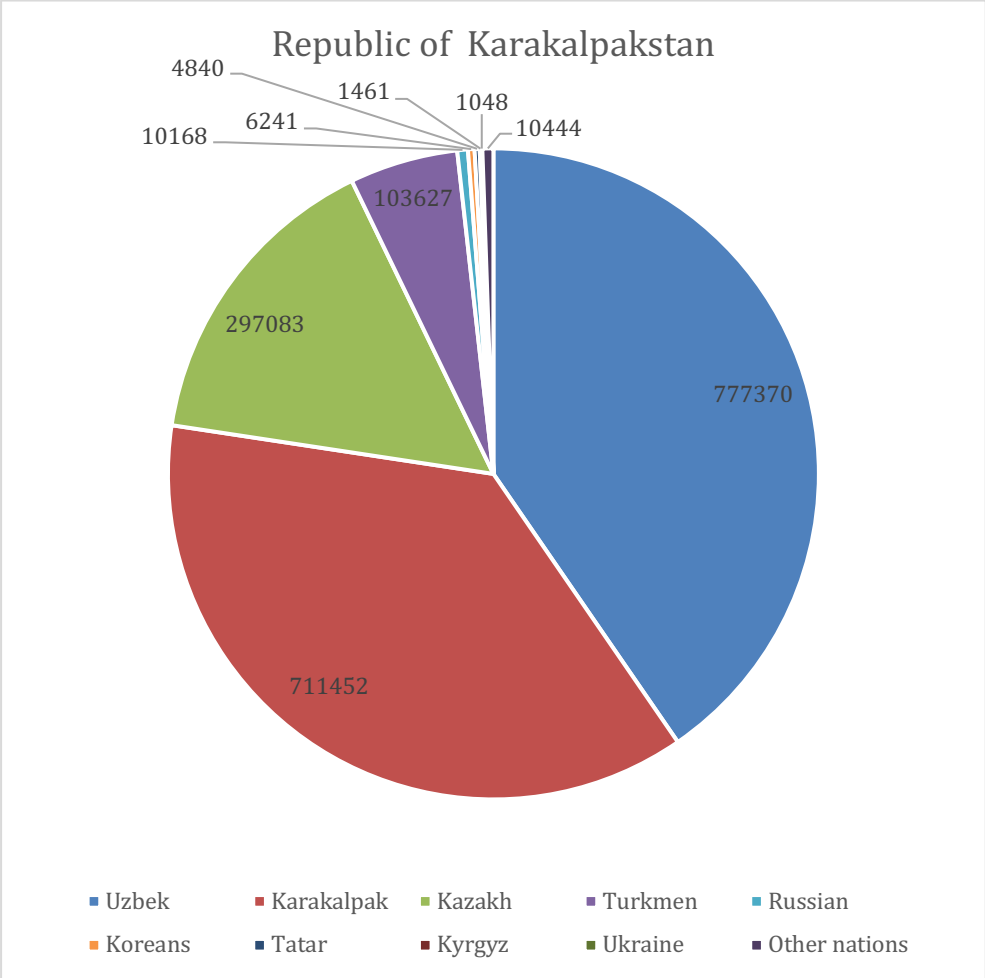


Figure 14-4 Ethnic breakdown of Karakalpakstan Republic

FGD meetings showed that that, while Uzbek is the primary language spoken in the AOI communities, other languages are also used based on residents' nationalities. In the Abay community, both Uzbek and Kazakh are spoken. The Nayman community predominantly uses Uzbek. In Makhtumkuli, residents commonly speak Uzbek, Turkmen, and Karakalpak. In Dustlik, the main languages are Uzbek, Kazakh, and Turkmen. Meanwhile, in Kizil Kala, people mainly speak Uzbek, Kazakh, and Karakalpak.

National composition of project affected communities is provided in the table below.

Table 14-5 Breakdown of national composition in affected communities

NATIONALITY	ABAY	NAYMAN	MAHTUMKULI	DUSTLIK	KYZYL KALA
Uzbek	2960	6193	1447	3103	990
Karakalpak	200	60	1923	127	239
Russian	-	1	13	1	-
Kazakh	1931	-	294	1479	3419
Turkmen	29	-	3005	265	37
Tatar	3	-	23	-	-

NATIONALITY	ABAY	NAYMAN	MAHTUMKULI	DUSTLIK	KYZYL KALA
Kyrgyz	1	-	-	4	-
Others	-	40	-	-	-

14.2.7 Indigenous people

The policy framework and legislation of the Government of Uzbekistan do not recognize any section of the national population that can be considered 'Indigenous Peoples' (IPs). The ADB Safeguard Requirements 3 and IFC Performance Standard 7 prescribe the following qualification criteria for IPs in the characterization of project-affected communities:

- Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others.
- Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories.
- Customary cultural, economic, social, or political institutions that are separate from those of the mainstream society or culture.
- A distinct language or dialect, often different from the official language or languages of the country or region in which they reside.

According to this guidance, all of the above criteria must be met for any project-affected groupings to be identified as IPs requiring avoidance, mitigation and off-setting measures specified in the ADB PR 2 and IFC PS7. These guidelines recognize IPs as particularly vulnerable to disproportionate adverse impacts and exclusion from benefits associated with development projects, in comparison with other ethnic minorities and mainstream demographics within project-affected communities.

A review of the national policies and legislation (including customary law) of Uzbekistan, literature survey and consultation with the community development (makhalla) departments of the district- and regional khokimiyats indicated that no IPs are presented within the project-affected districts and communities.

On the community level, the ESIA-stage FGDs with the project-affected communities did not identify any ethnic residents and groupings that qualify as IPs.

14.2.8 Economy and Employment

The Republic of Karakalpakstan boasts significant natural, mineral, and agricultural resources, a strong labor force, and extensive road, transport, and communication networks. It has a strategic geographical location and ample territory. According to the annual report from the Statistics Committee, the gross regional product (GRP) for 2023 was 32,916.1 billion UZS, marking

a 3.5% increase from the previous year. Industrial production in the region was valued at 18,803.1 billion UZS, also reflecting a 3.5% growth from the prior year.

There is no available data with regards to employment as well as unemployment statistics for 2024 and 2023. In 2022, the unemployment rate was 9.1% in both the Republic of Karakalpakstan and Beruniy district.

By 2023, the average monthly salary in Karakalpakstan was 3,779,800 UZS (around USD $302), while in Beruniy district, it was 2,802,200 UZS (approximately USD $225). According to Beruniy district khokimiyat, in 2023 there are 294 people moved into the district, while 650 people left, resulting in a net migration loss of 356 people.

Types of jobs specific to project affected communities as well as number involved people are summarised in the table below.

Table 14-6 Breakdown of population in affected communities

POPULATION EMPLOYMENT	ABAY	NAYMAN	MAHTUMKULI	DUSTLIK	KYZYL KALA
Workers in enterprises and organizations	450	1010	1210	778	432
Businessmen / entrepreneurs	59	17	816	207	178
Seasonal workers	80	200	830	877	864
Migrated people to other countries in search of work	110	2	228	216	42
People engaged in child care	335	345	112	190	298
University students	38	45	83	76	101
Working pensioners	20	7	21	11	12
Unemployed people	201	120	-	114	95
Officially unemployed people	25	120	-	0	0

During the FGD, it appeared that most community members work for enterprises /organisation in the transportation sector (providing taxi services and logistics using their own vehicles), seasonal work, agriculture, livestock breeding, and rely on remittances from migrants. Additionally, participants reported high unemployment in the area, but noted that the most unemployed individuals receive benefits from the government and the "Saxovat va ko'mak" (Generosity and Support) fund. This fund, established by the Government of Uzbekistan on April 22, 2020, provides daily necessities, medicines, and other goods to large families, individuals with disabilities, the elderly in need of social protection, and temporarily unemployed individuals who have lost their income, with the support amount based on the socioeconomic

status of the families. All respondents affirmed that there is no child labor or forced labor in their communities. The average income varies among communities, ranging from 600,000 UZS to 2,500,000 UZS.

14.2.9 Poverty and Equity

Based on data from the Asian Development Bank (ADB), 11.5% of Uzbekistan's population lived below the national poverty line as of 2020. Additionally, by 2021, 6.5% of the workforce was earning less than $1.90 per day using the purchasing power parity poverty measure. Though poverty rates in Uzbekistan had been declining, the COVID-19 pandemic adversely affected this trend. In 2020, it was estimated that 1.3% of the population (around 448,000 people) may have slipped into poverty due to the pandemic.

Uzbekistan uses the minimum consumption expenditure index to determine the poverty line. According to the State Statistics Committee, the minimum monthly consumer expenditure per person was 621 thousand soums.

As of 2023, data from the Ministry of Poverty Reduction and Employment indicates that there are 1,307.8 thousand impoverished families in Uzbekistan, with the poverty rate at 14.1% (down from 17% in 2022). The Republic of Karakalpakstan has the highest poverty rate in the country at 19.7%.

14.2.10 Vulnerable Groups

The following criteria is applied for the identification of socioeconomically vulnerable groups:

- Household with one or more physically and/or mentally disabled members
- Household with one or more chronically sick members
- Household with an overall monthly income level that is below the national poverty line
- Household with informal land use potentially impacted by the project
- Household with female headship
- Household with child headship
- Household with an Indigenous People (IP) or refugee status
- PAPs that will experience loss of more than 10% of the land they use whether on a permanent or temporary basis.

Local community administrations maintain a register of families that are considered vulnerable. This register is updated annually. However, this criteria is slightly different than the lenders' criteria, as it does not account for informal land use, IP or refugees, and PAPs who

experience loss of more than 10%. The breakdown of vulnerable families in project affected communities is provided in the table below.

FGD meetings revealed that the majority of vulnerable families in the 5 communities are categorised as "Families in need" who require additional governmental support.

Table 14-7 Breakdown of families registered as vulnerable in project affected communities

TYPE OF VULNERABILITY	ABAY	NAYMAN	MAHTUMKULI	DUSTLIK	KYZYL KALA
The number of families who have lost their breadwinners	14	14	40	22	11
Families receiving benefits and financial assistance through the social register	370	375	730	461	185
Number of families with many children (four or more children)	56	26	12	321	62
The number of disabled people	51	55	184	33	78
Number of elderly people (above 60)	1	0	5	2	3

The household-level socioeconomic surveys undertaken as part of the LALRP study entailed a vulnerability analysis to identify PAHs whose livelihoods may be impacted disproportionally due to one or more pre-existing elements of socioeconomic instability, marginalization, and proneness to impoverishment.

The table below provides a general overview of PAHs that are likely to be more vulnerable. Further details are provided in the LALRP.

Table 14-8 Number of vulnerable PAHs by socioeconomic vulnerability category

NO	ELEMENT OF VULNERABILITY	NUMBER OF PAHS
1	Physical and/or mental disability	5
2	Chronic illness	8
3	Female household headship	3
4	Child-headed households	0
5	Informal tenure of affected land use/ resources	7
6	Extreme poverty	n/a
7	IP	n/a
8	PAHs that would experience severe impacts from economic displacement i.e., more than 10% of impacted land	19

No	Element of Vulnerability	Number of PAHs
Total number of vulnerable PAHs		**25**
Total number of vulnerable PAPs		**147**

14.2.11 Gender Equality

In a recent report prepared and published by the World Bank in May 2024, the gender equality and issues in Uzbekistan were assessed and the key findings are reflected below:

- The participation of women in the jobs equally to men is predicted to improve the livelihoods and financial status by pulling 700,000 people from poverty.
- Uzbekistan is ranked 106 out of 189 countries in the 2022 global Gender Development Index. This index measures gaps in human development achievements across health, knowledge, and living standards.
- Harmful gender norms contribute to unequal economic opportunities between men and women, and unfair wages for the latter.
- In some regions, women are facing discriminatory attitudes from the society which limit the women's freedom for education and employment. Based on the world Bank surveys, 30% of the respondents believe that women should get paid less than men, and 70% of the respondent confirm that women should work less than men to have more time taking care of the household. 75% of women reported that during 2022 they were not able to work due to household responsibilities.
- The survey further revealed that the mahalla leaders share similar opinions with regards to the rights and status of the woman in the society, as those discussed above.

14.2.12 Cultural heritage

Based on data from the Statistics Agency's department for the Republic of Karakalpakstan, as of January 1, 2023, there were 288 sites of material and cultural heritage in the Republic of Karakalpakstan. These included:

- 131 archaeological sites,
- 88 monumental art structures,
- 45 attractions, and
- 24 architectural monuments.
- A pilgrimage site named Sulton Uvays is located app 5 km west from Abay, Dustlik and Kyzyl Kala communities.

During the FGDs, residents of the Abay and Dustlik communities noted the proximity of the Sulton Uvays pilgrimage site to their areas. In contrast, representatives from Nayman reported the absence of cultural heritage objects in their locality.

Among the cultural sites that has a local importance residents of Mahtumkuli community mentioned cemeteries located in their area. In Kyzyl Kala, there is an old castle known as Kyzyl Kala that has local importance for villagers. According to the Kizil Kala community leader, this castle is near the borders of Ellik Kala district, about 9-10 km from the OHTL.

No intangible cultural heritage was mentioned by FGD participants and community leaders. It was stated that all holidays, performances associated with their customs are celebrated withing residential areas.

14.2.13 Agricultural and livestock grazing activities

Project region is mainly focused on agriculture and livestock breeding. In 2023, agricultural production in the Republic of Karakalpakstan totalled 15.349 trillion UZS (1.244 billion USD), marking a 4% increase from 2022. Farming contributed 7.148 trillion UZS (579 million USD), while livestock husbandry accounted for 8.2 trillion UZS (665 million USD).

In the Beruniy district, agricultural output in 2023 was valued at 2.067 trillion UZS (167 million USD), showing a 2.1% increase from the previous year. Farming generated 943.6 billion UZS (76 million USD), whereas livestock husbandry yielded 1.1238 trillion UZS (91 million USD) during the same period.

In all 5 project affected communities the majority of households cultivate annual agricultural crops in tomorka (small land plot adjacent to residential house) for own consumption. The number of tomorka land plots in each community is as follows:

- Abay community - 750 households have garden plots (tomorkas), covering a total area of 139.6 hectares;
- Nayman community - 1,232 households own tomorkas totaling 273 hectares;
- Mahtumkuli community - 1,134 households own tomorkas spanning 239.7 hectares;
- Dustlik community - 980 households own tomorkas covering 245.3 hectares; and
- Kyzyl Kala community - 1,024 households own tomorkas with a combined area of 188.6 hectares.

In addition to agricultural activities, residents from affected communities also keep livestock for own needs, i.e., obtaining milk, wool and meat for household consumption.

The table below provides breakdown of livestock owned by residents from project affected communities.

Table 14-9 Breakdown of livestock owned by residents from project affected communities

TYPE OF LIVESTOCK	ABAY	NAYMAN	MAHTUMKULI	DUSTLIK	KYZYL KALA
Number of houses with livestock	776	1195	1085	750	802
Total number of livestock	**5108**	**4065**	**7799**	**2726**	**6399**
Large horned cattle	2500	1845	5425	2048	2690
Sheep and goats	2480	2150	2170	621	3566
Horses	45	5	154	25	81
Donkeys	38	10	25	32	47
Camels	45	0	0	0	15
Rabbits	0	40	25	0	0
Pigs	0	15	0	0	0
Number of families with poultry	776	1232	930	950	845

In addition, very few households from project affected communities are involved in fishing:

- Abay community – 2
- Nayman - 4
- Makhtumkuli – 11
- Dustlik -1
- Kyzyl Kala – 2

Fishing is carried out primarily at Amudarya river, and fish is used only for household needs.

14.2.14 Land use and resettlement

Wind farm

Land allocated to Wind Farm is owned by State Committee on Sericulture and Wool Development Industry. Currently Project area as well as surrounding areas are leased to Beruniy Karakul LLC for 49 years.

FGD discussions revealed that few community members use the project area to graze livestock. However, most residents use random agricultural areas after harvesting season free of charge. Farmers allow people from nearby villages to use their land before preparations for the next planting season. FGD participants stated that typically they keep their livestock in stables located on their residential land plots and graze livestock on their tomorka. They also mentioned that Wind Farm area is far from their village making it impractical to travel long distances to graze livestock.

Site observations and surveys undertaken as part of the LALRP identified 6 herders from the project affected communities who use Wind Farm area for grazing activities. The detailed information about these herders is provided in the LALRP.

OHTL

Unlike the Wind Farm, the proposed OHTL route passes through a highly modified area, primarily consisting of rural areas and agricultural fields.

Although the number of PAPs is significant, it is noteworthy that the magnitude of impact is not as substantial. For example, permanent land acquisition is only required for the OHTL tower footprints. In addition, impacted farmers will experience only temporary land use restrictions within OHTL HPZ during the construction phase. Local legislation in force (SaNPiN 0350-17) allows the cultivation of crops in the HPZ of the OHTL.

The two identified commercial shops will need to be relocated due to land use restrictions within the HPZ.

With regards to residential land plots, no residential houses are located within the OHTL HPZ, hence physical displacement will not be triggered. However, owners of affected residential plots will have restrictions in areas within the HPZ, in which structures (e.g., toilets, barn, etc.) should not be placed within this area.

The impacts of land acquisition on PAPs are discussed in the LALRP report in detail.

14.3 Area of Influence and Receptors

The following table provides an overview of E&S impact receptors in the context of potential impacts on livelihoods and social infrastructure within the Project's Areas of Influence (AoI). A sensitivity rating and corresponding description is further provided for each relevant receptor.

Table 14-10 E&S impact receptors – Livelihoods and social infrastructure (socioeconomics)

RECEPTOR	SENSITIVITY	JUSTIFICATION
Wind farm: Herders	High	Herding households that are subject to economic displacement due to permanent land-take and access severance during construction are vulnerable to associated economic shocks, impoverishment, and hardship, considering the limited extent and quality of pastures nearby the dwellings and grazing areas of affected herders.
OHTL: Farmers/commercial structures/residential land plots	High	Farmers cultivating agricultural crops, owners of commercial shops as well as owners of residential land plots including those with property along the OHTL corridors are vulnerable to losses and expenditures due to potential physical impacts on crops and property.

RECEPTOR	SENSITIVITY	JUSTIFICATION
Project-affected communities and districts	High	Residents within the project-affected communities, particularly those based along the OHTL route vulnerable to construction-phase influences on local infrastructure, food, water and housing markets, morbidity, and cultural norms, due to existing livelihood challenges in certain areas (e.g., water and power shortages, unemployment, low crop yields, land-based livelihoods and low-income status).
Utilities and social service providers	Medium	Public utility structures operating within OHTL corridor can be damaged during construction of OHTL.
Vulnerable groups & Women	High	Vulnerable groups & vulnerable women (as defined in Section 14.2.10) can experience disproportionate impacts from the Project compared to other groups.
Workers working within the supply chain	High	Workers working within the supply chain are highly likely to be exposed to risks relating to labour & working conditions.
Local/Regional Economy	High	The proposed Project is likely to influence regional businesses. Not only local contractors and those directly involved in the construction but also local commercial operations such as food suppliers.
Employment Market	Medium	The development of the Project will result in the creation of employment opportunities and will offer an opportunity for greater dissemination of skills especially during the construction phase of the Project.

14.4 Potential Impacts and Management Measures

14.4.1 Construction phase

14.4.1.1 Economic displacement

The construction of the wind farm and OHTL will result in economic displacement only, with no expected physical resettlement. The wind farm construction will impose temporary land use restrictions on 6 informal herders. After construction, herders can return to resume their grazing activities. The land required for the installation of WTGs and associated facilities will be permanently acquired from the State Committee for Sericulture and Wool Development Industry.

The construction of the OHTL, along with the application of the health protection zone, will lead to temporary land restrictions for farmers cultivating seasonal agricultural crops. Some structures owned by individuals or located within residential land plots will need to be removed due to the health protection zone restrictions. However, farmers can continue crop cultivation within the OHTL health protection zone, as local legislation permits farming activities in such areas.

A detailed discussion of the impacts caused by land acquisition will be provided in the Land Acquisition and Livelihood Restoration Report (LALRP).

14.4.1.2 Accidental damage to public property and utility service interruptions

The construction phase of the Project will encompass various operations, such as the transportation of workers, the haulage of heavy machinery and materials, land clearance, and earthworks. Specific construction activities for both the WF and the OHTL pose a significant risk of inadvertent physical damage to private and public property beyond the areas designated for construction.

14.4.1.3 Employment and Economics

The primary economic impact during the construction phase is expected to arise from employment opportunities generated by the project within its limited timeline. The project will offer jobs for both unskilled and appropriately skilled workers, with a preference for hiring local labor to minimize socio-cultural conflicts that might arise from an influx of non-local workers. This approach is intended to align with the skill sets available locally and meet the project's requirements.

Employment on the project will provide direct financial benefits to the families of the employed workers. Additionally, wages paid to workers are anticipated to have a positive multiplier effect on the local economy. This effect occurs as workers spend their earnings locally, thereby stimulating further economic activity and recirculating money within the community.

However, a portion of the workforce will be recruited from other countries, which may lead to the repatriation of wages. This could reduce the overall economic benefit to the local area as a portion of the wages will be spent outside the local economy.

14.4.1.4 Training and Dissemination of Skills

In addition to the immediate financial benefits generated by employment during the construction phase, the project presents a valuable opportunity for the transfer of skills and knowledge to the local workforce. This includes not only construction and construction support skills but also international best practices in occupational health & safety and environmental & social standards.

Exposure to these advanced standards and techniques through collaboration with expatriate workers will enhance the local labor force's competencies. This skill dissemination is expected to significantly boost the employability of local workers, equipping them with qualifications and experience that increase their chances of securing similar employment opportunities after the project's construction phase concludes. This capacity building can contribute to long-term

economic development by expanding the local talent pool and improving workforce readiness for future projects.

14.4.1.5 Purchase of Construction Materials and Food Products Locally

The construction phase is expected to generate secondary economic impacts through the procurement of both local and international goods and services. While specialized materials required for the development are likely to be sourced internationally, essential construction materials such as concrete and aggregate will be procured locally. This local sourcing is expected to benefit local suppliers and contribute positively to the regional economy.

Furthermore, there is potential for an economic boost through the purchase of locally produced food products. Workers' demand for fresh vegetables and daily consumables can provide local farmers and vendors with additional sales opportunities, thereby stimulating local agriculture and retail sectors.

However, this increased demand may have a downside. If the purchasing power of the workforce drives up prices at local shops, it could lead to inflationary pressure on basic commodities. This price increase could negatively impact local households, particularly those with fixed or lower incomes, by making essential goods more expensive and less accessible.

14.4.1.6 Consumption of Water

The key uses of water during the construction phase are expected to be for dust suppression, personal consumption, domestic use and concrete mixture. The largest consumers of construction phase water will be for dust suppression, estimated by the EPC Contractor as 4,500m^3 per year after full NTP, with 900 m^3 for the total concrete requirements and approximately 6m^3 per day for domestic water consumption (per 100 workers).

At this stage it is understood that water will be sourced from the municipal water supply network or supplied to the Project site via water tanker trucks, however, it has not been confirmed where the water will be sourced from.

Based on the socio-economic survey undertaken, water supply does not reach all households in affected communities. As a result, many households either rely on wells or purchase water from suppliers. As such, If the supply of water to the Project site is not properly coordinated and managed, the Project demand for water may potentially create a shortage for the local community, or an increase in the price of water.

14.4.1.7 Disproportionate Impacts to Vulnerable Groups and Women

Vulnerable groups, including women and individuals living with disabilities, are likely to experience impacts from the Project that differ from those affecting other community

members. Due to existing social biases and systemic barriers, these groups may face challenges in accessing and enjoying the full benefits of the Project.

During the recruitment process, women and individuals with disabilities may encounter difficulties in securing employment opportunities due to potential discrimination and a lack of accessible accommodations. This could result in unequal participation in the economic benefits generated by the Project.

Furthermore, the influx of new workers into the community poses additional risks. Women may be particularly vulnerable to gender-based violence and harassment, while both women and individuals with disabilities could be exposed to labor rights violations and unsafe working conditions. These risks necessitate targeted measures to safeguard vulnerable populations and ensure that they are not disproportionately affected by the Project.

Further exploration of these issues can be found in the chapters on **Community Health, Safety and Security**, and **Human Rights, Labour & Working Conditions.** These chapters provide a detailed analysis of potential risks and propose strategies to mitigate negative impacts on vulnerable groups.

14.4.1.8 Disruption of Local Custom

The arrival of workers and migrants to the Project site may introduce new habits and practices that differ from the established local culture. This cultural divergence could potentially lead to conflicts between incoming workers and local residents, or a decline in social cohesion within the community.

However, this risk is mitigated by several factors. The construction workforce is relatively small, with a peak workforce estimated at 200 individuals. Moreover, the Project site is situated at a considerable distance from local communities. These conditions significantly reduce the likelihood of meaningful disruption to local customs and social dynamics. Therefore, the anticipated impact on local customs and social cohesion is expected to be negligible.

To further minimize any potential disruption, the Project will implement cultural sensitivity training for incoming workers and encourage practices that respect local customs and traditions.

Table 14-11 Socioeconomics Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
Employment Opportunities	**Minor Positive**	Employment Market	Medium	**Minor Positive**	• Where suitably skilled workers are available, including women. The EPC Contractor will aim to engage 50% of the workforce from Uzbekistan and local communities, where suitably skilled workers aer available. • The EPC and sub-contractors' HR Policy will be prepared to ensure consistency in line with local labour laws and international ILO and UN conventions. The EPC Contractor is to ensure that this is applied as an overarching policy for all sub-contractor company HR policy as part of their contractual arrangements. • EPC Contractor will undertake local community consultation during recruitment process in order to consider equitable job opportunity distribution among the locals to avoid conflict between the local people • The EPC Contractor will provide equal employment opportunities to women and preferences will be given to local women for unskilled and semi-skilled labour positions.	**Minor Positive**
Training and dissemination of construction skills	**Minor Positive**	Local Population	High	**Minor Positive**	• All Project workers will receive induction training at the Project, as well as vocational specific training for on-site construction works. • All workers will receive training in regard to health and safety, as well as environmental and social awareness, GBV and SEA/SH. • The Project Company will develop a GRM for SEA/SH issue and will map service providers for any past records of SEA/SH incidents. • Toolbox talks will be conducted before work on each day to ensure workers are reminded of key topics. • Cultural awareness training for all foreign workers and those coming from other regions in Uzbekistan.	**Minor Positive**
Purchase of construction materials and food resources locally	**Minor Positive**	Local/Regional Economy	High	**Minor Positive**	• The EPC Contractor will purchase goods and materials from the local/regional economy where possible. • The EPC Contractor will purchase some of the food products such as meat, milk from the suppliers. • Establish market network between the Project workers and the local people where possible in consultation with the community leaders. Monitor prices of basic commodities.	**Minor Positive**
	Minor Negative	Inflation in prices of locally sourced construction materials and food supplies		**Minor**	• The EPC Contractor will ensure that the influx in workers does not lead to an increase in retail prices of basic commodities by providing the workers with food or giving them transportation to larger towns where they can buy food and non-food items.	**Negligible**

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
Consumption of Water	**Moderate Negative**	Water Resources	Medium	**Moderate**	• The EPC Contractor will engage a licensed water tanker trucks and obtain relevant permits. • Prior to engaging a licensed water supply company, the EPC Contractor will determine the source of the water to be used for the Project. • Where water is sourced from the same water supplier that nearby villagers use, the EPC Contractor will undertake sustainability assessment to ensure that the Project's water demand does not create a shortage for the local communities or drive up the price of water. • The Project workforce will be trained on ways to minimise water consumption and to ensure they understand water resources and resource efficiency. • The grievance mechanism will allow communities to lodge any complaints or concerns regarding water issues related to the Project. • Water storage tanks, pipes, taps etc. will be inspected for leakage and repaired immediately once identified.	**Minor**
Disproportionate impacts on vulnerable groups	**Minor Negative**	Vulnerable groups & women	High	**Minor**	• The CLO will regularly undertake informal meetings including with women focus groups & vulnerable groups to ensure that on-going stakeholder engagement is gender inclusive. • The Project Company will ensure that the EPC Contractor employs a female within the social experts who will support the CLO in addressing potential gender-based violence and harassment issues. • Implementation of mitigation and management measures provided under Community Health, Safety & Security and Labour & Working Conditions.	**Negligible**
Disruption of Local Custom	**Negligible Negative**	Welfare of Local Communities	High	**Minor**	• The EPC Contractor will provide adequate training to the non-local workers in the Project, especially in terms of interaction with the local community members. • Local residents will be able to report concerns associated with loss of cultural values through the grievance mechanism. • The EPC Contractor will adopt a zero-tolerance policy towards unacceptable workforce behaviors towards females or any community members i.e., sexual harassment or violence. • The grievance mechanism will be made available to the local communities i.e., community members can make verbal or written complaints at the Project security gate or request to speak to the Environmental Manager	**Minor**

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
Land Acquisition	**Negligible Negative**	Herders at WF /farmers owners of structures along	Medium	**Negligible**	• Standalone report will be prepared to access impacts due to the land acquisition for WF and OHTL and propose compensation, livelihood restoration programs • The GRM process and contact details have been provided to the herder and family in accordance with the SEP. • The EPC Contractor will clearly mark out construction areas which will be inaccessible during the construction phase of the Project. • If required, alternative access roads for the local communities will be identified before access to any of the existing roads is restricted. The alternative roads must be in good condition to allow for vehicle, livestock passage and safe for walking. • The Community Liaison Officer will notify the communities of any access restrictions. • The construction schedule will be shared with the community. • Signs will be put in place in local languages to show the alternative access routes available to the herders and local communities once the construction areas have been demarcated. • Monitoring will be conducted to ensure that the PAPs livelihoods are not impacted in the future.	**Negligible**

14.4.2 Operation Phase

At a strategic level, the Wind Farm represents a significant step toward a low-carbon transition for Uzbekistan's economy by harnessing the country's wind resources. The Project aligns with the Uzbekistan 2030 Energy Strategy by reducing the country's dependency on fossil fuel-generated power and decreasing atmospheric pollution. Additionally, it supports the sustainable growth of the national economy through a reliable and renewable power supply.

Similar to the construction phase, the operational phase will create economic benefits through local employment. However, the workforce required during operation will be significantly smaller, with an estimated maximum of 15 permanent positions. These roles will primarily consist of management, technical operators, security teams, and office-based support staff.

While the operational workforce is limited in size compared to the construction phase, it offers valuable opportunities for skill dissemination due to the longer duration of employment. ACWA Power's established processes and proven track record suggest that non-technical staff, such as security and support staff, will likely be sourced locally.

To maximize the economic impact, the Project will implement a targeted local recruitment strategy and invest in the development of local human capital. This approach will enhance the skillset of the local workforce, providing lasting economic benefits and fostering greater community involvement in the ongoing operation of the Wind Farm.

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Table 14-12 Socioeconomics Impact Significance, Mitigation & Management Measures and Residual Impacts – Operation

Potential Impact	Magnitude	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
Sustainable supply of energy	**Moderate Positive**	NEGU	-	**Moderate Positive**	• Ensuring that the appropriate operation and maintenance of the Wind Farm to enable a secure supply of renewable energy	**Moderate Positive**
Employment Opportunities	**Minor Positive**	Employment Market	Medium	**Minor Positive**	• The Project's recruitment policy will ensure a preference for employing workers from the local population especially women where appropriately skilled workers are available locally (or if unskilled positions are available). • The HR Policy will be prepared to ensure consistency with the ACWA Power's Environmental & Social Management System Implementation Manual which will ensure compliance with local labour laws and international ILO and UN conventions. • Workers will be encouraged to develop their careers and may be provided with opportunities to attend training courses and other career development processes. • Training plans to be developed and implemented to facilitate career development and advancement within the local workforce.	**Minor Positive**
Training and dissemination of skills	**Minor Positive**	Welfare of Local Population	High	**Minor Positive**	• All Project workers will receive induction training at the Project, as well as vocational specific training for on-site works, as required • All workers will receive training in regard to health and safety, as well as environmental and social awareness, GBV and SEA/SH. • The grievance mechanism will be confidential and provide referral and support system for any workers reporting cases of GBVH and SEA/SH. This system will also map relevant service providers, including legal, medical, and psychological support services, to ensure comprehensive assistance for affected individuals.	**Minor Positive**

14.5 Monitoring

Table 14-13 Socioeconomic Monitoring Requirements – Construction and Operation

MONITORING	PARAMETER	FREQUENCY & DURATIONS	RESPONSIBLE ENTITY
Resettlement impacts (i.e., economic displacement)	Please refer to the project Land Acquisition and Livelihood Restoration Plan (LALRP) for relevant monitoring requirements		
Accidental damage to third party property	Grievances concerning incidental damage to public or private (third party) property	On-going	EPC Contractor CLOs
Accidental damage to utility structures	Grievances/formal requests concerning damage to utility structures by local authorities	On-going	EPC Contractor CLOs
Increased pressure on public infrastructure and resources	Grievances concerning project-related burden on utility and communal infrastructure and resources	On-going	EPC Contractor CLOs
Employment	Number of persons employed from the villages near the Project site	On-going	- EPC Contractor CLOs - Project Company CLOs
Third Party Grievances	Issues related to socioeconomic factors, land use and ownership, as well as general community grievances, including concerns about GBV and SEA/SH	Ref. to Grievance Mechanisms section in SEP	- EPC Contractor CLOs - Project Company CLOs

15 COMMUNITY HEALTH, SAFETY & SECURITY

15.1 Applicable Requirements & Standards

15.1.1 National Regulations

CONSTITUTION OF THE REPUBLIC OF UZBEKISTAN (1992, AS AMENDED IN 2023)

The constitution of the Republic of Uzbekistan lays out an array of constitutional rights, entitlements and duties pertaining to public health and safety, and access to judicial remedies for criminal offences. Key articles in this connection include the following:

- Article 25 states "The right to life is an inalienable right of every human being and shall be protected by law".
- Article 26 states "Human honour and dignity are inviolable. Nothing may be a basis for their derogation. No one shall be subjected to torture, violence or other cruel, inhumane, or degrading treatment or punishment.
- Article 27 states "Arrest, commitment, and confinement are allowed only by a court decision. Without a court decision, a person may not be detained for more than forty-eight hours".
- Article 40 states "Everyone shall have the right to a favourable environment, reliable information about its condition.
- Article 48 states "Everyone shall have the right to health and qualified medical care".
- Article 55 states "Everyone shall be entitled to legally defend his/her rights and freedoms and shall have the right to appeal any unlawful decisions, acts and omissions of State bodies and other organizations, their officials".

RESOLUTION OF CABINET OF MINISTERS OF REPUBLIC OF UZBEKISTAN NO.95 ON THE APPROVAL OF GENERAL TECHNICAL REGULATIONS OF ENVIRONMENTAL SAFETY (2020)

Provides for the establishment of health protection zones and isolation measures for energized national grid components, including electrical sub-stations and powerlines. These exclusion zones and safeguards are intended to prevent negative impacts on human health and ecological receptors, including exposure to hazardous levels of electromagnetic radiation, electrocution, and collision-related avian mortality.

DECREE OF THE CABINET OF MINISTERS OF THE REPUBLIC OF UZBEKISTAN NO.1050 ON APPROVAL OF RULES FOR PROTECTION OF POWER GRID FACILITIES (2018)

This decree establishes the procedure for mandating Grid Security Zones (GSZ) for power grid facilities, as well as special conditions for using land located within these exclusion zones, to

ensure sustainable operation of the said facilities, with minimum risk to public health and safety, as well as vulnerable wildlife.

Grid Security Zones for power grid facilities shall be established on both sides of the power transmission line from the outermost wires and along the perimeter of substations at the following distances for voltages:

- 110kV – 20 meters from each outer-most conductor
- 220kV – 25 meters from each outer-most conductor
- 500kV – 30 meters from each outer-most conductor

The Grid Security Zone (GSZ) applicable to the protection of the Project's 220 kV OTLs is 25 metres (from the outermost conductors).

The Health Protection Zone for the Wind Farm has been established by the Agency for Sanitary and Epidemiology as 250 meters.

SAN RULES & NORMS NO. 0236-07 – SANITARY NORMS AND RULES TO ENSURE SAFETY FOR PEOPLE LIVING NEAR HIGH VOLTAGE POWER TRANSMISSION LINES (2007)

This regulation prescribes the Health Protection Zone (HPZ) for overhead transmission lines planned within areas including human settlements and establishments. The extent of mandatory HPZ is commensurate with the voltage rating of overhead powerlines. The HPZ serves to safeguard the public from hazardous exposure to electromagnetic fields radiating from high-voltage powerlines.

The lateral extent of the HPZ is measures from the outermost conductors along a given overhead transmission line alignment, as follows:

- Up to 110kV/m – 10 meters from each outer-most conductor
- Up to 220kV/m – 15 meters from each outer-most conductor
- Up to 330kV/m – 20 meters from each outer-most conductor
- Up to 500kV/m – 30 meters from each outer-most conductor
- Up to 570kV/m – 40 meters from each outer-most conductor

LAW ON PROTECTION OF WOMEN FROM HARASSMENT AND ABUSE (2019)

The national law provides for the protection of women from all forms of harassment and abuse. While violence against women is recognized in the Criminal Code of Uzbekistan, provisions for the registration, investigation, and prosecution of GBV are not prescribed in the Code.

In furtherance of the Code, the Act established specific procedures for the management of GBV cases for relevant law enforcement authorities and mandates the provision of medical,

psychological, legal, economic, and humanitarian support to victims of GBV. In 2020, systems for the issuance of protection orders for victims of GBV were fully instituted across the country.

RESOLUTION ON MEASURES TO IMPROVE THE SYSTEM OF SOCIAL REHABILITATION AND ADAPTATION, AND THE PREVENTION OF DOMESTIC VIOLENCE (2018)

The Resolution No. PP-3827 of the Head of the State dated 07.02.2018 "On measures to improve the system of social rehabilitation and adaptation, as well as the prevention of domestic violence" identifies priority areas for improving the system of social rehabilitation and adaptation, prevention of family and domestic violence, and approved the program of practical measures to improve the system of social rehabilitation and adaptation, as well as the prevention of domestic violence.

The Resolution provides for the following key measures:

- Priority areas include improving the social system of rehabilitation, adaptation and preventative measures against domestic violence.
- A program of practical measures to improve the system of social rehabilitation, adaptation and prevention of domestic violence.
- A Center for Rehabilitation and Adaptation for victims of violence, as well as the prevention of suicides in territorial divisions of the Women's Committee of Uzbekistan.
- Public "hot line" on number "1146", for provision of emergency psychological, psycho-therapeutic and legal support and information about organizations that may provide additional assistance.

OTHER RELEVANT LEGISLATION

The list of laws and decrees with broad provisions for the protection of public health, safety and security, and other human rights in the context of public wellbeing, includes:

- Decree No. 964 of 5 December 2017 on measures for improvement of the activity of self-government bodies aimed at ensuring employment, firstly for the youth and women
- The National Human Rights Strategy was approved by Presidential Decree on 22 June 2020. No. PD-6012
- Law on guaranteeing equal rights and opportunities for women and men (2019)
- The Law on mediation (2018)
- Law on public control (2018)
- Law on administrative procedures (2018)

HUMAN RIGHTS

As a member of the United Nations, Uzbekistan supports and implements all the main international instruments of the United Nations relating to the protection of human rights and

freedoms, including UN Universal Declaration of Human Rights, Human Rights Council Resolution No. 30/15 on human rights and preventing and countering violent extremism, Convention on the Elimination of all Forms of Discrimination against Women among others.

Uzbekistan's State Policy on human rights is aimed at preventing violations or any restriction on human rights and freedoms and at establishing the necessary organizational, legal, social, economic, spiritual and moral foundations for the protection of human rights.

GENDER-BASED VIOLENCE, HARASSMENT, AND EXPLOITATION

Over the past decade, the Government of Uzbekistan has implemented a number of legal reforms and interventions geared towards the protection of women's rights and the elimination of GBV. An overview of the key executed initiatives to this end is provided in the table below.

Table 15-1 Reforms and Initiatives for Protection of Women's Rights and Support for GBV Victims

INTERVENTION	OBJECTIVES
Establishment of the Law on Protection of Women from Harassment and Abuse (2019)	The national law provides for the protection of women from all forms of harassment and abuse. While violence against women is recognized in the Criminal Code of Uzbekistan, provisions for the registration, investigation, and prosecution of GBV are not prescribed in the Code. In furtherance of the Code, the Act established specific procedures for the management of GBV cases for relevant law enforcement authorities and mandates the provision of medical, psychological, legal, economic, and humanitarian support to victims of GBV. In 2020, systems for the issuance of protection orders for victims of GBV were fully instituted across the country.
Establishment of the Resolution on Measures to Improve the System of Social Rehabilitation and Adaptation, and the Prevention of Domestic Violence (2018)	The Resolution No. PP-3827 of the Head of the State dated 07.02.2018 "On measures to improve the system of social rehabilitation and adaptation, as well as the prevention of domestic violence" identifies priority areas for improving the system of social rehabilitation and adaptation, prevention of family and domestic violence, and approved the program of practical measures to improve the system of social rehabilitation and adaptation, as well as the prevention of domestic violence. The Resolution provides for the following key measures: 1. Priority areas include improving the social system of rehabilitation, adaptation and preventative measures against domestic violence. 2. A program of practical measures to improve the system of social rehabilitation, adaptation and prevention of domestic violence. 3. A Centre for Rehabilitation and Adaptation for victims of violence, as well as the prevention of suicides in territorial divisions of the Women's Committee of Uzbekistan. 4. Public "hot line" on number "1146", for provision of emergency psychological, psycho-therapeutic and legal support and

INTERVENTION	OBJECTIVES
	information about organizations that may provide additional assistance.

15.1.2 Lenders Requirement

ADB

Under ADB Safeguard Requirement 1: Environment, the assessment of community health and safety is required in ESIA.

Specifically, 'The borrower/client will identify and assess the risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the project, and will establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts.'

This includes reasonably foreseeable incidents, accidents, and natural impacts (due to the Project) and requires affected communities to be informed. Appropriate provisions must be in place to plan for such events.

AIIB

ESS1 – Environmental and Social Assessment and Management: Point 8.1 outlines the need to consider community health and safety in the impact assessment, further stating "*this would include, as appropriate, risks related to pandemics and other forms of transmission of communicable diseases.*"

Section D 'Social Coverage' outlines the requirement for social assessment, including, but not limited to, vulnerable groups and discrimination, gender, gender-based violence, etc.

EPFIs

IFC Performance Standard 4 establishes requirements to safeguard local communities from potential risks associated with the Project including impacts associated with introduction of communicable disease, site access and operation, material use etc. The key objectives of PS4 are:

- To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances.
- To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.

In regard to human rights:

- In line with EP IV requirements, the United Nations Human Rights Guiding Principles apply to the Project. HRGP II on "The corporate responsibility to respect human rights"

recognises that it is the responsibility of businesses and corporations to respect human rights. It is a global standard of expected conduct for all business enterprises wherever they operate. It exists independently of a States' ability and/or willingness to fulfil their human rights obligations and does not diminish those obligations.

15.2 Baseline Conditions

15.2.1 Nearby Communities

Wind Farm

As it stated in Section 2.3 and the Socioeconomics Chapter, there are no permanent communities in proximity of WF area. The nearest one is located at distance of 9 km. As a result, WF is not directly impacting local communities.

The land designated for the Project is confirmed to be owned by the State Committee on Sericulture and Wool Development Industry (SWID) and has been leased to Beruniy Karakul LLC for a 49-year term. Observations during the ESIA phase revealed that the Project area is utilized by 6 seasonal herders for grazing, who bring their livestock from spring to mid-summer and use temporary structures like fences, watering facilities, and movable vans. These herders are informal, mostly coming from nearby communities, and do not have formal agreements with either SWID or Beruniy Karakul LLC.

OHTL

Unlike the WF, the OHTL crosses through five residential communities. The nearest community, Nayman, is situated within 190 meters of the route, while the furthest, Kyzyl Kala, is 4.4 km away. Additionally, the proposed OHTL route passes through the Makhtimkuli community area without affecting any residential houses.

The land required for tower installation along the OHTL route is leased to various farmers for crop cultivation. Besides farmland, the OHTL will also impact areas owned by several state organizations, such as the Forestry Fund and municipal land, as well as plots that are part of residential structures.

15.2.2 Existing Public Infrastructure

WIND FARM

There are no public structures and utilities at the WF area. This was confirmed through the number of site observations at Scoping and ESIA stages. In addition, absence of any buried infrastructure as well as public utility structures was confirmed during stakeholder consultations with various local authorities.

OHTL

Unlike the WF area, there are number of various public utility structures along the OHTL route.

Site observations and stakeholder consultations conducted at ESIA stage revealed presence of following structures:

- Irrigation and drainage canals crossing the agricultural areas;
- Main gas pipe that goes in parallel with OHTL route;
- Underground communication cables;
- Railway line;
- Existing OTL lines;
- Water pipes.

Location of each utility is provided in the figures below.

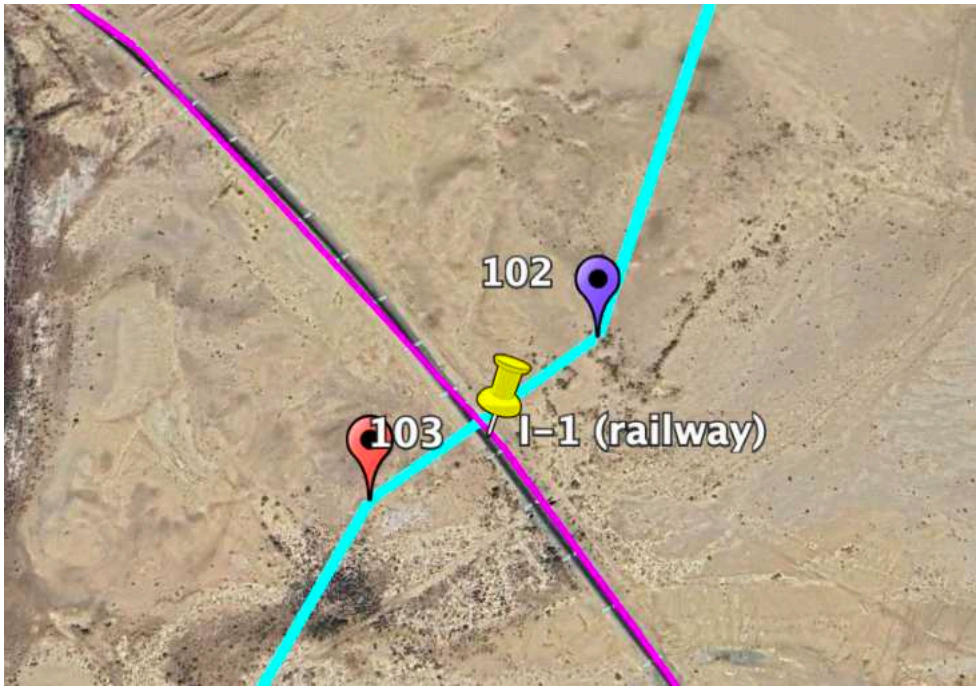

Figure 15-1 Cross section of railway and OHTL route

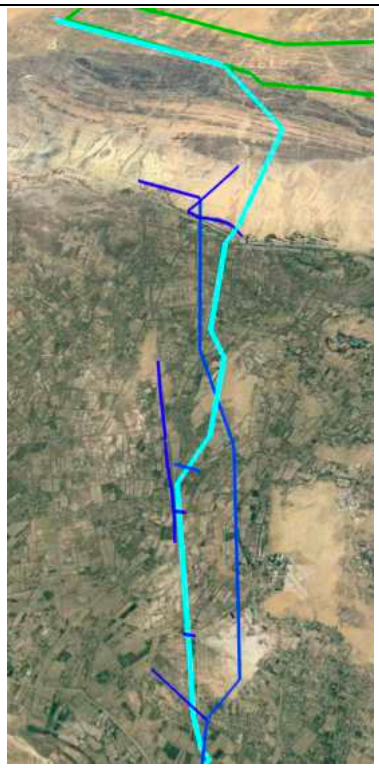

Figure 15-2 Cross section of existing OTLs with proposed route

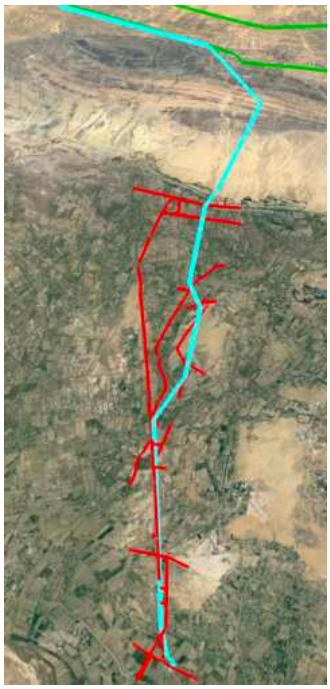

Figure 15-3 Cross section of existing drainage and irrigation canals with proposed OHTL

Figure 15-4 Cross section of existing water pipes with proposed OHTL

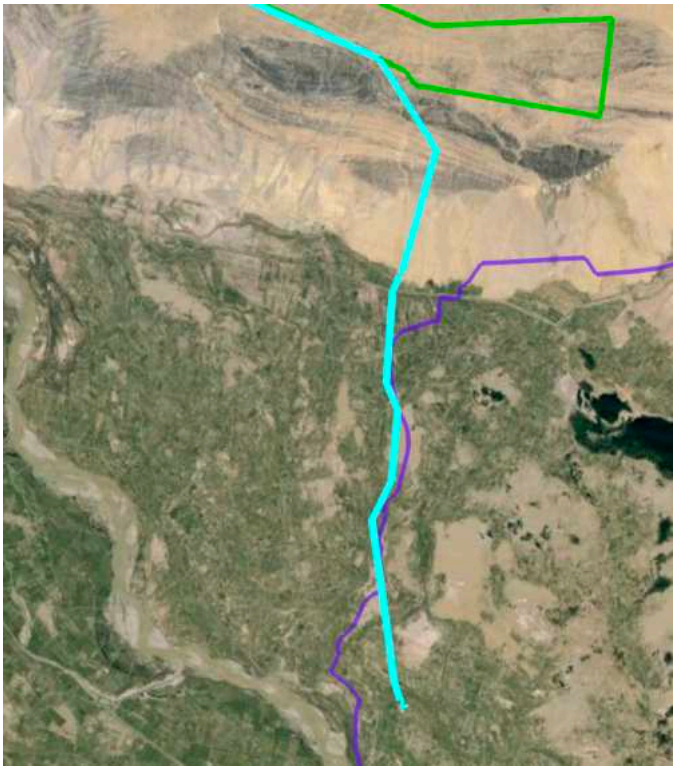

Figure 15-5 Cross section of main gas pipeline

Information related to the location of underground cables as well as gas pipes is pending from by relevant state organisations. With regards to other utility, standalone consultations were

conducted by various state organisations in charge of these structures. Consultations revealed that these structures are located in a safe distance from OHTL towers and required health protection zone specific for each type of utility is followed.

Public structures of local communities, i.e., schools, kindergartens and medical clinic, are located within the residential areas and do not fall under AoI of OHTL route. Information on available public structures and their number in five communities is provided in the table below.

Table 15-2: Public infrastructure in affected communities

TYPE OF STRUCTURE	ABAY	NAYMAN	MAHTUMKULI	DUSTLIK	KYZYL KALA
Kindergartens	4	11	3	6	3
Schools	3	4	3	4	4
Medical clinic	1	1	1	0	1

15.2.3 Gender based Violence, Harassment and Exploitation

The population of Uzbekistan follows a patriarchal culture with an inherent bearing on gender equality in education, employment and political representation. Historically, various forms of violence, harassment and exploitation have prevailed across the country.

Since 2017, the country's Parliament and Government have made significant efforts to increase the economic and social inclusion of women, which were part of the transformative reform agenda launched after many years of stagnation and isolation from the outside world. These culminated in the passage of the two historic laws to guarantee women and men equal opportunities and to protect women from violence and oppression, in 2019. The law to protect women from violence establishes a legal basis for police complaints against gender-based violence, giving way to the systematic protection of victims. Although violence against women is illegal under existing criminal laws, no provisions previously existed for the registration of gender-based violence cases, nor for measures that are recommended to support and protect victims. The passage of the new legislation recognises gender-based violence as a distinct type of criminal offense, and sets out special requirements for the registration, processing, and enforcement of these cases. Moreover, under this law, the Government has committed to providing support to affected women and girls, including free legal, economic, social, psychological, medical, and other services. In January 2020, the Uzbek authorities approved measures to establish protection orders for victims of gender-based violence, enabling the respective state agencies to provide police and other support to those in need (Mantovanelli, 2021). Additionally, a women's rehabilitation and adaptation centre at "Madad" NGO is available for incidents related to GBVH and/or SEA/SH. This centre provides support to women and their children who have experienced GBVH and/or SEA/SH, and is located in Nukus city, Republic of Karakalpakstan. The centre is registered under the National Agency of Social Protection, operating under the President of the Republic of Uzbekistan. The centre can also support GBVH victims through its hotline at 1169. Additionally, the Ministry of Support of Mahalla and Elderly People offer hotline assistance via 1146.

Victims of GBVH can also report incidents to the police inspector within their community.

15.3 Potential Impacts, Mitigation, Management & Residual Impacts

This chapter assesses the impacts relating to the health & safety of the local community who live and work in the surrounding area and may be subject to Project related impacts.

15.3.1 Construction Phase

15.3.1.1 Worker Influx, Community Health and Crime

ACCOMMODATION

The Project's construction phase will involve a workforce of permanent staff, contractors, and specialist sub-contractors, increasing the on-site and local population. With an estimated workforce of 200, staff accommodations will be located within the nearby villages close to the Project footprint. Additionally, sub-contractors may also need off-site housing in nearby communities. Workers, including international experts, will come from outside the Project area and Karakalpakstan, possibly leading to cultural or religious conflicts with local populations due to differing practices and ideals.

DISEASE AND ILLNESS

Interaction among workers from different regions and the proximity of on-site and accommodation facilities may lead to the spread of communicable diseases, including STIs, skin infections, affecting both workers and nearby communities. Additionally, construction activities could create breeding grounds for bacteria and parasites, and potential site contamination, such as sewage or hazardous material spills, might lead to waterborne diseases through surface and groundwater contamination.

HIV/AIDs

The arrival of construction workers, including those from different regions of Uzbekistan and international locations, presents health risks to both workers and local communities. Consequently, the EPC Contractor must implement a sexual health and HIV awareness campaign, producing information leaflets for distribution in the local communities in partnership with local health authorities, and providing awareness training for Project workers.

15.3.1.2 Safety

All construction projects have potential risks relating to public safety that could arise, particularly in regard to the use of high-powered equipment, heavy construction machinery, excavations, transportation of oversized loads and use of HGVs, Risks also include fire and pollution releases.

Risks will be suitably managed in the construction phase through the implementation of a robust CESMP and the preparation and implementation of an Emergency Preparedness and Response Plan.

15.3.1.3 Security

During the construction phase, site security will be necessary to prevent public access to construction areas both for WF and OHTL, thereby reducing the risk of incidents or damage to machinery. However, there is a potential risk of security personnel abusing their authority, leading to gender-based violence or harassment against workers or community members.

The EPC Contractor must conduct a thorough security risk assessment and ensure security measures align with the UN Code of Conduct for law enforcement officials, the IFC's Good Practice Handbook on Security Forces, the Voluntary Principles on Security and Human Rights, and the UN Basic Principles on the Use of Force and Firearms, especially if security personnel are armed.

Additionally, security staff will receive training on managing grievances, directing complainants to appropriate channels, and will be trained in cultural awareness to respect local customs, particularly for those not from the region.

15.3.1.4 Human Rights Risks to Local Communities

Based on the Project's area of influence (as per potential impacts upon different environmental and social parameters), there are expected to be specific Project impacts to the local herders at WF area, land users and nearby communities along OHTL. A Grievance Mechanism will allow any third parties to raise grievances against the Project without cost, retribution or fear of negative consequences.

In addition, the Project will ensure that the right of local communities along OHTL to a clean and safe environment is safeguarded through the implementation of mitigation and management measures detailed in this ESIA including adherence to the monitoring requirements.

RIGHT TO SECURITY

The interaction of workers with local communities could lead to an increase in illicit behaviour such as alcoholism, prostitution, gambling, etc. all of which can result into robbery and crime. Increases in crime pose safety risks to the local communities thereby interfering with right to security of the local communities.

In addition, security personnel may also abuse their position of power to violate the rights of community members. To address this, the project will be required to implement the mitigation measures detailed in the Security section.

RIGHT TO HEALTH

The influx of workers and migrants to the project area will potentially result in additional pressure on local clinics especially in case of an emergency if no alternative health facilities (i.e., site clinic) are provided for the workers.

As such, the EPC Contractor, will be required to have a site-based health clinic and make arrangement with other regional hospitals so that the services to the local communities are not undermined.

ECONOMIC RIGHT

During construction, the Project will cause temporary restriction on use of land and access by herders who graze livestock at the Project site, thereby impacting the herders' right to access resources that support their livelihoods.

From a human rights perspective, displacement and temporary restrictions to accessing the site must not result in a detriment to human rights nor should it create obstructions to the right to continuous improvement of living conditions (Van der Ploeg & Vanclay, 2017).

Following determined case of loss of grazing lands at WF area, as well as impact to crops and structures along OHTL the Project will implement a Livelihood Restoration Plan and comply with IFC PS5 and EBRD PR5 in order to ensure that the impacts of the Project are minimised and managed.

15.3.1.5 Human Right Risks to Vulnerable Groups

RIGHT OF ETHNIC MINORITIES

The Project will ensure that the right to information and participation for any ethnic minorities is maintained through the implementation of the stakeholder engagement and awareness creation of the grievance mechanism. In addition, all Project information will be made easily accessible and in appropriate languages (such as Karakalpak, and Uzbek) and the EPC Contractor will hire translators where necessary.

As stated in the Socioeconomic Chapter, Project there are no people who possess the characteristics of indigenous people.

GENDER BASED VIOLENCE AND HARASSMENT, SEXUAL EXPLOITATION AND ABUSE AND SEXUAL HARASSMENT

The Project will bring an influx of mainly young male workers during construction, potentially increasing the demand for sex workers and posing a risk of women and children being trafficked to the area for sexual exploitation. This influx may also increase the risk of adolescent girls being forced into early marriages with Project workers perceived to have better wages. Children in the community could face heightened risks of gender-based violence, harassment,

sexual exploitation, and abuse, being unable to consent or resist advances, leading to serious long-term health and psychological impacts.

Furthermore, the presence of these young men might disrupt community and household power dynamics, possibly inciting male jealousy and violence if interactions with local women are perceived.

To address these risks, the EPC Contractor will conduct a risk assessment for GBVH/SEA/SH, provide training for all Project workers, and implement a GBVH Policy outlining unacceptable behaviour, reporting procedures, sanctions for perpetrators, and support systems for victims.

15.3.2 Operational Phase

15.3.2.1 Blade and Ice Throw

In the event that a wind turbine fails this can result in a blade becoming detached and falling resulting in safety risk to local communities (including herders). During cold weather conditions such as snow, ice can accumulate on the blades and pieces of this ice can be thrown to surrounding areas while the blade is rotating or dropped on the ground if the turbine is idle.

The Health Protection Zone for the Wind Farm has been established by the Agency for Sanitary and Epidemiology as 250 meters.

According to the WBG/IFC EHS Guideline on Wind Energy a minimum setback requirement of 1.5 x turbine height (tower + rotor radius) is required for blade throw, therefore for the Project a setback of 309 m is required. A minimum setback requirement of 1.5 (rotor diameter + hub height) is required for ice throw as established in International Energy Agency on Wind Energy Projects in Cold Climates and referenced in the IFC EHS Guideline on Wind Energy. For the Project a 437 m setback is required for ice throw.

As all of the WTGs are over 9 km from the nearest residential areas, and approximately 2.5km from cultural heritage area, where presence of people can be expected, the likelihood/risk of blade & ice throw is anticipated to be negligible. In addition, it is expected that the wind turbines will be subject to continuous monitoring and regular maintenance.

15.3.2.2 OHTL Failure

In the event that an OHTL tower collapses, for example due to a faulty foundation, there is the potential for electric shock and/or burns, which may lead to serious injuries and damages to the residential houses.

Risks to public safety will be appropriately addressed and prepared for in the operational phase 'Emergency Preparedness and Response Plan' and via appropriate training of staff.

15.3.2.3 Electromagnetic Field (EMF) hazards and related incidents

The energization and operation of the overhead and underground powerlines will generate electromagnetic fields (EMF) around the high-voltage conductors. The strength of the EMF around powerlines decreases with increasing distance from the lines and with attenuation from intervening media such as concrete/metallic shielding structures and trench overburden. A number of studies have linked extended exposure to EMF underneath and close to high-voltage overhead powerlines to adverse health effects, which include chronic and potentially fatal conditions such as cancers (i.e., Leukaemia etc.). The violation of mandatory Health Protection Zones (HPZs) for the Project's OTL therefore poses a significant hazard to human health.

The northern half of the OHTL is located within desert area without human settlements. As such, potential impacts relating to EMF will potentially be in the agricultural zones and areas near human settlements. As the OHTL is of 220kV rating, a 25m minimum health protection zone will apply on each side from the conductors in line with SanPiN No 0236-07 Health Protection Zone requirements for single circuit OHTLs with 220kV rating.

The figure below shows the mean magnetic field around a typical 230kV transmission line up to a distance of 91m (NIEHS, 2002). The application of a 25m health protection zone is sufficient as EMF outside this area is below the requirements set in the SanPin 0236-07, which state that EMF in population living areas shall not exceed 1.0kV/m and magnetic fields 80 A/m (equivalent to 100μT).

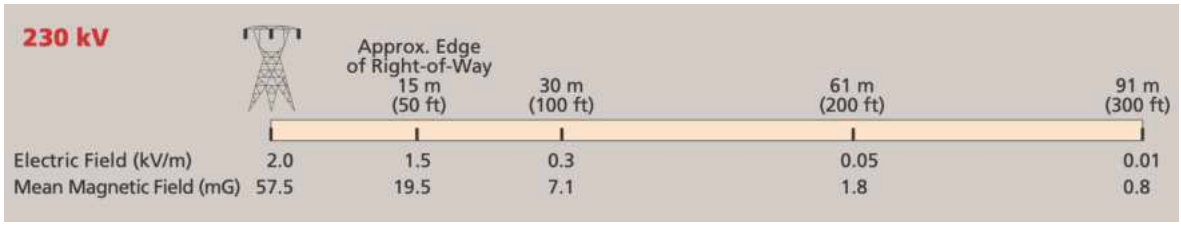

Figure 15-6 Typical EMF levels for Power Transmission Lines

Source: *National Institute of Environmental Health Sciences, 2002*

It is expected that some agricultural activities will continue directly under the OHTLs where the EMF may exceed the national and lenders requirements. However, agricultural activities under the OHTLs are expected to be spaced out, thus limiting the period of exposure to workers and animals.

OHTL maintenance workers typically have a higher exposure to EMF than the general public due to working in proximity to power lines (IFC guidelines on Electric Power Transmission &

Distribution). As such, occupational EMF exposure will be prevented and minimised through the preparation and implementation of an EMF safety program.

Cumulative Impacts

There are certain locations close to the Beruniy sub-station where multiple OHTL lines are run in proximity to each other. As outlined above, EMF (or the combination electric and magnetic fields) is dependent on certain items. Magnetic fields relate more closely to the current flowing through a line and are mostly the focus of EMF exposure considerations. Magnetic fields reduce with distance and are specific to individual lines and hence there isn't a cumulative magnification effect.

As outlined above, in Uzbekistan, the applicable Sanitary Agency through the SanPiN regulations sets provisions for the safe distances of certain receptors and activities from transmission lines, based on transmission type. Hence, there is a Health Protection Zone already considered from the project's OHTL, which is also expected to apply to other lines. Assuming receptors are not located within these areas, the expectation is that the most significant impacts to humans would be avoided.

15.3.2.4 Security

The Project is a critical facility for electricity generation and will require robust site-based security at the main entrance and for patrolling the site. The O&M Contractor will conduct a security risk assessment to establish the appropriate security measures for the facility. Security protocols should align with the UN Code of Conduct for law enforcement officials, the Voluntary Principles on Security and Human Rights, and the UN Basic Principles on the Use of Force and Firearms, particularly if security personnel are armed.

Security staff will also receive training on grievance handling, including reporting processes and engaging with local community members.

A comprehensive maintenance and check-up schedule, including a security risk assessment, should be developed for OHTL to ensure the safety of nearby structures and local communities. GRM should be established and operating for nearby property owners and farmers to report any issue, if applicable.

15.3.2.5 Human Rights Risk

The risk to human rights abuses during the operational phase will be limited due to the reduced workforce and interaction with local communities. However, the risks will not be entirely eliminated, and mitigation measures will need to be put in place just as in the construction phase.

In addition, the O&M Company will be required to implement a grievance mechanism, conduct consultations and provide information to local communities in line with the SEP that will be submitted alongside the ESIA.

GENDER BASED VIOLENCE & HARASSMENT, SEXUAL EXPLOITATION & ABUSE AND SEXUAL HARASSMENT

Even though there will be reduced workforce during the operational phase of the Project, the risk of GBVH/SEA/SH will remain especially towards women, girls and boys. There will still be a limited level of interaction between the operational phase team and the host communities. As a result, measures will be put in place to ensure that exploitative sexual relationships and unwanted aggressive advances and harassment are prevented and addressed.

15.3.3 Mitigation and Management Measures

Table 15-3 Community Health, Safety and Security Mitigation and Management Measures - Construction Phase

TOPIC	MITIGATION AND MANAGEMENT MEASURES
Worker Influx	• Where suitably skilled workers are available, the EPC Contractor will aim to engage 50% of the workforce from Uzbekistan and local communities. • Worker accommodation areas will be managed in accordance with the EBRD and IFC Workers' Accommodation: Processes and Standards. The provision of good quality living accommodation, services and amenities will likely reduce the need for mixing with local communities. Gender aspects will be considered in the worker accommodation. • Project induction training will include a section on code of conduct when engaging with local community members. This will include an overview of culturally and religious appropriate measures and etiquette to bear in mind. • Sexual harassment or violence in and out of the Project site will not be tolerated and the EPC Contractor will work with local community leaders, gender-based organisations and government officials to ensure that any complaints are addressed in accordance with the law. • The EPC Contractor will develop a Worker Influx Management Plan to provide a clear set of actions that will be undertaken for the management and mitigation, monitoring and evaluation of impacts related to worker influx in the Project area. • Additional management and mitigation measures will be in accordance with the World Bank guidance note on Managing the Risks of Adverse Impacts on Communities from Temporary Project Induced Labour Influx (2016).
Public/Community Health	• The Health and Safety teams on site will provide advice during training/inductions on exposure to disease including preventative measures e.g., TB, STDs and HIV/AIDS. • During construction, staff will have access to medical professionals and suitable medical facilities, which will aim to prevent the spread of diseases internally and externally. Site personnel will only be cleared

TOPIC	MITIGATION AND MANAGEMENT MEASURES
	for work with a medical fitness certificate from an authorised medical centre. • The EPC Contractor will prepare a medical evacuation emergency plan with contact details for local ambulance services. • Any reportable disease will be diagnosed by the authorised occupation health centre doctor. Diagnosis includes identifying any new symptoms, or any significant worsening of existing symptoms. • Any external and internal spreading diseases will be diagnosed and precautions will be taken as per the instructions from the national/ local medical authority. • The potential for exposure to water-borne, water-based, vector-borne diseases and communicable diseases as a result from project activities will be avoided or minimised. • Potholes will be filled immediately to prevent the breeding of bacteria and parasites that may pose a risk to the health of the communities near the site. • The EPC Contractor, in coordination with the local authorities, will conduct awareness campaigns regarding the transmission of STIs in the communities near the Project site. • Workers will be provided with free condoms and advice will be given on how to access testing in public hospitals. • Information regarding the transmission of HIV/AIDS will be prepared and disclosed in a culturally sensitive manner and targeted towards young adults of consenting age.
Public/Community Safety	**Impact to Aviation** • WTG final positions (coordinates) and height information will be provided to CAA prior to installation/erection of WTGs. • The final NOC should be obtained from CAA and Ministry of Defence before the start of construction. • If required by CAA, red aircraft lighting will be installed on the hub and/or blade tips of the WTG (to be agreed before the WTGs are erected). **Other Public/Community Safety** • The employees during the construction phase shall undergo a Code of Conduct training to ensure smooth coordination with the neighbouring community. • Risks to public safety will be appropriately addressed and prepared for in the construction phase 'Emergency Preparedness and Response Plan' and training. • The plan will include the appropriate procedure to respond to any such incidents, as well as site specific contact details and details of external agencies who may be required. • Project induction training will include a section on Code of Conduct when engaging with local community members. This will include an overview of culturally appropriate measures and etiquette to bear in mind. • All high-risk areas including fuel storage areas will be secured with internal fencing and will be patrolled by security throughout the day. • Smoking will be prohibited at chemical and fuel storage areas. • Appropriate mechanisms for emergency control (e.g., well-equipped firefighting equipment) will be placed at suitable positions around the site.

TOPIC	MITIGATION AND MANAGEMENT MEASURES
Project Secuirty - Public/Community Security	• The Project will employ its own security staff who will provide 24/7 security control across the Project site and dedicated security staff at gatehouses. Where possible and practical the security staff will be employed from the local communities. • The security staff will be employed based on local regulations. • The EPC will prepare a Security Plan consistent with its Security Risk Assessment. • Security arrangements shall be guided by UN Code of conducts for law enforcement officials, Voluntary Principles on Security and Human Rights and UN basic principles on the use of force and Firearms by law enforcement officials (where firearms are in use). Security personnel will follow a strict code of conduct and will be trained in weapons handling, human rights and receipt of grievances. • Any use of firearms will be in accordance with the Uzbekistan legal requirements. • All vehicles entering the site will require pre-approved clearance and will need to be registered. Project security will record all instances of incoming vehicles. • CCTV will be installed at key locations around the site and at gatehouses. • Appropriate lighting will be provided at gatehouses for security personnel to prevent unauthorised access. • Project personnel will only be provided access to the construction site with valid ID cards and permits to work in line with HSE requirements. • People trying to gain unauthorized access to the site without appropriate permits and PPE will not be permitted, or will be removed from site if identified and an investigation carried out on how they were able to access the site and corrective action taken. • GBVH related grievances must be handled by specially trained professionals in this regard who must apply a victim-centred approach.
Human Right Risks to Local Communities – Right to Security	• Substance abuse prevention and management programs will be provided to workers; • The Project will provide training to local law enforcement staff on management of illicit behavior; • A Workers' Code of Conduct will be developed and implemented to guide any interaction with local communities. • Regular and sporadic site checks with regards to substance abuse will be conducted at accommodation camps whilst respecting workers' freedom of movement rights. • Prior to the commencement of construction, local communities will be informed about the risks of entering the Project site • Security arrangements at the Project site will be guided by UN Code of conducts for law enforcement officials and UN basic principles on the use of Force and Firearms by law enforcement officials (where firearms are in use). Security personnel will follow a strict code of conduct and will be trained in weapons handling and human rights. • The EPC Contractor will develop and implement a Security Plan that will outline expectations with regards to security management.
Human Right Risks to Local Communities – Right to Health	• The EPC Contractor will make provisions for suitable health clinic and medical professionals at the Project site. • Arrangement should be made with other regional hospitals so that the services to the local communities are not undermined.

TOPIC	MITIGATION AND MANAGEMENT MEASURES
Human Right Risks to Local Communities – Economic Right (Economic & Physical Displacement of Herders)	• The Project is not expected to negatively impact the livelihood of the local community, including the herder or his family. The herder family will remain a stakeholder in the SEP for the implementation of the Project and will have access to the GRM should any issues need to be raised. Issues will be dealt with on a case-by-case basis.
Human Right Risks to Vulnerable Groups – Right of Ethnic Minorities	• EPC Contractor to provide adequate training to the non-local workers in the Project, especially in terms of interaction with the local ethnic minority; • Allow locals including residents to report concerns through the Grievance Mechanism; • EPC Contractor will adopt a zero-tolerance policy towards unacceptable workforce behaviour towards females or any community member. • Project induction training will include a section on code of conduct when engaging with local community members. This will include an overview of culturally and religious appropriate measures and etiquette. • Sexual harassment or violence in and out of the Project site will not be tolerated and the EPC Contractor will work with local community leaders, gender-based organizations and government officials to ensure that any complaints are addressed in accordance with the law.
Human Right Risks to Vulnerable Groups – GBV, SEA & SH	• The Project Company and the EPC Contractor will conduct a GBV/SEA/SH risk assessment in consultation with relevant stakeholders including women leaders and those working with young adolescent girls and boys. This will also include the identification of potential interventions and risk mitigation measures. • A Project-specific GBVH Policy detailing the list of unacceptable behaviour among workers, provisions for reporting, sanctions for perpetrators and available resources & support systems for the victims will be prepared and implemented in accordance with lenders and Uzbek requirements including ACWA Power's Environmental & Social Management System Implementation Manual. • Awareness training will be mandatory for all Project workers regarding the GBV/SE/SH risks and the workers responsibilities and the legal consequences of being a perpetrator. • Training will be provided to the community members on the risks of GBV/SEA/SH and information provided on how to report any cases of GBV/SEA/SH and the services that will be made available to offer support to any of the victims. • Approach towards GBV/SEA/SH prevention, mitigation and response will be survivor centered and ensure confidentiality, dignity and respect. • The Project staff will be trained on how to preserve the safety of the women, girls, boys when interviewing them and collecting information about their experiences on GBV/SEA/SH. • The Project will provide essential services for survivors such as access to counselling services, support groups, legal support etc. at no cost to them. • All determined cases of GBV/SEA/SH will be referred to relevant legal entities in the Project area for further investigation and prosecution.

TOPIC	MITIGATION AND MANAGEMENT MEASURES
	• GBVH related grievances must be handled by specially trained professionals in this regard who must apply a victim-centred approach. • The Project grievance mechanism will be made available to project workers and community members and will ensure that survivors' information is confidential and kept anonymous. • All cases relating to GBV/SEA/SH shall be documented and closed. • The EPC Contractor will prepare and implement a GBV/SEA & SH Prevention and Response Action Plan which will put necessary protocols and mechanisms to address the risks of GBV/SEA/SH and how to address any allegations that may arise in accordance with the World Bank Good Practice Note on Addressing SEA/SH in Investment Project Financing involving Major Civil Works and the EBRD Guidance Note on Addressing GBVH.
Grievance Mechanism	• The Project will implement an appropriate system to allow external parties to raise grievances in regard to the Project. • The Grievance Mechanism will be clearly defined, transparent and accessible to identified stakeholders. • EPC Contractor will appoint a community liaison officer preferably from the local community who will maintain communication with the local leaders and community members. • The grievance mechanism will be confidential and provide referral and support system for any workers reporting cases of GBVH and SEA/SH. • This EPC Contractor will map relevant service providers, including legal, medical, and psychological support services, to ensure comprehensive assistance for affected individuals.
Human Rights Policy	In addition to adhering to the national human rights requirements, the EPC Contractor will put in place a human right's policy in line with the UN Guiding Principles on Business and Human Rights. The statement policy will: • Be approved at the most senior level of the company; • Informed by relevant internal and external expertise; • Stipulate the EPC's human rights expectations of personnel, local communities, sub-contractors and other suppliers directly linked to the construction of the project; • Be publicly available and communicated internally and to the relevant stakeholders; • Be reflected in the other policies and procedures to embed it throughout their construction phase activities.

Table 15-4 Community Health, Safety and Security Mitigation and Management Measures - Operation Phase

TOPIC	MITIGATION AND MANAGEMENT MEASURES
Public/Community Safety	**Wind Farm – Blade and Ice Throw** • In order to minimise the likelihood of blade failure, wind turbines that have been subject to independent design verification/certification, and surveillance of manufacturing quality will be selected in accordance with IFC EHS Guideline on Wind Energy.

TOPIC	MITIGATION AND MANAGEMENT MEASURES
	• Periodic blade inspections should be carried out and any defects that could affect blade integrity should be repaired immediately. • Wind turbines should be equipped with vibration sensors that can react to any imbalance in the rotor blades and shut down the turbine if necessary **OHTL** • The OHTL towers will be installed in accordance with GIIP. • The required HPZ around the OHTL will be implemented. • Automatic fault/damage detection system will be installed to enable early detection of any faults with OHTL installation. • The tower will be tested for collapse to ensure design and installation is in line with NEGU & GIIP. **OHTL – EMF** • Installation of cables at increased height above ground to allow for agricultural activities and movement of machinery under the OHTL to continue. This will also reduce EMF exposure to farm workers. • All land users along the RoW will be provided with a written document which will include land use restrictions and an explanation of safety risks to them in case of violations i.e., construction of new buildings within the HPZ, planting certain trees or crops etc. • After provision of such information, land users will be required to sign a form as proof they were briefed and they understand the future restrictions and potential risks (including EMF). • Safety signals and warning signs will be posted along the OHTL. • EMF safety program for Project workers will be managed through the development of a robust Operational phase Occupational Health & Safety Plan in line with best industrial practices. • Identification of potential exposure levels in the work area including surveys of exposure levels and establishment of safety zones. • Access and maintenance of the OHTL will be limited to trained workers who are equipped with suitable PPE. **Wind Farm & OHTL** • All risk to public safety will be appropriately addressed and prepared for in the operational phase 'Emergency Preparedness and Response Plan' and training. • The plan will include the appropriate procedure to respond to any such incidents, as well as site specific contact details and details of external agencies who may be required. • The employees during the operational phase shall undergo a Code of Conduct training to ensure smooth coordination with the neighboring community. • Appropriate mechanisms for emergency control (e.g., firefighting equipment) will be placed at suitable positions around the site. • A Grievance Redressal Mechanism shall be made accessible to the community to ensure that community members raise grievances to the Project leadership. • Sexual harassment or violence in and out of the Project site will not be tolerated and the O&M Company will work with local community leaders and government officials to ensure that any complaints are addressed in accordance with the law.

TOPIC	MITIGATION AND MANAGEMENT MEASURES
	• The Health and Safety teams on site will provide advice during training/inductions on exposure to disease including preventative measures e.g., TB, STDs and HIV/AIDS.
Public/Community Security	• The Project will employ its own security staff who will provide 24/7 security control across the Project site and dedicated security staff at gatehouses. • The security personnel will be regularly trained on GBVH code of conduct including how to handle grievances related to GBVH from the community. • All vehicles entering the site will require pre-approved clearance and will need to be registered. Project security will record all instances of incoming vehicles. • CCTV will be installed at key locations around the site and at gatehouses. • Appropriate lighting will be provided at gatehouses for security personnel to prevent unauthorised access. • Project personnel will only be provided access to the construction site with valid ID cards and permits to work in line with HSE requirements.
Gender Based Violence & Harassment, Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	• The Project Company and the O&M Company will conduct a GBV/SEA/SH risk assessment in consultation with relevant stakeholders including women leaders and those working with young adolescent girls and boys. This will also include the identification of potential interventions and risk mitigation measures. • Awareness training will be mandatory for all Project workers regarding the GBV/SEA/SH risks and the workers responsibilities and the legal consequences of being a sexual or violence perpetrator. • Training will be provided to the community members on the risks of GBV/SEA/SH and information provided on how to report any cases of GBV/SEA/SH and the services that will be made available to offer support to any of the survivors. • Approach towards GBV/SEA/SH prevention, mitigation and response will be survivor centered and ensure confidentiality, dignity and respect to them. • The Project staff will be trained on how to preserve the safety of the women, girls, boys when interviewing them and collecting information about their experiences on GBV/SEA/SH. • The Project will provide essential services for survivors such as access to counselling services, support groups, legal support etc. at no cost to them. • All determined cases of GBV/SEA/SH will be referred to relevant legal entities in the Project area for further investigation and prosecution. • The Project Grievance Mechanism will be made available to Project workers and community members and will ensure that survivors' information is confidential and kept anonymous. • All cases relating to GBV/SEA/SH shall be documented and closed. • The O&M Company will prepare and implement a GBV/SEA & SH Prevention and Response Action Plan which will put necessary protocols and mechanisms to address the risks of SEA/SH and how to address any allegations that may arise in accordance with the World Bank Good Practice Note on Addressing SEA/SH in Investment Project Financing involving Major Civil Works.

TOPIC	MITIGATION AND MANAGEMENT MEASURES
Grievance Mechanism	• The Project will implement an appropriate system to allow external parties to raise grievances in regard to the Project. • The Grievance Mechanism will be clearly defined, transparent and accessible to identified stakeholders. • EPC Contractor will appoint a community liaison officer preferably from the local community who will maintain communication with the local leaders and community members. • The Grievance Mechanism will be confidential and provide referral and support system for any workers reporting cases of GBVH.
Human Rights Policy	In addition to adhering to the national human rights requirements, the O&M Company will put in place a human right's policy in line with the UN Guiding Principles on Business and Human Rights. The statement policy will: • Be approved at the most senior level of the company; • Informed by relevant internal and external expertise; • Stipulate the O&M's human rights expectations of personnel, local communities and other suppliers directly linked to the operational phase of the project; • Be publicly available and communicated internally and to the relevant stakeholders; • Be reflected in the other policies and procedures to embed it throughout the operational phase activities.

15.4 Monitoring

Monitoring of Community Health, Safety and Security will be undertaken as required via the management measures outlined above. For instance, monitoring of the security plan will form part of the wider Environmental and Social Management System internal audits to be undertaken. The following table outlines key indicators for community health, safety and security impacts.

Table 15-5 Key Monitoring Indicators

INDICATOR	PARAMETER	FREQUENCY	RESPONSIBLE ENTITY
Record of any conflict between the workers and community members including any cases relating to sexual harassment	Complaints filed by community members or Project workers	Daily during construction and quarterly during operation	- EPC Contractor experienced CLOs - Project Company CLOs
Number of SEA/SH grievances handled through a survivor centred approach	Number of grievances handled and how many cases are referred to legal entities for redress.	Ongoing	- EPC Contractor experienced CLOs - Project Company CLOs
Record of average period taken to handle SEA/SH grievances in accordance with lenders	Complaints received and the period of time it takes to close them.	Ongoing	- EPC Contractor experienced CLOs - Project Company CLOs

INDICATOR	PARAMETER	FREQUENCY	RESPONSIBLE ENTITY
requirements and referral to legal entities			
Discharging of firearms by security personnel on site	Security personnel/local police	Ongoing in the event the security personnel are armed	- EPC Contractor experienced CLOs - Project Company CLOs
Record of human rights violation/complaints from the local communities	Complaints filed by community members in relation to the Project	Ongoing	- EPC Contractor experienced CLOs - Project Company experienced CLOs
Record of incidents/accidents and near misses (involving external parties)	Records from daily monitoring procedures on site	Ongoing	- EPC Contractor CLOs - Project Company experienced CLOs
Record of any communicable diseases on site that could pose a risk to the local communities	Project site clinic or HSE personnel	Ongoing	- EPC Contractor experienced CLOs - Project Company experienced CLOs
Number of grievances closed out	Grievance Management System	Quarterly / bi-yearly	- EPC Contractor experienced CLOs - Project Company experienced CLOs
Average time for grievance processing and close out and trends	Grievance Management System	Quarterly / bi-yearly	- EPC Contractor experienced CLOs - Project Company experienced CLOs
Number of grievances open, method to submit the grievance and trends	Grievance Management System	Quarterly / bi-yearly	- EPC Contractor experienced CLOs - Project Company experienced CLOs
Topics raised in grievances and trends	Grievance Management System	Quarterly / bi-yearly	- EPC Contractor experienced CLOs - Project Company experienced CLOs

16 HUMAN RIGHTS, LABOUR & WORKING CONDITIONS

16.1 Applicable Requirements & Standards

16.1.1 National Regulations

CONSTITUTION OF THE REPUBLIC OF UZBEKISTAN (1992, AS AMENDED IN 2023)

Key constitutional provisions in regard to labour rights include:

Everyone shall have the right to decent work, to free choice of profession and occupation, favourable working conditions that meet the requirements of safety and hygiene, to fair remuneration for work without any discrimination and not below the established minimum wage, as well as the right to unemployment protection in the manner prescribed by law.

The minimum wage shall be determined considering the need to ensure a decent standard of living for a person.

It shall be prohibited to refuse to hire women, dismiss them from work and reduce their wages on the basis of pregnancy or having a child.

Any forced labour shall be prohibited, except as punishment under the court decision, or in some other Instances specified by law.

Any form of child labour that poses a threat to the health, safety, morality, mental and physical development of the child, including those that prevent him or her from getting an education, shall be prohibited.

The amount of pensions, allowances and other types of social welfare established by law, may not be set lower than the officially fixed minimum consumer expenditure.

Trade unions express and protect the social and economic rights and interests of workers.

Membership in trade unions is voluntary.

With regards to human rights, the constitution asserts that "democracy in the Republic of Uzbekistan shall be based upon common human principles, according to which the highest values shall be the human being, his life, freedom, honour, dignity and other inalienable rights."

LABOUR CODE OF THE REPUBLIC OF UZBEKISTAN (1995, AMENDED IN 2021)

The principal law on labour rights and welfare in Uzbekistan sets out the following requirements:

The main health and safety provisions in the labour law include H&S requirements, employees' obligation to comply with H&S standards, procedures and use of PPE, additional H&S measures for disabled employees, reporting and investigating accidents etc.

The labour code also specifies collective bargaining through collective contracts and agreements as a way of regulating labour relations and harmonising social and economic interests of both the employer and the employees.

OCCUPATIONAL HEALTH AND SAFETY (OHS) LEGISLATION

The legislation comprises the Labor Code, the Law on Occupational Health and Safety, the decrees of the President of the Republic of Uzbekistan, Occupational Health and Safety standards, decisions of executive government agencies taken within their competence in the form of decrees, executive orders, regulations, directives, rules, etc.

THE LAW ON OCCUPATIONAL SAFETY IN HAZARDOUS PRODUCTION FACILITIES (2006)

The Law stipulates the legal, economic and social terms of ensuring safe exploitation of hazardous production facilities, with the aim of building enterprise capacity and preventing accidents.

In addition to the main legislation, the Republic also has national normative documents addressing the issues of occupational health and safety. These include (i) Sanitary Rules and Norms (SanR&N), (ii) State Occupational Safety Standards (GOST, SSBT), (iii) Construction Norms and Rules (CR&N (SNiPs)), (iv) standards of the content of harmful substances (maximum allowable concentrations and levels), and (v) normative methodological documents on individual issues setting forth requirements for occupational safety in hazardous facilities, when manufacturing or applying various products. In addition to state normative documents, various sectors of industry enforce departmental and interdepartmental norms, requirements and rules of occupational safety and health.

The main state bodies responsible for the implementation of OHS policy are:

- Ministry of Employment and Labor Relations of the Republic of Uzbekistan, including the State Labor Inspection under the Ministry with territorial branches distributed throughout the Republic;
- State Committee for Industrial Safety of the Republic of Uzbekistan (Goskomprombez);
- Sanitary and Epidemiological Welfare and Public Health Committee of the Republic of Uzbekistan under the Ministry of Health of the Republic of Uzbekistan.

The Ministry of Employment and Poverty Reduction has an OHS directorate and the State Labor Inspection and its regional branches in the Republic of Karakalpakstan, viloyats (provinces), and the Tashkent city and district directorates and branches on labor, employment and social security. They constitute a single system of supervision and monitoring compliance with OHS requirements for ministries and agencies, institutions, organizations, and industrial and

agricultural enterprises, with the exception of hazardous facilities that are under the jurisdiction of the State Inspection on Safety in Industry, Mining and the Housing and Utilities Sector.

OTHER PERTINENT LEGISLATION

The list of other laws and regulations providing for fair and safe working conditions and benefits include the following:

- Law "On the Employment of the Population" No. 642 of 20.10.2020
- Joint Decree of the Ministry of Labour and Social Protection of the Population (No. 7) and the Ministry of Healthcare (No. 13) "On approval of the list of jobs with unfavorable working conditions, where the employment of persons under 18 years is prohibited" registered by the Ministry of Justice of the Republic Uzbekistan, dated July 29 2009, No. 1990
- Decree of the Cabinet No. 133 of 11 March 1997 to approve normative acts necessary for the realization of the Labour Code of the Republic of Uzbekistan.
- Decree of the Cabinet of the Ministers No. 1011 of 22 December 2017 "On Perfection of the Methodology of Definition of Number of People in Need of Job Placement, including the Methodology for Observing Households with Regard to Employment Issues, also for the Development of Balance of Labour Resources, Employment and Job Placement of Population".
- Decree of the Cabinet of the Ministers No. 965 of 5 December 2017 "On the Measures for Further Perfection of the Procedure of Establishment and Reservation of Minimum Number of Job Places for the Job Placement of Persons who are in need of Social Protection and Face Difficulties in Searching Employment and Incapable of Competing in Labour Market with Equal Conditions".
- Decree No. 964 of 5 December 2017 "On the measures for Improvement of the Activity of Self-Government Bodies Aimed at Ensuring Employment, firstly for the Youth and Women".
- The Protection of Women Against Harassment and Violence Act (2019).
- The National Human Rights Strategy was approved by Presidential Decree on 22 June 2020. No. PD-6012.
- Law on guaranteeing equal rights and opportunities for women and men (2019).
- The Law on Mediation (2018).
- Law on Public Control (2018).
- Law on Administrative Procedures (2018)

HUMAN RIGHTS

As a member of the United Nations, Uzbekistan supports and implements all the main international instruments of the United Nations relating to the protection of human rights and freedoms, including UN Universal Declaration of Human Rights, Human Rights Council

Resolution No. 30/15 on human rights and preventing and countering violent extremism, Convention on the Elimination of all Forms of Discrimination against Women among others.

Uzbekistan's State Policy on human rights is aimed at preventing violations or any restriction on human rights and freedoms and at establishing the necessary organizational, legal, social, economic, spiritual and moral foundations for the protection of human rights.

In 1995-1996, two independent and effective institutions for the protection of human rights were established in Uzbekistan: The Human Rights Commissioner (Ombudsman) of the Oliy Majlis of the Republic of Uzbekistan and the National Centre for Human Rights. In subsequent years, special structures for the protection of human rights were established in various ministries and departments of the Republic of Uzbekistan.

THE PROTECTION OF WOMEN AGAINST HARASSMENT AND VIOLENCE ACT (2019)

The Act defines the various forms of violence - sexual, physical, economic, psychological against women. Protection from harassment and violence is defined as a system of urgent measures of economic, social, legal, organizational, psychological and other nature in order to eliminate the danger to women's life and health, to ensure their safety and to prevent repeated illegal actions against them.

Other relevant legislations include:

- The National Human Rights Strategy was approved by Presidential Decree on 22 June 2020. No. PD-6012;
- Law on guaranteeing equal rights and opportunities for women and men (2019);
- The Law on Mediation (2018);
- Law on Public Control (2018); and
- Law on Administrative Procedures (2018)

16.1.2 Lender Requirements

EBRD

PR2 is applicable to Labour and Working Conditions and has the following key objectives:

- Respect and protect the fundamental principles and rights of workers;
- Promote the decent work agenda, including fair treatment, non-discrimination and equal opportunities of workers;
- Establish, maintain and improve a sound worker-management relationship;
- Promote compliance with any collective agreements to which the client is a party, national labour and employment laws;

- Protect and promote the safety and health of workers, especially by promoting safe and healthy working conditions; and
- Prevent the use of forced labour and child labour (as defined by the ILO) as it relates to project activities.

Concerning dedicated accommodation, compliance is required with:

- IFC & EBRD Workers Accommodation: Processes and Standards (2009).

In regard to human rights:

- According to EBRD's Environmental and Social Policy, EBRD is committed to the respect of human rights in the Project they finance. EBRD is also guided by the International Bill of Human Rights and the eight core conventions of the International Labour Organization.

ADB

The Environmental Safeguard requirements necessitate the Borrower/client to, '*provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities.'*

The ADB Social Protection Strategy requires client to promote efficient labour markets, diminish peoples exposure to risks and comply with core labour standards which includes: (a) freedom of association and the effective recognition of the right to collective bargaining, (b) the abolition of all forms of forced or compulsory labour, (c) the elimination of discrimination in respect of employment and occupation and (d) the elimination of child labour.

AIIB

ESS1 – Environmental and Social Assessment and Management: Point 8.1 outlines the need to consider worker health and safety in the impact assessment. Section F covers Labour and Working Conditions, including labour management relationships, child and forced labour.

EPFIs

The following applicable IFC Performance Standards aim to identify and ensure that social and economic impacts of a project are addressed in the relevant areas, in particular:

Performance Standard 2: Labour and Working Conditions;

- In accordance with IFC Performance Standard 2 (Labor and Working Conditions) there is a requirement to align with the following conventions:

- ILO Convention 29 on Forced Labor;
- ILO Convention 87 on Freedom of Association and Protection of the Right to Organize;
- ILO Convention 98 on the Right to Organize and Collective Bargaining;
- ILO Convention 100 on Equal Remuneration;
- ILO Convention 105 on the Abolition of Forced Labor;
- ILO Convention 138 on Minimum Age (of Employment);
- ILO Convention 182 on the Worst Forms of Child Labor;
- ILO Convention 111 on Discrimination (Employment and Occupation);
- UN Convention on the Rights of the Child, Article 32.1; and
- UN Convention on the Protection of the Rights of all Migrant Workers and Members of their Families.

In addition, the Project will also be required to adhere to the United Nations Guiding Principles on Business and Human Rights to ensure that it complies with all applicable laws and to respect human rights.

In regard to human rights:

- In line with EP IV requirements, the United Nations Human Rights Guiding Principles (HRGP) apply to the Project. HRGP II on "The corporate responsibility to respect human rights" recognises that it is the responsibility of businesses and corporations to respect human rights. It is a global standard of expected conduct for all business enterprises wherever they operate. It exists independently of a States' ability and/or willingness to fulfil their human rights obligations and does not diminish those obligations.

The IFC Guidance on GBVH in the Construction Sector is also relevant to Labour and Working Conditions.

<u>IFC Guidance on Gender Based Violence and Harassment (GBVH) in the Construction Sector</u>

The assessment, prevention, monitoring and response measures in regards to GBVH should be underpinned by the following principles:

- Survivor Centered: The rights of GBVH survivors need to be consistently prioritised and used as the starting point for all decisions on efforts to assess, prevent, monitor and respond to GBVH.
- Safe: Survivors, witnesses and those who report and seek to address GBVH can be at risk of retaliation, including threatening and violent behaviour, often from those who do not like their position of power being challenged. Companies should prioritise the safety of those who have experienced, witnessed and reported GBVH.

- Context specific: All measures need to be rooted in a thorough understanding of the local context. Investors and companies should understand the legal and social context and identify the support mechanisms that are in place.
- Collaborative: Companies should seek inputs from a range of internal and external stakeholders to increase the likelihood of broader buy-in and make GBVH prevention more effective.
- Inclusive: Companies should recognise the heightened risks of GBVH faced by certain groups who are subject to discrimination and marginalisation. High risk groups often include people with disabilities, single parents, migrants and ethnic minorities and sexual and gender minorities. The system should also account for illiterate or non-literate people who may not be able to access written information on GBVH reporting mechanisms.
- Integrated: Processes, efforts to assess, prevent, monitor and respond to GBVH needs to be integrated as much as possible into existing processes and management systems, such as occupational health safety, security management systems, environmental and social management systems (ESMS) and human resources (HR) policies and procedures.
- Non-discriminatory: All survivors need to be listened to and treated equally and promote diversity in the workplace.
- Well-informed: Companies should draw on relevant expertise when developing prevention and response measures. The grievances mechanism and investigation procedures should be set up to ensure they are appropriate, relevant and safe in the local context.

16.2 Baseline Conditions

CONSTRUCTION LABOUR IN UZBEKISTAN

Uzbekistan has achieved steady economic development over the past few decades, with the expansion of private sector businesses and progressive policy reforms geared towards the country's transition to a market-based economy. The country's labour force has grown at a rate of 350,000 to 370,000 people per year. Moreover, work and education draw many rural residents to the cities, especially Tashkent and Andijan. Daily migration has been reported to influence the employment rate and culture of rural residents, besides improving the ties between rural and urban communities.

The construction industry is amongst the leading labour-intensive contributors to the national economy, other such sectors being agriculture and manufacturing. In addition, the cross-cutting service sector holds the most potential for job creation. The construction sector, along with agriculture and industry employ about 60% of the labour force accounting for Small to Medium Enterprises (SMEs), with the remainder of labour engaged in the services sector. The leading demographics for informal labour within the country's construction sector and other industries are males, rural residents, and workers with relatively low educational attainment.

With regards to the gender distribution, construction represents the second most dominant sector for male recruitment, with 25% of the national male labour employed in construction. Conversely, only 0.6% of the national female labour have been shown to hold occupations within the construction sector (Anderson et al., 2020).

INDECENT WORKING CONDITIONS

The prevalence of indecent working conditions across different economic sectors in Uzbekistan is not well documented. Despite the paucity of publicly available information in this regard, a review of literature offering highlights on labour conditions within the country's cotton production sector was carried out.

Cotton production in Uzbekistan continues to rank among the most exploitative enterprises, globally. About 90% of the countries cotton plantations utilize manual labour for cotton picking, and the majority of these estates operate with forced labour. Cotton harvesting is performed in harsh climatic conditions, with exposure to hazardous agrochemicals such as pesticides, herbicides and defoliants resulting from a widespread inadequacy of PPE. Employed labourers are made to work for long working hours with little to no weekly and monthly time off. During the harvesting season, labourers are accommodated on on-farm facilities, most of which lack essential services such as water supply, air conditioning, food provisioning, communication and medical services (Association of Human Rights in Central Asia, 2010).

Many employees had official part-time or low-income jobs and many continued to work informally. In April 2021, the International Monetary Fund (IMF) estimated the informal sector employed approximately 40% of the workforce and produced one-third of the GDP. The government worked to shift more of the economy from informal to the formal economy and to provide labour and social protections to those working informally. Despite an increase in the number of labour inspectors in prior years, the Ministry of Employment and Labour Relations lacked adequate staff to enforce compliance and prevent many violations in the informal sector. The most common labour violations were working without contracts, receiving lower than publicly announced payments, delayed payments, and substandard sanitary or hygienic working conditions.

FORCED LABOUR

According to the latest Trafficking in Persons Report issued by the United States Department of State, Uzbekistan has not yet attained full compliance with minimum standards for the elimination of human trafficking, although significant progress towards these standards has been realised. In 2019, there were 95 reported victims of human trafficking, 89 of whom were victims of sexual exploitation. While most of the victims were exploited abroad, 15 endured exploitation within the country. The report highlights that Uzbekistan's efforts include steps to end to the systematic mobilisation of students, teachers, and health care personnel for the annual cotton harvest, and granting international, third-party observers' unimpeded access

for monitoring purposes. According to 2017 data from Uzbek Ministry of Internal Affairs, out of 501 victims of human trafficking, 303 were women, 198 were men and 61 children. In 2018, the victims included 147 women, 103 men and 41 children. In 2019, the victims of human trafficking included 87 women, 3 men and 35 children.

In July 2019, a Decree of the President of the Republic of Uzbekistan titled Additional Measures to Further Improve the System of Combating Trafficking in Persons and Forced Labour, entered into force. It transformed the Interdepartmental Commission of the Republic for Combating Human Trafficking into a National Commission under the guidance of the President of the Senate. The Commission comprises two sub-committees chaired by the Ministry of Internal Affairs and the Ministry of Employment respectively. Regional commissions were created in each of the Country's regions and a national rapporteur was eventually appointed.

In August 2020, the country's 2008 law on human trafficking was amended as new concepts, preventive measures, and a procedure to identify victims of human trafficking (including minors and their rights), were introduced. While listing the main policy lines in this sector, the law provides a specific definition of the status of the National and Territorial Commissions for combating human trafficking and forced labour, as well as the powers of the Council of Ministers. The relevant government agencies include the General Prosecutor's Office and the Ministry of Employment and Labour Relations. A new chapter on human trafficking prevention has been introduced in the legislation, with measures ranging from ongoing monitoring and awareness raising campaigns on dangerous situations to the development and implementation of educational programs in public and private educational establishments. The Ministry of Internal Affairs will create a unified database for human trafficking crimes, with information on traffickers, victims and the various types of exploitation. The new law introduces a two-stage procedure to identify the victims of human trafficking. When individuals are granted the status of victim of human trafficking they are entitled to rehabilitation and social integration programs, according to the outcome of the final investigation carried out by the Territorial Committee (United States Department of State, 2021).

CHILD LABOUR

In 2019, Uzbekistan achieved appreciable progress in action towards the elimination of the worst forms of child labour. The government took active measures to prevent the use of child labour in the cotton harvest, including by introducing criminal penalties for repeat violations of hazardous work prohibitions, doubling the number of labour inspectors, and conducting extensive awareness-raising on child labour laws and penalties for violations. The government also established a new National Commission on Combating Trafficking in Persons and Forced Labour and adopted a new roadmap to combat trafficking in persons and forced labour. However, children in Uzbekistan engage in the worst forms of child labour, including in commercial sexual exploitation. Although the government made meaningful efforts in all relevant areas, laws prohibiting the commercial sexual exploitation of children do not meet

international standards. Uzbekistan also has not carried out a national child labour survey to determine the prevalence of child labour in sectors other than cotton production.

Surveys conducted by UNESCO and ILO have shown that about 5% of children in Uzbekistan are engaged in work during studies, and 4.3% are fully devoted to employment. Whilst the surveys have indicated that children below the age of 18 years are chiefly employed in the agricultural and service industries, children were also shown to engage in sex trafficking transnationally, and also internally in brothels, clubs, and private residences. Children in institutions were also shown to be vulnerable to sex trafficking. The table below provides an overview of the sectors and occupations reported to employ minors in Uzbekistan.

Table 16-1 Sectors and Work Streams Employing Child Labour in Uzbekistan

SECTOR/ CATEGORY OF LABOUR	ACTIVITY
Agriculture	- Cultivating silk cocoons; - Preparing land for crop planting.
Services	- Vending; - Car washing; - Begging; - Collection of scrap metals; - Refurbishing school grounds and facilities; - Vending in markets.
Categorical Worst Forms of Child Labour	- Commercial sexual exploitation, sometimes as a result of human trafficking; - Forced labour in cultivating silk cocoons; - Forced labour in construction, non-cotton agriculture, and cleaning parks, streets, and buildings.

With regards to child labour in agriculture and the cotton cultivation sub-sector in particular, the Government of Uzbekistan abolished the oppressive quota system that governed cotton production in some parts of Uzbekistan in 2020. Under the pre-existing cotton production quota system, regional and local officials were mandated to mobilise sufficient labour to meet production targets assigned to farmers, and child workers were recruited with onerous working conditions. Vestiges of child labour in cotton farming are reported to employ children in a supporting capacity, whereby older children assist in harvesting to supplement household income (United States Embassy in Uzbekistan, 2022).

The following table provides a summary of key mechanisms for the Government's coordination of efforts towards the eradication of child labour in Uzbekistan.

Table 16-2 Mechanisms for Governmental Coordination of Child Labour Eradication Requirements Set out in Uzbekistan's Legal Framework

SECTOR/ CATEGORY OF LABOUR	ACTIVITY
National Commission on Combating Trafficking in	- Coordinates state and local entities' efforts to combat trafficking in persons and forced labour;

SECTOR/ CATEGORY OF LABOUR	ACTIVITY
Persons and Forced Labour (National Commission)	- Analyses and monitors efficacy of government programs to address trafficking in persons and forced labour; - Organises international cooperation on combating human trafficking and forced labour; - Provides legal and policy recommendations for improvement of government efforts in these areas. Chaired by the National Rapporteur on Combating Trafficking in Persons and Forced Labour. Comprises the two sub-commissions on combating human trafficking and on forced labour, respectively. The Minister of Internal Affairs heads the Sub-Commission on Combating Trafficking in Persons and the Minister of Labour heads the Sub-Commission on Combating Forced Labour. In 2019, the National Commission drafted and adopted a roadmap to combat trafficking in persons and forced labour, and roadmaps for the cotton harvest, a national plan for work with international organizations, and a media plan.
National Rapporteur on Combating Trafficking in Persons and Forced Labour (National Rapporteur)	Chairs the National Commission on Combating Trafficking in Persons and Forced Labour. - Reports annually to the President on trafficking in persons and forced labor issues, government efforts to punish perpetrators, and services for victims of human trafficking and forced labor crimes. - Conducts public awareness-raising activities related to human trafficking and forced labor. (35) In 2019, the National Rapporteur convened the National Commission monthly.
Local Commissions for Combating Human Trafficking and Forced Labour (Local Commissions)	- Ensure timely and rigorous implementation of all laws and regulations, including those issued by the National Commission, related to trafficking in persons and forced labour. Local Commissions mirror the structure of the National Commission, with sub-commissions on trafficking in persons and on forced labor, respectively. Local Commissions are chaired by the regional hokim (governor) and provide monthly reports to the National Commission.

OCCUPATIONAL HEALTH AND SAFETY

The most common violations committed by private sector employers were violations of wage, overtime, and occupational health and safety standards. Although regulations provide standards for workplace safety, workers reportedly worked without necessary protective clothing and equipment at some hazardous job sites. More specific information was not available on sectors in which occupational safety violations were common, as well as on specific groups of workers who worked in dangerous conditions or without needed safety equipment. In March 2020 the country joined the Commonwealth of Independent States' Interstate Council for Industrial Safety to improve its industry safety standards (United States Department of State, 2021).

16.3 Potential Impacts, Mitigation, Management & Residual Impacts

16.3.1 Construction Phase

16.3.1.1 Occupational Health and Safety

Common activities undertaken during construction such as the movement of heavy machinery, excavation, handling of chemicals, works undertaken at height etc. can introduce significant risk to the health and safety for the associated workforce. Risks are more likely for those who are not familiar with the type of works undertaken and the associated hazards.

In addition, occupational safety hazards may occur during possible blasting activities in the WTG area resulting in accidental explosions, or accidental exposure to controlled explosions.

The type of hazards attributable to a construction site will vary significantly depending on the construction methods employed and the degree of control implemented by the EPC and affiliated sub-contractors. It is therefore of the utmost importance that the EPC and sub-contractors demonstrate consideration of health and safety risks as part of their chosen construction methods and that these risks are appropriately mitigated.

As occupational health and safety is a risk rather than a potentially defined impact, its significance has not been assessed further in this ESIA. Health and safety risks to the site workforce will be managed through effective risk assessment, and the development and implementation of an Occupational Health & Safety Plan.

16.3.1.2 Human Right Risks to Workers

RIGHT TO WORK, FORCED LABOUR, RIGHT TO ADEQUATE STANDARD OF LIVING, NON-DISCRIMINATION

According to Article 14 of the Uzbekistan Labour Code, every citizen of the Country as well as foreign citizens and stateless persons that have reached working age are eligible for employment and signing of employment contract with an employer. Article 16 of the Labour Code and Article 37 of the Constitution states that everyone has the right to work, including the right to choose their occupation, to fair working conditions and to the protection against unemployment. Resolution No. PP-3913 dated August 20th 2018, requires reforms in the labour sector in order to protect labour rights, prevent and eradicate forced labour in Uzbekistan. In addition, the Resolution provides enhancement of national labour legislation in line with conventions and recommendations of the International Labour Organisation.

The Uzbek requirements are mostly aligned with lenders and ILO requirements, however, the main challenge relates to enforcement and implementation. For instance, even though progress has been made towards ending forced labour (especially in the cotton industry) challenges still persist (Uzbek Forum for Human Rights, 2020).

In relation to the Project, there will be approximately 200 workers at Wind Farm area and approximately 15 for OHTL during the construction phase. The local workforce will be encouraged to apply for different jobs available depending on skills and qualifications of the local people. During recruitment, there shall be no discrimination based on a person's gender, race, religion, disability, political opinion, etc. and every person will be given equal opportunity and treated fairly.

Labour exploitation on construction sites unfortunately has become a reality in some parts of the world. Inequalities in income, education and opportunities has led to opportunistic, immoral practices with labourers and site staff suffering as a consequence of the exploitation. Examples from other projects within the region have shown that there can be instances of forced labour, labour with poor contracting conditions, or lacking processes in place to manage such elements. This is a potential impact for the Project, especially for contract staff, or those of sub-contractors.

To ensure the wellbeing of all staff associated with the Project, the EPC and associated subcontractors will need to plan for necessary provisions relative to the requirement of the required workforce. This includes carefully safeguarding risks through policy and internal processes (including monitoring and audit) and the provision of appropriate labour accommodation plans and mechanism for inspections and corrective actions.

The EPC Contractor shall adhere to good practice measures regarding worker welfare on and off site.

Risks associated with worker condition and worker welfare during construction will be managed through effective Project planning, and the enforcement of fair and just treatment throughout the construction phase.

CHILD LABOUR

Children under the working age (18 years) as established in the Labour Code will not be employed at the Project site. However young persons (16 years of age) can be engaged for light work i.e., work that will not impact the process of learning and will not impact the physical and mental health & moral/social development of the young person.

EBRD and EPFIs require the Project to comply with all relevant national laws or international labour standards regarding employment of minors, whichever provides a higher degree of

protection for the child. According to PR2 and PS2, young people below the age of 18 years should not be employed for hazardous work. This is in line with Uzbek and ILO requirements.

During the recruitment process, the EPC Contractor & associated subcontractors shall adhere to all requirements regarding employment of underage workers on and off site. Where child labour is discovered in the subcontractor or supply chain workforce (for example young persons 16 years of age working in a hazardous environment), the Project shall undertake the necessary steps in accordance with Uzbek Labour Code and ILO Convention 182 on the Worst Forms of Child Labour so that dismissing the child or ending the child's contract will not impact other human rights (right to security, right to privacy) and result in the child being exploited in other ways.

WAGES, WORKING HOURS, RIGHT TO REST AND JOB SECURITY

Although not expected, there is a risk that workers may be requested to work excessive hours and possibly without overtime pay. It is noted that Article 115 of the Labour Code states that normal working hours should not exceed forty-hours per week in a six-day working week duration. In addition, overtime may only be allowed with the consent of the worker and compensation provided.

The Project Company and EPC Contractor will ensure that all workers, regardless of rank, gender or religious affiliation etc are paid a fair wage and equal remuneration for work of equal value without discrimination. In addition, remuneration must be enough for workers to be able to live a decent life.

Job security for construction workers will only be for the period when construction is undertaken and workers will be employed on contractual basis and as such no retrenchment is expected to occur. The Project Company and the EPC Contractor will ensure that all workers are informed on the nature of their contracts, duration so that they understand the start and end period.

WORKERS' RIGHT TO HEALTH

It is expected that there will be approximately 200 workers at the peak of the Wind Farm and 15 workers at OHTL construction phase as such there are potential risks for the spread of communicable, sexually transmitted diseases. There is also a likelihood of injury when different work processes are being undertaken. As such, and due to the remote location of the Project site, the EPC Contractor will be required to provide workers with access to medical care. This may include the provision of a site-based clinic with a nurse or trained first-aid provider or access to an ambulance that can transport workers to larger district hospitals.

In case of outbreaks such as typhoid, cholera etc, the EPC Contractor will be required to notify the local health department and conduct adequate screening/tests for all workers in line with national/local requirements.

There is no limit to sick leave in Uzbekistan for employees. However, in the case of prolonged illness the employee will be subject to a special medical expert commission which issues a conclusion on the employees' ability to continue working. According to Article 285 of the Labour Code, sick leave allowance should range from 60 to 100% of the salary depending on the employee's payment of state social security contributions. In case of labour related injury or occupational illness, the workers will be compensated based on 100% of their average earnings.

COLLECTIVE BARGAINING AND FREEDOM OF ASSOCIATION

Workers shall be allowed to be involved in collective bargaining in accordance with Article 30 of the Labour Code as far as they comply with the established requirements for collective bargaining and agreements. In Uzbekistan, trade unions are more common for state owned companies and not very common in private companies (Dentons, 2020). Regardless of this, the EPC Contactor and associated subcontractors will not prevent workers from forming associations or joining trade unions depending on their preferences.

WORKERS' FREEDOM OF MOVEMENT

Workers will not be restricted to the accommodation camps and will be allowed to move freely within the community and travel to outside the project area, region and country. However, in order to avoid cultural or religious conflicts with the local communities due to alternative ideals, behaviour and cultural practices that some of the workers might have, adequate training (cultural sensitization training) will be provided to the non-local workers prior to interactions with the local community.

16.3.1.3 Potential Gender Risks Associated with the Project

GENDER BASED VIOLENCE AND HARASSMENT

Influx in workers from outside the Project region will increase the likelihood of Gender Based Violence and Harassment (GBVH), Sexual Exploitation & Abuse (SEA) and Sexual Harassment (SH). The construction workers are likely to be predominantly young male coming from other regions of Uzbekistan and outside the country. These workers will be away from their families and removed from their normal social spheres. This could potentially result into peer pressure and involvement in unlawful behaviour such as harassment of local women, young girls and boys or women within the Project workforce. Such behaviour can lead to increase in exploitative sexual relationships and unwanted aggressive advances and harassment. This

could also lead to disintegration of relationships in local households impacted by GBVH/SEA/SH.

During the construction phase, workers will also be vulnerable to various forms of harassment, exploitation, and abuse, aggravated by the traditionally male working environment. Incidents of GBVH/SEA/SH are likely to be committed by co-workers or construction supervisors and can be attributed to gender stereotypes about the sexual availability of female construction workers. As previously mentioned, there is a rehabilitation and adaptation centre located in Nukus that provide support to women and their children who have experienced GBVH and/or SEA/SH. In addition, income earning opportunities for women through direct employment during the construction phase or through indirect employment has the potential to increase household tensions and expose women to harassment and violence in their homes or communities.

Some of the male workers who will be transporting Project machinery and equipment and goods will also be involved in long distance travel which in some cases will be between different countries. There is a risk that they can also be involved in GBVH/SEA/SH on the routes they use and at stops associated with the Project even if it is outside the Project boundary.

GBVH/SEA/SH IN ACCOMMODATION FACILITIES

It is understood that the EPC Contractor (and possibly the sub-contractors) will provide accommodation facilities for their workers on site. This presents a safety risk especially for women who may be working at the Project and living within the designated accommodation areas and their use to common areas such as the cafeteria.

To address such risks, the EPC Contractor will be required to provide safeguards such as locating women accommodation facilities in a separate compound from the men, provision of locks on doors, separate sanitation facilities, adequate lighting etc. In addition, since majority of the population in Uzbekistan is Muslim, the EPC Contractor will provide options for separate social facilities for the men and women.

WAGE DISCRIMINATION BASED ON GENDER

In an effort to promote wage parity between men and women, the government of Uzbekistan ratified ILO's Convention No. 100 (Equal Renumeration for Men and Women Workers for Work of Equal Value). However, the problem is that women tend to be concentrated in low-status sectors which leads to low-wage jobs. In addition, the construction industry is predominantly male and women may only be offered low-paying jobs such as cooks, cleaners etc.

As such, the EPC Contractor will be required to provide access to recruitment opportunities for women based on their qualifications and equal salaries as their male counterparts undertaking

work of the same value. In addition, a policy of equal pay will be included in the EPC Contractor's HR Policy or as a stand-alone.

DISCRIMINATION BASED ON EMPLOYMENT BENEFITS AND GUARANTEES

Traditional norms in Uzbekistan associate women roles to care givers especially in rural areas. Women who intend to pursue a career are still expected to balance between their job obligations and family life which ultimately affect their career paths. In addition, employers may potentially prefer to employ men over women because most of the employment family benefits and guarantees are associated to women. For instance, according to Article 233 of the Labour Code, women employees are entitled to paid maternity leave for a period of 126 days and in some cases childcare allowances are also provided. This includes 70 days given before the expected birth of the child and 56 after the birth. In case of complications, maternity leave can be extended by an additional 14 days. Even though men can also claim similar benefits in paternity leave, childcare (especially in rural areas) is still seen as a woman's job.

As such, women of childbearing age may face potential discrimination during the recruitment process because the EPC Contractor may want to avoid providing the benefits and guarantees relating to maternity or childcare. To mitigate this, the EPC Contractor will be required to include the benefits and guarantees for both men and women in the HR policy with a clear commitment to non-discrimination during the recruitment process.

DISCRIMINATION BASED ON SEXUAL ORIENTATION

The Uzbek laws and regulations prohibit discrimination in the workplace based on race, gender and religion. However, it is noted that there are no provisions that provide protection to workers against discrimination because of their sexual orientation or gender identity. As such, any workers who have a different gender identity and/or sexual orientation may face discrimination for not conforming to societal and/or religious norms. They may also be at a high risk of violence and harassment as a way of punishing them to conform to prevailing societal views.

To address such risks, the EPC Contractor's HR policy will include a non-discrimination policy and a code of conduct, GBVH policy applicable to all employees and sub-contractors.

16.3.1.4 Supply Chain Risks

The engagement of suppliers will present potential risks relating to labour and working conditions such as:

- Child labour, forced labour, gender- based violence and sexual abuse, exploitation and harassment

- Lack of written contracts for workers;
- Labour rights violations including poor working conditions and poor terms of agreement for female employees, overtime work without pay etc.;
- Health & safety issues for workers and local communities;
- Risks associated with the use of migrant labour and ethnic minorities;
- Risks to freedom of movement e.g., being able to leave worker accommodation; and
- Impact on the environment relating to pollution of water supplies, soil and air.

ACWA Power will request to assess these risks from their suppliers by undertaking supply risk assessment.

16.3.2 Operational Phase

16.3.2.1 Occupational Health and Safety

The risks associated with the operational phase of the Project are anticipated to be less than the construction phase due to reduced site activity and requirements for heavy plant and machinery.

There will be occupational health and safety risks attributable to the operational phase associated with maintenance and inspection requirements. Maintenance and inspection will also require the use of site vehicles and activities that pose risks to human health and safety.

During operation of the Project, there is the risk of working at height to undertake any maintenance works. Workers may also be required to work in confined spaces such as the nacelle (the wind turbine component that contains the electrical components) and other sections of the tower to conduct inspection, maintenance, replacement or repairs. As such, there is the risk that O&M workers will be exposed to electrical hazards (electrical shock & fire) during maintenance works.

With regards to the operation of the OHTL, there is a risk of electrocution of O&M personnel due to direct contact or indirect contact via tools, ladders or vehicles with high voltage electricity. There is also a risk of falling while working at height. O&M personnel will ensure deactivation of transmission line prior to work on these lines and where live work will be undertaken, this would be conducted by trained workers only. Fall protection equipment and adequate training will also be provided to maintenance workers to reduce the risk of falling from height.

A structured GRM will be implemented at the Project level in multiple languages anonymously (online and hardcopy) so that workers have access to express their concerns. The human resources department shall be responsible for implementing the GRM for the facility.

The severity and likelihood of risks during the operational phase will be dependent on the frequency and requirements for planned and unplanned maintenance. The operation and maintenance team will need to ensure that a robust plan is in place to appropriately manage these risks.

16.3.2.2 Human Right Risks to Workers

FORCED LABOUR AND CHILD LABOUR

As the vast majority of staff will be direct employees of the Project Company or O&M Company the potential risks associate with worker exploitation are expected to be limited due to consistent processes in place as part of the respective HR management systems, assuming they are appropriately designed and have adequate resources. However, where there is an agency/contract staff the risks of exploitation (particularly forced and child labour) may be more prevalent.

RIGHT TO ADEQUATE STANDARD OF LIVING

No long-term accommodation requirements are anticipated for the operational phase of the Project. However, as with construction, operational activities will need to plan for and enforce just and fair treatment of operation and maintenance staff (including any engaged sub-contractors) in accordance with lender requirements and relevant Uzbekistan national requirements. Allowance will also need to be made for site staff welfare facilities including sanitation, rest, recreational and medical facilities.

16.3.2.3 Potential Gender Risks

Although there will be reduced workforce during the operational phase of the Project, the risk of gender issues relating to GBHV/SEA/SH, wage discrimination and access to employment benefits etc will remain. However, as with construction, operational activities will need to plan for and enforce just and fair treatment of operation and maintenance staff (including any engaged sub-contractors) in accordance with lender requirements and relevant Uzbekistan national requirements. Gender needs will be considered for welfare facilities including sanitation, rest, recreational and medical facilities. All the mitigation and management for gender risks during the construction phase will also be applicable for the operational phase of the project. As previously mentioned, there is a rehabilitation and adaptation centre located in Nukus that provide support to women and their children who have experienced GBVH and/or SEA/SH.

In addition, the O&M Company will also be required to have a HR policy with clear provisions for non-discrimination, code-of conduct and a GBVH policy.

16.3.3 Mitigation and Management Measures

Table 16-3 Labour and Working Conditions Mitigation and Management Measures – Construction

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
Occupational Health and Safety	• Workers will be provided with a safe and healthy work environment, considering inherent risks and specific classes of hazards associated with the Project. • Trained specialist will handle the blasting activities. • Specific personnel training on explosives handling and safety management will be conducted. • Explosives storage will adhere to relevant standards, with restricted access limited to trained personnel exclusively. • After blasting, qualified personnel will inspect blasting sites for malfunctions and unexploded blasting agents before work resumes. • The EPC Contractor will implement and maintain an OHS management system taking into account specific risks associated with the Project, legal requirements and duty of care. • The EPC Contractor will be responsible for ensuring that all affiliated sub-contractors comply with the OHS management system. The OHS management system will be in-line with recognised international best practice and as a minimum, this plan will include: • Means of identifying and minimising, so far as reasonably practicable, the causes of potential H&S hazards to workers. • Provision of preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances. • Provision of appropriate equipment to minimise risks, and requiring and enforcing its use. • Training of workers, and provision of appropriate incentives for them to use and comply with H&S procedures and protective equipment. • Documentation and reporting of occupational accidents, diseases and incidents. • Emergency prevention, preparedness and response arrangements
Human Right Risk to Workers – Right to Work, Forced Labour, Right to Adequate Standard of Living, Non-Discrimination	• Local workers will be considered for available positions depending on skills & qualifications. • The Project's process for employment will consider the availability of local talent. • The EPC contractor will not make employment decisions on the basis of personal characteristics, such as gender, race, nationality, ethnic origin, religion or belief, disability, age or sexual orientation, unrelated to inherent job requirements. • The EPC contractor will not employ forced labour, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements.

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	• Workers will be provided with easily understandable contracts that include details of their benefits, deductions (if any and within the limits of the law) and obligations. In addition to the copy signed for the EPC records, the employees will also be provided with a copy for their records. • Employees will be free to terminate their employment in accordance with the Uzbekistan Labour Code • The EPC contractor will provide a plan detailing how working conditions and terms of employment are compliant with national labour, social security and occupational health and safety laws. • Employees will be provided with suitable accommodation and worker accommodation areas will be managed in accordance with the EBRD and IFC Workers' Accommodation: Processes and Standards. The provision of good quality living accommodation, services and amenities will likely reduce the need for mixing with local communities. • Employment relationship will be on the principle of equal opportunity and fair treatment and will not discriminate with respect to any aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment including provisions for maternity/paternity leave, accommodation, access to training, promotion, termination of employment or retirement, and discipline. *Special measures of protection or assistance to promote local employment opportunities or selection for a particular job based on the inherent requirements of the job, which are in accordance with national law, will not be deemed discrimination.*
Human Right Risk to Workers - Child Labour	• The EPC contractor will comply with all relevant national laws, lenders requirements and ILO provisions related to the employment of minors. • The EPC Contractor will devise a management procedure to ensure that all workers are above the minimum legal age of employment at the time of hiring. This will include the verification of official personal registration documents i.e., national ID, passport etc. • Young people below the age of 18 years will not be employed in hazardous work and all work of persons under the age of 18 will be subject to an appropriate risk assessment. • Where workers under the age of 18 are employed, the EPC Contractor shall establish a system to regularly monitor the working conditions and working hours of such young workers in line with Uzbek Labour Code.
Human Right Risk to Workers - Wages, working hours, right to rest, benefits, and retrenchment	• HR policies and procedures will be adapted appropriately to the size of the workforce required for the Project. Policies and procedures must be prepared to demonstrate consistency with the requirements of national legislation and IFC PS 2 and include a code of conduct on GBVH/SEA/SH. • The EPC contractor will document and communicate to all workers their working conditions and terms of employment including their entitlement to wages, hours of work, overtime arrangements and overtime compensation, and any benefits (such as leave for illness, maternity/paternity, or holiday). • Wages, benefits, leave days and other conditions of work offered should, overall, be comparable to those offered by equivalent employers in the relevant region of that country/region and sector concerned.

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	• The wages to all the workers (skilled and unskilled) will be enough to guarantee a living wage for all the workers (i.e., adequate food, clothing and housing). • Workers will be provided equal remuneration for work of equal value. • Workers will receive their pay on time and in full for ordinary and overtime hours, as well as paid leave. • Wages will be paid regularly based on the agreed pay-day and adequate notice provided where exceptional circumstances necessitate change in the regular pay day. • Where required, workers will be provided with the option of flexible work schedule in order to manage personal obligations while adequately fulfilling their employment duties. • If the EPC contractor anticipates collective dismissals associated with the proposed project, the EPC contractor will develop a plan to mitigate the adverse impacts of retrenchment, in line with national law and good industry practice and based on the principles of non-discrimination and consultation. Without prejudice to more stringent provisions in national law, such consultation will involve reasonable notice of employment changes to the workers' representatives and, where appropriate, relevant public authorities so that the retrenchment plan may be examined jointly in order to mitigate adverse effects of job losses on the workers concerned. The outcome of the consultations will be reflected in the final retrenchment plan..
Human Right Risk to Workers - Workers Right to Health	• During construction, workers will have access to medical professionals and suitable medical facilities, which will aim to prevent the spread of diseases internally. Site personnel will only be cleared for work after with a medical fitness certificate from an authorized medical centre; • Any reportable disease will be diagnosed by the authorized occupation health centre doctor. Diagnosis includes identifying any new symptoms, or any significant worsening of existing symptoms; • Any internal spreading diseases will be diagnosed and precautions will be taken as per the instructions from the national/ local medical authority; • The potential for exposure to water-borne, water-based, vector-borne diseases and communicable diseases as a result from project activities will be avoided or minimized; • EPC Contractor will comply with Uzbek sick leave requirements.
Human Right Risk to Workers – Collective Bargaining and Freedom of Association	• HR Policies shall include the ability of workers to form or join all types of associations. • HR Policies shall include the ability of workers to join a Trade Union; as well as ensure collective bargaining rights of workers. • Trade unions must be permitted to function freely subject only to limitations that are in line with the Uzbekistan Labour Code and the International Human Right standards.
Human Right Risk to Workers – Freedom of Movement	• Workers will be allowed to move freely and interact with local communities • EPC Contractor to provide adequate cultural sensitization training during induction training to the workers, especially in terms of interaction with the local community members; • EPC Contractor will adopt a zero-tolerance policy towards unacceptable workforce behaviour towards any community member.

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	• Workers will be provided adequate periods of leave to enable them travel to their home countries and spend time with their families.
Gender Risk - Gender Based Violence and Harassment	• The workers will be provided with information regarding worker code of conduct in local languages as part of their employment contract which will include provisions for reporting, investigations, termination and disciplinary action against those who perpetrate gender violence and harassment. • The EPC Contractor shall conduct mandatory regular training and awareness raising for the workforce about gender-based violence and harassment towards local community members and their colleagues especially women and the availability of a grievance mechanism to report any GBVH/SEA/SH cases. • The workers shall be made aware of the laws and regulations that make sexual harassment and gender-based violence a punishable offence which is prosecuted. • Ensure inclusion of a balanced representation of women on the HSE team who will be easily relatable and approachable to female workers. • Project personnel in charge of receiving GBVH/SEA/SH grievances will be provided with appropriate training on how to handle such complaints. It is recommended that the personnel are trained in coordination with any GBVH organisations working in the Project area where available. • Female workers will be included in the grievance redress committee to help female workers and host community female members raise their grievances. • Regular consultations should be undertaken with women on their concerns about the project • The EPC Contractor will work to identify a suitable labour pool locally in order to minimize the need for bringing large number of workers from other regions or countries. This could also help the EPC Contractor in cutting cost associated with provision of accommodation facilities if the majority of the workers are sourced locally. • Provision of opportunities for the workers to regularly return to their families who may be located far from the Project site. • The EPC Contractor will provide opportunities for workers to have access to entertainment opportunities away from the host communities. • EPC Contractor will allow submission and investigation of anonymous sexual harassment complaints by workers and host community members and protect the confidentiality of the complainants. • The EPC Contractor will work in close coordination with the local authorities in investigating any complaints relating to gender violence and harassment in the host communities where it relates to Project workers. • The EPC Contractor will provide targeted training (including in life skills such as leadership and decision-making) and awareness raising to vulnerable workers such as women. • The EPC Contractor will prepare a Gender Equality and GBVH/SEA/SH Policy in line with Uzbek and lenders requirements. This will include provision of training to workers, subcontractors and suppliers on GBVH associated risks.

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
Gender Risk - GBVH/SEA/SH in Accommodation Facilities	• The EPC shall provide safe, secure and separate accommodation facilities and sanitary facilities for the male and female workers (lockable sanitary facilities will be mandatory for women). • The EPC Contractor will provide separate social facilities for the men and women. • Worker accommodation areas will be managed in accordance with the EBRD and IFC Workers' Accommodation: Processes and Standards.
Gender Risk - Wage discrimination based on Gender	• EPC Contractor to provide access to recruitment opportunities for women based on their qualifications. • EPC Contractor will develop a Local Recruitment Plan that ensures equal opportunities are provided to women in the employment process, training and promotions • The EPC Contractor shall implement an equal wage policy for women employees. • Women will be provided equal remuneration as their male counterparts for work of equal value.
Gender Risk- Discrimination Based on Employment Benefits & Guarantees	• The EPC Contractor will include the benefits and guarantees for both men and women in the HR policy with a clear commitment to non-discrimination during the recruitment process. • EPC Contractor to improve employment opportunities by developing guidelines to ensure that discrimination against women on the basis of their marital or reproductive status is avoided. • The EPC Contractor shall implement a zero-tolerance process for discrimination against women.
Gender Risk – Discrimination Based on Sexual Orientation	• The EPC Contractor's HR policy will include a non-discrimination policy and a code of conduct. • The EPC Contractor's HR policy will include GBVH policy applicable to all employees and sub-contractors. • Sexual violence or harassment will not be tolerated and the EPC Contractor will include this in the worker's code of conduct which will be provided in the local languages. • The grievance mechanism will be made available to all workers at no cost and without risk of retribution. • The EPC Contractor will provide gender and inclusion orientation to its workforce in a culturally appropriate manner in order to eliminate the risk of harassment and violence.
Grievance Mechanism	• The EPC contractor will provide a grievance mechanism for workers to raise reasonable workplace concerns. The client will inform the workers of the grievance mechanism at the time of hiring, and make it easily accessible to them. The mechanism should involve an appropriate level of management and address concerns promptly, using an understandable and transparent process that provides feedback to those concerned, without any retribution. The mechanism should not impede access to other judicial or administrative remedies that might be available under law or through existing arbitration procedures, or substitute for grievance mechanisms provided through collective agreements. • The grievance mechanism shall provide for confidential reporting and a support system for any workers reporting issues relating to GBVH/SEA/SH. The grievance mechanism will also allow for reporting through word of mouth for those who cannot write.

POTENTIAL IMPACT	MITIGATION AND MANAGEMENT MEASURES
	• Female workers will be included in the grievance redress committee to help female workers and host community female members raise their grievances.
Human Rights Policy	In addition to adhering to the national human rights requirements, the EPC Contractor will put in place a human right's policy in line with the UN Guiding Principles on Business and Human Rights. The statement policy will: • Be approved at the most senior level of the company; • Informed by relevant internal and external expertise; • Stipulate the EPC's human rights expectations of personnel, local communities, sub-contractors and other suppliers directly linked to the construction of the project; • Be publicly available and communicated internally and to the relevant stakeholders; • Be reflected in the other policies and procedures to embed it throughout their construction phase activities.
Risks Related to Supply Chain	• ACWA Power & the Project Company will develop a Supply Chain Management Plan and an E&S Supplier & Vendor Management Plan. • ACWA Power & the Project Company will ensure its core suppliers will implement the recommendations from the Supply Chain audit in relation to Envision's supply chain management system. • ACWA Power & the Project Company will establish a responsible sourcing policy to ensure traceability from wind turbine suppliers. • ACWA Power and the Project Company will ensure that Envision and its core suppliers adopt self-covenants and codes to the loan agreement mandating the suppliers to map and complete risk assessment of the core WTG components. • Envision must provide a Letter of Commitment to the Project Company which states that the suppliers involved in production/assembly of turbines will be locked contractually and any new or replacement supplier will go through a separate due diligence process to confirm no association with child and forced labour risks. • A Corrective Action Plan (CAP) will be developed and implemented to address the gaps identified during the supply chain assessment and to address any non-compliances that that will be identified in future audits • ACWA Power & the Project Company will notify the lenders when labour risks such as forced/child labour or allegations are raised in relation to their core suppliers. • ACWA Power and the Project Company will ensure that Envision and its core suppliers keep all records, rules and policies in relation to workers protection and the provision of safe working conditions. • A dis-engagement clause will be added to the loan agreement in case of material non-compliance with the measures listed above.

Table 16-4 Labour and Working Conditions Mitigation and Management Measures – Operation

TOPIC	MITIGATION AND MANAGEMENT MEASURES
Occupational Health and Safety	• Workers will be provided with a safe and healthy work environment, taking into account inherent risks and specific classes of hazards associated with the Project. • The Project's Operator will implement and maintain an OHS management system specific to the operational phase taking into account specific risks associated with the project, legal requirements and duty of care. • The Operator of the OHTL will ensure that adequate training with regards to electrocution, working at height and other risks is provided to O&M personnel responsible for maintenance works along the transmission line • The Project's Operator will ensure that adequately rated equipment such as hoisting/lifting equipment, tool bags and power tools are given to O&M personnel. • The Project's Operator will be responsible for ensuring that all affiliated sub-contractors comply with the OHS management system. The OHS management system will be in-line with recognised GIIP and as a minimum, this plan will include: - Means of identifying and minimising, so far as reasonably practicable, the causes of potential H&S hazards to workers. - Provision of preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances. - Provision of appropriate equipment to minimise risks, and requiring and enforcing its use. - Training of workers, and provision of appropriate incentives for them to use and comply with H&S procedures and protective equipment. - Documentation and reporting of occupational accidents, diseases and incidents. - Emergency prevention, preparedness and response measures
Human Right Risk to Workers –Forced Labour, Right to Adequate Standard of Living, Non-Discrimination	• The O&M Company will not employ forced labour, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labour, such as indentured labour, bonded labour or similar labour-contracting arrangements. • The O&M Company will not make employment decisions on the basis of personal characteristics, such as gender, race, nationality, ethnic origin, religion or belief, disability, age or sexual orientation, unrelated to inherent job requirements. • Employment relationship will be on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment including provisions for maternity/paternity leave, accommodation, access to training, promotion, termination of employment or retirement, and discipline. *Special measures of protection or assistance to promote local employment opportunities or selection for a particular job based on the inherent requirements of the job, which are in accordance with national law, will not be deemed discrimination.*
Human Right Risk to Workers – Child Labour	• The O&M Company will comply with all relevant national laws, lenders requirements and ILO provisions related to the employment of minors.

TOPIC	MITIGATION AND MANAGEMENT MEASURES
	• Young people below the age of 18 years will not be employed in hazardous work and all work of persons under the age of 18 will be subject to an appropriate risk assessment.
Human Right Risk to Workers – Wages, working hours, right to rest, benefits, and retrenchment	• Wages, benefits, leave days and other conditions of work offered should, overall, be comparable to those offered by equivalent employers in the relevant region of that country/region and sector concerned. The wages to all the workers including to any unskilled workers will be enough to constitute for a living wage. • If the O&M Company anticipates collective dismissals associated with the proposed project, the O&M Company will develop a plan to mitigate the adverse impacts of retrenchment, in line with national law and good industry practice and based on the principles of non-discrimination and consultation. Without prejudice to more stringent provisions in national law, such consultation will involve reasonable notice of employment changes to the workers' representatives and, where appropriate, relevant public authorities so that the retrenchment plan may be examined jointly in order to mitigate adverse effects of job losses on the workers concerned. The outcome of the consultations will be reflected in the final retrenchment plan.
Gender Risk- Discrimination Based on Employment Benefits & Guarantees	• The Project Company will develop partnerships with local education providers to promote STEM careers for young women through a women-focused outreach initiative to publicise the new internship programme. • The Project Company will Introduce a new and certified internship programme to equip at least 20 young women (i.e. at least 5 per year) with higher skill levels, in collaboration with the local education partners.
Gender Risk- Gender Based Violence and Harassment	• The workers will be provided with information regarding worker code of conduct in local languages as part of their employment contract which will include provisions for reporting GBVH (either in person or anonymously), investigation procedure, termination and disciplinary action against those who perpetrate gender violence and harassment. • The O&M Company shall conduct mandatory regular training and awareness raising for the workforce about gender-based violence and harassment towards local community members and their colleagues especially women. • The workers shall be made aware of the laws and regulations that make sexual harassment and gender-based violence a punishable offence which is prosecuted. • Mandatory and regular training for workers on required lawful conduct in host communities and legal consequences for failure to comply including dismissal. • O&M shall provide safe, secure and separate living spaces and sanitary facilities for the male and female workers (lockable sanitary facilities will be mandatory for women). • Provision of opportunities for the workers to regularly return to their families. • O&M Company will allow submission and investigation of anonymous sexual harassment complaints by workers and host community members and protect the confidentiality of the complainants. • The O&M Company will work in close coordination with the local authorities in investigating any complaints relating to gender

TOPIC	MITIGATION AND MANAGEMENT MEASURES
	violence and harassment in the host communities where it relates to Project workers. • O&M will identify local based GBVH/SEA/SH organizations that can offer support to those who experience violence or harassment. • The O&M's HR policy will include a non-discrimination policy and a code of conduct. • The O&M's HR policy will include GBVH policy applicable to all employees and sub-contractors.
Grievance Mechanism	• The O&M Company will provide a Grievance Mechanism for workers to raise reasonable workplace concerns including GBVH. The client will inform the workers of the grievance mechanism at the time of hiring and make it easily accessible to them. The mechanism should involve an appropriate level of management and address concerns promptly, using an understandable and transparent process that provides feedback to those concerned, without any retribution. The mechanism should not impede access to other judicial or administrative remedies that might be available under law or through existing arbitration procedures, or substitute for grievance mechanisms provided through collective agreements.
Human Rights Policy	In addition to adhering to the national human rights requirements, the O&M Company will put in place a human right's policy in line with the UN Guiding Principles on Business and Human Rights. The statement policy will: • Be approved at the most senior level of the company; • Informed by relevant internal and external expertise; • Stipulate the O&M's human rights expectations of personnel, local communities and other suppliers directly linked to the operational phase of the project; • Be publicly available and communicated internally and to the relevant stakeholders; • Be reflected in the other policies and procedures to embed it throughout the operational phase activities.

16.4 Monitoring

Monitoring of Labour, Working Conditions and Human Rights will be undertaken as required via the management measures outlined above. For instance, monitoring of the worker accommodation will form part of the wider Environmental and Social Management System internal audits. The following table outlines key indicators.

Table 16-5 Labour and Working Conditions Key Monitoring indicators

Monitoring	Parameter	Frequency & Durations	Monitoring Locations	Responsible Entity
Construction & Operations				
Worker Contracts & HR	Records of contracts, payments, receipt of benefits, leave entitlements, retrenchment etc.	On-going	For all Project workers (direct staff) and oversight of sub-contractor staff dedicated to the project	- EPC Contractor HR Manager - Project Company HR Manager
Women employed in the Project	Number of women employed in the project including their rank and renumeration compared to men occupying the same positions.	On-going	For all female Project personnel including those employed by the sub-contractors.	- EPC Contractor HR Manager - Project Company HR Manager
Worker Welfare	Sanitation Facilities, Office Spaces, Welfare and Rest Areas	On-going	At all such facilities on-site	- EPC Contractor E&S Manager - O&M Contractor E&S Manager
Quality of Accommodation	Inspection/internal audit of worker accommodation facilities vs. IFC & EBRD standards	Monthly	All accommodation facilities provided to direct and full time sub-contracted labour.	- EPC Contractor E&S Manager - O&M Contractor E&S Manager
OH&S Near Misses (involving external parties)	Any classified near miss	On-going	n/a	- EPC Contractor HSE Manager - O&M Contractor E&S Manager
OH&S Emergency Situations and Incidents	Any classified emergency situation or incident	On-going	n/a	- EPC Contractor HSE Manager - O&M Contractor E&S Manager

Monitoring	Parameter	Frequency & Durations	Monitoring Locations	Responsible Entity
Grievances including those relating to gender-based violence and harassment, sexual exploitation & abuse and sexual harassment	Grievances received	On-going	Project site and any other grievances received from communities in reference to Project workforce including suppliers.	- EPC Contractor CLOs - Project Company CLOs
Health of the workers	Records of the illnesses the workers are suffering from and an analysis of top diseases.	On-going	Project site clinic or first aid facility	- EPC Contractor HSE Manager - O&M Contractor E&S Manager
	COVID-19	Daily	All Project site workers including those under different sub-contractors, suppliers etc.	- EPC Contractor HSE Manager - O&M Contractor E&S Manager
Human rights complaints/violations as reported by Project workers including workers hired through third-parties or in the supply chain	Grievances received	On-going	As defined in the Stakeholder Engagement Plan (SEP)	- EPC Contractor HR Manager - Project Company HR Manager

17 CLIMATE AFFAIRS

17.1 Applicable Requirements & Standards

17.1.1 National Requirements

Uzbekistan submitted its Third National Communication to the UNFCCC and it ratified the Paris Agreement in November 2018 which brought its Intended Nationally Determined Contribution (INDC) into effect for the period up to 2030. The long-term objective of the INDC is to decrease specific emissions of greenhouse gases per unit of GDP by 10% by 2030 from level of 2010. This envisages the support from the international organisations and financial, ensuring access to advanced energy saving and environmentally sound technologies and resource allocation for climate financing.

The ratification of the Paris Climate Agreement committed Uzbekistan to transitioning to a green economy, and adoption of the following normative documents:

- Decree of the President of the Republic of Uzbekistan. № PD-4477, dated October 4, 2019 "On approval of the Strategy on transition of the Republic of Uzbekistan to the "green" economy for the period 2019-2030".,
- Decree of the President of the Republic of Uzbekistan, № PD-5863, dated October 30, 2019, "On approval of the Concept of environmental protection of the Republic of Uzbekistan until 2030".

Priority areas of "The Strategy on transition of the Republic of Uzbekistan to the "green" economy for the period 2019-2030" regarding to the electricity producing industry are:

- Reconstruction and modernization of generating capacities of existing power plants with implementation of highly efficient technologies based on combined cycle gas and gas turbine units;
- Improvement of configurations and modernization of main power networks to increase the stability of the power system;
- Implementation of organizational and technical measures, including optimization of modes;
- Increasing the level of automatization of technological processes; and
- Full equipment of power consumption systems with automatic control and metering devices.

17.1.2 Lender Requirements

ADB

ADB Environment Safeguards, the borrower/client is required to promote the reduction of project-related greenhouse gas (GHG) emissions in a manner appropriate to the nature and scale of the project operations and impacts. During the development or operation of projects that are expected to or currently emit significant quantitates of greenhouse gases, defined as amounting to 100,000 $_{t}CO_2e$ per annum or more aggregate direct and indirect emissions, the borrower should quantify:

- Direct emissions from the facilities within the physical project boundary; and
- Indirect emissions associated with the off-site production of power used by the project.

The borrower should also evaluate technically and financially feasible and cost-effective options to reduce or offset project-related GHG emissions during project design and operation.

AIIB

The Asian Infrastructure Investment Bank (AIIB) has a comprehensive Environmental and Social Framework (ESF) 13 that integrates climate change considerations into its policies and operations. The ESF aims to ensure that the projects financed by AIIB are environmentally and socially sustainable, and it reflects the Bank's commitment to addressing climate change.

- The Environmental and Social Policy requires projects to undergo a climate risk and vulnerability assessment to identify potential climate-related risks and ensure resilience. This includes evaluating the impact of climate change on project performance and longevity. The policy requires the estimation and reporting of GHG emissions for relevant projects. It encourages the implementation of measures to reduce emissions and enhance carbon sequestration.
- The Environmental and Social Standards also requires the assessment of climate change risks and the integration of appropriate mitigation and adaptation measures into project design and implementation. In addition, it focuses on resource efficiency, including energy use, and the reduction of pollution, including GHG emissions. It promotes the use of clean and renewable energy sources.

EPFIs

Equator Principles IV establishes that impacts to climate should be avoided where possible, and in support of the 2015 Paris Agreement recognises that EPFIs have a role to play in improving the availability of climate-related information.

13 Environmental and Social Framework, Approved February 2016 (Amended February 2019, May 2021 and November 2022). https://www.aiib.org/en/policies-strategies/_download/environment-framework/AIIB-Environmental-and-Social-Framework_ESF-November-2022-final.pdf

Factors including climate change are required to be incorporated into the Project Review and Categorisation (EP1), while a key element of EP IV (under EP2 for Environmental and Social Assessment) is that an assessment of climate change risks is expected in an ESIA.

For projects that have Scope 1 & 2 GHG emissions of over 100,000 tonnes of CO2 equivalent per annum, there are also other requirements linked to alternative analysis and client annual reporting on GHG emissions.

17.2 National Context

Uzbekistan is among the countries most vulnerable to climate change and has identified agriculture, economy, population health, energy, water resource management and disaster risk reduction as its most vulnerable sectors (WBG, 2021). Average annual air temperatures have risen steadily and significantly in Uzbekistan over the past century, albeit with no variation from year to year. From 1950 to 2013, temperatures rose at an average rate of 0.27°C per decade. Analysis in the total annual precipitation amount averaged by various regions of Uzbekistan for the period 1950-2013 show very low trends towards decreases.

Climate observations in Uzbekistan show that the number of days of high air temperature (>40°C) has increased from the 1950's to 2000s. The number of days with low temperature (below either -15°C or -20°C) has decreased.

According to Third National Communication of the Republic of Uzbekistan under the UN Framework Convention on Climate Change (2016) the different regions of Uzbekistan face varying vulnerability to climate change. Karakalpakstan, where the Project is located, is classified as one of the three most vulnerable territories in Uzbekistan to climate change.

17.3 Climate Projections

Climate projection data is modelled data from the global climate model compilations of the Coupled Model Inter-comparison Projects (CMIPs), overseen by the World Climate Research Program. The following data is summarised from the World Bank Climate Change Knowledge Portal.

TEMPERATURE

Climate change is expected to produce increases in monthly maximum temperatures across Uzbekistan. The model ensemble's estimate of warming under the highest emission pathway (RCP 8.5) is an average temperature increase of 2.4°C by mid-century and nearly 5°C by end of the century.

The number of hot days in Uzbekistan is projected to increase by 28.6 days by 2040-2059 days, under an RCP 8.5 scenario.

The number of tropical nights (minimum temperature above 20°C) is projected to increase by over 31 days by 2040-2059, under an RCP 8.5 scenario.

PRECIPITATION

Uzbekistan will experience a high variability of rainfall across different agroecological and climatic zones.

Across the country, however, there have been some spatial differences in precipitation trends, with annual precipitation declining between 50-100mm in some central and eastern districts and moderately increasing in areas surrounding the Aral Sea.

Increased heat and precipitation variability will lead to increased evapotranspiration in summer months resulting in a decrease in river flowing conditions.

Future projections suggest that increased glacier melting (glaciers in Central Asia have shrunk by 25% and are expected to shrink by another 25% over the next 20 years) is expected to impact water availability and river flow in the short to long term in Uzbekistan.

DROUGHTS

The risks of dry years and droughts is also anticipated to increase in Uzbekistan due to decreases in river runoff and increases in population growth. This will be especially prevalent in the downstream reaches of the rivers in the Amu-Darya River basin such as Karakalpakstan.

17.4 Potential Project Impacts on Climate Change

17.4.1 Construction Phase

17.4.1.1 Fuel Combustion

At this stage, the expected quantity of fuel to be consumed during construction by the appointed EPC & subcontractors is unknown. This will depend on the type and number of mobile equipment and diesel generators used, the hours of machinery/equipment operation and the efficiency of equipment. Therefore, the assessment of construction impacts is based upon assumptions, using existing experience and understanding of the construction requirements of similar projects.

STATIONARY SOURCE

The primary stationary combustion fuel source that will be used during the construction of the Project will be temporary diesel generators. Power will be supplied by one (1) 250kW diesel

generator and four (4) to six (6) 5kV diesel generators, and approximately 6,000 to 10,000 L/month of diesel will be required to operate the diesel generators

GHG emissions during construction were calculated using the Greenhouse Gas Protocol calculation tool for GHG Emissions from Stationary Combustion (World Resources Institute, 2015), and are summarised in the table below.

Table 17-1 GHG Emissions from Stationary Combustion During Project Construction

Fuel Type	Volume of Fuel (lt)	CO_2	CH_4	N_2O	All GHGs (tonnes CO2e)
Liquid fossil (Diesel)	6,000 – 10,000	16.059 – 26.765	6.502E-04 – 1.084E-03	1.300E-04 – 2.167E-04	16.112 – 26.853
Total GHG emissions from fossil fuels (tonnes CO2e)					**16.112 – 26.853**
*if/when the generators are operational					

Mobile Source

The construction of the Project will require an amount of mobile equipment, machinery and vehicles to facilitate works. Such equipment (such as excavators, rollers, cranes, pneumatic compressors, and other vehicles) will be ample on the site, access road and OHTL route, and are expected to be used in most construction processes. It is anticipated that these will be fuelled by either diesel or unleaded petrol. The expected fuel quantity for operating the construction vehicles and equipment is approximately 200,000 L/month.

GHG emissions during construction were calculated using the Greenhouse Gas Protocol calculation tool for GHG Emissions from Mobile Combustion Sources (World Resources Institute, 2015), and are summarised in the table below.

Table 17-2 GHG Emissions from Mobile Combustion During Project Construction

Activity Type	Fuel Source	Vehicle Type	Amount of Fuel (L)	CO_2	CH_4	N_2O	GHG Emission (tonnes CO2eq)
Fuel use	Diesel	Diesel medium- and heavy-duty vehicles	200,000	539.439	2.371E-03	2.232E-03	540.097
Total GHG emissions from fossil fuels (tonnes CO2e)							**540.097**
*if/when the mobile equipment and machinery are operational							

Loss of Carbon Sinks

The Project is located in an open area with desert shrubs as the major vegetative cover and the site lacks the voluminous biomass that would present stores for carbon. While it is noted that the construction phase will result in the removal of ground cover vegetation, this is not expected to be widespread as it will be primarily limited to WTG & OHTL tower footprints and the access road. As such, significant loss of carbon storage is not anticipated due to the Project's development.

17.4.2 Operational Phase

17.4.2.1 GHG Emission - Grid Electricity Usage

Although being a renewable energy project, the generation of wind power is intermittent and restricted to certain wind conditions. As such the project will draw power from the grid during calm wind conditions to provide electricity for lighting, security purposes (e.g. security systems, CCTV etc.).

The amount of power usage is expected to be minimal, and there will be no operational processes that will require large quantities of power to be drawn from the grid. As such, this limited amount of Scope 2 GHG emissions has not been assessed herein.

17.4.2.2 Mobile Source - Fuel Combustion

Operational emissions are not expected from the operation of the Wind Farm. Mobile source GHG emissions during operations will only relate to the few vehicles for operation & maintenance purposes. The Project does not require key supply chains (i.e. regular deliveries or removals) and is not expected to require significant maintenance.

The mitigation and management measures for all potential emissions are as provided in the Air Quality Chapter in Part of this ESIA.

17.5 Vulnerability of the Project to Climate Change

A climate physical risk refers to those risks that arise as a result of climate change and can be either acute or chronic. Acute risks refer to event-driven changes in climate patterns e.g., increased severity of extreme weather events. Chronic risks refer to longer-term shifts in climate patterns e.g., sustained higher temperatures, that may lead to sea level risk or chronic heat waves (Equator Principles, 2020).

According to the World Bank Climate Change Knowledge Portal (2021), impacts from climate change make Uzbekistan increasingly vulnerable to: droughts, high temperatures, heat waves, heavy precipitation, mudflows, floods, and avalanches.

The key vulnerabilities for Karakalpakstan and the Project are that:

- Summer months are expected to have high temperatures, prolonged heat waves, and expanded summer season. Heat waves, and increased frequency of the consecutive number of days above 39°C are expected to occur throughout the country. There is the potential for maintenance workers to work outdoors, however, this is expected to be limited and impacts to the Project from increased temperatures are assessed to be negligible.
- Droughts may become more frequent due to river runoff decrease, particularly for areas with increased demand and consumption from economic development and population growth. This is especially relevant due to the Project's location to the Amu Darya. Water is not a primary resource for the operation of the Project and potable water is able to be transported to the Project site and this is deemed to be a negligible impact.
- There is the potential for higher frequency heavy rainfall, which may result in increased runoff/flooding, however, as per the UzAssystem (2022) hydrology study there is not expected to be a significant change in precipitation as a result of climate change. The flood modelling has modelled 1 in 50- and 100-year storms and recommended mitigation strategies.

17.5.1 Climate Transition Risks

Climate transition risks refer to those which may arise from the plans or processes that may be put in place to adjust to a lower-carbon, climate-resilient economy. These can include changes or updates to policy or legislation (e.g., introduction of emission limits), imposition of carbon tax, shifts in demand and supply due to technology and market changes and reputation risks reflecting changing customer or community perceptions (Equator Principles, 2020).

As part of the Uzbekistan 2030 Energy Strategy, the country aims to develop and expand the use of renewables and integrate it into the unified power system. The 200 MW Wind Farm is a renewable energy project therefore it is not expected to result in emission of any greenhouse gases during operations.

Given that the Nukus 200MW Wind Farm Project is a zero-carbon operation project, there are not anticipated to be any specific transition risks of concern.

18 CUMULATIVE IMPACT ASSESSMENT

Cumulative impacts are those that '*result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones'*. CIA is therefore the process of:

- Analysing the potential impacts and risks of proposed developments in the context of the potential effects of other human activities and environmental and social external drivers on the chosen Valued Environmental and Social Components (VECs) over time; and
- Proposing concrete measures to avoid, reduce, or mitigate such cumulative impacts and risk to the extent possible.

The purpose of a cumulative impact assessment is to determine how the potential impacts of a proposed development might combine cumulatively, with the potential impacts of other projects or human activities as well as natural stressors such as droughts or extreme climatic events.

The objectives and expected outcomes of a Cumulative Impact Assessment process are as follows:

- Identification of VECs such as air, water, soil etc. that may be affected by the Project and the selected VECs the assessment will focus on;
- Identification of existing and reasonably anticipated and/or planned developments, as well as natural environmental and external social drivers, that could affect the selected VECs;
- Assessment and/or estimation of the future condition of selected VECs, as the result of the cumulative impacts that the development is expected to have, when combined with those of other reasonably predictable developments;
- Evaluation of the future condition of the VECs relative to established or estimated thresholds of VEC condition or to comparable benchmarks;
- Avoidance and minimization of cumulative impacts of the Project on the VECs and
- Monitoring and management measures to ensure the VEC viability over the life span of the development or its impacts.

18.1 Identification of Valued Environmental and Social Components (VECs)

This ESIA has assessed cumulative impacts of several environmental and social parameters in the main sections of this ESIA. For instance, biodiversity impacts, construction air quality

(particulates) and construction noise impacts have considered the measured baseline conditions in combination with the predicted process contributions. As a result, this has provided an assessment of cumulative impacts, as a result of the Project itself.

18.2 Identification of Other Activities and Environmental Drivers

For the purpose of this ESIA and in light of the two (2) active mining areas, the CIA will be undertaken to establish whether there are barriers to both current and future development within the projects area of influence, such as:

- Is there sufficient environmental carrying capacity available for future development?
- Are there any factors that may restrict future development?
- Are there any key factors of concern that may relate to the development/operation of other projects in tandem with the proposed Nukus 200MW Wind Farm Project?

Table 18-1 Known and/ Future Projects in the Project's Area of Influence

PROJECT	DESCRIPTION	DISTANCE TO PROJECT
Mining	M2 – Marmor LLC has obtained a license from the Ministry of Mining Industry and Geology, valid for 27 years, and they are currently conducting marble mining activities within the designated area.	4.5 km south from wind farm site boundary and approximately 1 km west from OHTL
	M3 – This mine is currently inactive and, according to the Ministry of Mining Industry and Geology, does not have formal rights to undertake mining activities. However, it has been included in the CIA due to the potential for mining works to occur.	6 km south from wind farm site boundary and approximately 900 m west from OHTL
Cement Plant	Cement Plant belonging to Karakalpak Cement LLC Facility with a total capacity of 1.2 million tons per year (Mt/yr).	8 km south from wind farm site boundary
Nukus 100 MW Wind Farm & OHTL	A wind farm project that is currently being developed by ACWA Power alongside the Nukus 200 MW Wind Farm Project	Adjacent to the Nukus 200 MW Wind Farm bordering it to the west

The following table presents the different environmental and social components or aspects that were considered within this ESIA and therefore have the potential to be impacted by the construction & operation of on-going activities and existing facilities within the Project's area of influence.

Table 18-2 Valued Environmental & Social Components (VEC's)

Environmental and Social Components	Considered VEC to be included in CIA?	Justification for Inclusion or Exclusion
Terrestrial Ecology	**Yes**	Project related impacts with regards to terrestrial ecology would be those associated with habitat loss, habitat fragmentation, biodiversity loss and displacement. Cumulative impact to terrestrial ecology is only anticipated when the operation of the Nukus 200 MW wind farm & OHTL is undertaken simultaneously with mining works at the mining areas and the Nukus 100 MW Wind Farm and OHTL.
Air Quality	**Yes**	Project related impacts on ambient air quality would be those associated with construction: temporary emissions from vehicles, dust from earthworks and dust from vehicle movements within the Project. Cumulative impact on air quality with respect to dust generation and gaseous emissions is only anticipated when construction activities at Nukus 200 MW Project site is undertaken simultaneously with mining works at the mining areas and construction activities at Nukus 100 MW Wind Farm and OHTL.
Noise and Vibration	**Yes**	Project related impacts with regards to nuisance to sensitive receptors from noise and vibration would be those associated with construction: use of vehicles, heavy plant and machinery, in particular earthworks and operation of the WTGs etc. Cumulative noise and vibration impacts at receptor location particularly any activities that will be undertaken at the boundary is only anticipated when extraction processes is being undertaken at the mining areas and construction activities at Nukus 100 MW Wind Farm and OHTL at the same time as the Nukus 200 MW wind farm construction activities.
Soils Geology, Groundwater and Surface water	**No**	Project related impacts on soil and groundwater quality would be those related to the potential contamination of soil and groundwater resources during construction as well as during operation. However, the effect of these impacts will be localized and limited within the Project boundaries and area of works along the OHTL route, with very limited potential for cumulative effects. Furthermore, no extraction of local groundwater resources is envisaged during the construction and operation of the Project.
Archaeology and Cultural Heritage	**No**	Project related impacts in relation to archaeology and cultural heritage would mainly be those related to the excavation, earthworks and clearance of the Project site and the potential for encountering unknown buried archaeological remains. The risk is considered low as it is limited to the Project area and OHTL tower construction area. Therefore it is not envisaged that significant cumulative impacts will take place.

Environmental and Social Components	Considered VEC to be included in CIA?	Justification for Inclusion or Exclusion
Landscape and Visual	**Yes**	Project related impacts in relation to landscape will mainly be those related to the clearance of the Project site, loss of typical desert landscape and visual impact due to the anthropogenic intrusion of vertical wind turbine structures. The Nukus 100MW WF will also lead to further clearance of the land and erection of the WTGs.
Shadow Flicker	**No**	Cumulative impacts from Shadow Flicker are not anticipated as there are no permanent residential receptors located within 9 km of the nearest wind turbine generator (WTG) in the Nukus 200 MW Wind Farm, and the shadow flicker assessment conducted for the Nukus 100 MW WF demonstrates that none of the assessed locations exceed the IFC worst-case criteria (30 hours per year or less than 30 mins per day).
Socio-economics	**Yes**	Project related impacts in relation to socio-economics would be mainly those related to creation of employment (beneficial impact) and dissemination of skills during both construction and operational phases. Given the scale of the Project, significant beneficial cumulative impacts are anticipated. Nonetheless, communities within the project-affected communities have access to basic social services and infrastructure. Nevertheless, unstable power supply and recurrent water shortages, and the lack of irrigation systems in the district is a major challenge for all forms of local agriculture.
Waste and Wastewater Management	**No**	Project related impacts in relation to waste and wastewater management would mainly be those related to the potential deterioration and/or contamination of soil and groundwater resources during construction and operation due to improper or uncontrolled handling, storage, transport and disposal of waste. However, given the amounts of waste generated it is not envisaged that cumulative impacts with other projects will be significant.
Community Health, Safety and Security	**Yes**	Project related impacts with regards to community health, safety and security would mainly be those associated with construction: influx of workers, public trespassing, security concerns as well as incidents (accidents) from the presence of vehicles, heavy plant and machinery. Cumulative impacts are therefore anticipated as a result of increase in equipment & machinery use, influx of workers.

Environmental and Social Components	Considered VEC to be included in CIA?	Justification for Inclusion or Exclusion
Worker Conditions & Occupational Health and Safety	**No**	Project related impacts with regards to worker conditions and occupational health and safety would mainly be those associated with construction and will depend on conditions within the Project site as well as depending on Project-specific construction activities. Significant cumulative impacts with other projects are therefore not envisaged.

18.3 Assessment of Cumulative Impacts on VECs Due to Development of Project Area

The table below provides a summary of cumulative impacts on the VECs identified in the section above to be included in the cumulative impact assessment. Only those environmental and social parameters envisaged to have noticeable or discernible cumulative impacts due to the construction and operation of the Nukus 100 MW Wind Farm in combination with the mining facilities and Nukus 200 MW Wind Farm & OHTL has been included.

Table 18-3 Summary of Cumulative Impacts (Qualitative Assessment)

	Construction	Operation
Terrestrial Ecology		
Impacts from Nukus 200 MW Wind Farm & OHTL	Please refer to the Biodiversity Cumulative Impact Assessment report in Volume 4.	Please refer to the Biodiversity Cumulative Impact Assessment report in Volume 4.
Impacts from active mining areas and cement plant		
Impacts from future mining areas		
Impact from Nukus 100 MW Wind Farm & OHTL		
Cumulative Impacts		
Air Quality		

	CONSTRUCTION	OPERATION
Impacts from Nukus 200 MW Wind Farm & OHTL	Local ambient air quality will be potentially affected by increased dust during site clearance, and earthworks as well as by gaseous emissions of nitrogen oxides, sulphur dioxides, carbon monoxide, carbon dioxide from the exhaust of construction vehicles, equipment and temporary power generators.	None
Impacts from active mining areas and cement plant	-	Extraction of gypsum and other geological activities at the mines during operation will generate dust and release pollutants into the air. Additionally, the cement plant will impact local ambient air quality through emissions of particulate matter, various pollutants, and heavy metals.
Impacts from future mining areas	Construction of complete mine site facilities and plants will give rise to dust generating activities and the emission of pollutants into the air thereby leading to significant changes in ambient air quality that may be cumulatively above Uzbekistan and WHO/IFC Ambient Air Quality Standards.	
Impact from Nukus 100 MW Wind Farm & OHTL	Expected to be similar to the impacts identifies for Nukus 200 MW Wind Farm & OHTL	None
Cumulative Impacts	Local ambient air quality will be potentially affected by increased dust during the site clearance and excavations as well as due to the transportation of materials on local roads. This will also include impact from gaseous emissions from the exhaust of construction vehicles, equipment and temporary power generators. With the adoption of typical common management practices (mitigation, management and monitoring measures) outlined in the Nukus 200MW ESIA, the cumulative impacts are anticipated to have minor significance.	Even if the Project operation period coincide with mining extraction process, cumulative impact is not anticipated
Noise and Vibration		
Impacts from Nukus 200 MW Wind Farm & OHTL	Construction activities will result in temporary and short duration increases in the noise and vibration levels emanating from the project sites, access road and the laydown area.	The Noise chapter has determined that there is unlikely to be any operational noise impacts of significance as result of the operation of the Project, due to the distance separating the receptors from the WTG site boundaries.
Impacts from active mining areas and cement plant	-	The noise levels from the operation of the cement plant and mining activities will be the same as construction as such, it will not increase the existing noise levels.

	CONSTRUCTION	OPERATION
Impacts from future mining areas	Increases in ambient noise due to construction machinery, equipment and vehicles.	
Impact from Nukus 100 MW Wind Farm & OHTL	Expected to be similar to the impacts identified for Nukus 200 MW Project	Expected to be similar to the impacts identified for Nukus 200 MW Project
Cumulative Impacts	No cumulative impact will occur if the Project construction period do not overlap with mining activities. If the project construction period coincide with mining activities, cumulative impact will occur at receptors within the area of influence which is defined as 2km in this ESIA. Receptors within the area of influence may be temporarily impacted by the cumulative impact from the increase in ambient noise due to operation of construction machinery and equipment for both Nukus 200 MW & Nukus 100MW WFs. In addition, local communities may experience cumulative noise impacts if the Nukus 200 MW accommodation facilities are located near their village. With the adoption of typical common management practices (mitigation, management and monitoring measures) outlined in the Nukus 200MW ESIA, the cumulative impacts are anticipated to have minor significance. With regards to the OHTL, no cumulative impacts are anticipated along the OHTL route there are no known existing or future projects along the route.	Cumulative noise levels from the wind farms and mining facilities will not significantly increase existing noise level. With regards to the OHTL, no cumulative noise impact is anticipated as operation of the OHTL does not generate noise and there are no known existing or future projects along the route.
Landscape and Visual		
Impacts from Nukus 200 MW Wind Farm & OHTL	Construction stage will result to levelling, grading etc. and gradual construction of WTG, pylons and buildings which will eventually transform the landscape and result in land use change. Movement of machinery, vehicles will potentially lead to disturbance to the visual envelope of receptors.	Permanent visual impacts from the development of the Nukus 200 MW WF Project with the addition of new structures, which will be visible to receptors looking into the Project site. Additionally, lighting from the project & spill & glare in a such as lights at the control room and aviation lights on WTGs will be visible from outside the projects boundary.
Impacts from active mining	-	

	CONSTRUCTION	OPERATION
areas and cement plant		Changes to topography, dust generation and the presence of industrial structures.
Impacts from future mining areas	Disturbance to the visual envelope of receptors due to construction machinery, equipment and vehicles.	
Impact from Nukus 100 MW Wind Farm & OHTL	Expected to be similar to the impacts identified for Nukus 200 MW Project	Expected to be similar to the impacts identified for Nukus 200 MW Project
Cumulative Impacts	Through the construction and sustained operations of Nukus 200MW WF and Nukus 100MW WF, the land in the Project areas will change due to the intrusion of vertical turbine structures. This will result to a significant change to the visual amenity. Lighting from the projects especially during construction will introduce some limited light & spill in a night time haze likely to be visible from outside the projects boundary. Any impacts from lighting are anticipated to be minimised by limiting works being undertaken during the night and by the implementation of specific controls detailed in the CESMP on-site.	
Socio-Economic		
Impacts from Nukus 200 MW Wind Farm & OHTL	The Project will lead to economic displacement within the wind farm project boundaries, which will impact herders who graze livestock. Additionally, the construction of the OHTL will require land acquisition and will lead to temporary land restrictions for farmers cultivating seasonal agricultural crops. This will be mitigated through the Project specific LALRP. Positive impacts will include additional local employment and generation of electricity. Nonetheless, the construction phase will expose resident communities to a higher influx of construction workers, which can increase the burden on limited social services and resources (e.g., housing, water, food), with the possibility added economic hardship from associated inflation. A high demand for water may also overwhelm utility services.	This project will reduce Uzbekistan dependency on fossil fuel generated power and will reduce atmospheric pollution; in comparison to other power generation technologies in the current energy mix of Uzbekistan. It will also support the continued growth of the national economy through the provision of sufficient power supplies in Uzbekistan.
Impacts from active mining areas and cement plant	-	Positive in terms of additional local employment.
Impacts from future mining areas	Positive in terms of additional local employment.	

	CONSTRUCTION	OPERATION
Impact from Nukus 100 MW Wind Farm & OHTL	Expected impacts are anticipated to be similar to those identified for Nukus 200 MW Project, with the exception of economic displacement and land acquisition.	Expected to be similar to the impacts identified for Nukus 200 MW Project
Cumulative Impacts	If the project construction period coincide with mining activities this will also lead to increase in local employment With regards to the Nukus 100 MW Wind Farm, positive cumulative impact is anticipated in terms of cumulative increase in local employment in the Region. Nonetheless, the construction phase will expose resident communities to a higher influx of construction workers, which can increase the burden on limited social services and resources (e.g., housing, water, food), with the possibility added economic hardship from associated inflation. A high demand for water may also overwhelm utility services.	Positive impact in terms of increase in power generation and employment opportunities. With regards to the Nukus 100 MW Wind Farm, positive cumulative impact is anticipated in terms of cumulative increase in renewable energy power generation in the Country and local employment in the Region
Community, Health and Safety		
Impacts from Nukus 200 MW Wind Farm & OHTL	It is expected that with the implementation of mitigation and management measures the impacts relating to community health, safety and security will be low in relation to conduct of workforce in the community, spread of diseases and illnesses, incidents and accidents from operation of vehicles and machinery etc. However, the risk of COVID-19 infections could be high if the safety precautions and procedures are not followed.	Impacts related to operations will mainly be: new workers, public trespassing, as well as incidents (accidents) from equipment operation and the Project vehicles.
Impacts from active mining areas and cement plant	-	
Impacts from future mining areas	Local employment is expected to result in similar impacts identified for the Project.	
Impact from Nukus 100 MW Wind Farm & OHTL	Expected to be similar to the impacts identified for Nukus 200 MW Project	

	CONSTRUCTION	OPERATION
Cumulative Impacts	If the project construction period coincide with mining activities & construction of the Nukus 100 Wind Farm & OHTL, the influx of workers during the construction phase could lead to outbreak of diseases and illnesses, strain the public social services etc. Construction works could also increase the risk relating to public safety particularly in regard to use of high-powered equipment, machinery etc. However, impacts relating to safety and security will be site-specific and therefore the cumulative impacts are considered to be insignificant.	