

Khizi 3 Wind Farm Project Khizi Region Azerbaijan



Environmental & Social Impact Assessment (ESIA) Report

Prepared for:



May 2022, V4

DOCUMENT INFORMATION

PROJECT NAME	Khizi-3 Wind Farm Project, Khizi Region, Azerbaijan
5Cs PROJECT NUMBER	1305/001/088
DOCUMENT TITLE	Environmental & Social Impact Assessment (ESIA) Report
CLIENT	ACWA Power
5Cs PROJECT MANAGER	Reem Jabr
5Cs PROJECT DIRECTOR	Ken Wade

DOCUMENT CONTROL

VERSION	VERSION DATE	DESCRIPTION	AUTHOR	REVIEWER	APPROVER
1.0	31 July 2021	Draft ESIA Report	RMJ/ EFO BC/ LBG	BC/KRW	-
1.1	5 August 2021	Draft ESIA Report	RMJ	KRW	-
2.0	6 December 2021	Final ESIA	RMJ/ EFO/ BC/ NM	KRW	AJJB
2.1	14 December 2021	Revised ESIA	RMJ	KRW	AJJB
3.0	19 April 2022	Final ESIA for Disclosure	RMJ/ LBG/ EFO/ BC	KRW	AJJB
4.0	17 April 2022	Revised Final ESIA for Disclosure	RMJ	KRW	AJJB



1	Financial Capital	Regardless of location, mode of delivery or function, all organisations are dependent on
2	Social Capital	<i>The 5 Capitals of Sustainable Development</i> to enable long term delivery of its products or services.
3	Natural Capital	
4	Manufactured Capital	Sustainability is at the heart of everything that 5 Capitals achieves. Wherever we work, we strive to provide our clients with the means to maintain and enhance these stocks of capital assets.
5	Human Capital	

DISCLAIMER

5 Capitals cannot accept responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from the party which commissioned it.

This document is issued for the party which commissioned it and for specific purposes connected with the above-identified project only. It should not be relied upon by any other party or used for any other purpose

CONTENTS

1	INTRODUCTION	1
1.1	Project Overview	1
1.2	Key Project Information	2
1.3	Scope of ESIA Study	2
1.4	Objectives of the ESIA	3
1.5	Structure of the ESIA	4
2	PROJECT INFORMATION	8
2.1	Project Rationale	8
2.2	Goals & Objectives	9
2.3	Project Location	9
2.3.1	Wind farm	9
2.3.2	OHTL	11
2.4	Land Ownership	13
2.4.1	Wind Farm	13
2.4.2	OHTL	14
2.5	Site Conditions and Land Use	18
2.5.1	Wind Farm	18
2.5.2	OHTL	22
2.6	Surrounding Land Use	28
2.7	Existing Road Network	34
2.8	Project Description	34
2.8.1	Project Layout	34
2.8.2	Process Description	35
2.8.3	WTG Specification	36
2.8.4	WTG Components	36
2.8.5	Project Auxiliary Facilities	42
2.9	Associated Facilities	43
2.10	Traffic and Logistics for Transporting WTGs	47
2.11	Project Construction Requirements	49
2.11.1	Wind Farm	49
2.11.2	OHTL	49
2.11.3	Batching Plant	49
2.11.4	Laydown Area	50
2.11.5	Utility Requirements	50

2.11.6	Water Supply	51
2.11.7	Workforce	51
2.11.8	Temporary Offices	51
2.11.9	Worker Accommodation	52
2.11.10	Waste Streams	52
2.11.11	Vehicles, Equipment and Heavy Machinery Requirements	60
2.12	Project Operational and Maintenance Requirements	60
2.13	Decommissioning of the Project	62
2.14	Alternatives Assessment	62
2.14.1	No Project Alternative	63
2.14.2	Site Selection	63
2.14.3	Technology (Turbine) Alternatives	65
2.14.4	WTG Layout	66
2.14.5	OHTL Route	69
3	REGULATORY FRAMEWORK	73
3.1	National Requirements	73
3.1.1	The Constitution	73
3.1.2	Environmental Laws, Regulations and Standards	73
3.1.3	International and Regional Conventions/Protocols	78
3.2	Lenders Requirements	79
3.2.1	EBRD	80
3.2.2	ADB	81
3.2.3	OFID	81
3.2.4	Equator Principles	82
3.3	Applicable Environmental Standards	82
3.3.1	Lenders Standards	82
3.4	EIA/ESIA Requirements	85
3.4.1	National Environmental Impact Assessment (EIA) Requirements	85
3.4.2	Lender Requirements	85
4	APPROACH TO ESIA	88
4.1	ESIA Team	88
4.2	ESIA Methodology	89
4.2.1	Baseline Studies	90
4.2.2	Project Stakeholder and Consultations	92
4.2.3	Impact Assessment & Significance Criteria	93
4.2.4	Mitigation & Management Measures	98
4.2.5	Residual Impacts	98
4.2.6	E&S Disclosure	98

5	AIR QUALITY	100
5.1	Standards and Regulatory Requirements	100
5.1.1	National Requirements	100
5.1.2	Lenders Requirements	101
5.2	Area of Influence	102
5.3	Baseline	103
5.3.1	Regional Conditions	103
5.3.2	Influences on Air Quality	107
5.3.3	Ambient Air Quality Monitoring	109
5.4	Sensitive Receptors	119
5.5	Potential Impacts, Mitigation, Management & Residual Impact	122
5.5.1	Construction Phase	122
5.5.2	Operational Phase	130
5.6	Monitoring	132
6	NOISE AND VIBRATION	133
6.1	Standards and Regulatory Requirements	133
6.1.1	National Requirements	133
6.1.2	Lenders Requirements	133
6.2	Area of Influence	135
6.3	Baseline	136
6.4	Sensitive Receptors	142
6.5	Potential Impacts, Mitigation, Management & Residual Impact	144
6.5.1	Construction Phase	144
6.5.2	Operation Phase	152
6.6	Monitoring Requirements	167
7	BIODIVERSITY	168
7.1	Standards and Regulatory Requirements	168
7.1.1	National Requirements	168
7.1.2	Lenders Requirements	168
7.2	Critical Habitat Assessment (CHA)	170
7.3	Area of Influence and Ecologically Appropriate Area of Analysis (EAAA)	171
7.4	Observation and Baseline Conditions	172
7.4.1	Ecosystems, Habitats and Plant Communities	172
7.4.2	Birds	190
7.4.3	Bats	211

7.4.4	Mammals	218
7.4.5	Herptiles	222
7.4.6	Invertebrates	227
7.5	Sensitive Receptors	232
7.6	Potential Impacts, Mitigation, Management & Residual Impact	240
7.6.1	Construction Phase	240
7.6.2	Operational Phase	256
7.7	Monitoring & Reporting for Compliance and Performance	275
7.7.1	Design Phase	275
7.7.2	Pre-construction	276
7.7.3	Construction	277
7.7.4	Post-construction	277
7.7.5	Pre-Operation	277
8	SOIL, GEOLOGY & GROUNDWATER	278
8.1	Standards and Regulatory Requirements	278
8.1.1	National Requirements	278
8.1.2	Lenders Requirements	278
8.2	Area of Influence	281
8.3	Baseline	282
8.3.1	Geological Structure	282
8.3.2	Stratigraphy and Lithology	282
8.3.3	Tectonics and Seismicity	283
8.3.4	Geomorphology	285
8.3.5	Orography and Terrain	285
8.3.6	Hydrogeological Conditions	286
8.3.7	Project Site Conditions	287
8.3.8	Soil Quality Analysis	290
8.4	Sensitive Receptors	301
8.5	Potential Impacts, Mitigation, Management & Residual Impact	301
8.5.1	Construction Phase	301
8.5.2	Operational Phase	308
8.6	Monitoring	311
9	DRAINAGE & WATER	312
9.1	Standards and Regulatory Requirements	312
9.1.1	National Requirements	312
9.1.2	Lenders Requirements	312
9.2	Area of Influence	313

9.3	Observation and Baseline Conditions	313
9.3.1	Site-based Observations and Desk Based Research	313
9.3.2	Baseline	317
9.3.3	Hydrology Study	324
9.4	Flood Risk	326
9.5	Sensitive Receptors	327
9.6	Potential Impacts, Mitigation, Management & Residual Impact	328
9.6.1	Construction Phase	328
9.6.2	Operation Phase	336
9.7	Monitoring	339
10	SOLID WASTE & WASTEWATER MANAGEMENT	340
10.1	Standards and Regulatory Requirements	340
10.1.1	National Requirements	340
10.1.2	Lenders Requirements	340
10.2	Area of Influence	342
10.3	Observations and Baseline Conditions	342
10.3.1	Solid Waste Management	342
10.3.2	Wastewater Management	344
10.4	Sensitive Receptors	347
10.5	Potential Impacts, Mitigation, Management & Residual Impact	347
10.5.1	Construction Phase	347
10.5.2	Waste Characterization	349
10.5.3	Waste Management Hierarchy	350
10.5.4	Operational Phase	357
10.6	Monitoring	363
11	ARCHAEOLOGY AND CULTURAL HERITAGE	364
11.1	Standards and Regulatory Requirements	364
11.1.1	National Requirements	364
11.1.2	Lenders Requirements	365
11.2	Area of Influence	366
11.3	Baseline	369
11.3.1	Regional Conditions	369
11.3.2	Site Conditions	372
11.3.3	Laydown Area	378
11.3.4	Revised Cabling Route	378
11.3.5	Revised Access Road	378
11.3.6	OHTL	380

11.3.7	Recommendations by Institute of Archeology and Ethnography of ANAS	381
11.4	Intangible Cultural Heritage	382
11.5	Sensitive Receptors	382
11.5.1	WF	382
11.6	Potential Impacts, Mitigation, Management & Residual Impact	390
11.6.1	WF Design	390
11.6.2	Construction Phase	390
11.6.3	Operation Phase	398
11.7	Monitoring	400
12	LANDSCAPE & VISUAL AMENITY	401
12.1	Standards and Regulatory Requirements	401
12.1.1	National Requirements	401
12.1.2	Lenders Requirements	401
12.1.3	Guidelines	402
12.2	Area of Influence, Baseline, and Sensitive Receptors	402
12.2.1	Desktop Study	402
12.2.2	Fieldwork Survey	403
12.2.3	Landscape Baseline	403
12.2.4	Visual Amenity Baseline	406
12.2.5	Lighting	415
12.3	Potential Impacts, Mitigation, Management & Residual Impact	420
12.3.1	Construction Phase	420
12.3.2	Operation Phase	422
12.4	Monitoring Requirements	431
13	TRAFFIC AND TRANSPORTATION	432
13.1	Standards and Regulatory Requirements	432
13.1.1	National Requirements	432
13.1.2	Lenders Requirements	433
13.2	Area of Influence	433
13.3	Observation and Baseline Condition	433
13.3.1	Existing Local Road Network	433
13.3.2	Project Logistics	435
13.4	Sensitive Receptors	452
13.5	Potential Impacts, Mitigation, Management & Residual Impact	452
13.5.1	Construction Phase	452
13.5.2	Operational Phase	461
13.6	Monitoring	461

14	INFRASTRUCTURE AND UTILITIES	463
14.1	Site Conditions	463
14.2	Consultations	463
14.3	Potential Impacts, Mitigation, Management and Residual Impacts	468
14.3.1	Construction Phase	468
14.3.2	Operational Phase	469
15	COMMUNITY HEALTH, SAFETY & SECURITY	471
15.1	Standards and Regulatory Requirements	471
15.1.1	National Requirements	471
15.1.2	Lenders Requirements	472
15.2	Area of Influence	474
15.3	Baseline	474
15.3.1	WF	474
15.3.2	OHTL	475
15.3.3	Consultations and Safety/Buffer Zones	476
15.4	Potential Impacts, Mitigation, Management & Residual Impact	477
15.4.1	Construction Phase	477
15.4.2	Operational Phase	482
15.5	Mitigation and Management Measures	484
15.6	Monitoring	492
16	SOCIOECONOMICS	494
16.1	Standards and Regulatory Requirements	494
16.1.1	National Requirements	494
16.1.2	Lenders Requirements	495
16.2	Area of Influence	497
16.3	Baseline	497
16.3.1	National and Regional Baseline Conditions	497
16.3.2	Outcome of Socio-economic Survey	511
16.3.3	Use of Project Site	520
16.3.4	Socioeconomic Profile of PAPs	523
16.3.5	Outcome of Socio-economic Survey along the OHTL Route	535
16.4	Sensitive Receptors	540
16.5	Potential Impacts, Mitigation, Management & Residual Impact	541
16.5.1	Construction Phase	541
16.5.2	Operational Phase	559
16.6	Monitoring	561

17	STAKEHOLDER ENGAGEMENT AND CONSULTATION	562
17.1	Standards and Regulatory Requirements	562
17.1.1	National Requirements	562
17.1.2	Lenders Requirements	562
17.2	Public Consultation Timeline	567
17.3	Objectives of Public Consultation	568
17.4	Public Information Centre (PIC)	568
17.5	Public Consultation Process During ESIA Preparation	570
17.6	Summary of Public Consultations and Minutes of Meetings	580
17.6.1	Engagement during Scoping Stage	580
17.6.2	Engagement during ESIA Study	588
17.6.3	Informal Meeting with Nomadic Herder	588
17.6.4	Meeting Held Refugees and IDPs from Sitalchay Village	589
17.6.5	Meeting Held with Women	589
17.6.6	Meeting Held with Elderly	590
17.6.7	Meeting with Seasonal Farmers/ Herders (surrounding project area)	591
17.6.8	Meeting Held with Farmer with LLA at WF and Farmer along OHTL	591
17.6.9	Poultry Farm	592
17.6.10	Institutional stakeholders Consultations	592
17.6.11	Consultations Undertaken for CHA	598
17.6.12	Consultations regarding Land Use and PAPs (as part of LRP)	598
17.7	Public Disclosure Meetings	598
17.8	Grievances Received	602
17.9	Media Coverage of the Project	602
18	LABOUR & WORKING CONDITIONS	604
18.1	Standards and Regulatory Requirements	604
18.1.1	National Requirements	604
18.1.2	Lenders Requirements	606
18.2	Area of Influence	608
18.3	Baseline	608
18.4	Potential Impacts, Mitigation, Management & Residual Impact	608
18.4.1	Construction Phase	608
18.4.2	Operational Phase	615
18.5	Mitigation and Management Measures	617
18.6	Monitoring	624
19	CLIMATE AFFAIRS	627

19.1	Overview	627
19.2	Standards and Regulations	627
19.2.1	National Context and Regulations	627
19.2.2	Lender Requirements	628
19.3	Area of Influence	628
19.4	Observation and Baseline Conditions	629
19.4.1	Historic and Existing Conditions	629
19.5	Potential Project Impacts upon Climate Change	630
19.5.1	Construction	630
19.5.2	Operations	632
19.6	Vulnerability of the Project to Climate Change	633
19.6.1	Climate Physical Risks	635
19.6.2	Climate Transitions Risks	636
19.7	Recommended Mitigation Measures	636
20	CUMULATIVE IMPACT ASSESSMENT (CIA)	638
20.1	Introduction	638
20.2	Identification of Valued Environmental and Social Components (VECs)	639
20.3	Identification of Other Activities and Environmental Drivers	639
20.4	Assessment of Cumulative Impacts on VECs Due to Development of Project Area	640
20.4.1	Construction Phase	640
20.4.2	Operation Phase	645
	REFERENCES	659

FIGURES

Figure 1-1 Regional Location of 240 MW Wind Farms.....	1
Figure 2-1 Project Location	10
Figure 2-2 OHTL Location Map.....	12
Figure 2-3 Land Use Map of Project Area and Sumgaitchay River (ARPA Consulting, 2021)	22
Figure 2-4 OHTL Khizi – Yashma	23
Figure 2-5 OHTL Khizi – Pirakashkul	25
Figure 2-6 Pirakashkul – Gobu OHTL	27
Figure 2-7 Takhtakorpu-Jeyranbatan Water Canal.....	29
Figure 2-8 Land Use Map.....	33
Figure 2-9 Road Network.....	34
Figure 2-10 Project Layout.....	35
Figure 2-11 Outline of Hub.....	37
Figure 2-12 Outline of Nacelle	37
Figure 2-13 Schematic of the Electrical System – Electrical Drive Chain for DFAG	40
Figure 2-14 BOP Design Layout (Roads, Cables and Substation)	43
Figure 2-15 Route considered for Transporting WTG components (Blue Water Shipping, 2020)	47
Figure 2-16 Roads being Considered to Access Khizi 3 Wind Farm Area.....	48
Figure 2-17 Location of Laydown Area.....	50
Figure 2-18 Wind speeds at 100-meter hub height (in m/s) (IRENA, 2019)	63
Figure 2-19 240 MW Wind Project Considered Sites	65
Figure 2-20 Changes in WTG Layout	67
Figure 2-21 Changes in WTG Layout	69
Figure 2-22 Initial Risks Identified along the Preliminary Route	71

Figure 5-1 Climate Map of Project Area and Adjacent Territories	103
Figure 5-2 Annual Air Temperature and Precipitation	106
Figure 5-3 Annual Wind Rose	106
Figure 5-4 Location of the Project Site in Relation to the Road Track	108
Figure 5-5 Location of Meteorological Masts at Khizi 3	109
Figure 5-6 Ambient Air Quality Monitoring Location.....	110
Figure 5-7 24 Hour Average Concentrations Obtained at KS-1	111
Figure 5-8 SO ₂ 24 Hour Average Results	112
Figure 5-9 SO ₂ 1-Hour Average Results.....	112
Figure 5-10 NO ₂ 24 Hour Average Results	113
Figure 5-11 NO ₂ 1-Hour Average Results	114
Figure 5-12 Average 24-Hourly Concentration of PM ₁₀ and PM _{2.5} as Compared Against WHO Standards.....	115
Figure 5-13 Hourly Concentration of Ozone	116
Figure 5-14 Wind Rose Showing Wind Direction at the KS-1 Monitoring Location.....	117
Figure 5-15 Hourly Result of Temperature, Relative Humidity and Wind Speed During the Monitoring Period.....	118
Figure 5-16 Air Quality Sensitive Receptors – Wind Farm	121
Figure 5-17 Air Quality Sensitive Receptors – OHTL.....	121
Figure 6-1 Baseline Noise Monitoring Locations	136
Figure 6-2 Noise Monitoring Locations	139
Figure 6-3 OHTL Baseline Noise Monitoring Locations.....	140
Figure 6-4 OHTL Noise Monitoring Results.....	141
Figure 6-5 Noise and Vibration Sensitive Receptors (Construction Phase)	142
Figure 6-6 Access Roads and Noise Receptors.....	148
Figure 6-7 Operational Noise and Vibration Sensitive Receptors and Background Monitoring Locations.....	154

Figure 6-8 Background Noise Measurement Equipment.....	159
Figure 6-9 Regression Analysis for all Monitoring Locations	160
Figure 6-10 Octave Data for the turbines (hub height, 10m/s, not adjusted for uncertainty).....	161
Figure 6-11 HR-18 and the OHTL Routes.....	165
Figure 7-1 Project Ecosystems.....	173
Figure 7-2 Habitat Map	175
Figure 7-3 Vegetation Map of Azerbaijan Endemics.....	178
Figure 7-4 Locations of Azerbaijan Endemics.....	179
Figure 7-5 Threatened Flora Locations.....	179
Figure 7-6 Threatened Flora Locations.....	180
Figure 7-7 AzRDB Threatened Species Recorded along Segment 1	182
Figure 7-8 Location of Flora Species Endemic to Azerbaijan along Segment 1.....	183
Figure 7-9 Flora Species Endemic to the Caucasus Region along Segment 1.....	183
Figure 7-10 AzRDB Threatened Species Recorded along Segment 2	185
Figure 7-11 Location of Flora Species Endemic to Azerbaijan along Segment 2.....	186
Figure 7-12 Flora Species Endemic to the Caucasus Region along Segment 2.....	186
Figure 7-13 AzRDB Vulnerable Species Anabasis salsa Recorded along Segment 3	189
Figure 7-14 Location of Flora Species Endemic to Azerbaijan along Segment 3.....	189
Figure 7-15 Location of Flora Species Endemic to the Caucasus Region.....	190
Figure 7-16 Global Migratory Flyways	190
Figure 7-17 IBAs within 30km.....	191
Figure 7-18 IBA Trigger Criteria – Yashma Island	191
Figure 7-19 IBA Trigger Criteria – Alty Agach National Park	192
Figure 7-20 IBA Trigger Criteria – Mount Kargabazar and Mount Gush-gaya	192
Figure 7-21 All VPs for WF.....	197
Figure 7-22 Spring 2022 VPs	197

Figure 7-23 OHTL Segments 1 Khizi-Yashma (Red), Segment 2 Khizi- Pirakashkul (Blue) & Segment 3 Gobu-Pirakeshkul (Green)	198
Figure 7-24 Breeding Colonies and Nests	204
Figure 7-25 Location of Poultry Farm	208
Figure 7-26 Red Line indicates Pirakashkul-Gobu Segment passing by Lake Shoruchteppe (dotted line)	210
Figure 7-27 Location of Bird carcasses and Remains Recorded during Autumn OHTL Survey	210
Figure 7-28 Migratory Movements of Bats	212
Figure 7-29 Active Monitoring Transects and Passive Detectors Locations Khizi 3	213
Figure 7-30 Locations of Mist Netting & Roost Search Physical Inspections – Khizi 3 WF	214
Figure 7-31 Active Monitoring Transects – OHTL	215
Figure 7-32 Survey Area - Reptiles	224
Figure 7-33 Location Map of <i>Saga Ehippiger</i>	229
Figure 8-1 Geological Structure of Azerbaijan	282
Figure 8-2 Map of M≥5 Earthquakes Recorded on the Territory of Azerbaijan.....	284
Figure 8-3 Tectonic Zones on the Territory of Azerbaijan	284
Figure 8-4 Orographic Map of Azerbaijan.....	286
Figure 8-5 Groundwater Map in Azerbaijan	287
Figure 8-6 TIN & Digital Elevation Model of the Project Site (ARPA, 2021a)	289
Figure 8-7 Location of Soil Samples – WTG and BOP Areas.....	290
Figure 8-8 Soil Sampling Locations - Laydown.....	291
Figure 8-9 Sampling at the Project Site- WTG, BOP and Laydown	292
Figure 8-10 Location of Soil Samples – OHTL.....	298
Figure 8-11 Sampling at the Project Site – OHTL	298
Figure 9-1 Map Showing Water Bodies in Khizi Region and the Adjacent Territories (Ecoenergy, 2021).....	314

Figure 9-2 Water Bodies.....	315
Figure 9-3 Surface Water Bodies in the Project Area.....	316
Figure 9-4 Location of Water Quality Sampling Sites – WF and Surroundings Areas .	320
Figure 9-5 Location of Water Quality Sampling Sites – OHTL	323
Figure 9-6 Local Catchments in the Khizi Plot Site (ARPA Consulting, 2021)	324
Figure 9-7 Watershed in the Khizi Plot Site (ARPA Consulting, 2021)	325
Figure 9-8 Riverbed of the Vegverchai in the South Part of the Plot Site (ARPA Consulting, 2021)	325
Figure 9-9 Flood Extent and Depth of the Long-Term Rainstorm Event in the Khizi Plot Area (ARPA Consulting, 2021)	326
Figure 9-10 Flood Extent and Depth of the Short-Term Rainstorm Event in the Khizi Plot Area (ARPA Consulting, 2021)	327
Figure 10-1 Location of Nearest Waste and Wastewater Management Facilities....	346
Figure 10-2 Waste Hierarchy	351
Figure 11-1 Changes in WTG Layout	368
Figure 11-2 Khizi 3 WF - Survey Area	374
Figure 11-3 Location of Pottery Shards.....	378
Figure 11-4 Site Access Road Surveyed by Team	379
Figure 11-5 Ruins of Buildings.....	379
Figure 11-6 4. Remains of Bilhasan Village	380
Figure 11-7 Access Roads – Archaeological Features.....	380
Figure 11-8 Archaeological Sites Locations (based on Old Layout)	387
Figure 11-9 Archaeological Sites Locations (based on current Layout)	389
Figure 12-1 Site and Surrounding Areas Land Use	404
Figure 12-2 Landscape Character Areas	406
Figure 12-3 Viewpoint Locations.....	407
Figure 12-4 Bortle Scale	417

Figure 12-5 Towards Baku from Poultry Farm	417
Figure 12-6 Sitalchay Village	418
Figure 12-7 M1 Highway and Existing Wind Farm	418
Figure 12-8 Existing Wind Farm to the Left and Darkness of Site to the Right	419
Figure 12-9 Existing Wind Farm	422
Figure 12-10 Sensitive Receptors (Operations) –	424
Figure 12-11 WBG/IFC Worst Case Maximum Minutes per Shadow Day	429
Figure 12-12 WBG/IFC Worst Case Maximum Minutes per Shadow Day	430
Figure 13-1 Dirt Roads in the Project Area (Adapted from Blue Water Shipping, 2021)	434
Figure 13-2 Shipping Requirements (Adapted from Blue Water Shipping, 2020)	435
Figure 13-3 Map Showing the Numbers and Location of Road Limitations (Blue Water Shipping, 2021)	438
Figure 13-4 BOP Design Layout (Roads, Construction & Storage Yard and Substation)	450
Figure 13-5 OHTL Location Map.....	451
Figure 16-1 Azerbaijan Population Pyramid (CIA, 2021)	498
Figure 16-2 Distribution of Population by Region Beginning of 2021 (Population of Azerbaijan, 2021)	499
Figure 16-3 Structure of the GDP in 2019 (STAT, 2020)	501
Figure 16-4 Distribution of Expenditure in Azerbaijan (STAT, 2020)	503
Figure 16-5 Economic Activity by Gender, 2020 (State Statistical Committee of the Republic of Azerbaijan, 2021)	508
Figure 16-6 Size of Households (Socio-economic survey, 2021)	511
Figure 16-7 Monthly Income of Survey Respondents.....	514
Figure 16-8 Farms of Sitalchay Villagers using the Project's Surrounding Area for Seasonal Grazing.....	514
Figure 16-9 Conditions of Infrastructure in Sitalchay	516

Figure 16-10 Example of Sitalchay Road Infrastructure	516
Figure 16-11 Sources Contributing to Environmental Deterioration.....	517
Figure 16-12 Types of Utilities and Commodities	518
Figure 16-13 Daily Housework and Lines of Responsibility.....	518
Figure 16-14 Survey Respondents Anticipated Impacts of the Wind Farm Project ...	518
Figure 16-15 Survey Respondents Expectations from the Project	520
Figure 16-16 Seasonal Farms surrounding Project Site	521
Figure 16-17 Seasonal Farmers Grazing Area within the Project Site.....	522
Figure 16-18 Designated Route Nomadic Herders Use Between Highlands and Lowlands.....	522
Figure 16-19 Herb Collection Area within the Project Site	523
Figure 16-20 Land Users Along OHTL Route	536
Figure 16-21 Project Components in relation to the Grazing Areas	544
Figure 16-22 Project Components in relation to the Herb Collection.....	545
Figure 17-1 Letter Distributed in Sitalchay Village – Scoping Stage.....	581
Figure 19-1 Average Monthly Temperature and Precipitation in Azerbaijan for 1991-2020 (World Bank Climate Change Knowledge Portal, 2021)	629
Figure 19-2 Key Natural Statistics in Azerbaijan for the Period of 1985-2018 (World Bank Climate Change Knowledge Portal, 2021)	630
Figure 19-3 Boxplots showing the model ensemble estimate of the annual number of >35 °C days in 2080 - 2099 under four emission pathways in Azerbaijan	634
Figure 20-1 Existing WFs in Khizi – Wider Project Area	640
Figure 20-2 Northbound Spring Migration	648
Figure 20-3 Southbound Autumn Migration.....	649
Figure 20-4 Yeni Yashma WF, Khizi 3 WF and OHTL.....	650
Figure 20-5 Yeni Yashma WF From M1 Highway	655
Figure 20-6 Cumulative Visual Impact on Motorists	656

TABLES

Table 1-1 Key Project Information	2
Table 2-1 Electricity Generation by Source (GWh) (IRENA, 2019).....	8
Table 2-2 Project Coordinates of WTGs	10
Table 2-3 220 kv Khizi 3 - Yashma OHTL	12
Table 2-4 220 kv Khizi – Pirakashkul OHTL.....	12
Table 2-5 220 kv Pirakashkul – Gobu OHTL.....	13
Table 2-6 Land Ownership Status along OHTL Route.....	15
Table 2-7 Land Use.....	32
Table 2-8 Brief Technical Information of WTG (Envision Energy Co., Ltd, n.d.)	41
Table 2-9 Pirakashkul – Gobu OHTL	44
Table 2-10 Khizi – Yashma OHTL	45
Table 2-11 Pirakashkul – Khizi OHTL	45
Table 2-12 Typical Waste Generated during Construction (ACWA Power)	53
Table 2-13 Vehicles & Construction Equipment During the Construction Phase	60
Table 2-14 Key Risks Identified along the preliminary OHTL route (provided 3 May 2021)	70
Table 3-1 Protective Zones set by National Requirements	77
Table 3-2 Environmental & Human Right Treaties, Conventions and Protocols (Treaty Body Database, 2020).....	78
Table 4-1 5 Capitals' Project Team	88
Table 4-2 Ecoenergy Project Team	88
Table 4-3 Juru Energy Project Team (Livelihood Restoration Plan (LRP))	89
Table 4-4 Environmental and Social Baseline Surveys	90
Table 4-5 Environmental Value of Receptor or Resources.....	93
Table 4-6 Criteria for Magnitude of Impacts	96

Table 4-7 Criteria for Determining Significance of Effects	97
Table 4-8 Definition of Significance of Effects	97
Table 5-1 Ambient Air Quality Standards ($\mu\text{g}/\text{m}^3$, unless otherwise stated)	100
Table 5-2 EC Ambient Air Quality Standards ($\mu\text{g}/\text{m}^3$ unless stated)	101
Table 5-3 WHO Ambient Air Quality Standards ($\mu\text{g}/\text{m}^3$ unless otherwise specified) .	102
Table 5-4 Repetition of Wind Directions and Number of Zero-Wind (calm) days, (%)	104
Table 5-5 Average Monthly and Annual Wind Speed (m/sec)	104
Table 5-6 Average Number of Windy (>15 m/s) Days	104
Table 5-7 Potentially High-Speed Winds.....	104
Table 5-8 Average Monthly Air Temperature, $^{\circ}\text{C}$	104
Table 5-9 Monthly and Annual Precipitation, mm	104
Table 5-10 Evaporation, mm.....	104
Table 5-11 Relative humidity characteristics	104
Table 5-12 Average Monthly Indicators of Key Climate Elements for the Siyazan Meteorological Station.....	105
Table 5-13 Meteorological Masts	108
Table 5-14 Ambient Air Quality Monitoring Location.....	110
Table 5-15 24 Hours Average Ambient Air Quality Result Obtained at KS-1 (unless otherwise stated)	111
Table 5-16 Air Quality Sensitive Receptors	119
Table 5-17 Air Quality- Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction (WF & OHTL)	126
Table 5-18 Air Quality – Impact Significance, Mitigation & Management Measures and Residual Impacts – Operation (WF and OHTL)	131
Table 5-19 Air Quality Monitoring Requirements (WF & OHTL)	132
Table 6-1 National Noise Standards	133
Table 6-2 World Bank Ambient Noise Level Guidelines	134

Table 6-3 Baseline Noise Survey Locations	137
Table 6-4 Noise Monitoring Results	138
Table 6-5 Additional Noise Monitoring Results	139
Table 6-6 OHTL Baseline Noise Monitoring Locations.....	140
Table 6-7 Noise and Vibration Sensitive Receptors (Construction Phase)	143
Table 6-8: Noise Level of Typical Construction Equipment.....	144
Table 6-9 Noise (Excavation and Foundation Works) Attenuation by Distance	145
Table 6-10 Noise (Turbine Erection and Assembly Works) Attenuation by Distance .	146
Table 6-11 Noise Impacts at Receptors	146
Table 6-12 Construction Phase Noise - ABC Assessment	147
Table 6-13 Noise and Vibration Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction	150
Table 6-14 Noise and Vibration Sensitive Receptors (Operation Phase)	153
Table 6-15 IFC/World Bank Group Noise Level Guideline (adopted from WHO guidance)	155
Table 6-16 ISO9613 Parameters used in the Preliminary Noise Assessment.....	158
Table 6-17 Derived Background Noise Limits.....	161
Table 6-18 Noise Levels at Receptors - First Floor (4m above ground)	162
Table 6-19 Compliance with IFC/Derived Background Noise Assessment Limits (10m/s)	163
Table 6-20 Noise and Vibration Impact Significance, Mitigation & Management Measures and Residual Impacts – Operation	166
Table 6-21 Noise Monitoring Requirements	167
Table 7-1 Azerbaijan Species on IUCN Red List of Threatened Plants	174
Table 7-2 Summary of Threatened and endemic species	176
Table 7-3 Summary of Threatened and Endemic Species in Segment 1	180
Table 7-4 Summary of Threatened and Endemic Species in Segment 2	184

Table 7-5 Summary of Threatened and Endemic Species in Segment 3	187
Table 7-6 Threatened Species Potentially Occurring in Project Region (as per IUCN Red List)	192
Table 7-7 Bird Surveys (2020 – 2021)	195
Table 7-8 Coordinates of VPs	196
Table 7-9 VP Survey Results Spring 2020 to Summer 2021	199
Table 7-10 March 2022 VP Survey Results	201
Table 7-11 April 2022 VP Survey Results	202
Table 7-12 VP Survey OHTL Segment 1 (Khizi-Yashma) Threatened Birds	204
Table 7-13 VP Survey OHTL Segment 2 (Khizi-Perikashkul) Threatened Birds	206
Table 7-14 Survey OHTL Segment 3 (Pirakashkul-Gobu) Threatened Birds	207
Table 7-15 Location and Species of Carcasses Recorded during Autumn OHTL Survey	209
Table 7-16 Incidental Bird Sightings during the Autumn OHTL Survey	211
Table 7-17 Passive Detectors	213
Table 7-18 Overall BAI (Passive Detector)	216
Table 7-19 Active Transects – contacts/hour by month	216
Table 7-20 Active Transects – contacts/hour by month	216
Table 7-21 Recorded from Khizi 3 WF Surveys	217
Table 7-22 Results-Bat Survey - Species Registered during Surveying along OHTL 2021	218
Table 7-23 List of Rare and Threatened Mammals of Azerbaijan	219
Table 7-24 List of Mammals Recorded at Wind Farm	220
Table 7-25 List of Mammals Recorded at OHTL Segment 1 Khizi-Yashma	221
Table 7-26 List of Mammals Recorded at OHTL Segment 2 Khizi-Pirakashkul	221
Table 7-27 List of Mammals Recorded at OHTL Segment 3 Pirakashkul-Gobu	222
Table 7-28 List of Rare and Threatened Reptiles and Amphibians of Azerbaijan	222

Table 7-29 List of herptiles recorded during the herpetology baseline survey	224
Table 7-30 List of Reptiles recorded along the OHTL Segment 1 Khizi – Yashma.....	225
Table 7-31 List of Reptiles recorded along the OHTL Segment 2 Khizi – Pirakashkul..	226
Table 7-32 List of Reptiles recorded along the OHTL Segment 3 Pirakashkul-Gobu..	227
Table 7-33 Summary of Threatened and Endemic Species in Segment 3	229
Table 7-34 Arthropod Species Recorded during the Entomology Survey of Segment 2	230
Table 7-35 Arthropod Species Recorded during the Entomology Survey of Segment 3	231
Table 7-36 Sensitive Receptors (Biodiversity)	233
Table 7-37 Habitat Loss.....	240
Table 7-38 Natural Habitat Loss	240
Table 7-39 Significance of Habitat Loss	241
Table 7-40 Residual Significance of Habitat Loss	241
Table 7-41 Significance of Construction Earthworks Impact.....	242
Table 7-42 Residual Significance of Construction Earthworks Impact	243
Table 7-43 Significance of Construction Vehicular Collision Impact.....	244
Table 7-44 Residual Significance of Construction Vehicular Collision Impact.....	244
Table 7-45 Significance of Construction "Take" Impact	245
Table 7-46 Residual Significance of Construction "Take" Impact	246
Table 7-47 Significance of Construction Littering Impact	246
Table 7-48 Residual Significance of Construction Littering Impact	247
Table 7-49 Significance of Construction Disturbance Impact	247
Table 7-50 Residual Significance of Construction Disturbance Impact	248
Table 7-51 Significance of Construction Proliferation Impact.....	249
Table 7-52 Residual Significance of Construction Proliferation Impact.....	250
Table 7-53 Significance of Introduced Pathogen/Invasive Species Impact	250

Table 7-54 Residual Significance of Introduced Pathogen/Invasive Species Impact	251
Table 7-55 Significance of Construction Air Pollution Impact	251
Table 7-56 Residual Significance of Construction Air Pollution Impact	252
Table 7-57 Significance of Construction Noise Impact	252
Table 7-58 Residual Significance of Construction Noise Impact	253
Table 7-59 Significance of Construction Lighting Impact	254
Table 7-60 Residual Significance of Construction Lighting Impact	254
Table 7-61 Significance of Construction Contamination Risk Impact	255
Table 7-62 Residual Significance of Construction Contamination Risk Impact	255
Table 7-63 Significance of Soil Compaction Impact	256
Table 7-64 Residual Significance of Soil Compaction Impact	256
Table 7-65 Significance of Habitat Fragmentation Impact	257
Table 7-66 Collision Risk Modelling	258
Table 7-67 Significance of Bird Turbine Collision Impact	260
Table 7-68 Residual Significance of Bird Turbine Collision Impact	262
Table 7-69 Turbine Collision Risk of Bat Species	263
Table 7-70 Significance of Bat Turbine Collision Impact	264
Table 7-71 Electrocutation Risk of various Bird Species	266
Table 7-72 Significance of Bird OHTL Electrocutation Impact	267
Table 7-73 Residual Significance of Bird OHTL Electrocutation Impact	268
Table 7-74 OHTL Collision Risk of Various Bird Species	269
Table 7-75 Significance of Bird OHTL Collision Impact	271
Table 7-76 Residual Significance of Bird OHTL Collision Impact	272
Table 7-77 Background noise levels (linear regression)	273
Table 7-78 Significance of Operational Noise Impact	274
Table 7-79 Significance of Operational Lighting Impact	274

Table 7-80 Residual Significance of Operational Lighting Impact	275
Table 8-1 Azerbaijan Soil Quality Standards	278
Table 8-2 Dutch Soil and Groundwater Standards	280
Table 8-3 Soil Sampling Location - WTG, BOP and Laydown	291
Table 8-4 Soil Analysis Result – WTG, BOP and Laydown	295
Table 8-5 Soil Sampling Location – OHTL.....	298
Table 8-6 Soil Analysis Result – OHTL	300
Table 8-7 Soils, Geology & Groundwater - Receptor Sensitivity.....	301
Table 8-8 Soils, Geology and Groundwater Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction (WF and OHTL)	304
Table 8-9 Soils, Geology and Groundwater Impact Significance, Mitigation & Management Measures and Residual Impacts – Operation	309
Table 8-10 Monitoring Requirements (WF & OHTL).....	311
Table 9-1 Water Use (FAQ, 2008)	314
Table 9-2 Water Quality Analysis Equipment and Methods	317
Table 9-3 Location of Water Quality Sampling Sites – WF and Surroundings Areas .	319
Table 9-4 Water Quality Analysis Results – WF and Surroundings Areas	321
Table 9-5 Location of Water Quality Sampling Sites – OHTL.....	322
Table 9-6 Water Quality Analysis Results – OHTL.....	323
Table 9-7 Catchment Basins and Calculated Average and Flood Discharges (ARPA Consulting, 2021)	326
Table 9-8 Water and Drainage Receptors	327
Table 9-9 Drainage and Water Impact Significance, Mitigation & Management Measures and Residual Impacts- Construction.....	331
Table 9-10 Water and Drainage Impact Significance, Mitigation & Management Measures and Residual Impacts -Operation.....	337
Table 9-11 Water and Drainage Monitoring Requirements	339
Table 10-1 Waste Generation based on the Economic Activity (STAT, 2019).....	343

Table 10-2 Distance to Nearest Waste and Wastewater Management Facilities.....	345
Table 10-3 Waste and Wastewater – Receptor Sensitivity	347
Table 10-4 Waste Characterization.....	350
Table 10-5 Waste Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction	352
Table 10-6 Waste Impact Significance, Mitigation & Management Measures and Residual Impacts – Operation	359
Table 10-7 Waste Management Monitoring Requirements (Construction and Operation).....	363
Table 11-1 Registered Cultural Heritage Sites (UNESCO)	370
Table 11-2 Intangible Cultural Heritage in Azerbaijan (UNESCO)	370
Table 11-3 List of all Registered Archaeological Sites	383
Table 11-4 Archaeology and Cultural Heritage Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction (WF, Access Roads and Cable Routes, Laydown, etc)	393
Table 11-5 Archaeology and Cultural Heritage Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction (OHTL)	395
Table 11-6 Archaeology and Cultural Heritage Impact Significance, Mitigation & Management Measures and Residual Impacts - Operation	399
Table 11-7 Cultural Heritage - Monitoring Requirements.....	400
Table 12-1 Landscape Character Areas	405
Table 12-2 Viewpoint Locations.....	407
Table 12-3 KLV1	408
Table 12-4 KLV3	409
Table 12-5 KLV4	410
Table 12-6 KLV6	411
Table 12-7 KLV7	412
Table 12-8 KLV8	413

Table 12-9 KLV9	414
Table 12-10 KLV10	415
Table 12-11 Lighting Survey Camera Settings	416
Table 12-12 Bortle Scale Classes.....	416
Table 12-13 Lighting Survey SQM and Bortle Scale Results.....	420
Table 12-14 Landscape and Visual Amenity Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction	421
Table 12-15 Sensitive Receptors (Operation Phase)	425
Table 12-16 Turbine Details.....	427
Table 12-17 Sunshine Hours for Realistic Scenario	428
Table 12-18 Shadow Flicker Occurrence at Each Receptor (Khizi & the existing Yeni Yashma)	428
Table 12-19 Landscape and Visual Amenity Impact Significance, Mitigation & Management Measures and Residual Impacts – Operation	431
Table 13-1 Traffic & Transportation – Receptor Sensitivity.....	452
Table 13-2 Traffic & Transportation Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction (WF & OHTL)	454
Table 13-3 Traffic and Transportation Impact Significance, Mitigation & Management Measures and Residual Impacts (WF & OHTL).....	461
Table 13-4 Traffic and Transportation Monitoring Requirements (Construction) (WF & OHTL).....	461
Table 14-1 Utilities and Infrastructure Consultation Summary Table	464
Table 14-2 Outcome of Consultations	466
Table 14-3 Existing Infrastructure Mitigation & Management Measures – Construction	468
Table 14-4 Existing Infrastructure Mitigation & Management Measures– Operational Phase	470
Table 15-1 Protective Zones set by National Requirements	471

Table 15-2 Community Health, Safety and Security Mitigation & Management Measures – Construction Phase.....	484
Table 15-3 Community Health, Safety and Security Mitigation & Management Measures – Operational Phase.....	489
Table 15-4 Key monitoring indicators (Construction & Operations)	492
Table 16-1 Territorial Units by Regions in Azerbaijan in 2020 (State Statistical Committee, 2020)	497
Table 16-2 Population by Ethnic group and Native Language	499
Table 16-3 Population by Ethnic group for Khizi region	501
Table 16-4 Number of Employment within Azerbaijan, Absheron Economic Region, and Khizi Region (STAT, 2020)	502
Table 16-5 Population's Sources of Income in 2019 (STAT, 2020)	502
Table 16-6 Main Crops in Azerbaijan, Absheron Economic Region, and Khizi Region (STAT, 2020).....	503
Table 16-7 Animal Products in Azerbaijan, Absheron Economic Region, and Khizi Region (STAT, 2020)	504
Table 16-8 Distribution of Schools and Students in Azerbaijan, Absheron Economic Region, and Khizi Region for the School Year 2019/2020 (STAT, 2020)	504
Table 16-9 Healthcare Facilities in 2019 (STAT, 2020).....	505
Table 16-10 Main Causes of Death in Azerbaijan in 2019 (STAT, 2020)	506
Table 16-11 Vulnerable Individuals Who Took part in Survey	512
Table 16-12 Affected Households	523
Table 16-13 Age Structure of the Households	524
Table 16-14 Marital Status of Affected Households	524
Table 16-15 Education Level of Surveyed Households	525
Table 16-16 Employment Status of Households and their Families	526
Table 16-17 Source of Income	526
Table 16-18 Average Household Expenditure	527

Table 16-19 Frequency of the Visits to the Hospital/Medical Centre	528
Table 16-20 Use of Public Transport by PAPs.....	529
Table 16-21 Grazing Activities	530
Table 16-22 Number of Livestock Owned and Employment Status	530
Table 16-23 Herb Collection Activities.....	532
Table 16-24 Number of Vulnerable People Impacted by the Project	533
Table 16-25 Concerns Raised by PAPs	534
Table 16-26 Land Users Surveyed along the OHTL Route	535
Table 16-27 Land Users within 1km of the OHTL.....	537
Table 16-28 Family Size in the Farms.....	538
Table 16-29 Number of Individuals Working for Local Businesses.....	539
Table 16-30 Economic Activities and Monthly Income of the Farms	539
Table 16-31 Potential Socio-Economic Receptors	541
Table 16-32 Anticipated Loss of Grazing Land within the Project Site.....	545
Table 16-33 Anticipated Loss of Herb Collection Area within the Project Site.....	546
Table 16-34 Socio-Economics Impact Significance, Mitigation & Management Measures and Residual Impacts-Construction.....	549
Table 16-35 Socio-Economics Impact Significance, Mitigation & Management Measures and Residual Impacts-Operation.....	560
Table 16-36 Socio-Economic Monitoring Requirements (Construction and Operations)	561
Table 17-1 Stakeholder Engagement during the ESIA Preparation	570
Table 17-2 Responses to MENR Questions.....	584
Table 17-3 Response to Questions.....	586
Table 17-4 Response to Questions.....	587
Table 17-5 Response to Questions.....	589
Table 17-6 Response to Questions.....	590

Table 17-7 Public Disclosure Meeting – Participants	599
Table 18-1 Labour & Working Conditions Mitigation & Management Measures – Construction.....	617
Table 18-2 Labour & Working Conditions Mitigation & Management Measures – Operational Phase	621
Table 18-3 Key Monitoring Indicators	624
Table 19-1 Generators-GHG Emissions During Construction of the Project	631
Table 19-2 Estimated CO ₂ Emissions Mitigated in Tonnes per Year	632
Table 19-3 Annual Water consumption Based on Type of Use	635
Table 20-1 Summary of CIA – Construction Phase (Qualitative Assessment)	640
Table 20-2 CIA – Cumulative Annual Collisions (Area 1 and Khizi 3 WF)	646
Table 20-3 Summary of Potential Cumulative Effects on Biodiversity Receptors (Operation)	652
Table 20-4 Cumulative KLV4 Visual Impact	657
Table 20-5 Noise Levels at Receptors – First Floor Level – Yeni Yashma & Khizi Wind Farms (Reference wind speed 10m/s)	657
Table 20-6 Noise Levels at Receptors - First Floor (4m above ground) (Khizi 3 WF only)	658

PLATES

Plate 2-1 Project Site Conditions – Compilation of Photographs.....	19
Plate 2-2 Land Use – Compilation of Photographs	21
Plate 2-3 Khizi -Yashma OHTL - Compilation of Photographs.....	24
Plate 2-4 Khizi - Pirakashkul OHTL - Compilation of Photographs.....	26
Plate 2-5 Pirakashkul – Gobu OHTL- Compilation of Photographs.....	28
Plate 2-6 Surrounding Land Use – Compilation of Photographs	30
Plate 11-1 Stone Ruins and Potential Graveyard Observed during Site Visit in November 2029	373
Plate 11-2 Site-38 (WTG K43 (O)).....	376
Plate 11-3 Selected Photographs of Findings.....	376
Plate 16-1 Compilation of Photographs during OHTL Socio-economic Survey	538
Plate 17-1 Public Information Centre at Sitalchay Village	569
Plate 17-2 Picture of Letters being distributed in Sitalchay Village	582
Plate 17-3 Consultation Meeting - Community Members of Sitalchay Village.....	583
Plate 17-4 Consultation Meeting - Members of Public Council of NGOs.....	587
Plate 17-5 Announcements Placed in Sitalchay Village	600
Plate 17-6 Sample Letters Issued to State Agencies, NGOs and Unions	600
Plate 17-7 Announcements Placed in Sitalchay Village ...	Error! Bookmark not defined.

LIST OF ABBREVIATIONS

ABBREVIATION	MEANING
ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
ASL	Above Sea Level
BOO	Build Own Operate
CESMP	Construction Environmental & Social Management Plan
CFS	Country Fact Sheet
CHA	Critical Habitat Assessment
CIA	Cumulative Impact Assessment
dB	Decibel
DFIG	Doubly Fed Induction Generator
EAAA	Appropriate Area of Analysis
EBRD	European Bank for Reconstruction and Development
Ecoenergy	Ecoenergy Ltd.
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EP	Equator Principles
EPC	Engineering, Procurement and Construction
EPFI	Equator Principle Financial Institutions
ESIA	Environmental & Social Impact Assessment
ESMS	Environmental and Social Management Systems
ESS	Environmental & Social Standards
EU	European Union
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
GBVH	Gender Based Violence and Harassment
GFRP	Glass Fibre Reinforced Polymer
GGGI	Global Gender Gap Index
GHG	Greenhouse Gas
GIIP	Good International Industry Practice
GIS	Geographic Information System
GRM	Grievance Redressal Mechanism
HGV	Heavy Goods Vehicles
H&S	Health & Safety
HSS	High Speed Shaft
IAQM	Institute of Air Quality Management
IBAs	Important Bird Areas
IDPs	Internally Displaced Persons
IEA	International Energy Agency
IEE	Initial Environmental Examination
IFC	International Finance Corporation

ABBREVIATION	MEANING
IOA	Institute of Acoustics
ILO	International Labour Organisation
L&FS	Life and Fire Safety
LCAs	Landscape Character Areas
LCOE	Least Cost of Energy
LEAs	Local Executive Authorities
LRP	Livelihood Restoration Plan
MAC	Maximum Allowable Concentration
MENR	Ministry of Ecology and Natural Resources
MoE	Ministry of Energy
MoM	Minutes of Meeting
NAP	National Adaptation Plan
NDC	Nationally Determined Contribution
NOMAC	First National Operation and Maintenance Co. Ltd
NSRs	Noise Sensitive Receptors
NTS	Non-Technical Summary
ODS	Ozone Depleting Substances
OEMP	Operational Environmental Management Plan or
OESMS	Operational Environmental & Social Management System
OFID	OPEC Fund for International Development
OHS	Occupational Health & Safety
OHTL	Overhead Transmission Line
O&M	Operation and Maintenance
OOP	Out-of-Pocket
PIC	Public Information Centre
PPA	Power Purchase Agreement
PPE	Personal Protective Equipment
PRs	Performance Requirement
PS	Performance Standards
RH	Relative Humidity
RPF	Resettlement Planning Framework
SAARES	State Agency for Alternative and Renewable Energy Sources
SEA	Sexual Exploitation & Abuse
SOW	Scope of Work
SGC	Southern Gas Corridor CJSC
SH	Sexual Harassment
SLR	Single-lens Reflex
SOCAR	State Oil Company of the Azerbaijan Republic
SQM	Sky Quality Meter
SSCRA	State Statistical Committee of the Republic of Azerbaijan (SSCRA)
TBC	To be Confirmed

ABBREVIATION	MEANING
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
VOC	Volatile Organic Compounds
WD	Wind Direction
WEE	Waste Electrical Equipment
WHO	World Health Organisation
WS	Wind Speed
WTG	Wind Turbine Generators
WWTP	Wastewater Treatment Plant
5 Capitals	5 Capitals Environmental & Management Consultancy

1 INTRODUCTION

1.1 Project Overview

Azerbaijan's National State Programme on the Use of Alternative and Renewable Energy Sources, 2016-2020, aims to increase the share of alternative and renewable energy sources to 20%. The Programme has identified wind as the preferred source of alternative energy with an estimated annual wind power capacity of 800 MW, based on International Energy Agency (IEA). This is due to the unlimited wind availability in Azerbaijan and the lower costs of the technology (IEA, 2020). ACWA Power signed an implementation agreement with the Ministry of Energy (MoE) in Azerbaijan for developing, building and operating a 240 MW wind power project. The wind project is expected to operate for 25 years on a Build Own Operate (BOO) basis according to the Power Purchase Agreement (PPA). The 240 MW wind project will be split and built on two (2) locations as follows:

- Khizi 3: Capacity up to 162.5 MW and will be generated using 25 x 6.5 MW Wind Turbine Generators (WTG), located in Khizi region; and
- Area 1: Capacity up to 78 MW and will be generated using 12 x 6.5 MW WTGs, located at Absheron region.

Figure 1-1 Regional Location of 240 MW Wind Farms



1.2 Key Project Information

Table 1-1 Key Project Information

PROJECT TITLE	Khizi 3 Wind Project
LOCATION	Khizi Region - Azerbaijan
PROJECT DEVELOPER	ACWA Power
PROJECT COMPANY	ACWA POWER AZERBAIJAN RENEWABLE ENERGY
OFF-TAKER	Azerenergi
EPC CONTRACTOR	To Be Confirmed (TBC)
O&M COMPANY	First National Operation and Maintenance Co. Ltd (NOMAC)
ENVIRONMENTAL CONSULTANT	5 Capitals Environmental & Management Consultancy (Lead Consultant) PO Box 119899, Dubai, UAE Tel: +971 (0) 4 343 5955, Fax: +971 (0) 4 343 9366 www.5capitals.com
	Ecoenergy Ltd. (Local Consultant) Baku AZ1065, Azerbaijan Tel: +994 50 367 3200
POINT OF CONTACT	Ken Wade (Director) Ken.wade@5capitals.com

1.3 Scope of ESIA Study

ACWA Power has appointed 5 Capitals Environmental & Management Consultancy (5 Capitals) to prepare the Environmental & Social Impact Assessment (ESIA) for the Project.

This report is the ESIA Study for the Khizi 3 Wind Project (the Project). The ESIA has been informed by the Environmental & Social Scoping Study (Ref Appendix A), prepared by 5 Capitals and has been prepared in accordance with the environmental regulations of Azerbaijan and the expected environmental and social requirements of the prospective Lenders.

In order to ensure that the project meets the Ministry of Ecology and Natural Resources (MENR) requirements and is submitted by a registered consultancy, 5 Capitals has appointed Ecoenergy Ltd. (Ecoenergy), who will be responsible for elements of the assessment process, including baseline studies submission and liaison with MENR and the necessary consultations.

ACWA Power is seeking project finance from International lenders including European Bank for Reconstruction and Development (EBRD), Asian Development Bank (ADB) and OPEC Fund for International Development (OFID) who have their own defined Environmental and Social Policies and standards/requirements) and/or banks with investment policies that ultimately align with Equator Principles requirements or the IFC Performance Standards. As such, this ESIA has been prepared in accordance with the expected environmental and social requirements of the prospective international lenders.

It should however be noted that for the purpose of this document the term ESIA is considered to be inclusive of the Environmental Impact Assessment (EIA) requirements of MENR as well as the Environmental & Social Impact Assessment requirements of the lenders. As such, references to the impact assessment of environmental and social parameters are termed as ESIA, unless there is specific reference to the EIA requirements of MENR.

OVERHEAD TRANSMISSION LINES (OHTL) – ASSOCIATED FACILITY

Overhead transmission lines (OHTL) will connect both Wind Farms (Khizi 3 and Area 1 WFs) and to the national grid. The responsibility for developing, constructing, commissioning and operating the OHTL lies with the Project off-taker, Azerenergi, and is not being directly funded under the loan agreement with lenders. During the course of the ESIA process, there was no information available concerning the OHTL, however, preliminary design information was recently made available by Azerenergi in May 2021 (OHTL route preliminary design).

It was agreed with EBRD on 28 June 2021 that a high-level assessment of potential OHTL impacts to be included as part of the ESIA study, therefore, 5 Capitals carried out the necessary environmental and social baseline surveys required to establish any risks associated with the development of the OHTL as part of the EISA studies and a preliminary assessment has been included in the ESIA Report. The surveys completed and included in this ESIA include:

- Noise;
- Soil and Water Quality;
- Terrestrial Ecology;
- Socio-economic survey;
- Bird Surveys;
 - o Surveying Existing OHTL to Record Dead Birds;
 - o Breeding Survey; and
 - o Autumn Breeding Report.
- Bat Survey; and
- Archaeology Survey.

The Scope of Work (SOW) for OHTL submitted and approved by EBRD is provided in Appendix K.

1.4 Objectives of the ESIA

The main objectives of this ESIA in relation to the Project are as follows:

- Provide an overview of the Project design, identification of sensitive receptors in the Project's area of influence and assessment of Project alternatives;

- Assessment of baseline conditions (existing conditions) prior to the development of the project through review of available data and conducting surveys;
- Assessment of the project's environmental and social impacts for the construction and operational phases;
- Review of compliance obligations, including applicable national regulations and international regulations and standards as well as international lender requirements;
- To engage with key stakeholders and project affected people to disclose Project information, study outcomes, gain local knowledge about the local environmental and social context and seek feedback on project;
- Determination of applicable mitigation and management measures to be implemented in order to avoid or minimise potential impacts; and
- Consideration of alternatives that can be used for the project leading to greater social and environmental gains; and
- Prepare a framework from which the construction phase and operational phase respective E&S Management Systems and supplementary plans can be developed and implemented.

1.5 Structure of the ESIA

In order to comply with the requirements for environmental and social assessment established by international good practice, this report is presented in the following format developed by 5 Capitals:

- Volume 1: Non-Technical Summary (NTS)
- Volume 2: Main Text, Tables and Figures
- Volume 3: Environmental and Social Management Framework
- Volume 4: Appendices

Volume 1 provides a Non-Technical Summary of the ESIA, including the main outcomes, and conclusions.

Volume 2 comprises the main text of the ESIA and full impact assessment, with mitigation, management and monitoring measures identified. Volume 2 aligns with the following chapter structure:

1. Introduction

- Project Overview
- Key Project Information
- Scope of ESIA
- Objectives of the ESIA
- Structure of the ESIA

2. Project Information

- Project Rationale
- Goals and Objectives
- Project Location
- Land Ownership
- Site Conditions and Land Use
- Surrounding Land Use
- Existing Road Network
- Project Description
- Associated Facilities
- Traffic and Logistics for Transporting WTGs
- Project Construction
- Project Operational and Maintenance Requirements
- Decommissioning of the Project
- Alternatives Assessment

3. Regulatory Framework

- National Regulation
- Lender Requirements
- Applicable Environmental Standards
- EIA/ESIA Requirements

4. Approach to ESIA

- ESIA Team
- ESIA Methodology

5. Air Quality (same structure for environmental aspects 6 to 14)

- Standards and Regulatory Requirement
- Area of Influence
- Baseline Conditions
- Receptors
- Potential Impacts, Mitigation, Management Measures & Residual Impacts
 - o Construction and Operational Phases
- Monitoring

6. Noise and Vibration

7. Biodiversity

8. Soil, Geology and Groundwater

9. Drainage & Water

10. Solid Waste & Wastewater Management

-
11. Archaeology & Cultural Heritage
 12. Landscape & Visual Amenity
 13. Traffic & Transportation
 14. Community Health, Safety & Security
 15. Socio-Economics
 16. Livelihood Restoration
 17. Public Consultation
 18. Labour & Working Conditions
 19. Climate Affairs
 20. Cumulative Impact Assessment
 21. References

Volume 3 provides a framework for the development of the Construction, Commissioning and Operational Environmental and Social Management Systems (including associated management plans) based on the findings from this ESIA. The intention is that this volume (alongside the full ESIA package and other E&S documents) will be issued to the Engineering, Procurement and Construction (EPC) Contractor and Operation and Maintenance (O&M) Company to develop and implement project specific management processes respectively.

Volume 4 comprises Appendices, which are as follows:

- Appendix A – Environmental & Social Scoping Report
- Appendix B – Land Cadastre and Communications with Ministry of Energy on Land Ownership and Land Use
- Appendix C – OHTL Site Reconnaissance Survey
- Appendix D – Calibration Certificates
- Appendix E – Lab Analysis (Soil and Water)
- Appendix F – Baseline Survey Reports
- Appendix G – Shadow Flicker Report
- Appendix H – Critical Habitat Assessment (CHA) Report
- Appendix I – Consultation Letters and Minutes of Meetings (MoM)
- Appendix J - Noise Modelling Report
- Appendix K: Scope of Work for OHTL – Associated Facilities
- Appendix L: Khizi 3 Wind bat baseline Study Evaluation

-
- Appendix M: Collision Risk Modelling (CRM) Report
 - Appendix N: Public Disclosure Meeting Report

2 PROJECT INFORMATION

2.1 Project Rationale

In 2009, the State Agency for Alternative and Renewable Energy Sources (SAARES) was established as part of the Ministry of Energy under a Presidential Decree (No. 123) in order to accelerate the implementation of decisions outlined in the country's "State Program on the Use of Alternative and Renewable Energy Sources in the Republic of Azerbaijan", adopted in 2004. The main objective of this Programme is to promote the use of renewable energy by identifying the potential alternatives renewable sources and increase their utilisation, decrease CO₂ emissions and support job creation (IEA, 2020 and IRENA, 2019). The status of the Agency was altered by Presidential Decree No. 464 of 14 January 2019.

Based on data published by IRENA, 80% of the power produced in Azerbaijan comes from thermal power plants, followed by hydropower plants (6-10%), biomass, solar PV and finally wind power accounting for 1% as of 2017 data as presented in the Table below (IRENA, 2019).

Table 2-1 Electricity Generation by Source (GWh) (IRENA, 2019)

SOURCE	2010	2011	2012	2013	2014	2015	2016	2017
Thermal	15,262.7	17,618.0	21,167.1	21,729.6	23,249.3	22,859.9	22,761.0	22,344.9
Hydro	3,446.3	2,675.8	1,821.0	1,489.1	1,299.7	1,637.5	1,959.3	1,746.4
Wind	0.5	-	-	0.8	2.3	4.6	22.8	22.1
Solar PV	-	-	-	0.8	2.9	4.6	35.3	37.2
Biomass	-	-	-	134.1	173.5	181.8	174.5	170.3
Total	18,709.5	20,293.8	22,988.1	23,354.4	24,727.7	24,688.4	24,952.9	24,320.9

Source: State Statistical Committee of Azerbaijan (2018)

Wind power has been identified as the preferred energy source in Azerbaijan due to its cost and unlimited availability. The projected annual capacity of wind power is approximately 800 MW per year of economic wind power and 3,000 MW of technical, which will generate 2.4 billion kWh of electricity. This will save up to 1 million tons of conventional fuel, therefore reducing the carbon emissions (IEA, 2020). This is in line with Country's carbon commitments in reducing its Greenhouse Gas (GHG) emissions 35% by 2030, measured from the 1990 base year set in its Nationally Determined Contribution (NDC) under the Paris Agreement (IRENA, 2019).

2.2 Goals & Objectives

This Project will contribute towards Azerbaijan's carbon commitments in reducing its Greenhouse Gas (GHG) emissions 35% by 2030, measured from the 1990 base year set in its Nationally Determined Contribution (NDC) under the Paris Agreement (IRENA, 2019).

Other benefits include:

- Social benefits: The project is expected to create employment opportunities during the construction and operational phases;
- Economic benefits: Due to the reduction in GDP growth and substantial drop in oil prices in recent years, the country is planning to diversify its economy and move towards a modernised energy system, which includes renewable energy projects. Non-oil sector foreign direct investment (FDI) is set to increase from 1.5% to 4% by 2025 and an increase in the share of non-oil sector exports from USD 200 per capita in 2016 to USD 450 by 2025 and USD 1 200 by 2035, as set by the Strategic Roadmap on National Economic Perspectives (approved by Presidential Decree on 6 December 2016) (IRENA, 2019). Part of this diversification will be achieved through the development of the Khizi 3 and Area 1 WFs; and
- Environmental benefits: The operation of the WF is a proactive measure towards a low carbon transition for Azerbaijan's economy harnessing the abundant wind resource in the country. This project will reduce the country's dependency on fossil fuel generated power and will reduce atmospheric pollution; in comparison to other power generation technologies in the current energy mix of Azerbaijan.

2.3 Project Location

2.3.1 Wind farm

The Project is located on the hilltops of the Khizi region, approximately 55km north west of Baku. The project will include a maximum of 25 WTGs. The proposed Project coordinates and locations are provided in the table and figures below. The Project footprint will include the following:

- WTG platforms (this includes foundation and crane pad area);
- Substation and any storage facilities;
- Trenches for underground cables; and
- Access roads.

Figure 2-1 Project Location



Table 2-2 Project Coordinates of WTGs

WTG Co-ordinates (WGS84 Zone 39T)				
Sr. No.	Loc ID	X [m]	Y [m]	WF Area
1	K4	356274	4508724	Khizi
2	K5	356611	4508474	Khizi
3	K6	357102	4508384	Khizi
4	K7	357649	4508316	Khizi
5	K8	358075	4508178	Khizi
6	K9	358450	4508100	Khizi
7	K10	358822	4507988	Khizi
8	K11	359173	4507775	Khizi
9	K12	359718	4507482	Khizi
10	K13	360108	4507274	Khizi
11	K14	360728	4507051	Khizi
12	K15	361169	4506551	Khizi
13	K16	361614	4506323	Khizi
14	K17	361979	4506238	Khizi
15	K18	362318	4506103	Khizi
16	K19	362740	4505974	Khizi
17	K20	363077	4505780	Khizi
18	K21	363483	4505799	Khizi

WTG Co-ORDINATES (WGS84 ZONE 39T)				
Sr. No.	Loc ID	X [M]	Y [M]	WF AREA
19	K22	363827	4505724	Khizi
20	K23	364527	4505549	Khizi
21	K24	364875	4505400	Khizi
22	K25	365218	4505275	Khizi
23	K26	365559	4505204	Khizi
24	K27	365972	4505224	Khizi
25	K32	364172	4505606	Khizi

2.3.2 OHTL

As stated earlier, an OHTL will connect both Wind Farms (Khizi 3 and Area 1 WFs) and to the national grid. The responsibility for developing the OHTL lies with Azerenergi Open Joint Stock Company (Azerenergi), the Project off-taker and as such, the OHTL is considered an 'Associated Facility' to the Project; as it is not being directly funded under the loan agreement with lenders.

The OHTL is split into three (3) lines as follows:

- 220 kv Khizi 3 - Yashma OHTL: This OHTL will connect the Khizi 3 WF substation (SS) to the existing Yashma SS and is approximately 20 km long (red line in Figure below) – assessed as part of Khizi 3 ESIA report;
- 220 kv Khizi – Pirakashkul OHTL: The OHTL line that will connect Khizi 3 and Area 1 WFs SS and is approximately 30 km long (yellow line in Figure below) - assessed as part of Khizi 3 and Area 1 ESIA report; and
- 220 kv Pirakashkul – Gobu OHTL: The OHTL line that will connect the Area 1 WF SS to the existing Gobu Power Station and is approximately 30 km long (Green line in Figure below)- assessed as part of Area 1 ESIA report.

Figure 2-2 OHTL Location Map



The OHTL routes and proposed coordinates are shown in the tables below.

Table 2-3 220 kv Khizi 3 - Yashma OHTL

No	X	Y
1	360709.00	4507503.00
2	362219.00	4508389.05
3	367852.00	4505699.00
4	370677.00	4504712.00
5	371403.00	4503357.00
6	372086.00	4503189.00

Table 2-4 220 kv Khizi – Pirakashkul OHTL

No	X	Y
1	372431.00	4490635.00
2	372889.00	4491095.00
3	373287.00	4495853.00
4	368789.00	4505046.00
5	364862.00	4507040.00
6	360855.00	4507521.00

Table 2-5 220 kv Pirakashkul – Gobu OHTL

No	X	Y
1	386910.00	4474746.00
2	386609.00	4474792.00
3	386282.00	4475416.00
4	385269.00	4476276.00
5	384478.00	4477650.00
6	379471.00	4479483.00
7	376238.00	4479090.00
8	375868.00	4479367.00
9	374326.00	4485825.00
10	375122.00	4487324.00
11	375586.00	4490640.00
12	372458.00	4490614.00

2.4 Land Ownership

2.4.1 Wind Farm

The Constitution of the Republic of Azerbaijan, Article 13, stipulates there are three (3) types of property ownership; State ownership, Municipal ownership and Private ownership (Asian Development Bank, 2014).

The project area is Municipality and State owned. Appendix B includes the land documents for project area.

The land has been assigned to Ministry of Energy for leasing by a Presidential Order No. 2366 of 2020 and Cabinet of Ministers Order No. 720 of 2020. The Presidential and cabinet of Ministers Orders instruct the government to lease the state/public lands to the 240.5 MW Wind Projects, which Khizi 3 WF Project is part of.

In terms of the Khizi 3 WF project site, the Ministry of Energy through a Land Lease Agreement (LLA) will grant the Project Company all rights necessary to use, occupy and access, the Project Site for the purposes of the Project. The term of the Land lease shall be 30 years from the date of execution of the Land Lease Agreement and certification by a notary in the Republic of Azerbaijan.

The land use status for the project boundary has been changed from Agricultural to the category of lands specified for industrial, transport, communication, defence and other uses and any short-term lease contractors were not renewed by the state or municipality.

LAND USE STATUS

The WF project area (WTG, roads, substations sites) is currently not leased or used under any formal agreement by the municipality or the government. However, based on the consultations undertaken with the local communities, surrounding farmers/herders and municipality from January 2020 to August 2021, the following has been confirmed:

- Based on meetings/survey held with nearby users (farmers), the project area is occasionally used for seasonal animal grazing (October/ November to May) by these farmers without an official lease agreement;
- Other use observed during a site survey undertaken by local consultant team include collection of herbs.

Section 17 and 18 of this ESIA Report include detailed information on the consultations and surveys undertaken regarding social and land use.

2.4.2 OHTL

Based on information provided by Azerenergi, *'in accordance with the requirements of the "Rules for the protection of electrical networks with a voltage of more than 1000 volts" approved by the Resolution of the Cabinet of Ministers of the Republic of Azerbaijan dated 10.06.2005, No 103, "Land plots included in the protection zones of electricity networks remain in the use of the land owner or user and can be used by them for agricultural and other purposes in compliance with the requirements of these Rules"*.

Based on the socio-economic survey undertaken for the OHTL, 66% of land crossed by the OHTL is State owned and 34% is Municipality owned. This is based on consultations undertaken by local consultant with representatives of state regional agencies including Absheron Regional Agency, Khizi Committee for Property Issues, Sumgayit City Committee for Property Issues, and local municipalities of Cayli and Sitalchay villages. None of the plots crossed by the OHTL are privately owned. The table below provides a summary of land ownership status along the OHTL route. At this stage the development of the OHTL will not involve expropriation of land for the OHTL sites.

Table 2-6 Land Ownership Status along OHTL Route

ID	LAND OWNERSHIP	OHTL STRETCH	LENGTH (APPROXIMATE IN LENGTH, KM)	OWNER ENTITY	LAND STATUS	LAND USE
1	Municipal	1	0.33	Gobu settlement	Land rented by state camel farm for grazing	Land provides grazing for livestock
2	Municipal	1	4.38	Gobu settlement	No land lease	Land provides grazing for livestock
3	State	1	4.90	Absheron region Executive Power	No land lease	Land provides grazing for livestock
4	State	1	2.93	Absheron region Executive Power	No land lease	Land provides grazing for livestock
5	State	1	1.50	Absheron region Executive Power	No land lease	Land provides grazing for livestock
6	State	1	1.65	Absheron region Executive Power	No land lease	Land provides grazing for livestock
7	Municipal	1	1.25	Pireshkul village	No land lease	Land provides grazing for livestock
8	State	1	0.04	Absheron region Executive Power	Land rented	Adult pine trees
9	State	1	0.32	Absheron region Executive Power	Land rented	Almond orchard
10	Municipal	1	0.10	Pireshkul village	Land rented	Almond orchard
11	Municipal	1	2.60	Pireshkul village	Land rented	Almond orchard
12	Municipal	1	0.13	Pireshkul village	Land rented	Almond orchard
13	Municipal	1	0.11	Pireshkul village	Land rented	No development or use; land provides grazing for livestock

ID	LAND OWNERSHIP	OHTL STRETCH	LENGTH (APPROXIMATE IN LENGTH, KM)	OWNER ENTITY	LAND STATUS	LAND USE
14	Municipal	1	1.65	Pireshkul village	Not applicable	Land provides grazing for livestock
15	Municipal	1	0.28	Pireshkul village	Land rented	Land provides grazing for livestock
16	Municipal	1	5.10	Pireshkul village	Not applicable	Land provides grazing for livestock
17	State	2	12.30	Absheron region Executive Power	Not applicable	Land provides grazing for livestock
18	State	2	0.87	State Land Fund	Land rented =	Partially cultivated grazing land
19	State	2	0.10	State Land Fund	Land allocated to Baku - Mozdok gas pipeline	Pipeline safety zone for its right of way; Land provides grazing for livestock
20	State	2	0.95	State Land Fund	Land rented	Land provides grazing for livestock
21	State	2	1.78	State Land Fund	Not applicable	Land provides grazing for livestock
22	State	2	0.65	State Land Fund	Land rented by Baku State University (BSU)	No development or use by BSU; Land provides grazing for livestock
23	State	2	1.10	State Land Fund	Land rented by "PERM" Company	No development or use by Company; Land provides grazing for livestock
24	State	2	4.43	State Land Fund	No land lease	Land provides grazing for livestock
25	Municipal	2	2.90	Sitalchay village	No land lease	Land provides grazing for livestock
26	Municipal	3	2.90	Sitalchay village	No land lease	Land provides grazing for livestock

ID	LAND OWNERSHIP	OHTL STRETCH	LENGTH (APPROXIMATE IN LENGTH, KM)	OWNER ENTITY	LAND STATUS	LAND USE
27	State	3	6.14	State Land Fund	No land lease	Land provides grazing for livestock
28	State	3	0.87	State Land Fund	No land lease	Land provides grazing for livestock
29	State	3	0.35	State Land Fund	Land allocated to Military Base	Occupied by military personnel & buildings
30	State	3	1.00	State Land Fund	No land lease	Land provides grazing for livestock

Note

- **Stretch 1** = Perekeshkul -Gobu OHTL route
- **Stretch 2** = Khizi – Pirakashkul OHTL route
- **Stretch 3** = Khizi – Yashma OHTL route

The 330/220/110 kV "Gobu" Power Plant and 330/220/110 kV "Yashma" substations are located on land owned by "Azerenergy" OJSC. This will include installation of one (1) additional unit of 220 kV slot in the 220 kV open switchgear of 330/220/110 kV "Gobu" Power Plant and one (1) unit additional 220 kV slot in the open switchgear of 330/220/110 kV "Yashma" Substation.

2.5 Site Conditions and Land Use

2.5.1 Wind Farm

SITE CONDITIONS

A site visit to the Project site was carried out on 4th November 2019 by 5 Capital ESIA team. The visit included a general overview of the proposed development area. The below is also informed by the site visits carried out by the local consultant and 5 Capital's team from 28th March 2020 onwards.

The site was primarily in a natural condition and a lack of anthropogenic influences/activities was clear during the site visit with few impacts on this greenfield land. The site conditions observed during the site visit carried out in November 2019 and June 2021 can be summarised below:

- The project area is primarily open and does not include permanent structures. Where structures are located, these are at the base of the hill slopes on the north side of the area (off-site);
- The landscape includes large undulations with rounded hilltops. The land is elevated from the surroundings to the north and once within the hills, the topography is not as steep (not a plateau), but with softer gradients;
- The surface of the land was very dry, and primarily covered with grass species. Only a handful of trees were observed on in and around the development area;
- There is little to no physical infrastructure on the land. There are no roads, electrical connections, or other utilities. The farmers on the land in places had constructed make-shift water collection points, including ponds to collect rainwater runoff;
- A dried-up lake was found at in the centre of the site. At the time of the visit the lake was mud, with an area of salt.

Plate 2-1 presents a compilation of photographs of the Project site.

Plate 2-1 Project Site Conditions – Compilation of Photographs

SITE PHOTOGRAPHS	
Steep Gradient Entering the Site (November 2019)	Topography of Site (March 2020) – Hillslopes
	
Plateau Like Land Atop of the Slopes (November 2019)	
	
Tent and Cultivation Area on Site (November 2019)	Runoff Collection Pond On-Site (November 2019)
	
Typical Grass Vegetation Cover on Site (November 2019)	Few Trees Observed on Site (November 2019)

SITE PHOTOGRAPHS



Dried-up Lake

**LAND USE – PROJECT AREA**

As stated above, most of the project area is not used under any official agreement with the municipality or the government. The project area is occasionally used for informal seasonal grazing by nearby farms. The farming is seasonal and on a very small scale and occurs during the months of October to May (winter pastures) and during summer (June to September) the grazing is moved to the north of Azerbaijan (Guba Region). Other land use includes collection of herbs in certain seasons such as '*Dombalan*' which is a type of truffle that grows in Khizi region.

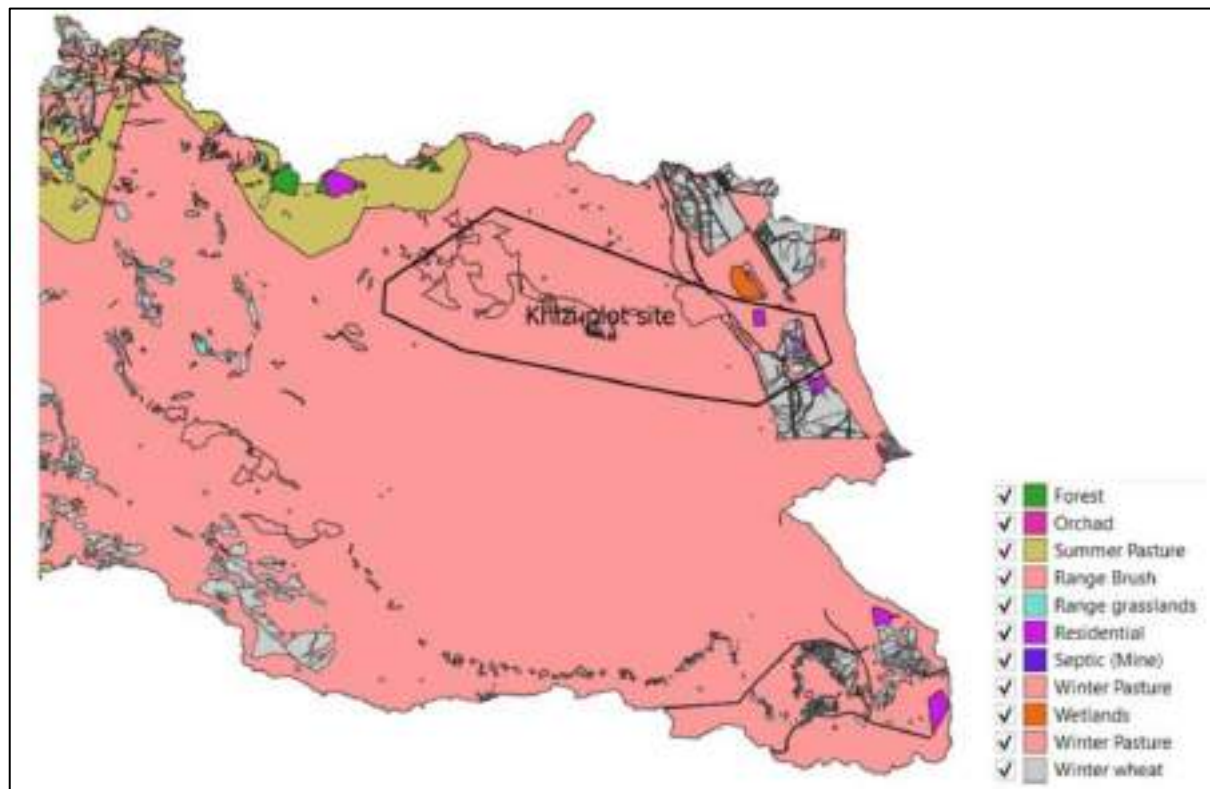
Based on informal consultation with the Municipality and the local consultant, herb collectors partially use project area, mainly at near the salt lake area going up to 1,000 m above the sea towards North West from mid-May till mid-June. Herders in pastures also collect herbs.

Plate 2-2 Land Use – Compilation of Photographs

SITE PHOTOGRAPHS	
Grazing observed on site (March 2020)	Grazing observed on site (November 2019)
	
Grazing Near Project Area (February 2021)	
	

According to the hydrology study conducted for Khizi 3 1 by ARPA Consulting in June 2021, the project and surrounding areas is predominantly characterised as winter pastures (agricultural use) and also has a sub-arid climate condition by which the terrain is exposed to significant erosion (ARPA Consulting, 2021).

Figure 2-3 Land Use Map of Project Area and Sumgaitchay River (ARPA Consulting, 2021)



2.5.2 OHTL

As part of the Khizi 3 and Area 1 WF ESIA studies, a site reconnaissance was carried out by the local consultant, between 6th and 12th of May 2021, along the OHTL route and immediate surroundings (provided in Appendix C of Volume 4). It should be noted that the OHTL has been revised based on the outcome of this reconnaissance survey to avoid areas where the line crossed over residential or agricultural areas. The maps below include the latest OHTL route.

The following was identified along the route and surrounding areas:

220 KV KHIZI 3 - YASHMA OHTL (OHTL CONNECT KHIZI 3 WF TO YASHMA SUBSTATION)

This section of the OHTL is located on the hilly terrain at northwest and interrupted by a flat plain at southeast. The region is characterised as sparse desert or semi-desert vegetation and some of the flat plain is used for agricultural purposes. The hilly terrain and plain area are used extensively for grazing of livestock and the flat plain is sustained by a complex system of irrigation canal and irrigation ditches.

The following was observed along the route:

- Agriculture fields (EC 4 and EC 12 in Map below);

- Marsh areas (with reeds, reedmace and rushes): low-lying plain areas of approximately 350 m to 750 m. The marsh is generally slightly saline. It is usually seasonally inundated and is species-rich. This low-lying wet grazing marsh may support a large number of bird species, the spur-thighed tortoise, amphibians and terrapins (EC7 to EC12 in Map below).
- Farms including the following:
 - Farm 1: A farm which includes a building and a yard for livestock (350 sheep, 5 Cattle and 1000 geese), located approximately 30 m east of proposed OHTL. The land is leased from the state land committee of Khizi district and land lease agreement will expire in 2034. The area is only used for grazing. (SC7 in Map below);
 - Farm 2: A farm located approximately 100 m south of proposed OHTL and includes 200 sheep and 50 cattle. The land is leased from the state land committee of Khizi district and will expire in 2036. The area is also used to collect thyme (SC9) in map below;
 - Military base: A military base located approximately 1 to 1.2 km from OHTL route. The OHTL crosses the eastern part of the military base;
- Features thought to be possibly archaeological (small mounds and circular elements that can be visible) (EC 5 in Map below).

Figure 2-4 OHTL Khizi – Yashma



Plate 2-3 Khizi -Yashma OHTL - Compilation of Photographs

SITE PHOTOGRAPHS	
Farm 1	Farm 2
	
Potential Archaeological Site	Trees along Route
	

220 KV KHIZI – PIRAKASHKUL OHTL

This route runs south-west to Khizi-3 project area, passing through semi-desert and desert habitat. The landscape is generally arid and flat, with no trees, hedges or fences to obscure long-distance views in all directions. However, several ranges of low hills are crossed by the stretch, each extending for approximately 1-2 km till the stretch reaches Khizi-3 hilly terrain. There is little cultivation of land due to aridity and agricultural practice is predominantly limited to the over-wintering of grazing livestock. There are small areas devoted for vegetable production.

The following was observed along the route:

- Farms including the following:
 - A farm which includes a house and yard for the livestock located approximately 100 m north east of OHTL. The farm includes 400 sheep and 100 cattle. The land is leased from the state land committee of Absheron District and LLA will expire in 2031 (SC6);

- A farm located approximately 110 m east of OHTL and includes 300 sheep. The farm is leased from the state land committee of Khizi District and LLA will expire in 2034. The land is used for grazing only throughout the year (SC10);
- Military training centre (SC8) located approximately 800 east of OHTL (previously the old OHTL route crossed over this centre, however, based on the outcome of the reconnaissance survey, Off-taker has changed route to avoid crossing over any residential, agricultural and other areas identified in the Report);
- Agricultural field (EC3) located approximately 115 m east of OHTL;
- The route runs parallel to an irrigation canal located approximately 800 m to the east.

Figure 2-5 OHTL Khizi – Pirakashkul

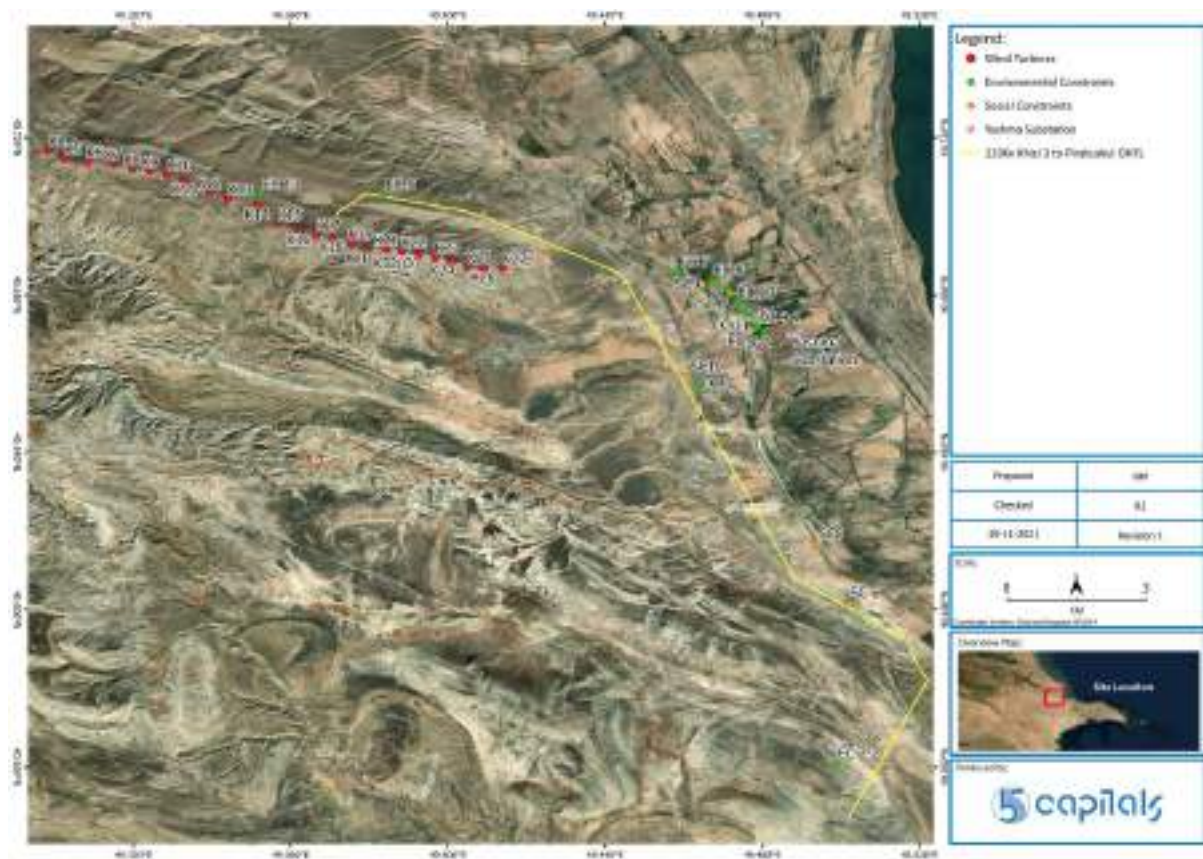


Plate 2-4 Khizi - Pirakashkul OHTL - Compilation of Photographs

SITE PHOTOGRAPHS	
Farm 3	Farm 4
	
Agricultural Field	Military Centre
	

220 KV PIRAKASHKUL – GOBU OHTL

This route runs from the Gobu substation; and moves westward mostly through semi-arid plain and low hilly areas until it crosses the Baku-Shemakhi highway and moves further north towards Area 1 through hilly terrain. The OHTL passes through very dry territory and over a number of semi-arid channel systems, including the Sumgayit river and many ephemeral gullies. The vegetation encountered is mixed, varying from natural, a sparse desert or semi-desert vegetation (uncultivated lands, which are generally grazed hills, slopes and flat areas) and are sparsely cultivated lands (generally flat areas). The following was observed along the route:

- Farms including:
 - Four (4) farms were observed along the route located between 500 to 700 m north west of proposed OHTL SC1, SC2, SC3 and SC4);
 - A farm with greenhouses located approximately 125 m east of OHTL. The land is leased from the state land committee of Absheron District. The LLA will expire in 2034 (SC11);

- A Dog shelter located approximately 150 m east of OHTL (SC12);
- An almond orchard 'Almond Agro Compny' (proposed OHTL route crosses this field) (SC5);
- Azerbaijan National Guard Training Facility located approximately 400 m south of OHTL (SC13); and
- A number of birds were observed along this route (EC1 and EC6).

Figure 2-6 Pirakashkul – Gobu OHTL



Plate 2-5 Pirakashkul – Gobu OHTL- Compilation of Photographs

SITE PHOTOGRAPHS	
Farm (SC1)	Farm (SC2)
	
Dog Shelter	Almond Orchard/ Company
	

2.6 Surrounding Land Use

There is an existing wind farm, Yeni Yashma Wind Park, located approximately 3.5 km to the closest WTG on the lower land to the south east of the project area. This Wind Park is the first wind project in Azerbaijan with a capacity of 50 MW and includes 20 WTGs. The WF is owned and operated by Azerishiq OJSC and started operation in October 2018 (IRENA, 2019). Other WFs include:

- A two (2) turbine pilot project wind farm (2 x 850 kW by Vestas) located approximately 9 km to the north east of project area;
- A four (4) 900 kW turbines located approximately 8.6 km to the north east of project area (farm closest WTG K27).

Based on local consultant feedback, both WFs are not operational or connected to the national grid.

A water channel is located to the east of the project and ultimately runs to the Jeyranbatan Reservoir in the north west of Baku. The Samur-Absheron Channel is an engineered open channel/canal that conveys rainwater from the mountainous regions of Azerbaijan. The channel is the main input of water to the reservoir that provides drinking water. Other sections

of the canal are used for irrigation. In the area of the Project, it appears that the channel collects rainwater runoff. The location of the water channel in relation to the project area is shown in the Figure below.

In 2006, and in accordance to the Ordinance of the Cabinet of Ministers of the Republic of Azerbaijan No. 42s, the reconstruction of the Samar- Absheron irrigation system project has been announced and included the Construction of Takhtakorpu-Jeyranbatan water canal. The location of Takhtakorpu-Jeyranbatan water canal in relation to project area is shown below.

Figure 2-7 Takhtakorpu-Jeyranbatan Water Canal



There are 11 seasonal farms identified surrounding the project boundary (within 7 km radius) as shown in the Figure below. The farms are used for seasonal farming / grazing during the winter months (October to May). From June until September, livestock are moved to the north of Azerbaijan to summer pastures. In addition, a poultry farm is located approximately 3.5 km south east of WTG K27. Not all of these farms are used, some are abandoned and not leased under any agreement.

Two villages and small settlements can be found within 15 km of the Project Site as shown in the land use figure below. The two villages are Sitalchay Village and Shuraabad are located approximately 9.9 km and 15.9 km north east of the Project area, respectively. Sitalchay village has a population of 1,234 and includes a military airbase. Additionally, two military blocks are located approximately 8 km north east of the Project area.

Plate 2-6 Surrounding Land Use – Compilation of Photographs



Yeni Yashma Wind Park



Poultry Farm

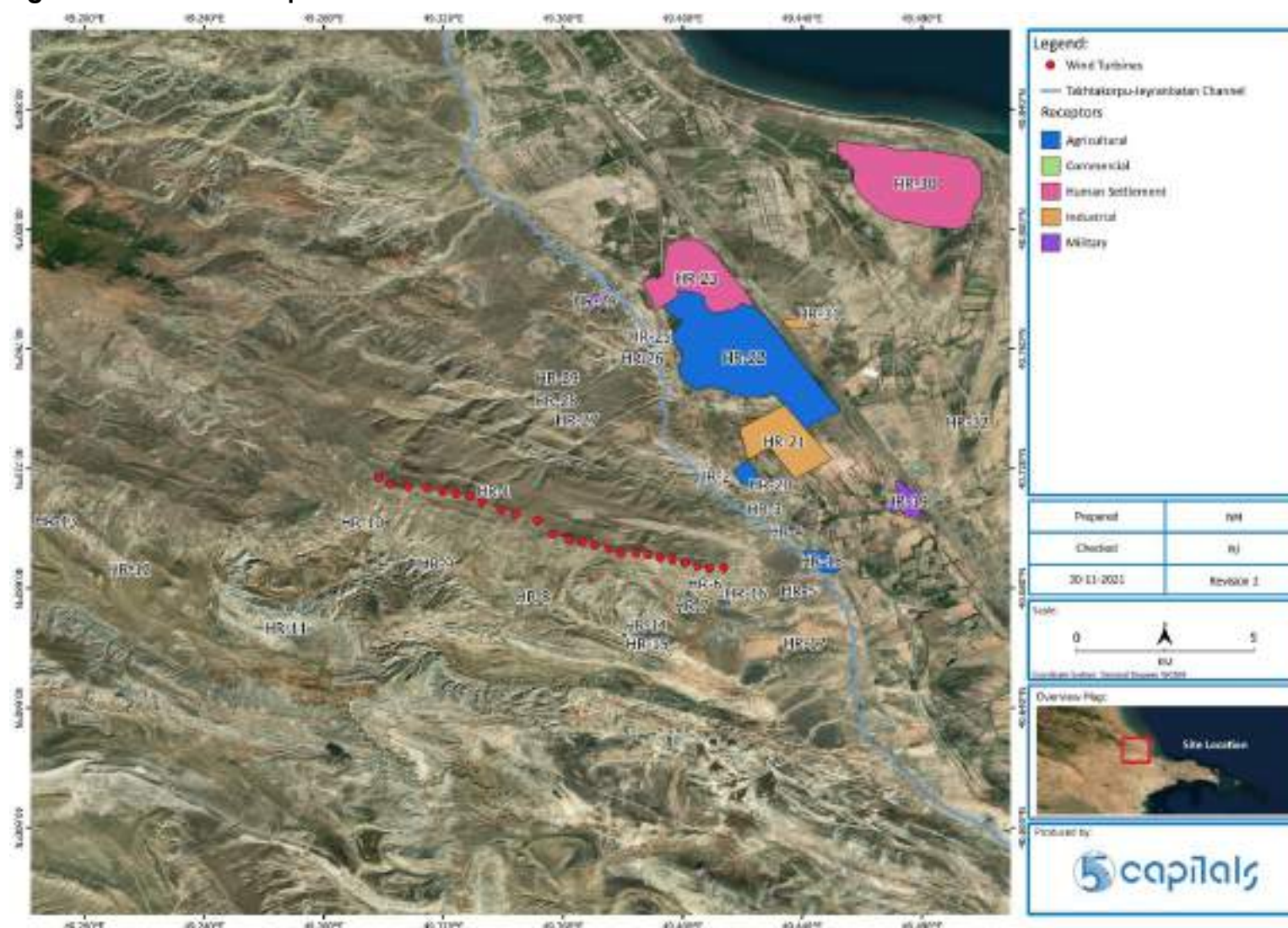


The land uses/ activities identified within the Project and surrounding areas are presented in the Table and Figure below.

Table 2-7 Land Use

ID	NAME	LAND USE/ CATEGORY	DISTANCE (m)	NEAREST WTG
1	HR-1	Tent and Fenced Area	487	K11
2	HR-2	Seasonal Farm	2,961	K27
3	HR-3	Seasonal Farm	2,389	K27
4	HR-4	Seasonal Farm	2,104	K27
5	HR-5	Seasonal Farm	1,991	K27
6	HR-6	Seasonal Farm	950	K25
7	HR-7	Seasonal Farm	1,796	K24
8	HR-8	Seasonal Farm	2,291	K15
9	HR-9	Seasonal Farm	2,604	K8
10	HR-10	Seasonal Farm	1,567	K5
11	HR-11	Seasonal Farm	6,013	K4
12	HR-12	Seasonal Farm	7,699	K4
13	HR-13	Seasonal Farm	9,142	K4
14	HR-14	Agricultural Field	2,948	K20
15	HR-15	Agricultural Field	3,136	K32(O)
16	HR-16	Agricultural Field	1,223	K27
17	HR-17	Poultry Farm	3,329	K27
18	HR-18	Agricultural Field	2,259	K27
19	HR-19	Military Base includes residential blocks	4,995	K27
20	HR-20	Agricultural Field	3,124	K27
21	HR-21	Yeni Yeshma Wind Farm	3,821	K27
22	HR-22	Agricultural Field	5,637	K27
23	HR-23	Sitalchay Village	8,483	K22
24	HR-24	Military Compound	7,756	K14
25	HR-25	Agricultural Field	7,184	K19
26	HR-26	Houses	6,931	K14
27	HR-27	Houses	3,859	K14
28	HR-28	Houses	4,201	K13
29	HR-29	Houses	4,377	K11
30	HR-30	Shurabad Village	13,756	K27
31	HR-31	Pilot Wind Project (2 turbines)	9,077	K27

Figure 2-8 Land Use Map



2.7 Existing Road Network

There is no permanent road infrastructure within the project site or surrounding areas. The closest highway to the site is E119 (M1) located to the east approximately 6.4 to the closest turbine (K27) and 13.8 km from furthest (K04) turbine. This highway runs along the coast and connects the border of Russia to Baku. The location of the highway in relation to the project site is indicated in Figure below. A road track is located approximately 2.6 to 9.9 km from the east which runs parallel to the E119 Highway. Road network surrounding project area is shown below.

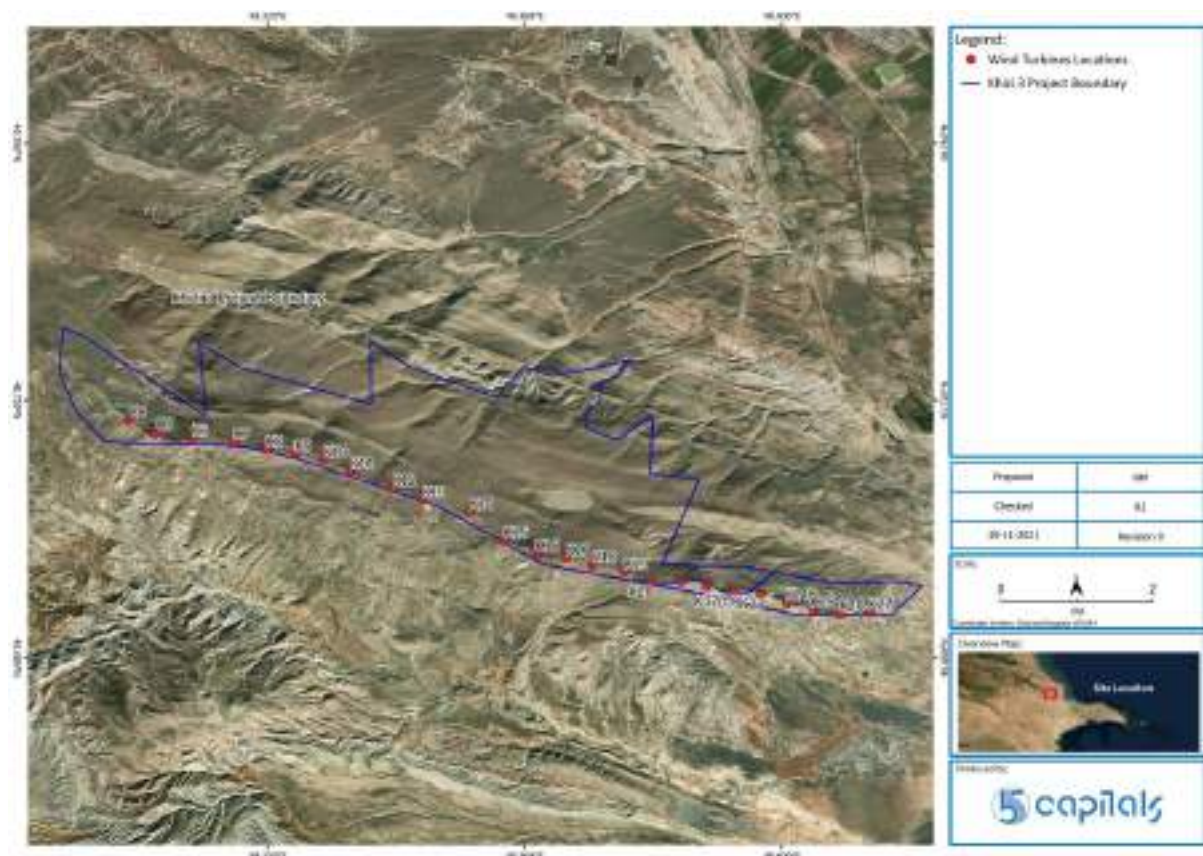
Figure 2-9 Road Network



2.8 Project Description

2.8.1 Project Layout

The Project will consist of a maximum of 25 WTG arranged upon hill crests in a specific arrangement across the proposed site to ensure the most efficient capture of the prevailing wind. The layout of the WTG is shown in the Figures below.

Figure 2-10 Project Layout

2.8.2 Process Description

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

Wind speeds increase with height above ground as turbulence intensity decreases at the same time. This 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 diameter from the turbine) significantly increase the swept area from which wind energy can be extracted.

Wind turbines are typically painted light-grey, with aviation safety lights at the top of the nacelle. The tips of the blades are sometimes painted orange or red to improve daytime visibility of the blade swept area while remaining unobtrusive to the character of the landscape as far as practical.

Turbines are also fixed to the ground and stabilised using reinforced concrete platforms, which ensure that the turbine remains stable. Foundation platforms are constructed below ground level, and soil will be placed over the platform to return the visible area to nearly its original condition.

2.8.3 WTG Specification

The proposed WTG for the Area 1 WF is the Envision Energy EN-171/6.5 Wind Turbine model. 'The EN-171/6.5 WTG has a rated power of 6.5 MW, 171m rotor diameter, and three (3) blades, horizontal axis, upwind direction, variable speed and pitch control (Envision Energy Co., Ltd, n.d.)'.

2.8.4 WTG Components

A brief description of the main components of the WTGs is provided below which has been extracted from the WTG specification document provided by Envision (Envision Energy Co., Ltd, n.d.):

BLADES

Each blade has an independent pitch system that actively regulates the pitch angle of the blade. The blade is made of glass fibre reinforced polymer (GFRP) and it is equipped with a lightning protection system. The discharger can direct the lightning current on the blade into the ground through the tower.

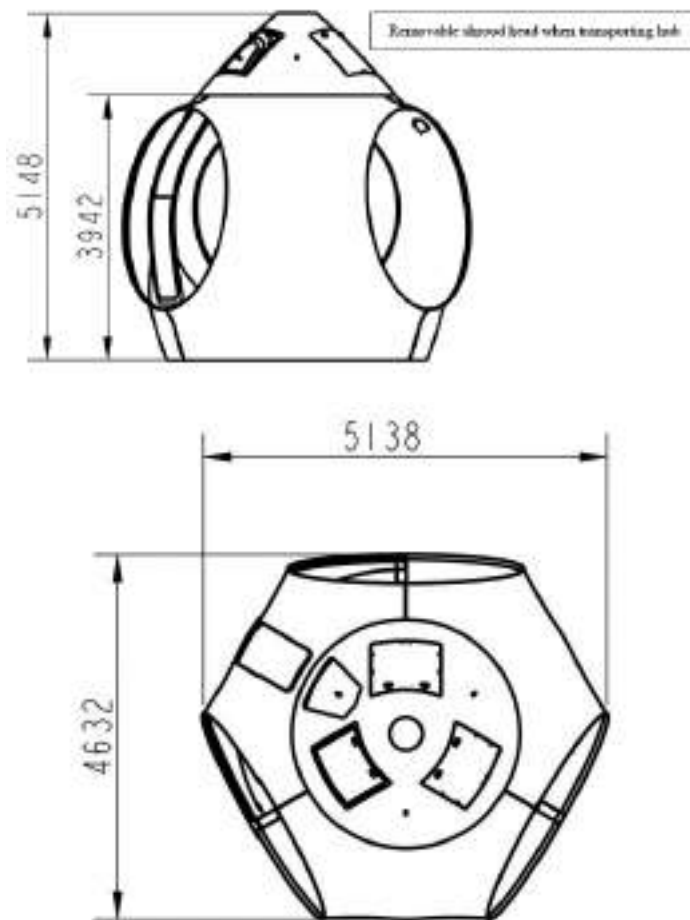
PITCH SYSTEM

The pitch bearings are used between the hub and blades to transfer loads from blades to the hub. The blades are connected to the inner race of a bearing with root bolts, and the outer race of pitch bearing, and blade pitch bearing is connected to the hub body with bolts. The pitch gears are integrated on the inner race of the bearing and blade pitch control is realised by the engagement with gears between pitch & gearbox.

The pitch system consists of two parts; the electrical and mechanical parts. The electrical assembly consists of a control cabinet, a motor and a backup power supply while the mechanical assembly consists of a pitch gearbox, pitch bearings and its connecting parts. The pitch control cabinet of the electrical assembly integrates controller, backup capacitor charging and monitoring and pitch motor brake holding control functions. It also effectively reduces system fault points. In the backup power supply, a supercapacitor module is used and this consists of fast charging, high power density features and it is less susceptible to ambient temperature. A supercapacitor can be fully charged within 10 minutes and its stored energy allows feathering at least once even in the worst case.

HUB

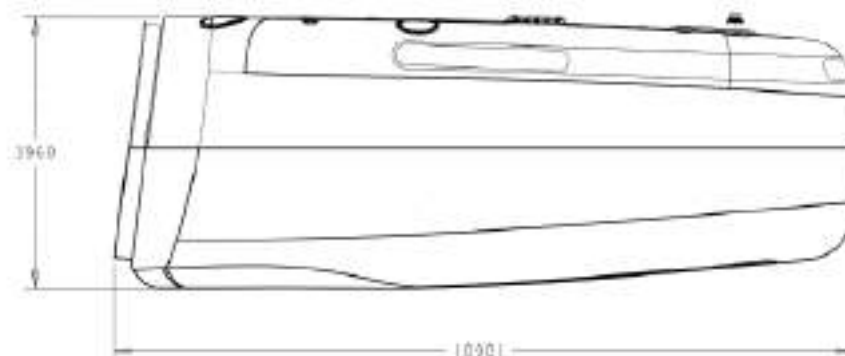
The hub is a cast construction with a combination of star type and ball type. The nacelle elevation angle, cone angle and blade preflex are used to ensure that the minimum distance between blade tips and the tower meets safety requirements.

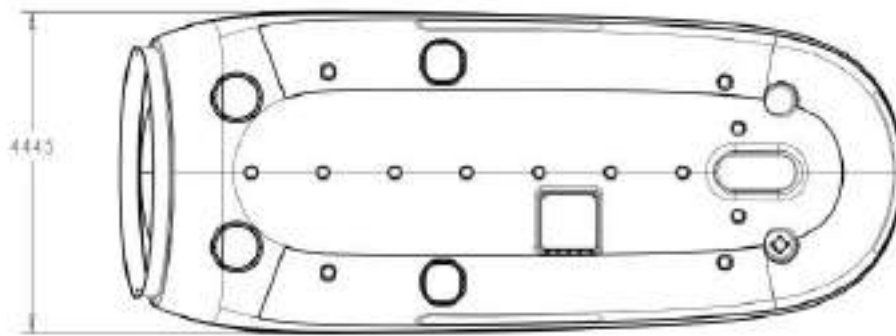
Figure 2-11 Outline of Hub

Source: Envision EN 171/6.5 Wind Turbine Specifications

NACELLE

The nacelle houses the generator and gearbox. The nacelle is equipped with control cabinet, hoist, yawing system, drive chain system etc.

Figure 2-12 Outline of Nacelle



Source: Envision EN 171/6.5 Wind Turbine Specifications

BRAKE SYSTEM

The primary braking method for the WTG is aerodynamic braking which is realised by three-blade pitch control. This braking system will work under various operating conditions such as normal shutdown, overspeed shutdown, emergency shutdown, etc. During aerodynamic braking, the pitch control keeps the wind rotor in a safe operating speed range. Supercapacitors supply power to three pitch systems individually and independently thus enabling individual and independent pitch control. In addition, a high-speed caliper is installed at the gearbox high speed shaft (HSS) end as an auxiliary brake for the whole machine.

After aerodynamic braking realised by pitch control reduces the speed of wind rotor to a certain range, the high-speed brake caliper at the gearbox HSS end acts to lock the drive chain. Based on EHS requirements, an all-round protective cover for HSS end is designed to ensure personal safety.

YAW SYSTEM

The yaw system is for wind alignment and cable untwisting and consists of yaw ring gears, yaw gearbox and yaw caliper. The yaw ring gear is arranged between the tower top flange and the yaw caliper, fixed on the flange with bolts. The yaw caliper and drives are bolted to the nacelle baseplate. By engaging the yaw ring gear with the yaw drive gear, the yaw caliper and the nacelle baseplate can slide relative to the yaw ring gear.

ELECTRIC SYSTEM

The electrical system mainly comprises of generator, convertor, transformer, electrical cabinet, power cable, pitch control, etc. Optimal matching between the doubly fed induction generator (DFIG) and its convertor enables the best power capture and good power grid quality. The generator's wind speed range allows the wind turbine to cut into a power grid under extremely low wind speed. Coupled with a high overspeed tolerance, it is suitable for extremely wide wind conditions and disturbance range.

Generator

The generator converts mechanical energy into electricity. The generator will be a DFIG with simple structure, high efficiency, speed range of 7.1rpm to 9.94rpm, rated power: 6750kW and rated voltage 1140V. The EN-171/6.5 turbine uses 1140V three-level electrical drive chain design instead of the traditional 690V two-level configuration to improve the efficiency of electrical drive chain. The generator has two (2) pairs of poles and is for horizontal installation. It will adopt air cooling system where cooled air in nacelle will enter the generator through the air inlet, passes through the winding end, magnetic pole, and radial ventilation slot, and cools down the components in the generator by taking away the heat and sending the warm air into the air collecting device.

The generator temperature rise at the ratings is Class B. It can operate at Class F temperature under special short-term conditions. Its designed thermal life for long term operation exceeds 20 years. The insulation system will be sealed windings which is highly resistible to dust, salt fog, humidity and temperature cycle. The generator consists of stator, rotor, stator shaft, rotor shaft, etc.

Generator Stator

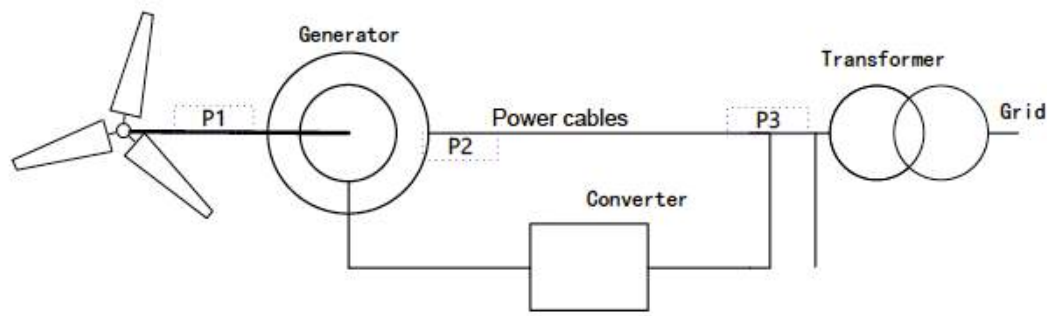
The generator stator connects to the box transformer directly and consists of stator support, core, windings, and other accessories. The stator employs a fractional slot winding arrangement to further eliminate the influence of harmonics. The unique arrangement of rotor poles reduces vibration and noise.

Generator Rotor

The rotor of the wind turbine converts the kinetic energy in the air into mechanical energy of rotation. It is connected to the converter through power cable, slip ring and carbon brush then the voltage is boosted by the box transfer and connected to the grid. Its rotation results from the lift created by the airflow over blades.

Converter System

The convertor system consists of an LV distribution circuit, complete converter power, control and distribution protection circuits. The generator-side converter in the convertor is connected to the rotor side of the doubly fed generator while the grid side is connected to the grid. The rotor side converter controls the generator torque and the reactive power exchanged between the stator side and the power grid by generating three phase voltages with different amplitudes and frequencies. The line side converter exchanges active power with the power grid. The amplitude of such active power is the active power absorbed or emitted by the rotor side converter. The line-side converter absorbs or emits reactive power.

Figure 2-13 Schematic of the Electrical System – Electrical Drive Chain for DFAG

Source: Envision EN 171/6.5 Wind Turbine Specifications

TOWER

The tower is the main supporting structure of wind turbine. The yaw bearing in the nacelle is directly connected to the tower flange by bolts so as to transfer the load on the upper section of wind turbine to the foundation through the tower. The tower will be equipped with ladders and fall protection equipment inside, as well as aiding apparatus or elevators upon the request of customer. Rest platforms will be provided inside the tower at intervals along the height direction, and all tower tubes will be provided with platforms and lamps.

GRID CONNECTION

Each wind turbine will be provided with one transformer to connect to the grid. The power transmission circuit will be connected with the low voltage side of transformers via a main switch for incoming line and directly buried cables. During the start-up and grid connection process of the wind turbine, the wind direction sensor will detect the wind direction and enable yaw controller to actuate, aligning the wind turbine with the wind direction. When wind speed exceeds cut-in wind speed, the wind turbine output voltage is adjusted to the value of grid voltage and the system frequency is made suitable for grid connection through the control of full power converter. At the same time, the phase difference between grid voltage and generator's terminal voltage is measured. When such difference becomes zero (zero crossing point), the power element of the converter, operates to achieve grid connection (all these actions in EN171.6.5 wind turbine can be realized through converter system). Other components of the wind turbine will include:

- Lightning protection and grounding;
- Environmental control system;
- Monitoring system; and
- Automatic fire protection system.

A brief technical information of the selected turbine is provided in the table below.

Table 2-8 Brief Technical Information of WTG (Envision Energy Co., Ltd, n.d.)

ITEM	UNIT	GW165-5.2 V42R01C100
Basic data of Wind Turbine		
Manufacturer/model		Envision EN 171/6.5
Rated Power	kW	6500
Rotor Diameter	m	171
Hub Height	m	100
Cut-in Wind Speed (10 minutes)	m/s	3
Rated Wind Speed (10 minutes)	m/s	12.8
Cut-out Wind Speed	m/s	25
Maximum Wind Speed (10min average)	m/s	42.5
Operating Temperature Range	°C	Normal atmospheric temperature wind turbine : -10°C to 40°C
Survival Temperature Range	°C	-20°C to 50°C
Design Service Life	Year	20
Blade		
Number of blades	-	3
Blade length	m	83.9
Weight	t	20.5
Blade Material		Glass fiber reinforced polymer (GFRP)
Blade Processing Technology	-	Vacuum infusion
Blade Root Connection	-	Metal flange
Swept Area of Rotor	m ²	22965
Pitch System		
Pitch control	-	Electric pitch control
Pitch range	-	-5° ~ 90°
Type of backup power supply for pitch control	-	Supercapacitor
Maximum speed of pitch motor	rpm	2500
Type of pitch motor	-	AC Permanent Magnet Synchro (PMS)
Pitch lubrication	-	Automatic lubrication
Hub		
Material	-	EN-GJS-400-18
Type	-	Casting
Generator		
Manufacturer	-	Envision
Type	-	Doubly fed induction generator
Number of pole pairs	-	2 pairs of poles
Rated Power	kW	6750
Rated Voltage	V	1140
Cooling Method	-	Air cooling
Rated efficiency of generator	-	97%
Rated frequency of generator	Hz	50Hz

ITEM	UNIT	GW165-5.2 V42R01C100
Generator protection class	-	IP54
Protection class of rotor slip ring	-	IP23
Insulation Class	-	F
Lubrication Method	-	Lubricated with grease
Converter		
Rated Output Power	kW	6500
Cooling Method	-	Air Cooling
Moisture-proof method	-	Heating and Ventilation
Rated Voltage	V	1140
Protection class	-	IP54
Brake System		
Primary Brake System		Aerodynamic brake achieved by of three blade pitch control
Yaw System		
Yaw Concept	-	Electro-mechanical yaw
Type of Yaw Brake	-	Yaw ring gear + passive brake
Material of Yaw Ring Gear	-	42CrMo4
Lighting Protection		
Lighting protection measures		Electrical lighting protection, blade tip lighting protection, etc.

2.8.5 Project Auxiliary Facilities

Auxiliary facilities for the Project will include:

- Site entrance and security building;
- Administration building, offices and amenities;
- Central Control Room;
- Warehouse and stores;
- Security;
- Lighting;
- Other mobile plant and vehicles;
- Access roads; and
- Electrical connections and substation.

INTERNAL ACCESS ROADS

The WF will include Internal access roads between turbines to enable easy access within the Project site. The internal access roads will be approximately 5.5 m wide including.

ACCESS ROADS

Appropriate roads are needed for site access and the hauling of equipment and turbines during construction and operation. The road to access project area mostly follows an existing road, however, new roads will be required between the WTGs. The layout for the BOP design, which is for the roads and cables are shown in the Figure below. Cables will be underground in trenches.

SUBSTATION

The project requires electrical substations which serve as the central points for electricity collection and transformation of the electricity to the transmission system voltage. The substation's primary role is to collect the electricity from the turbines and transform the voltage before being transferred to the transmission line for distribution to the national grid. Location of substation is shown in Figure above (shown in yellow).

Figure 2-14 BOP Design Layout (Roads, Cables and Substation)



2.9 Associated Facilities

Associated facilities are those which are not funded as part of the Project, but without which (or without their expansion) the Project would not be viable. The associated facilities for the Project will include:

- Overhead Transmission Lines (OHTL)– this is not funded by the Project and will be part of the Off-taker responsibility,
- To connect to the national grid, the Off-taker, is planning to install 1 unit additional 220 kV slot in the 220 kV open switchgear of 330/220/110 kV existing Gobu Power Plant and 1 unit additional 220 kV slot in the open switchgear of 330/220/110 kV existing Yashma Substation.

OHTL

As stated earlier, Azerenergi is responsible for developing, constructing, commissioning and operating the OHTL lines. Preliminary design information was made available by Azerenergi in May 2021 (OHTL route preliminary design).

This will include the development of three (3) 220kv single circuit OHTLs which will be a total of 80 km in length. The lines will connect Khizi 3 WF substation (SS) to the existing Yashma SS, Khizi 3 to Area 1 WFs SS and Area 1 WF SS to the existing Gobu Power Station.

Based on the preliminary design information provided by Azerenergi, the following Tables provide the design specifications for the OHTL route.

Table 2-9 Pirakashkul – Gobu OHTL

THE SPECIFICATION OF 220 kV GOBU POWER PLANT-PIRAKASHKUL POWER PLANT OVERHEAD LINES			
Pos	DESCRIPTION OF MATERIAL AND EQUIPMENT	UNIT OF MEASUREMENT	NUMBER
1	Cable ACK 500/64	Tone	172.0
2	Wire OPGW	Km	33.0
3	Anchor-angle metal support Y330-3+5 10	Tone	140.8
4	Anchor-angle metal support Y330-1+5 15	Tone	257.0
5	Anchor-angle metal support Y330-1+9 10	Tone	197.9
6	Tangent metal support П330-3 85 units	Tone	543.3
7	Jackets 480 units	m ³	720.0
8	24xПCB120Б suspension-insulator string	Unit	285.0
9	2x25xПCB120Б traction-insulator string	Unit	210.0
10	Connecting clips CAC330-1	Unit	87.0
11	Vibration self-regeneration ГВП-3,2-13-500/23	Unit	720.0
12	Vibration self-regeneration ГВП-1,6-11-350/16	Unit	240.0
13	Grounding Ø 16 mm	Tone	5.3
14	OPGW wire suspension fixture	Unit	85.0
15	OPGW wire traction fixture	Unit	70.0
16	Junction box for OPGW wire	Unit	15.0
17	Construction of roads along the route	m ³	30,000
18	Transmission of wire		

Table 2-10 Khizi – Yashma OHTL

THE SPECIFICATION OF 220 kV KHIZI WIND POWER PLANT-YASHMA SUBSTATION OVERHEAD LINES			
Pos	DESCRIPTION OF MATERIAL AND EQUIPMENT	UNIT OF MEASUREMENT	NUMBER
1	Cable ACK 500/64	Tone	115.0
2	Wire OPGW	Km	22.0
3	Anchor-angle metal support Y330-3+5 10	Tone	70.38
4	Anchor-angle metal support Y330-1+5 15	Tone	171.36
5	Anchor-angle metal support Y330-1+9 10	Tone	98.95
6	Tangent metal support П330-3 60 units	Tone	383.52
7	Jackets 320 units	m ³	480.00
8	24xПCB120Б suspension-insulator string	Unit	200.00
9	2x25xПCB120Б traction-insulator string	Unit	120.00
10	Connecting clips CAC330-1	Unit	114.00
11	Vibration self-regeneration ГВП-3,2-13-500/23	Unit	480.00
12	Vibration self-regeneration ГВП-1,6-11-350/16	Unit	160.00
13	Grounding Ø 16 mm	Tone	3.54
14	OPGW wire suspension fixture	Unit	60.00
15	OPGW wire traction fixture	Unit	40.00
16	Junction box for OPGW wire	Unit	10.00
17	Construction of roads along the route	m ³	30,000
18	Transmission of wire		

Table 2-11 Pirakashkul – Khizi OHTL

THE SPECIFICATION OF 220 kV PIRAKASHKUL WIND POWER PLAN-KHIZI WIND POWER PLANT OVERHEAD LINES			
Pos	DESCRIPTION OF MATERIAL AND EQUIPMENT	UNIT OF MEASUREMENT	NUMBER
1	Cable ACK 500/64	Tone	172.0
2	Wire OPGW	Km	33.0
3	Anchor-angle metal support Y330-3+5 10	Tone	140.8
4	Anchor-angle metal support Y330-1+5 15	Tone	257.0
5	Anchor-angle metal support Y330-1+9 10	Tone	197.9
6	Tangent metal support П330-3 85 units	Tone	543.3
7	Jackets 480 units	m ³	720.0
8	24xПCB120Б suspension-insulator string	Unit	285.0
9	2x25xПCB120Б traction-insulator string	Unit	210.0
10	Connecting clips CAC330-1	Unit	87.0
11	Vibration self-regeneration ГВП-3,2-13-500/23	Unit	720.0
12	Vibration self-regeneration ГВП-1,6-11-350/16	Unit	240.0
13	Grounding Ø 16 mm	Tone	5.3
14	OPGW wire suspension fixture	Unit	85.0
15	OPGW wire traction fixture	Unit	70.0

THE SPECIFICATION OF 220 kV PIRAKASHKUL WIND POWER PLAN-KHIZI WIND POWER PLANT OVERHEAD LINES			
POS	DESCRIPTION OF MATERIAL AND EQUIPMENT	UNIT OF MEASUREMENT	NUMBER
16	Junction box for OPGW wire	Unit	15.0
17	Construction of roads along the route	m ³	30,000
18	Transmission of wire		

A brief description of the main components of the transmission line are 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, it is anticipated that the transmission line will consist of a number of towers/pylons that will be self-supporting and grounded to ensure low resistance. Selected tower types will be designed to meet the applicable national standards and regulations. Based on national requirements, the protection zone for 220 kv lines is set at 25m (*Resolution of the Cabinet of Ministers of the Republic of Azerbaijan on the approval of the "Rules for the protection of electrical networks with voltage up to 1000 volts" and "Rules for the protection of electrical networks with voltages over 1000 volts"*).

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 depend on the outcome of the geotechnical investigations undertaken along the OHTL route.

CONDUCTORS

Conductors are the wires used to carry electrical power. These wires/conductors will be mounted on the towers. The earthing wires also called Optical Ground Wires (OPGW) combines the function of grounding and communications. The earthing wires 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.

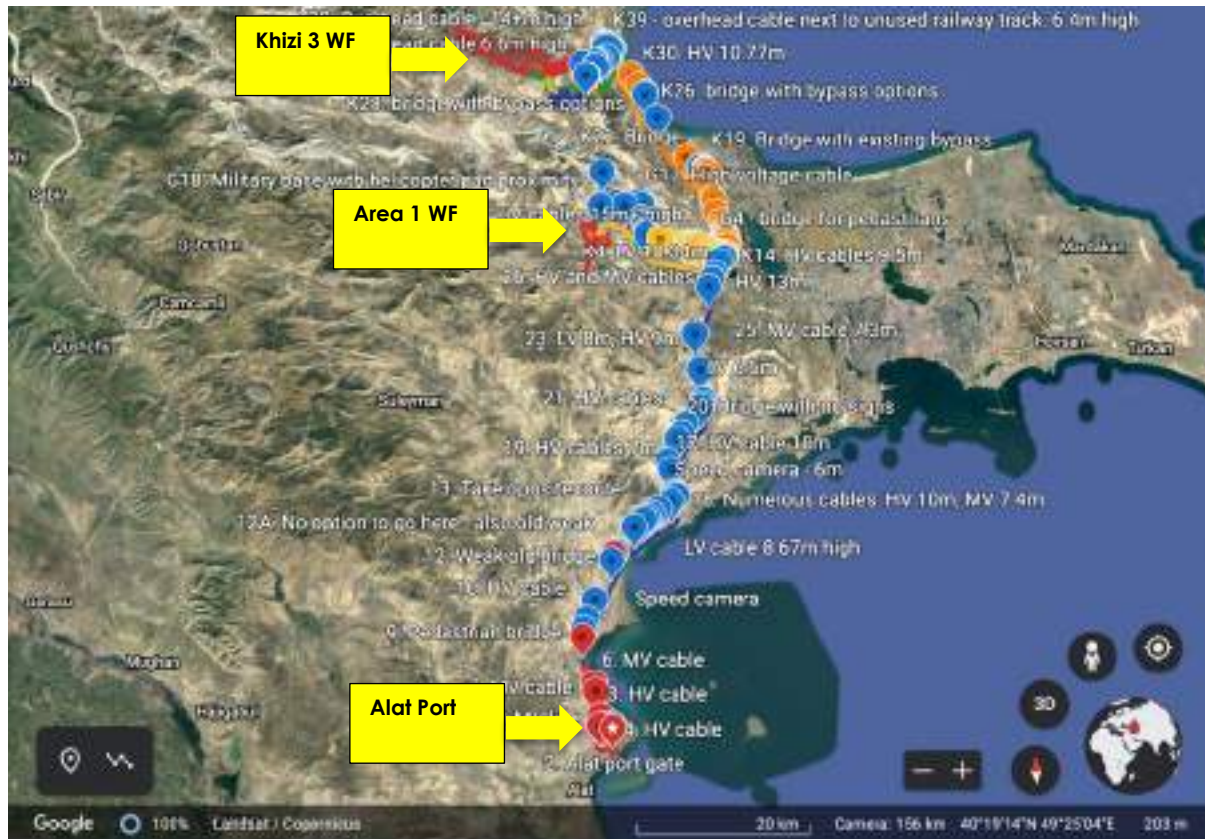
INSULATORS

Insulators are OHTL components installed between live conductors and earthed parts and subjected to mechanical and electrical stress.

2.10 Traffic and Logistics for Transporting WTGs

A preliminary route survey has been undertaken for the Project to assess the suitability of the road infrastructure and identify any restrictions and obstructions along the route from Alat Port in Baku to Khizi 3 and Area 1 WFs. The overall transport distance from Alat Port to Khizi 3 project area is approximately 100 km.

Figure 2-15 Route considered for Transporting WTG components (Blue Water Shipping, 2020)



Most of the route shown in the survey for transporting the equipment uses existing legal roads. The study identifies the locations where road improvements are required and overhead structures are recommended to be removed (e.g., speed camera gantry, pedestrian crossing, et.).

To enter the Khizi 3 WF, red route shown in Figure below is considered to access site. The routes mostly follow existing dirt road; therefore road improvements and construction of roads will be required. Please refer to Transportation and Traffic Section for more information on the roads and transport.

Figure 2-16 Roads being Considered to Access Khizi 3 Wind Farm Area



Transport method will be carried out using a combination of road and sea transport. Trailers will be used to transport the WTG components to project area by road. The survey identified that there are no width / length obstacles along the route and trailers should be selected based on the height factor and the total combination of weight and axle loadings to be approved to cross bridges.

A combination of Sea transport into one of the Black Sea ports and River transportation following the Russian river system into the Caspian Sea, will be undertaken using sea barges and marine vessels and will take approximately 16 weeks to reach Alat Port. This includes transit and temporary port stops along the route. The proposed vessels for sea transport include the following:

- Barges:
 - o Stand pontoon (barge): DWCC 3200 ts (full weight intake);
 - o Tween hold type barge :Dead Wait Cargo Capacity (DWCC) approx. 7,900 tons (this refers to barges that have two (2) sometimes three (3) decks);
- Marine vessels: 30,000T heavy lift vessels with 350t-crane. Total 4.5 vessels will be required to deliver the WTGs.

The transit time for barge transport is approximately 20 days for one (1) trip and 45 days for round trip. Generally, two (2) vessels carry three (3) WTGs, therefore 17 barges will be used for Khizi 3 Project.

2.11 Project Construction Requirements

2.11.1 Wind Farm

Typical activities during the planning and construction phases for wind farms are listed below:

- Detailed project planning and design and consideration of project components by the EPC Contractor;
- Transportation of components to the project site;
- Site preparation (comprising excavation, grading, levelling, and land clearing at WTG platforms) to create flat land area for installation of wind turbine towers and various project components;
- Primary project construction work (comprising excavation and levelling etc.) for installation and laying of transmission cables, collector/switchgear, and the installation of electrical substation(s);
- Additional facilities construction work (comprising excavation and levelling etc.) for access road, internal road network, construction of any building infrastructure (if required); and
- Commissioning tests of electrical infrastructure (including wind turbine generators) and inspection of civil engineering quality records.

2.11.2 OHTL

Based on preliminary information provided by Azerenergi, the expected duration to complete the construction of the OHTL route is 6 to 12 months. The construction of the OHTL will be carried out by the Off-taker.

2.11.3 Batching Plant

A concrete batching plant will be located at the wind farm if ready mix concrete will not be sourced for the project. At this stage, the exact location of the batching plant within the project site is unknown. With regards to water requirement for the batching plant this will be supplied to the site via water tankers. Please see sub-section 2.11.6 on Utility Requirements for additional information on water requirements for concrete works. This ESIA has assessed potential impacts from the batching plant in respective chapters herein.

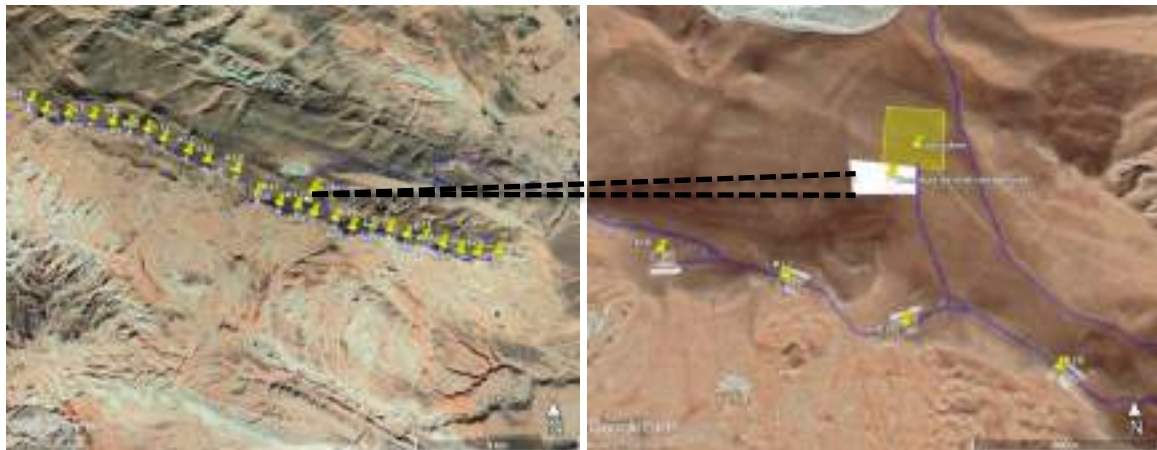
2.11.4 Laydown Area

The temporary construction laydown area will be located approximately 450m to the south of the dry lake. This area will be required during the construction phase of the Project for the storage of materials by the EPC contractor as well as sub-contractors. After completion of construction, the construction laydown areas will be disassembled, and the area will be returned to its original condition. Laydown areas usually 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 proposed laydown area is shown in the Figure below.

Figure 2-17 Location of Laydown Area



2.11.5 Utility Requirements

The EPC contractor will be solely responsible for all construction utilities including power supply, potable water, firefighting supplies and systems, erosion and sedimentation control, waste management and temporary medical and welfare facilities. Where possible, the EPC contractor will connect to existing utilities, where this is not possible utilities will be provided by water tankers and generators.

2.11.6 Water Supply

Water required for the construction activities will be sourced from Sumgait City Water and canal Department of "Azersu" JSC and supplied to the site via licensed water tanker trucks.

DOMESTIC WATER

Water Requirement for Workers at Site

During construction, the project will require potable water supply for workers at the site. The estimated quantity of potable water required is approximately 3 l/person/day. The estimated number of construction workers during peak will be 220 personnel, potable water is estimated at 660 l/day at peak periods of construction.

Accommodation Camp

As stated below, accommodation areas will be established either in Sumgait (located 11 km east of project area) or Baku since both cities will have the infrastructure to accommodate workforce including water supply network. Water for the accommodation camp will be supplied from the state water authority to the cities. IFC / EBRD Guidance on Workers' Accommodation states that 80 to 180 litres of water per person per day should be made available (dependant on weather conditions and accommodation standards). In line with EBRD/IFC requirements, the drinking water will meet national/local or WHO drinking water standards.

CONCRETE WORKS

A concrete batching plant might be located on site if ready mix concrete will not be sourced for the project. Table below presents the water consumption estimates per WTG for the different construction activities.

Water demand calculations are provided in Section 9.6.1 of the ESIA Report.

2.11.7 Workforce

Requirements for construction workforce are yet to be finalised. At this stage it is understood that about 220 personnel will be present at the Wind Farm during peak construction periods. This will comprise a combination of Project Company, EPC Contractor and sub-contractor staff.

2.11.8 Temporary Offices

A temporary office and storage area (laydown area) would be erected at wind farm site. Such temporary facilities will have welfare facilities and a concrete batch plant may also be present. The Contractor will provide suitable welfare facilities for all site personnel including:

- Regularly maintained general canteen/mess area;
- All site welfare facilities including lockable Male and Female flushable Toilet Block of portacabin type;
- Changing rooms/showers;
- First Aid cabin including, first aid equipment, etc;
- Installation and commissioning of all temporary power supplies;
- Adequate vehicle parking spaces for up to 40 cars/vans;
- Adequate area for temporary site offices and storage containers for all site contractors;
- Temporary site lighting and services for the compound;
- Temporary communications for the compound;
- Fuel tanks and other liquid storage areas with suitable segregation, refuelling areas; and
- Laboratory/testing or holding facilities.

2.11.9 Worker Accommodation

At this stage, the exact location of the worker accommodation and other workers accommodation requirements for either the EPC contractor and subcontractor have not been determined yet. However, it is expected that the necessary facilities and standards of facilities for all worker accommodation/camp will be specified by the Project Company and will be in accordance with the IFC/EBRD Worker Accommodation Processes and Standards.

Accommodation areas will be established either in Sumgait (located 11 km east of project area) or Baku since both cities will have the infrastructure to accommodate workforce. On site, a temporary camp will be set up for emergency accommodation and will be suitable to the weather in the area.

2.11.10 Waste Streams

Table below presents the typical wastes generated and estimated quantities for similar Wind Farm Projects as provided by ACWA Power.

Table 2-12 Typical Waste Generated during Construction (ACWA Power)

					DEPARTMENT			ESTIMATED QUANTITY	
TYPE OF WASTE	DESCRIPTION	RECOMMENDED CONTAINER	EWL CODE ¹	IWIC ²	OFFICE	SERVICE	CONSTRUCTION	CONSTRUCTION ESTIMATED QUANTITY ³ KG/WTG INSTALLED	KG/WTG SERVICED (ANNUAL GENERATION)
Non-hazardous Waste									
Organic Waste ⁴	Park and garden waste. Biodegradable waste	Organic waste container	20 02 01	-	x			-	-
Consumer Waste (office waste)	Mixed office waste (i.e., tables, chairs, etc.)	Urban waste container	20 03 01	-	x			-	-
Wood	Wood which does not contain hazardous substances (palettes)	Stackable or open container	17 02 01	-			x	350	3
Glass	Glass packaging	Specific container for glass	17 02 02	-	x			-	
Plastics	Plastics which do not contain hazardous substances. Plastic material used in packaging and protection	Open airtight container or drum with leaf spring closure system	17 02 03	-	x	x	x	90	3
Scrap Metal	Mixed metals which do not	Open airtight container or	17 04 07	-		x	x	12	10

					DEPARTMENT			ESTIMATED QUANTITY	
TYPE OF WASTE	DESCRIPTION	RECOMMENDED CONTAINER	EWL CODE ¹	IWIC ²	OFFICE	SERVICE	CONSTRUCTION	CONSTRUCTION ESTIMATED QUANTITY ³ KG/WTG INSTALLED	KG/WTG SERVICED (ANNUAL GENERATION)
	contain hazardous substances	drum with leaf spring closure system							
Electronic scrap	Cables without hazardous substances	Open airtight containers	17 04 08	-			x	30	-
Paper & Cardboard	Non-contaminated paper & Cardboard	Specific container for paper and cardboard	20 02 01	-	x	x	x	45	5
Construction & Demolition (C&D) (not applicable for Project)	Mixed cement, bricks, tiles, gypsum based and non-hazardous ceramic materials. Mixed construction and demolition waste not containing dangerous substances	Site container	17 07 01 17 07 03	-			x	275	-
Wastewater	Domestic water use in toilets on site						x	-	-
Hazardous Waste									

TYPE OF WASTE	DESCRIPTION	RECOMMENDED CONTAINER	EWL CODE ¹	IWIC ²	DEPARTMENT			ESTIMATED QUANTITY	
					OFFICE	SERVICE	CONSTRUCTION	CONSTRUCTION ESTIMATED QUANTITY ³ KG/WTG INSTALLED	KG/WTG SERVICED (ANNUAL GENERATION)
Used toner cartridges	Waste printing toner (including cartridges)	Specific container for toner	08 03 09	Q5 D15 S12 C41 H14 A170 B0019	x		x	-	-
Used oil	Non-chlorinated engine, gear, and lubricating oils. Hydraulic oils containing only mineral oil. Non-chlorinated insulating and heat transmission oils and other liquids	Drum with leaf spring closure system or original packaging	10 02 02 13 01 06 13 03 03	Q05 R13 S37 C16 H13 A170 B0019		x	x	15	5
Contaminated empty containers	Packaging containing residues of or contaminated by dangerous substances	Drum with leaf spring closure system	15 01 08	Q05 D15 S36 C41 H13 A170 B0019		x	x	10	4
Contaminated plastic containers	Plastic packaging with the remains of hazardous substances or	Drum with leaf spring closure system	15 01 08	Q05 D15 S36 C41		x	x	-	-

					DEPARTMENT			ESTIMATED QUANTITY	
TYPE OF WASTE	DESCRIPTION	RECOMMENDED CONTAINER	EWL CODE ¹	IWIC ²	OFFICE	SERVICE	CONSTRUCTION	CONSTRUCTION ESTIMATED QUANTITY ³ KG/WTG INSTALLED	KG/WTG SERVICED (ANNUAL GENERATION)
	which has been contaminated by hazardous substances			H13 A170 B0019					
Contaminated metal containers	Metal packaging with the remains of hazardous substances or which has been contaminated by hazardous substances	Drum with leaf spring closure system	15 01 08	Q05 D15 S36 C41 H13 A170 B0019		x	x	-	-
Contaminated absorbers	Absorbent materials (including paper and cardboard), filtration materials (including all oil filters not specified in other categories), sepiolite, cleaning rags and protective clothing contaminated	Drum with leaf spring closure system	15 02 02	Q05 D15 S36 C41 H13 A170 B0019		x	x	15	15

					DEPARTMENT			ESTIMATED QUANTITY	
TYPE OF WASTE	DESCRIPTION	RECOMMENDED CONTAINER	EWL CODE ¹	IWIC ²	OFFICE	SERVICE	CONSTRUCTION	CONSTRUCTION ESTIMATED QUANTITY ³ KG/WTG INSTALLED	KG/WTG SERVICED (ANNUAL GENERATION)
	by hazardous substances.								
Contaminated wipe clothes	Cleaning rags, protective clothing and wiping cloths contaminated by hazardous substances	Drum with leaf spring closure system	15 02 02			X		-	-
Contaminated oil filters	Filtration materials or oil filters contaminated by hazardous substances	Drum with leaf spring closure system				X-		-	6
Antifreeze	Antifreeze which contains hazardous substances	Drum with leaf spring closure system or original packaging		Q7 D15 L20 C51 HS A170 B0019		X	X	-	-
Electronic scrap	Waste electronic equipment or waste disposal of electronic equipment containing traces of hazardous products other than PCBs,	Drum with leaf spring closure system or container	16 02 13	Q6 D15 S/L8 CS1 H14 A170 B0019	X	X	X	2	-

					DEPARTMENT			ESTIMATED QUANTITY	
TYPE OF WASTE	DESCRIPTION	RECOMMENDED CONTAINER	EWL CODE ¹	IWIC ²	OFFICE	SERVICE	CONSTRUCTION	CONSTRUCTION ESTIMATED QUANTITY ³ KG/WTG INSTALLED	KG/WTG SERVICED (ANNUAL GENERATION)
	chloro-fluorocarbons, HCFCs, HFCs or asbestos								
Used batteries	Batteries containing mercury and mobile phone batteries/lead batteries	Specific container for batteries	16 06 03 16 06 01	Q06 R13 S37 C16 H14 A170 B0019	X	X	X	2	-
Contaminated Soil	Soil and stone (including material excavated from contaminated areas) which contains hazardous substances	Drum with leaf spring closure system or open container	17 05 03	Q5 D5 S23 C51 H14 A170 B0019		X	X	2	-
Fluorescent Lamps	Fluorescent tubes and other waste containing mercury	Drum with leaf spring closure system	20 01 21	Q6 D5 S40 C16 H14 A170 B0019		X	X	1	1
Aerosol (spray)-empty spray cans	Empty spray container	Drum with leaf spring closure system	20 01 22	Q14 D15R S36 C41C H14H		X	X	1	1

								DEPARTMENT			ESTIMATED QUANTITY	
TYPE OF WASTE	DESCRIPTION	RECOMMENDED CONTAINER			EWL CODE ¹		IWIC ²	OFFICE	SERVICE	CONSTRUCTION	CONSTRUCTION ESTIMATED QUANTITY ³ KG/WTG INSTALLED	KG/WTG SERVICED (ANNUAL GENERATION)
							A842(4) B0019					
Waste paint	Waste paint containing organic solvents and dangerous substances	Drum with leaf spring closure system			08 01 11				X	X	-	-
Epoxy waste 5	Resins used for blade reparation	Drum with leaf spring closure system							X	X	-	-
Other types of hazardous waste		-	-		X	X	X	-	-			

1 European Waste List Code

2 International Waste

3 Estimated Values based on previous Supply and Installation Wind Energy Projects. They may vary depending on the scope of the activities (i.e. EPC)

4 Normally managed by the local authorities

5 Epoxy waste refers to resins used for blade reparation. Preped, Isocynate waste, Polyester waste are most likely NOT relevant SBU's

2.11.11 Vehicles, Equipment and Heavy Machinery Requirements

EPC Contractors/sub-contractors responsible for different construction activities within the site will make use of various kinds of vehicles, equipment and heavy machinery during the construction phase of the wind farm. The anticipated vehicles, equipment and machinery to be used on site during the site preparation and construction activities include but not limited to:

Table 2-13 Vehicles & Construction Equipment During the Construction Phase

Name	Quantity	Type of Fuel
1200t crawling crane (main Crane)	1	Diesel
Auxiliary Crane (80t)	1	Diesel
50t crawling crane (Unload crane)	1	Diesel
Truck	3	Diesel
Forklift	2	Diesel
Diesel generator	1	Diesel
Wheel loader	1	Diesel
Backhoe excavator	7	Diesel
Crawler bulldozer	1	Diesel
Road roller	2	Diesel
Dump truck	10	Diesel
Batch plant	2	Electrical
Concrete Mixer Truck	1	Diesel
Large Concrete Mixer	1	Diesel

Note: The equipment/machinery listed above is anticipated to be used by the EPC Contractor only. The sub-contractors are expected to have additional equipment/machinery depending on their area of work. The final selection of equipment/machinery might slightly differ from those proposed in the table above.

2.12 Project Operational and Maintenance Requirements

The Wind Farm is expected to be operational for 20 years and operations and maintenance activities will be undertaken by The First National Operations and Maintenance Company (NOMAC), a wholly owned subsidiary of ACWA Power.

The operation of the wind farm will require limited operational activities such as 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 and migration periods during Spring and Autumn.

WORKFORCE

The operation of the wind farm is likely to be monitored and controlled from a remote location, as such, only a limited number of operational workforce are likely to be required. At this stage, it is understood that a workforce of about 10 will be engaged to carry out operation and maintenance activities of the wind farm.

ANCILLARY FACILITIES

Buildings will be constructed to accommodate employees and electric infrastructure for operation and maintenance activities. The O&M Building will be on the BOO site somewhere central and near the entrance. The O&M building will include;

- Office area (approximate size 60 m²);
- Storage area (approximate size 120 m²) with direct external ramp access;
- Switchgear room;
- Bunded area for products containing oil, area for hazardous substances;
- Workshop;
- Server/communications room;
- Meeting room;
- Kitchen and eating area;
- Mess room;
- Changing area/locker area; and
- Male and female toilets and showers and rest/recreation area all in accordance with relevant legislative requirements.

The O&M building will include permanent water supply and sewage connection or collection system (Septic tank) as applicable as well as all services (electrical, communications, water, etc.).

WATER SUPPLY

During operational stage, the project will require potable water supply for drinking, washing and cleaning purposes. The estimated quantity of potable water required during operation phase is approximately 50 l/person/day, therefore potable water is estimated at 500 l/day at peak periods of construction. A licensed potable water supply company will supply the water required to cover the water demand of the Project to the site via water tanker trucks.

WASTE STREAMS

The expected waste and wastewater streams from project operations include:

- Non-hazardous wastes will include municipal solid waste from workforce, offices and administration buildings;

- Hazardous wastes such as waste oil, transformers cooling oils, used sprays, contaminated plastic and metallic containers from machinery and maintenance activities; and
- Wastewater will be generated from the domestic use of water by staff.

2.13 Decommissioning of the Project

The expected operational life of the WF is 20 years. The plans for the WF towards the end of this period is unknown at this stage, however, any plans whether to replace the WTGs or decommission/ dismantle will be carried out according to the national Laws and project Agreements (e.g. Land Lease Agreement).

Given that the decommissioning of this Project is not expected for at least 20 years following Commercial Operation Date, it is not considered practical or of value to speculate on future environmental and social conditions including the sensitivity of current or future receptors at this time, or facilities that may or may not be present to handle wastes etc., or the extent of environmental and social regulation that may exist. Therefore, all impacts relating to the decommissioning phase of the Project will be planned to be approached and mitigated via a specific decommissioning plan prepared closer to the time of decommissioning and not included in the ESIA reports. The Decommissioning Management Plan will be able to account for changes in environmental regulations, improvements in technology and methods of demobilisation and will be developed prior to decommissioning and will be based on the Project's Environmental and Social Management System (ESMS).

All wastes generated during decommissioning will be managed in accordance with the waste management hierarchy. It is anticipated that a large quantity of materials will be segregated and recycled with minimal waste going to landfill. The methods for recycling or disposing the wind turbine components will be determined in compliance with future national legal requirements and applicable international best practices. A Decommissioning Management Plan will be developed at least 12 months prior to decommissioning, and this will include detailed methods for re-use, recycling and disposal of decommissioning materials and wastes. It is likely that a new ESIA would be required prior to approval/permitting for decommissioning.

2.14 Alternatives Assessment

In accordance with good practice methodologies for ESIA, the evaluation of various project design and activity alternatives should be considered, in order to ensure that the objectives of the proposed project have accounted for social, environmental, economic and technological options. The following project alternatives were considered at the feasibility stage:

- No Project Option;

- Site Selection;
- Technology (Turbine) Alternatives; and
- WTG Layout;
- OHTL Route.

2.14.1 No Project Alternative

Should the “Do Nothing” scenario be applied, then the anticipated negative impacts discussed throughout this ESIA will not occur. However, as assessed in this report, these impacts which are most likely to happen during the construction phase, are not expected to pose significant risks and can be adequately controlled through the implementation of the mitigation measures discussed in accordance with the Framework for Environmental and Social Management (ref. Volume 3 of this ESIA). If the project were not to go ahead, the positive impacts and benefits that will result from the operation of the WF such as environmental and socio-economic benefits and the increase in renewable energy, will not occur. Such benefits of the Project will therefore not be realised:

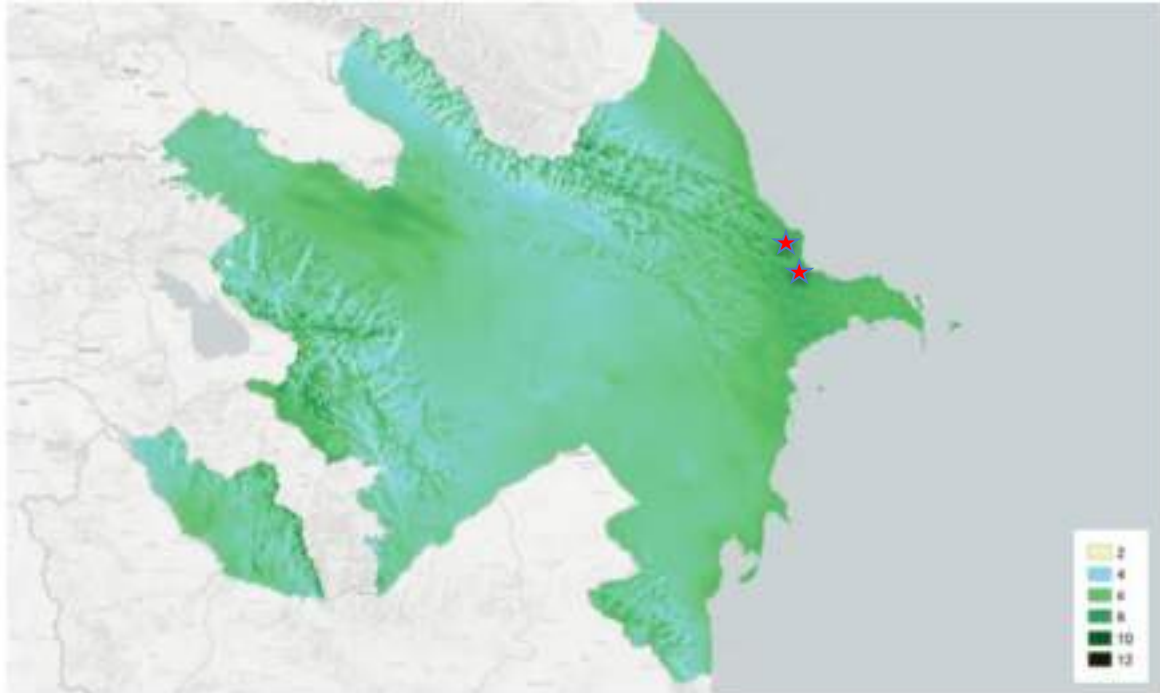
- Cutting carbon emissions and reducing reliance on traditional non-renewable power sources;
- Creating employment and training opportunities for Azerbaijan nationals in the field of wind and renewable energy;
- Reducing the reliance on fossil fuels and promoting alternate energy sources which is in line with country's commitments and economic drive.

Therefore, the implementation of the WF will have a positive impact in its contribution towards meeting the country's commitments and the “No Project Scenario” is expected to hinder the governments initiatives in achieving the above.

2.14.2 Site Selection

Based on surveys carried out in Azerbaijan, Absheron Peninsula, Caspian seashore and islands in the north-west of Caspian basin have excellent prevailing wind conditions as shown in Figure below. Based on a Wind Project (two (2) wind towers) installed by the Japanese company Tomen, together with Azerbaijan Scientific-Research Energy and Power Design Institute, the annual average wind speed is 7.9-8.1 m/sec in Absheron region. As shown in Figure below, the project sites are located within areas with best wind conditions.

Figure 2-18 Wind speeds at 100-meter hub height (in m/s) (IRENA, 2019)



In January 2020, three (3) sites were considered for the 240 MW Wind Projects in Azerbaijan as follows (also shown in Figure below):

- Khizi 3;
- Area 1 including extension areas (5 areas were considered within Area 1); and
- Area 7.

Figure 2-19 240 MW Wind Project Considered Sites



Out of the three (3) sites, Khizi 3 and Area 1 were selected due to the wind potential at these project areas and possible construction and operations synergies the close proximity of the two selected sites compared to the distance to Area 7 site.

Area 7 is considered far away and would require additional OHTL to connect this area with either Area 1 or Khizi 3.

2.14.3 Technology (Turbine) Alternatives

The turbines that were considered for the Project include the following:

- Siemens Gamesa – SG 6.0-155;
- Goldwind GW136-4.8;
- Goldwind GW165-5.2; and
- Envision EN171 6.5.

The Envision EN171-6.5 model was selected for the current layout and was based on the following:

- Least Cost of Energy (LCOE) which results in highest generation at lowest cost;
- Site Suitability of the chosen WTG Model; and
- Project Schedule.

2.14.4 WTG Layout

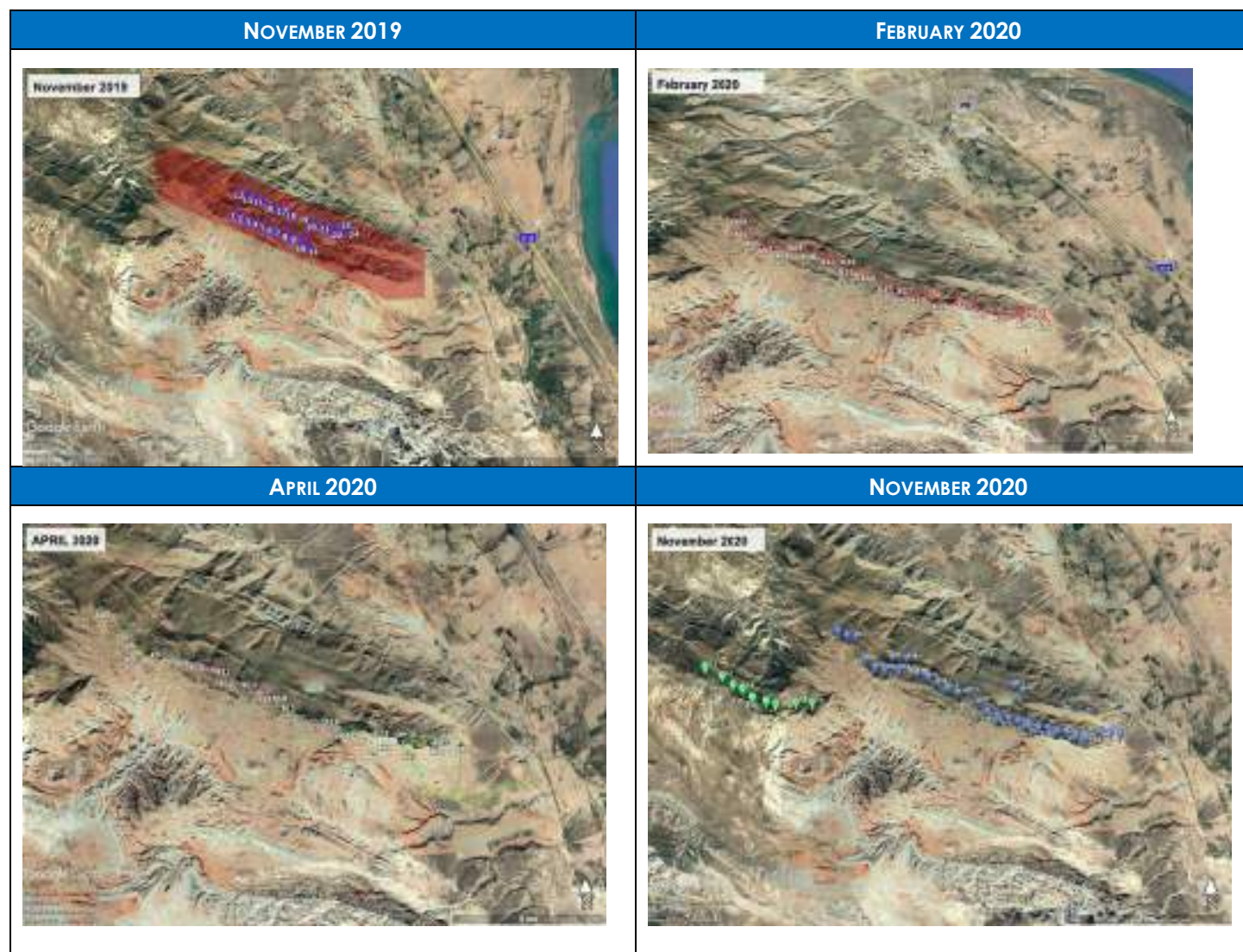
The layout and number of WTGs has progressed since the commencement of the ESIA study. Figure below shows the changes in the WTG layout from the initial stages of the project (site visit and site due diligence in November 2019), the scoping stage (March to May 2020), ESIA and updates in Layout (January and April 2021) to the current layout (November 2021).

The April 2021 layout included the maximum number of turbines that may be considered in this area. The layout and number of WTGs has been finalised and the selection of the WTG Layout is based on the following:

- Wind resource assessment;
- Distance from identified human and ecological receptors such as **breeding sites/ nests** identified during the Breeding surveys carried out for the Project;
- Outcome of the Archaeological surveys undertaken for the project to avoid identified archaeological sites;
- Outcome of the preliminary CRM and noise and shadow flicker modelling minimizing potential impacts on birds, bats, existing houses and settlements and as well as other environmental and social impacts;
- Balance of Plant Design (BOP);
- Constructability; and
- Operability.

The number of WTGs has been reduced from 49 to 25 WTGs. The reduction of WTGs was adopted by selecting larger capacity WTGs maintaining the overall wind farm capacity inclusive of Area-1 & Khizi-3 at 240MW, in turn minimising the impacts on birds even though it resulted in achievement of lower annual generation as compared to the generation that could have been achieved with lower capacity WTGs.

Figure 2-20 Changes in WTG Layout



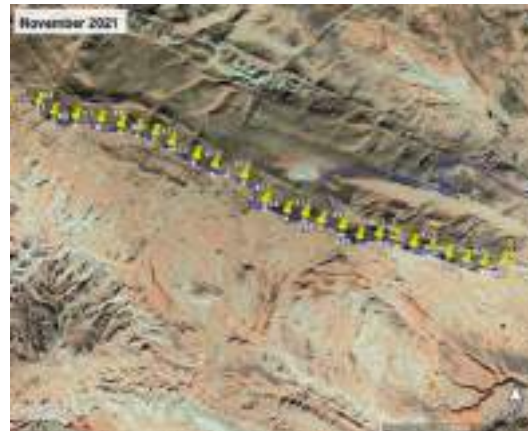
JANUARY 2021

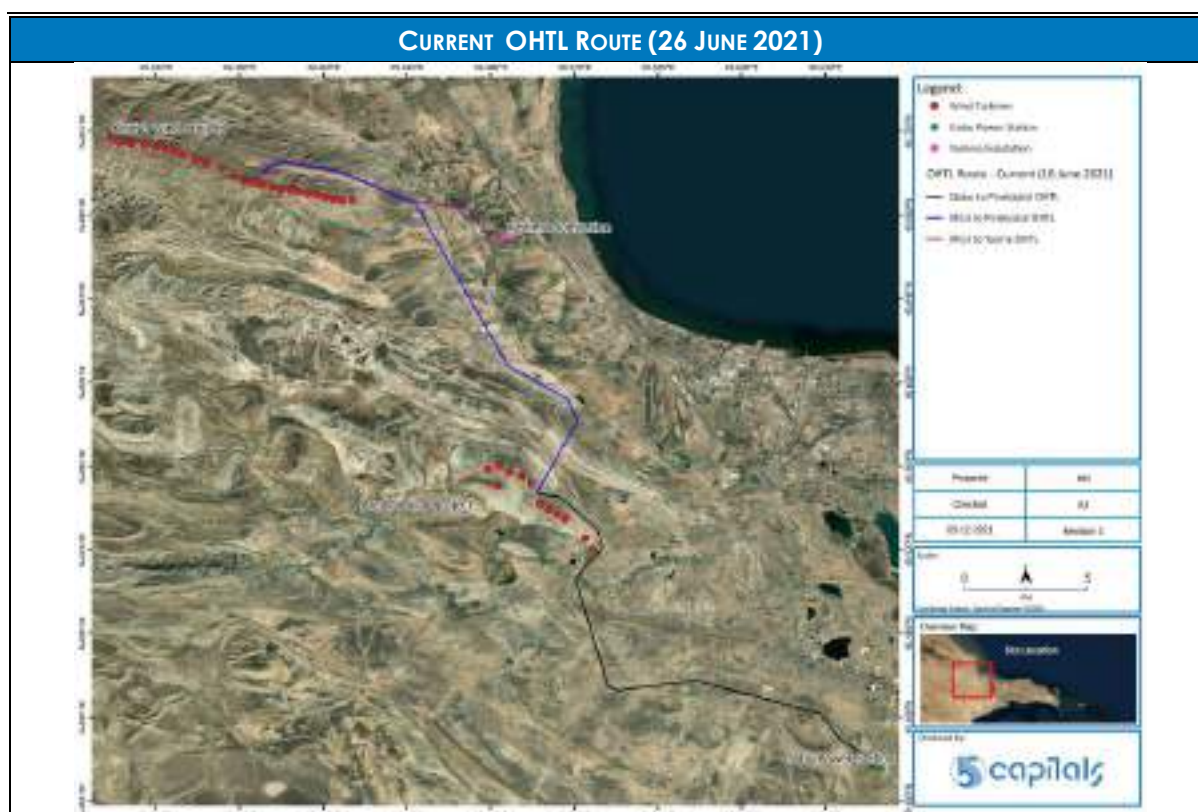


APRIL 2021 (CURRENT LAYOUT)



NOVEMBER 2021 (CURRENT LAYOUT)





The changes were based on the following:

1- Initial Identification of Key Environmental Risks

A review of the preliminary OHTL route and surrounding areas was carried out by 5 5Capitals using satellite imagery. Table and Figure below present the initial risks identified along the route. The key risk areas identified along the OHTL route can be summarised as follows:

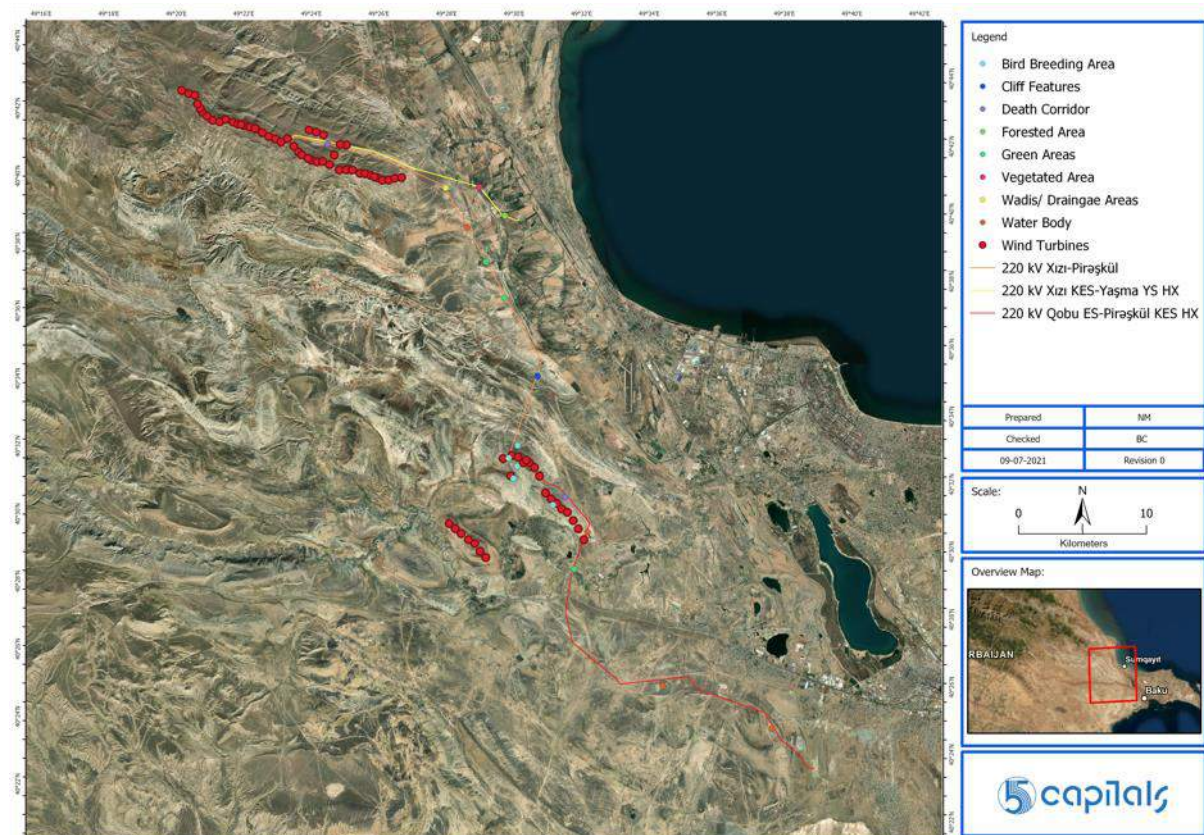
- Drainage, green and water features: More bird flight activity;
- Valley or wadi between cliffs: Potential paths for migrating birds;
- On top of cliffs: Raptors and other soaring birds getting thermals; and
- Cliff area: Could have nesting birds especially Raptors.

Table 2-14 Key Risks Identified along the preliminary OHTL route (provided 3 May 2021)

POINT	OHTL	Risks
A	Over dry Lake – two lines	Two lines increases risk of electrocution and collision (creates Death corridor)– also includes the WTGs
B	Crossing over green/ agriculture fields	More bird flight activity: Increases potential of Collision and Electrocution with Birds. Open agriculture fields are usually used by Raptors
C	Forested area (trees)	More bird flight activity and : Increases potential of Collision and Electrocution with Birds
D	Wadi/ Drainage	More bird flight activity and Potential paths for migrating birds.
E	Water Canal	Canal might not have much bird life.

POINT	OHTL	RISKS
F	Green Area	More bird flight activity: Increases potential of Collision and Electrocutation with Birds
G	Cliff Features	Requires survey this area to estimate risk. Cliff areas could have nesting areas esp. Raptors.
H	OHTL Line and WTGs	Cumulative risk increases with OHTL and WTGS
I	Water bodies	More bird flight activity: Avoid water bodies
J	Bird Breeding/ Colonies based on Breeding Surveys carried out for Khizi 3 and Area 1 Wind Farms	More bird activity

Figure 2-22 Initial Risks Identified along the Preliminary Route



Note: Map includes the previous WTG layout (April 2021).

Based on the initial / desk study review, Azerenergi revised the OHTL to avoid where possible the risks identified above.

2- Site Reconnaissance Survey

After, a site reconnaissance was carried out between 6 and 12 May 2021 along the OHTL route (provided 19 May 2021) and immediate surroundings. The key tasks included:

- Review of satellite imagery of OHTL route and surrounding areas;
- Site visit of representative areas along the OHTL route; and

-
- Preliminary identification of environmental and social conditions and any constraints along the route and immediate surrounding.

The site reconnaissance survey identified key environmental and social receptors along the route (outcome of the survey is provided in Section 2.5.2 above). Based on the outcome of the survey, Azerenergi revised the route to avoid, where possible farms and any other identified human and ecological receptors.

3- Outcome of Baseline Surveys

The outcome of the baseline surveys will also influence the final layout and route of OHTL by Azerenergi.

3 REGULATORY FRAMEWORK

The following chapter presents the regulatory requirements for conducting an ESIA for the Project in accordance with Azerbaijan national regulations as well as international guidelines, standards and good practices.

3.1 National Requirements

3.1.1 The Constitution

The highest Law within the Republic of Azerbaijan is the Constitution and prevails over the national laws and international agreements. The Constitution stipulates how to determine the applicability of national and international requirements as follows:

- International agreements acceded to by the Republic of Azerbaijan become an integral part of the legislative system of Azerbaijan; and
- If any conflicts arise between the normative-legal acts which constitute the legislative system of Azerbaijan (except for the Constitution and the acts adopted via referendum) and the international agreements acceded to by the Republic of Azerbaijan, the provisions of the international agreements shall apply.

It also stipulates the basic rights of people to live in a healthy environment, to have access to information on the state of the environment and to obtain compensation for damage suffered as the result of a violation of environmental legislation.

3.1.2 Environmental Laws, Regulations and Standards

The regulatory body within the Cabinet of Azerbaijan responsible for the regulation of the activities within the country that relate to ecology, environmental protection and use of natural resources is the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan (MENR).

The legal, economic and social framework for environmental protection in Azerbaijan is governed by the Environmental Protection Law of 1999 (No. 678-IQ) and its amending Laws (Law No. 1032-IVQD, 932-IVQD, 590-VQD and 553-IVQD).

The relevant national laws and regulations applicable to the proposed Project include (Laws of the Republic of Azerbaijan, 2020):

LAWS

- Presidential Decree Concerning the Enforcement of the "Environmental Protection" Law (14th July 2018);
- Law of the Republic of Azerbaijan "On Public Participation";

-
- Law on Automobile Roads (Protection of the environment during the construction or reconstruction of roads, official approvals from MENR);
 - SNIP 2.05.02-85 Building Code and Regulations for Automobile Roads, Environmental Protection (topsoil management, protection of local community, noise reduction, disposal of inert waste, etc);
 - Law on Protection of Historical and Cultural Monuments (Cultural Heritage);
 - Water Code (Protection of water resources);
 - Sanitary-epidemiological services;
 - Protection of Public Heritage;
 - Law on Public Radiation Safety No 432-IQ (if any radiation source would be used for non-destructive test);
 - Law of the Republic of Azerbaijan on Atmospheric Air Protection;
 - On accession of the Republic of Azerbaijan to the United Nations Basel Convention on the Control of Transboundary Movements and Disposal of Hazardous Wastes;
 - Law of the Republic of Azerbaijan on Fauna;
 - Law of the Republic of Azerbaijan on Hydrometeorological Activity;
 - Law of the Republic of Azerbaijan on Specially Protected Natural Areas and Objects;
 - Law of the Republic of Azerbaijan on Industrial and Domestic Waste;
 - About protection of greenery;
 - Law of the Republic of Azerbaijan on Approval of the Land Code of the Republic of Azerbaijan;
 - Law of the Republic of Azerbaijan on obtaining information on the environment;
 - Law of the Republic of Azerbaijan an Addition to the Law of the Republic of Azerbaijan "On Specially Protected Natural Areas and Objects";
 - Law of the Republic of Azerbaijan on accession to the Stockholm Convention on Persistent Organic Pollutants;
 - Law of the Republic of Azerbaijan on Environmental Security;
 - Law of the Republic of Azerbaijan on Environmental Protection;
 - Law of the Republic of Azerbaijan on accession to the European Convention for the Protection of Wildlife and the Natural Environment of Europe [http: //e-qanun.az/framework/2986](http://e-qanun.az/framework/2986);
 - Concerning the accession of the Republic of Azerbaijan to the UN Convention on Access to Information, Public Participation in Decision-Making and Open Conduct of Justice in Environmental Issues; and

- Law of the Republic of Azerbaijan on Accession to the Kyoto Protocol to the United Nations Framework Convention on Climate Change.

DECREES

- Law on Mandatory Environmental Insurance No 271;
- Decree on additional measures in the field of protection of greenery and ensuring safety in landslide zones during construction activities;
- Decree of the President of the Republic of Azerbaijan on some decrees of the President of the Republic of Azerbaijan related to land;
- Decree of the President of the Republic of Azerbaijan on the application of the Law of the Republic of Azerbaijan "On Environmental Protection";
- Decree of the President of the Republic of Azerbaijan on ensuring the implementation of the Law of the Republic of Azerbaijan "On Specially Protected Natural Areas and Objects"; and
- Decree of the President of the Republic of Azerbaijan on the application of the Law of the Republic of Azerbaijan "On obtaining information on the environment".

HUMAN RIGHT

The rights of people are guaranteed by the Constitution of Azerbaijan under Chapter III 'Basic Rights and Liberties of a Person and Citizen' which lists the main principles of these rights. The constitution states that "The state guarantees equality of rights and liberties of everyone, irrespective of race, nationality, religion, language, sex, origin, financial position, occupation, political convictions, membership in political parties, trade unions and other public organizations. Rights and liberties of a person, citizen cannot be restricted due to race, nationality, religion, language, sex, origin, conviction, political and social belonging."

Azerbaijan ratified the Convention for the Protection of Human Rights and Fundamental Freedoms (ECHR) on 15 April 2002. Human right treaties ratified by Azerbaijan are presented in the Table 3-1 below (Treaty Body Database, 2020).

LABOUR & EMPLOYMENT

The Labour law system in Azerbaijan is governed by (Labour Code, 1999):

- Constitution of the Republic of Azerbaijan;
- Labour Code of the Republic of Azerbaijan, February 1999.
- Relevant laws of the Republic of Azerbaijan;
- The normative and legal acts adopted by relevant Executive Authorities within the scope of their authority;
- International treaties signed or supported by the Republic of Azerbaijan with respect to Labour and socioeconomic issues.

- In accordance with Article 35 of the Constitution of the Republic of Azerbaijan, Labour is the basis of individual and public welfare. The Constitution stipulates that every person has the right to freely choose an activity, profession, occupation and place of work on the basis of his skills and abilities.

The Labour Code of the Republic of Azerbaijan (1999), authorises the following (Labour Code, 1999):

- *'Employment, social and economic rights of employees and employers in the sphere of labour relations on the basis of the appropriate legal norms and a minimum level of proper guarantees relating to said rights';*
- *'Employment, social and economic rights of employees and employers in the sphere of labour relations on the basis of the appropriate legal norms and a minimum level of proper guarantees relating to said rights';*
- *'Principles and procedures ensuring the right to employment, rest and work under safe and healthy conditions and to other basic human rights and freedoms as stipulated in Section Two of the Constitution of the Republic of Azerbaijan';*

Other Laws include:

- Law on Sanitary-Epidemiological Services (authorised by Presidential Decree No. 371); and
- Law of the Azerbaijan Republic on Protection of Public Health No. 360-IQ: Sets the regulations for public health protection and the health care system. The law stipulates the liability and compensation requirements in the event of damage to health that results from a polluted environment.

OHTLs

Based on the local requirements by the MENR, the environmental regulator in Azerbaijan, and the national Law on Environmental Impact Assessment (2018), an EIA is required for transmission lines of 220 kilovolts and more than 15 km in length (Annex 1 of the EIA Regulation).

"Design of electric power stations with a capacity of 300 megawatts and more and electricity transmission lines of 220 kilovolts more than 15 km in length."

Therefore, under local requirements, an EIA must be carried out for the OHTL.

Based on the information received from the Off-Taker (Azerenergi), an EIA might not be carried out within the ESIA timeline, therefore, and as agreed with EBRD, a high-level assessment of potential OHTL impacts has been included as part of the Khizi 3 and Area 1 Wind Farms ESIA studies.

Therefore, this ESIA includes the E&S assessment for the OHTL that connects Khizi 3 WF to Yashma Substation and connects both wind farms.

Other laws include (safety zones):

- Resolution of the Cabinet of Ministers of the Republic of Azerbaijan on the approval of the "Rules for the protection of electrical networks with voltage up to 1000 volts" and "Rules for the protection of electrical networks with voltages over 1000 volts", Approved by the Decision No. 103 of Cabinet of Ministers dated 10 June 2005.
- The protective zones identified for lines over 1000 V are presented in the Table below.

Table 3-1 Protective Zones set by National Requirements

LINE VOLTAGE (kV)	>1≤20	35	110	150	220	330-500
DISTANCE (M)	10	15	20	25	25	30

LAND RIGHTS AND RESETTLEMENT

Key legislative and regulations addressing land acquisition and resettlement in the Republic of Azerbaijan include (Asian Development Bank, 2014):

- The Constitution of the Republic of Azerbaijan (Adopted on 12 November 1995, revisions made on 18 March 2009);
- The Land Code (Adopted on 25 June 1999, last revisions made on 20 April 2012);
- The Civil Code (Adopted on 28 December 1999, last revisions made on 20 April 2012);
- The Flat Code (Adopted on 15 November 2011, last revisions made on 20 April 2012);
- The Land Acquisition Law (April 2010);
- Law on valuation activity (25 June 1998, last revisions made on 20 April 2012);
- Law on "Land Lease" (11 December 1998, № 587-IQ);
- Decree of the President on additional activities regarding to implementation of the Law on "Acquisition of Lands for State Needs" (15 February 2011);
- Decree of the President on ensuring the execution of the law No. 506-3 QD dated 7 December 2007 on —Amendments and Additions to the Civil Code of the Azerbaijan RepublicII (26 December 2007);
- Resolution of the Cabinet of Ministers on approving of guidelines for preparation of Resettlement Plan and Resettlement Guideline No. 45 dated 24 February 2012;
- Resolution of the Cabinet of Ministers on approving the guidelines for selection of a person or entity to prepare Resettlement Plan or Resettlement Guideline No. 55 (21 April 2011);
- Resolution of the Cabinet of Ministers No. 110 (28 June 1999);
- Resolution of the Cabinet of Ministers No. 42 On Some Normative and Legal Acts Relating to the Land Code (15 March 2000);

- Law of Azerbaijan Republic on Municipality Area and Lands (07 December 1999, No: 771-IQ); and
- Law on Management of Municipality Lands (29 June 2001, No: 160-IIQ).

3.1.3 International and Regional Conventions/Protocols

The environmental conventions and protocols ratified by the Milli Majlis of the Republic of Azerbaijan are listed in the Table below (Environmental Conventions and Protocols ratified by the Milli Majlis of the Republic of Azerbaijan, 2020). The Project must comply with the environmental and social requirements of the below protocols and conventions.

Table 3-2 Environmental & Human Right Treaties, Conventions and Protocols (Treaty Body Database, 2020).

NAME OF CONVENTION/ PROTOCOL	SIGNED/ RATIFIED
Environmental	
European Convention on the Protection of the Archaeological Heritage	1992
Vienna Convention for the Protection of Ozone Layer	1985
United Nations Convention for Combat Desertification	1994
Convention on the Protection of World Culture and Natural Heritage, November 16, 1972	06.12.1993
UN Framework Convention on Climate Change (Kyoto Protocol, 1992)	18.07.2000
Convention of the World Meteorological Organisation – Conclusion on International Civil Aviation Avimemeterological Supply Section 2 14.1	03.10.1993
Convention on International Trade Wildlife and Wildlife Species Threatening Roots CITES	-
Convention on Assessment of Environmental Effects in the Trans Border Context (Espo, February 25, 1991)	01.02.1999
European Convention on the Protection of Wildlife and Natural Environment of Europe (Bern, September 19, 1979)	01.02.1999
"Environmental issues related to data acquisition, Public Participation and Justice in Court Decision on Hold on" the UN Convention (Aarhus city, June 25, 1998)	09.11.1999
Convention on Assessment of Environmental Impact in the Border Context	01.02.1999
Montreal Protocol on Ozone Destruction Materials (September 15-17, 1997)	18.07.2000
Convention on Biological Diversity (June 5, 1992), Convention on Biological Diversity on Biotechnic 23 PROTOCOLES 23.0355A.	-
International Convention on Plant Protection (Rome, 1951)	14.03.2000
United Nations Convention on the Protection and Use of Border Water Flows and International Lakes, March 22, 1992 (Helsinki 22, 2009)	-
UNESCO Convention on Water Residents of International Significance, Mainly as Water Birds (Ramsar, February 2, 1971)	-
United Nation on Control Over Border Transportation and Disposal of Dangerous Waste March 22, 1989 Basel Case (April 22, 1989)	-

NAME OF CONVENTION/ PROTOCOL	SIGNED/ RATIFIED
Convention on Large Distance Air Transfer Border Pollution (Geneva, 13 November 1979)	09.04.2002
Stockholm Convention on Continuous Organic Polluters (May 22, 2001)	09.12.2003
Convention on the Border Effects of Industrial Accidents (Helsinki, March 17, 1992)	04.05.2004
Framework Convention on the Protection of the Caspian SEA Environment (Tehran, November 4, 2003)	04.04.2006
"European Landscape Convention (Florence, October 2000)	24.06.2011
Human Rights	
Convention against Torture and Other Cruel Inhuman or Degrading Treatment or Punishment	16 August 1996
Optional Protocol of the Convention against Torture	28 January 2009
International Covenant on Civil and Political Rights	13 August 1992
Second Optional Protocol to the International Covenant on Civil and Political Rights aiming to the abolition of the death penalty	22 January 1999
Convention for the Protection of All Persons from Enforced Disappearance	6 February 2007
Convention on the Elimination of All Forms of Discrimination against Women	10 July 1995
International Convention on the Elimination of All Forms of Racial Discrimination	16 August 1996
International Covenant on Economic, Social and Cultural Rights	13 August 1992
International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families	11 January 1999
Convention on the Rights of the Child	13 August 1992
Optional Protocol to the Convention on the Rights of the Child on the involvement of children in armed conflict	3 July 2002
Optional Protocol to the Convention on the Rights of the Child on the sale of children child prostitution and child pornography	3 July 2002
Convention on the Rights of Persons with Disabilities	28 January 2009

3.2 Lenders Requirements

ACWA Power are pursuing an amount of Project Finance from financial institutions who either:

- have their own internal E&S investment guidelines; or
- are members of the collective environmental and social agreements such as the Equator Principles.

At this stage, it is understood that EBRD has been mandated and ADB and OFID are potential lenders. As ACWA Power implements the E&S requirements of IFC on all its projects, the Area1 and Khizi 3 WF Projects must also comply with the IFC Performance Standards and IFC EHS Guidelines as part of ACWA Power Internal E&S requirements. The key E&S requirements for these financial institutions, as well as for any other Equator Principles Financial Institutions (EPFIs) that may also be involved are summarised below.

3.2.1 EBRD

POLICY AND PERFORMANCE REQUIREMENTS

EBRD has an internal Environmental and Social Policy (2019) and a set of specific Performance Requirement (PRs) covering key environmental and social components for consideration, assessment and management in their investments. These reflect EBRD's commitments to promote EU environmental standards as well as the European Principles for the Environment in their investments. The PRs are outlined below:

- PR1: Assessment and Management of Environmental and Social Impacts and Issues;
- PR2: Labour and Working Conditions;
- PR3: Resource Efficiency and Pollution Prevention and Control;
- PR4: Health and Safety;
- PR5: Land Acquisition, Involuntary Resettlement and Economic Displacement;
- PR6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
- PR7: Indigenous People;
- PR8: Cultural Heritage;
- PR9: Financial Intermediaries; and
- PR10: Information Disclosure and Stakeholder Engagement.

PROJECT CATEGORISATION

As per EBRD's Environmental and Social Policy (2019), 'EBRD categorises each project to determine the nature and level of environmental and social investigations, information disclosure and stakeholder engagement required'.

Appendix 2 of EBRD's E&S Policy outlines an indicative list of project types that would fall under Category A, which is defined as 'projects with potentially significant adverse future environmental and/or social impacts which require a formalized and participatory environmental and social impact assessment process'. This includes 'Large scale wind power installations for energy production (wind farms)' and 'Construction of high voltage overhead electrical power lines.

Therefore, this Project is expected to be categorised as Category "A". However, this to be confirmed with EBRD and Lenders.

3.2.2 ADB

The Project is required to be in compliance with the following guidelines, policies, and regulations, in addition to the legislation and standards of Azerbaijan:

- ADB Safeguard Policy Statement (2009);
- ADB Social Protection Strategy (2001);
- ADB Gender and Development Policy (1998); and
- ADB Access to Information Policy (2019).

In addition to ADB's internally developed requirements, it has usually advised by ADB that the following requirements are also expected for project compliance, as good practices:

- World Bank Group / IFC General Environmental, Health and Safety (EHS) Guidelines and Sector Specific Guidelines (e.g. EHS Guidelines for Wind Energy and EHS Guidelines for Electric Transmission and Distribution.);
- IFC Performance Standards (2012);
- IFC & EBRD Workers' Accommodation: Processes and Standards (2009) and applicable laws and regulations pertaining to environment, health, safety, social and labour in the investments' country of operations;
- Relevant international treaties to which the investments' country of operations are signatory such as the UN Declaration on the Rights of Indigenous Peoples, International Covenant on Economic, Cultural and Social Rights and relevant International Labour Organisation (ILO) Core Labour Standards Conventions;
- IFC Good Practice Handbook on Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets (2013); and
- Other relevant good industry practice guidelines and related documents.

PROJECT CATEGORISATION

Under ADB classification, the Project will most likely fall into Category A, where 'the proposed project's potential adverse environmental 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 (IEE), including an EMP, is required'.

3.2.3 OFID

The OPEC Fund for International Development (OFID) is a multilateral development finance institution that provides financing from member countries (12 countries) to non-member countries exclusively. Based on information published on the website, OFID assesses projects by undertaking social and environmental due diligence. In addition, OFID assesses '*the social, economic, and environmental viability of a development project and its contribution to the*

sustainable development objectives in the partner country' (OPEC Fund for International Development, 2021).

There are no specific environmental and social requirements disclosed on OFID's website.

3.2.4 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 projects 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 became effective on 1st October 2020. The principal changes relate to Human Rights and Climate Risk assessments. 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.

3.3 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.

3.3.1 Lenders Standards

An overview of the lender standards is presented below, whilst the applicable standards are presented in the respective environmental parameter sections of this report.

EBRD

In accordance with the EBRD Environmental and Social Policy (2019), 'The EBRD, as a signatory to the European Principles for the Environment, is committed to promoting the adoption of EU environmental principles, practices and substantive standards by EBRD-financed projects, where these can be applied at the project level, *'regardless of their geographical location. When host country regulations differ from EU substantive environmental standards, projects will be expected to meet whichever is more stringent.'*

EPFIs

EPIV 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 (PS)

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;
 - Including ILO Conventions;
- 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; and
- 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).

3.4 EIA/ESIA Requirements

3.4.1 National Environmental Impact Assessment (EIA) Requirements

A new Law on Environmental Impact Assessment was introduced in Azerbaijan on 14th July 2018, which sets out the mandatory EIA requirements within Azerbaijan. The purpose of this Law is to give effect to Article 54.2 of the Law on the Protection of the Environment in Azerbaijan, establishing the legal, economic and organisational framework for assessment of impacts on natural environment and human health associated with economic activities proposed by public and private developers.

Annex 1 of the Law lists the types of projects/activities that require an EIA. According to the list of projects provide in the Annex, this proposed wind project will require an EIA "Design of wind power stations with a capacity of more than 1 megawatt (wind generator parks)".

The key deliverables of the EIA process as required by the national legislation are:

- Scoping Meeting with MENR and relevant authorities (New EIA Law, 2018); and
- EIA Study.

Based on the new EIA Law (2018), a scoping report is not required and can be carried out in a form of a meeting. A virtual scoping meeting has been carried out with the MENR on 9th September 2020 and was attended by local consult and 5 Capitals. The purpose of the meeting was to present the project and confirm the content and scope of the study with MENR.

Further consultations letters were sent out to MENR with regards to the nearby Wind Farm and data required for the Cumulative Impact Assessment (CIA).

3.4.2 Lender Requirements

EBRD

In accordance with PR 1, there is a requirement for EBRD financed projects to undertake an appropriate Environmental and Social Assessment in order to:

- Identify and evaluate environmental and social impacts and issues of the Project;
- Adopt a mitigation hierarchy approach to address adverse environmental or social impacts and issues to workers, affected communities, and the environment from Project activities;
- Promote improved environmental and social performance of clients through the effective use of management systems; and

-
- Develop an ESMS tailored to the nature of the Project, for assessing and managing environmental and social issues and impacts in a manner consistent with the relevant PRs.

According to PR 1 "The ESIA will include an examination of technically and financially feasible alternatives to the sources of such impacts, including the non-project alternative, and document the rationale in selecting the particular course of action proposed. It will also identify potential improvement opportunities and recommend measures needed to avoid, or where avoidance is not possible, minimise and mitigate adverse impacts."

ADB

The proposed project most likely falls under Category A (under the environmental safeguard), an environmental impact assessment (EIA) including an environmental management plan (EMP) is required.

EU EIA LEGISLATION

EBRD is committed towards the promotion of the European Union's (EU) environmental requirements and is a signatory of the European Principles for the Environment. The Principles endorse and reinforce the European consensus on the values attached to the fundamental right for both present and future generations throughout the world to live in a healthy environment.

EIA Directive 85/337/EEC was introduced in 1985 and applied to a wide range of defined public and private projects. Since then, the initial Directive of 1985 and its three amendments have been codified by Directive 2011/92/EU of 13 December 2011. Directive 2011/92/EU was amended in 2014 by Directive 2014/52/EU.

Article 3 of the Directive states:

The environmental impact assessment shall identify, describe and assess in appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:

- a. Population and human health;
- b. Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
- c. Land, soil, water, air and climate;
- d. Material assets, cultural heritage and the landscape; and
- e. The interaction between the factors referred to in points (a) to (d).

The ACWA Power Khizi 3 Wind Farm falls under Annex II of the EIA Directive as 'Installation for the harnessing of wind power for energy production (wind farms)'. The Project will therefore undergo through a full EIA assessment.

EPFIs

Based on EP4, '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'. For Category A and, as appropriate, Category B Projects, the Assessment Documentation includes an ESIA.

4 APPROACH TO ESIA

4.1 ESIA Team

ACWA Power has engaged 5 Capitals to lead the environmental and social process with regard to this project. This includes supporting project consortium up to Financial Close with their prospective lenders.

In order to ensure that the project meets the national MENR expectations and is submitted by a registered consultancy, 5 Capitals has partnered with Ecoenergy, who will be responsible for elements of the ESIA process, including baseline studies stakeholder identification and engagement/consultation and liaison with relevant government authorities in Azerbaijan.

The team of specialists for this Project are presented in the tables below.

Table 4-1 5 Capitals' Project Team

Name	Role within ESIA
Ken Wade	Project Director
Reem Jabr	Project Manager and ESIA Specialist
Max Burrow	ESIA Specialist
Eniola Oladimeji	ESIA Specialist
Sonya Benjamin	Biodiversity, Ecological & Avifauna Expert
Lara Bou Ghanem	ESIA and Waste Specialist
Barney Chesher	ESIA Specialist Landscape and Visual Survey and Assessment Lighting Survey
Nicholas Meyer	GIS Mapping Specialist and Environmental Consultant
International Specialists	
Dr. Caleb Gordan (Xenops Environmental, LLC)	Ecological, Avifauna and CRM Expert. Dr. Caleb is an IFC consultant and international expert on the subject of birds and bats and wind farms. Dr. Gordon has worked on over 150 wind energy projects spanning 20 countries. Dr. Caleb was commissioned to review the bird and bat data and surveys undertaken by the local specialists and carry out the CRM for the revised WTG layouts.
Dr. Sunil Patel (ENTRAN)	Noise and Shadow Flicker Specialist – carry out the modelling for the revised WTG layouts.

Table 4-2 Ecoenergy Project Team

NAME	ROLE IN ESIA
Chingiz Orugov	Team Leader
Jeyhun Soltanov	Principal Environmental Adviser
Namig Muradov	Noise Specialist
Vugar Aghayi	Office Manager

NAME	ROLE IN ESIA
Dr. Elchin Sultanov	Ornithologist
Abdin Abbasov	Environmental Specialist
Nigar Aghayeva	Ornithologist
Dr. Ferid Aghabalayev	Ornithologist
Ilgar Mustafayev	Ornithologist
Saida Samadova	Ornithologist
Konul Aghayeva	Environmental Specialist
Dr. Nijat Hasanov Alisafa	Mammologist & Bat Specialist
Dr. Ilhama Karimova	Entomologist & Environmental Specialist
Sabina Bunyatova	Herpetologist & Environmental Specialist
Dr. Yusif Zeynalov	Botanist
Yusif Abiyev	Botanist
Aynur Erebzade	Botanist
Dr. Shamil Necefov	Archaeologist (Institute of Archaeology and Ethnography (AAS IAE) Azerbaijan National Academy of Sciences)
Dr. Muzaffar Huseynov	Archaeologist (Institute of Archaeology and Ethnography (AAS IAE) Azerbaijan National Academy of Sciences)
Dr. Anar Aghalarzada	Archaeologist (Institute of Archaeology and Ethnography (AAS IAE) Azerbaijan National Academy of Sciences)
Dr. Famil Humbatov	Radiologist (Radiation Institute of the National Academy of Science of Azerbaijan)

Table 4-3 Juru Energy Project Team (Livelihood Restoration Plan (LRP))

Name	Role within LRP
Umida Rozumbetova	LRP Project Manager
Zilola Kazakova	Social Resettlement Specialist
Sadar Huseynov	Local Social Specialist
Elnur Mammadov	Local Project Coordinator
Vusala Rustamova	Valuator - Safeguard Consultant (Social development and gender focused)

4.2 ESIA Methodology

This section provides information about the data collection and consultation process followed to inform the ESIA and the methodology that has been used to describe the sensitivity of environmental receptors; predict the magnitude of environmental impacts and assess the significance of impacts upon applicable environmental parameters.

4.2.1 Baseline Studies

Forming an integral part of the ESIA, the baseline surveys provide a benchmark of the existing conditions by which the potential impacts of the proposed project can be assessed for the construction and operational phase.

This ESIA has been informed by a review of relevant desktop information as well as a series of physical site surveys which have been summarised in the relevant environmental and social impact assessment chapters of this report. The environmental baseline surveys carried out as part of the ESIA included:

Table 4-4 Environmental and Social Baseline Surveys

SURVEY	MONITORING PERIOD	STATUS
Bird Surveys		
Bird Spring Migration Survey (2020)	27 March to 8 May 2020	Completed
Bird Breeding Survey (2020)	5, 9 and 11 June 2020	Completed
Bird Autumn Migration Survey (2020)	5 September to 11 December 2020	Completed
Bird Winter Survey (2020)	30 December 2020 to 10 March 2021	Completed
Bird Spring Migration Survey (2021)	17 March to 20 April 2021	Completed
Bird Breeding Survey (2021)	May to June 2021	Completed
Bird Autumn 2021	September to November 2021 (only for new VPs added during winter 2021 due to change in WTG Layout)	Stopped on 28 November (WTGs removed as per revised Layout)
Bat Surveys		
Passive Monitoring - Wind Masts	First passive detector installed 14 July to 16 October 2020 then detectors re-installed on 19 April 2021 for one Mast and on 7 July 2021 on another. Interruptions due to: 1. Shipment delays of detectors due to COVID-19 (March 2020 to June 2020) 2. Detectors are removed by November due to start of winter season (risk of damage to detectors) 3. Wind masts collapsed during winter (January 2021)	Completed
Active Monitoring - Transects and other surveys (Summer, Autumn)	Night Surveys 3 May 2020 until the end of October 2020 (3, 16, 26 May 2020; 1, 24 June 2020; 19 July 2020; 3, 30 August 2020; 12, 26 September 2020; 4 October 2020)	Completed
Additional Spring Survey (2021)	March to June 2021	Completed
Other Surveys		

SURVEY	MONITORING PERIOD	STATUS
Terrestrial Ecology	Survey carried out during: - May and October 2020 -Firs Survey (WF) - May 2021 (New area based on revised WTG Layout and Laydown area)	Completed
Soil and Water	WTG WF: Soil investigation conducted on 20 October 2020 and June 2021 Water sample collected on 21 October 2020 and June 2021 Laydown area: Soil investigation conducted on 19 May 2021 and 9 June 2021	Completed
Archaeology	Archaeology Survey (walk over) carried out in May 2020 Intrusive trial investigations carried out at several sites between 29 November 2020 and 16 December 2020 BOP route: (Roads and Cables) On-going: June 2021	Completed
Air Quality	24 April 2021 to 4 May 2021	Completed
Noise (background ambient noise measurements in line with IFC EHS Guidelines on Wind Energy)	1 June to 2 July 2021	Completed
Landscape and Visual	2-5 July 2021	Completed
Lighting	4 July 2021	Completed
Social Surveys		
Socio-economic Survey	Socio-economic survey was carried out for the Project between 17 July and 5 August 2020 in Sitalchay Village targeting 65 households.	Completed
Formal Interviews/ Meetings	Formal Interviews/ Meetings with seasonal farmers completed in February 2021.	Completed
Herders Survey	October/November 2021	Completed
OHTL Surveys		
Birds Breeding Survey	- OHTL 1: 3-7, 16, 23, 25, 27, 31 July 2021; 5, 6 August 2021 - OHTL 2: 30 June 2021, 2, 7, 13, 14, 18, 22, 24, 30, 31 July 2021; 3, 5, 7, 8 August 2021	Completed

SURVEY	MONITORING PERIOD	STATUS
	- OHTL 3: 5, 6, 8,15, 17, 27, 29 July; 1-2 August 2021	
Surveying Existing OHTL to Record Dead Birds	July/August 2021	Completed
Autumn Bird Survey	September to November 2021	Completed
Bats Survey	Bat Mist Netting & Active Monitoring: - OHTL 1: 23, 28 May; 18-20, 25-27 June; 3-5, 24-26 July; 8, 21,22 August 2021 - OHTL 2: 23, 28 May; 18-20, 25-27 June; 3-5, 24-26 July; 8, 21,22 August 2021 - OHTL 3: 23, 28 May; 18-20, 25-27 June; 3-5, 24-26 July; 8, 21,22 August 2021	Completed
Noise	25 and 27 June 2021 and 7, 12, 29 July 2021.	Completed
Ecology	June to August (Mammals, Reptiles, Entomology, Botany and Habitats, Herpetology)	Completed
Soil and Surface Water	28 and 29 July 2021	Completed
Archaeology	3 to 11 July 2021	Completed
Socio-economic Survey	July 2021	Completed

The baseline survey data for the different environmental and social aspects are described in respective chapters herein, with results provided, and included in the applicable appendices (Volume 4).

4.2.2 Project Stakeholder and Consultations

Consultation with stakeholders is an essential part of the environmental and social assessment process. A key objective of consultation is to establish dialogue with those stakeholders who may be affected by aspects of the Project or who may have an interest in the outcome of the ESIA process. For this Project, consultation has been undertaken during the ESIA process as follows:

- Engagement during Scoping Stage; and
- Engagement during ESIA Stage; and
- Public Disclosure of ESIA.

The methods used for the on-going stakeholder engagement process include letter correspondence with national, regional, local authorities and experts, face-to-face meetings, virtual meetings, emails and telephone calls.

Due to the COVID-19 pandemic and movement restrictions imposed in Azerbaijan during the course of the Project, alternative methods were developed for the consultations and engagement with stakeholders taking into account the national COVID-19 restrictions and

social distancing measures. This was based on EBRD briefing note for Consultations during COVID.

4.2.3 Impact Assessment & Significance Criteria

In order to obtain a credible assessment of environmental and social impacts, the assignment of “effect 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 an International Best Practice based on the assumption that the significance of an impact on resources or receptors is considered to result from an interaction between three factors:

- The nature and magnitude of the impact (i.e. a change in the environment, social and/or health baseline conditions);
- The number of resources or receptors affected (i.e. humans and the environment); 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 effects, as follows:

- Step 1 – Evaluation of value/sensitivity of resource or receptor;
- Step 2 – Assessing the magnitude of the impact on the resource or receptor; and
- Step 3 – Determining the significance of effects.

Identification and Evaluation of Sensitive Receptors

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 4-5 Environmental Value of Receptor or Resources

Value (sensitivity)	Description of Value
Very High	• High importance and rarity on an international scale 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

Value (sensitivity)	Description of Value
	supports (e.g, very limited or non-existent infrastructures and services such as (hospitals, 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 project's area, very frequent occurrences of gender based violence, very low probability of women's 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 infrastructures and services, limited access and high pressure on existing natural or economic resources available). • 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/marginalized 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 infrastructures 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 (or Lower)	• 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

Value (sensitivity)	Description of Value
	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).

Identification and Evaluation of Potential Impacts

During the evaluation undertaken, the following types of impacts will be 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.

Defining Impact Magnitude

The magnitude of the impact refers to the extent of change that is anticipated to occur for the receptor(s) under consideration and is considered as a function of:

- Extent/scale;
- Duration;
- Frequency; and
- Likelihood of occurrence.

In other words, the criterion that has been used for assessing the magnitude of impacts includes: the geographical scale of the impact, the permanence of impact and the reversibility of the impacted condition. A brief description of the magnitude of the impacts is provided in the Table below.

Table 4-6 Criteria for Magnitude of Impacts

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 scale, 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 above 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.
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.

Determining Significance of Effects

Significance of impacts is determined by taking into consideration the sensitivity of an identified receptor or resource and the magnitude of the Project impact. That is, the greater the environmental sensitivity of an identified receptor or resource, and the greater the magnitude of impact, the more significant the impact (project impact).

In addition to this, where a Project has a major detrimental impact on a highly valued environmental resource/receptor, the consequences of that impact on the said resource

would be significant adverse impact. In other words, it is the result of the impact acting on the receptor that produces an environmental impact.

Impacts can be either beneficial or adverse. The table below shows the criterion used for determining the significance of environmental impacts. Definitions of each significance categories are provided in the table below.

Table 4-7 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 to Major	Major	Major
	High	Neutral	Minor	Minor to moderate	Moderate to Major	Major
	Medium	Neutral	Negligible to minor	Minor	Moderate	Moderate to Major
	Low	Neutral	Negligible to minor	Negligible to minor	Minor	Minor to moderate
	Very Low	Neutral	Negligible	Negligible to minor	Minor	Minor

Table 4-8 Definition of Significance of Effects

SIGNIFICANCE CATEGORY	CRITERIA
Major	Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most 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	Important considerations at a local scale but, if adverse, are potential concerns to the project and may become key factors in the decision-making process.
Minor	These effects, if adverse, while important at a local scale, are not likely to be key decision-making issues. Nevertheless, 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	Local issue unlikely to be of importance in the decision-making process. Effects do not exceed statutory limits. Nevertheless, 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 of impact relies on reasoned argument, professional judgement and taking on board the advice and views of appropriate organisations. For some disciplines it is determined by comparison, wherever possible with company, locally, nationally or internationally accepted standards. If no standards are available then it is necessary to develop Project specific limits, based on guidance or best practice as necessary.

Such standards or limits are referred to as the **Significance Threshold**. If the size and type of impact is greater than the significance threshold, then this is termed a **Significant Impact**. Potential significant impacts need to be avoided and are therefore prioritised identifying mitigation measures to reduce the impact to an acceptable level.

Note: All predicted impacts with a beneficial impact have been colour coded green.

4.2.4 Mitigation & Management Measures

The Project includes a variety of measures to ensure that environmental and social standards and guidelines can be achieved by the Project. The Project's impact assessment process as outlined above will therefore take into consideration those measures included to the Projects design. In addition to specific measures included to the Projects design, 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 ameliorate 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 the lenders as part of the loan agreement.

4.2.5 Residual Impacts

Following assessment of the mitigation and management measures, the Projects residual impact significance will be considered to determine whether the proposed mitigation and management can be considered acceptable. The significance of such impacts is based upon the same criteria used to determine the impact significance before applying additional mitigation and management measures.

4.2.6 E&S Disclosure

In line with the EBRD, ADB, OFID and EPs requirements for consultations and disclosure, Project Information has been made available to the stakeholders and the general public at key stages of the ESIA assessment stages. The Project will undergo a 60-day disclosure period in accordance with the EBRD Environmental and Social Policy (2019) since the Project is an IPP and under the private sector and a 120-day disclosure period in accordance with the ADB Operations Manual as the Project falls under Category A of the environment safeguard.

In addition to posting the ESIA on ACWA Power's website, ESIA disclosure through public consultation meetings (in line with Covid-19) and the distribution of Project leaflets and brochures will be undertaken. The purpose of these meetings will be to invite the different stakeholders to present an overview of the Project, and the Environmental & Social assessment process undertaken; and to receive comments/feedback from the public (particularly the comments by the communities likely to be affected by the implementation of the Project), which will be incorporated to finalise the ESIA document.

At the end of 60 days EBRD disclosure period and 120 days ADB disclosure period, a public consultation and disclosure report will be developed based on additional consultation and feedback undertaken during the disclosure period. This feedback report will then be disclosed on ACWA Power's website together with the final ESIA package explaining the disclosure activities that have been undertaken, feedback received and whether/how these are addressed in the final ESIA and management plans.

5 AIR QUALITY

5.1 Standards and Regulatory Requirements

5.1.1 National Requirements

Ambient Air quality in Azerbaijan is regulated by the Law No. 109-IIQ on Protecting the Atmosphere. This law entered into force on 27th March 2001 with the purpose of:

- Protecting public health;
- Preventing air pollution;
- Regulation air emissions; and
- Gathering information on ambient air quality and pollution amongst others.

Currently, the air quality standards of the Soviet period are still in use in Azerbaijan. The table below provides the ambient air quality standards that should not be exceeded as a result of project activities.

Table 5-1 Ambient Air Quality Standards ($\mu\text{g}/\text{m}^3$, unless otherwise stated)

PARAMETER	AVERAGING PERIOD	MAXIMUM ALLOWABLE CONCENTRATION	
		MAC _{ON}	MAC _{AD}
Sulphur Dioxide (SO₂)	20-30 minutes	500	-
	1 hour	-	-
	24 hours	-	50
Nitrogen Dioxide (NO₂)	20-30 minutes	85	-
	1 hour	-	-
	24 hours	-	40
Carbon Monoxide (CO)	20-30 minutes	5 (mg/m ³)	-
	1 hour	-	-
	24 hours	-	3 (mg/m ³)
Ozone (O₃)	20-30 minutes	160	-
	8 hour mean	-	-
	24 hours	-	30
Benzene (C₆H₆)	20-30 minutes	1500	-
	24 hours	-	100
Lead (Pb)	20-30 minutes	1	-
	24 hours	-	0.3
Arsenic (As)	24 hours	-	2
Cadmium (Cd)	24 hours	-	0.3
Nickel (Ni)	24 hours	-	1

Note:

- **MACon** - the maximum allowable single concentration of a chemical in the air of residential areas, mg/m³. This concentration inhalation for 20-30 minutes should not cause reflex responses in humans.
- **MACad** - the maximum allowable daily average concentration of a chemical in the air of residential areas, mg/m³. This concentration should not affect a person direct or indirect harmful effects with an indefinite period of time.

5.1.2 Lenders Requirements

EUROPEAN STANDARDS (EBRD)

The following table presents the ambient air quality standards as established by the European Commission Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe, and previous Directives on air quality including 96/62/EC, 1-3 daughter Directives 1999/30/EC, 2000/69/EC, 2002/3/EC, and Decision on Exchange of Information 97/101/EC.

Table 5-2 EC Ambient Air Quality Standards (µg/m³ unless stated)

Pollutant	Concentration	Averaging Period	Permitted Exceedances per Year
PM_{2.5}	25	Annual	n/a
PM₁₀	50	24-hour	35
	40	Annual	n/a
Sulphur Dioxide	350	1-hour	24
	125	24-hour	3
Nitrogen Dioxide	200	1-hour	18
	40	Annual	n/a
Lead	0.5	Annual	n/a
Carbon Monoxide	10 mg/m ³	Maximum Daily 8-hour mean	n/a
Benzene	5	Annual	n/a
Ozone	120	Maximum Daily 8-hour mean	25 days averaged over 3 years
Arsenic	6 ng/m ³	Annual	n/a
Cadmium	5 ng/m ³	Annual	n/a
Nickel	20 ng/m ³	Annual	n/a
PAH	1 ng/m ³ (expressed as concentration of Benzo(a)pyrene)	Annual	n/a

Note: Not being a member State of the EU, it is noted that the Azerbaijan government does not manage ambient air quality in line with these standards, and as such the applicability of these standards in this ESIA assessment will only be for good practice benchmarking purposes, and not compliance assessment.

ADB AND EPFI's

Lenders will require adherence to the World Health Organisation (WHO) Ambient Air Quality requirements, as detailed in the IFC General EHS Guidelines.

Table 5-3 WHO Ambient Air Quality Standards ($\mu\text{g}/\text{m}^3$ unless otherwise specified)

PARAMETER	WHO AMBIENT AIR QUALITY STANDARDS	
	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 (guideline)	20 (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 (guideline)	10 (guideline)
NO ₂	200 (1 hour)	40
SO ₂	125 (Interim target 1)	500 (10-minute guideline)
	50 (Interim target 2)	
	20 (guideline)	
O ₃	160 (interim target 1) (8-hour daily maximum)	
	100 (8 hour daily maximum guideline)	

Source: World Bank General EHS Guidelines, 2007

5.2 Area of Influence

CONSTRUCTION PHASE

During construction, pollutants of concern that might impact air quality within the Project site, surrounding area and along the OHTL route include particulate matter from site clearance activities, gaseous emissions from vehicles, machinery and equipment and VOCs emission. Based on this the expected range of impacts are described below.

Particulate Matter/Dust Generation

According to the screening guidance of the UK's Institute of Air Quality Management (IAQM) for construction dust, dust generation is likely to impact:

- 'Human Receptor' within 350 m of the boundary of the site and/or within 50m of the route used by construction vehicles on public highway, up to 500m from the project site entrance; and
- 'Ecological receptor' within 50 m of the boundary of the site and/or within 50m of the route used by construction vehicles on public highway, up to 500m from the project site entrance.

Gaseous Emissions

According to the Design Manual for Roads and Bridges, gaseous emission is likely to impact receptors within 200 m of the project construction footprint or access route used by construction vehicles.

Odour and VOC emission

The expected range of impact from odour and Volatile Organic Compounds (VOC) are likely to be within a maximum of 100 m from source such as storage areas and various temporary toilets/septic tanks

OPERATION PHASE

In relation to air quality impacts during operation, emissions are not expected from the operation of the Wind Farm. However, gaseous emission from vehicles used in operation & maintenance activities are likely to impact receptors within 200m of the access route used by such vehicles.

5.3 Baseline

5.3.1 Regional Conditions

Climate indicators of Khizi District are characterized by data from the Baku and Siyazan (Gizil Burun) meteorological stations. The area has a temperate-hot semi-desert and dry desert climate. The climate is predominantly hot in summer and cold in winter. In summer, the soil temperature reaches 47-48 °C. In winter, the depth of soil freezing does not exceed 0.4 meters.

Figure 5-1 Climate Map of Project Area and Adjacent Territories



There are mostly north winds ("Nord") in the city during the year, making up a third of all winds. Their average speed during the year is 6.7 m/s, in some cases reaching 30-40 m/s. The average annual speed of southern and southwestern winds is 5.0 m/s. The annual volume of

precipitation is 220-230 mm. Annual evaporation is very high, with the main volume occurring in May-September when it varies between 1,100 and 1,250 mm.

The average annual relative humidity is 68-71% – 79-84% in winter (December-January) and 52-58% in summer. The main climate parameters (Baku meteorological station) are shown in the following tables.

Table 5-4 Repetition of Wind Directions and Number of Zero-Wind (calm) days, (%)

N	NE	E	SE	S	SW	W	NW	ZERO-WIND (CALM)
42	4	2	11	18	9	2	12	115

Table 5-5 Average Monthly and Annual Wind Speed (m/sec)

MONTHS												ANNUAL AVR.
JAN.	FEB.	MAR.	APR.	MAY	JUNE	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	
5.9	6.4	6.8	6.5	6.1	6.3	6.8	6.3	6.2	6.0	5.7	5.7	6.2

Table 5-6 Average Number of Windy (>15 m/s) Days

MONTHS												YEAR
JAN.	FEB.	MAR.	APR.	MAY	JUNE	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	
8.7	9.5	10.8	9.9	10.1	10.8	12.2	10.0	9.5	8.3	7.0	7.5	114

Table 5-7 Potentially High-Speed Winds

STATION	POTENTIAL WIND SPEED, M/SEC				
	1 YEAR	5 YEARS	10 YEARS	15 YEARS	20 YEARS
Baku	32	38	40	41	42

Table 5-8 Average Monthly Air Temperature, °C

MONTHS												ANNUAL AVR.
JAN.	FEB.	MAR.	APR.	MAY	JUNE	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	
3.4	3.8	6.3	10.8	17.7	22.4	25.4	25.5	21.5	16.6	10.8	6.4	14.2

Table 5-9 Monthly and Annual Precipitation, mm

MONTHS												ANNUAL AVR.
JAN.	FEB.	MAR.	APR.	MAY	JUNE	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	
20.6	20.5	24.4	26.7	12.8	9.3	4.4	6.5	13.5	35.4	28.4	25.1	18.9

Table 5-10 Evaporation, mm

MONTHS												ANNUAL AVR.
JAN.	FEB.	MAR.	APR.	MAY	JUNE	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	
40	33	48	71	125	188	245	212	128	80	50	42	105

Table 5-11 Relative humidity characteristics

ANNUAL PRECIPITATION, MM	EVAPORATION, MM	RELATIVE HUMIDITY, %
227.3	1,262	18.01

The climate indicators of Khizi District also include data from the Gizil Burun (Siyazan) meteorological station located in the north of the area.

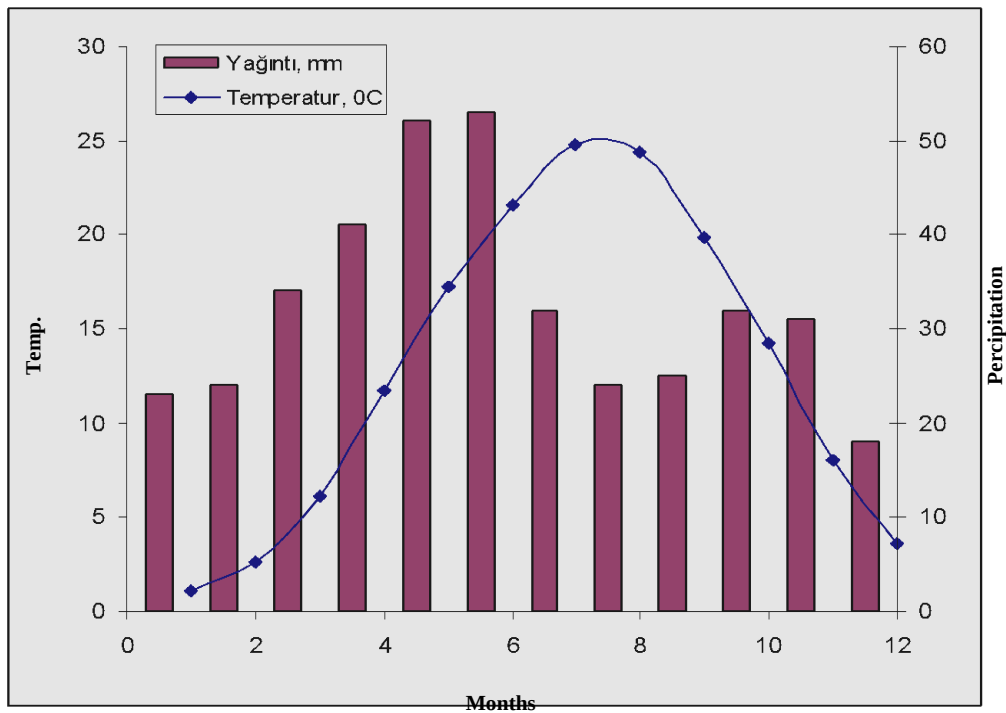
Table 5-12 Average Monthly Indicators of Key Climate Elements for the Siyazan Meteorological Station

No	ELEMENT	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	ANNUAL
1	Air temperature, °C													
	a) average	1.4	2.0	4.4	9.5	16.0	21.0	24.3	24.0	19.9	14.2	8.7	4.1	12.5
	b) absolute maximum	24	24	28	34	35	40	40	41	39	36	28	21	41
	c) absolute minimum	-18	-17	-9	-4	1	5	10	10	5	-4	-9	-14	-18
	d) average minimum	-1.3	-0.7	1.2	5.5	11.6	16.2	19.6	19.4	15.4	10.5	5.6	1.2	8.7
2	Precipitation, mm	27	21	26	27	18	19	16	13	32	38	43	28	308
3	Wind speed, m/sec	4.3	4.2	4.6	5.0	4.3	4.6	4.6	5.0	4.6	4.2	4.3	4.1	4.5
4	Absolute air humidity, mb	6.1	6.1	6.8	9.3	13.4	16.8	20.3	20.4	17.0	12.8	9.4	6.9	12.1
5	Relative air humidity, %	84	84	82	77	73	65	64	66	72	80	82	83	76
6	Insufficient humidity, mb	1.2	1.2	1.6	3.2	5.6	9.7	11.3	10.5	6.8	3.4	2.0	1.5	4.8

According to the observations of the Gizil Burun (Siyazan) meteorological station, there is a semi-desert and arid steppe climate in this area due to the temperature and the amount of precipitation. The highest maximum temperature is observed in the summer months (40-41 °C) and the lowest (-21-24 °C) in winter. The number of frost-free days in a year is 236.

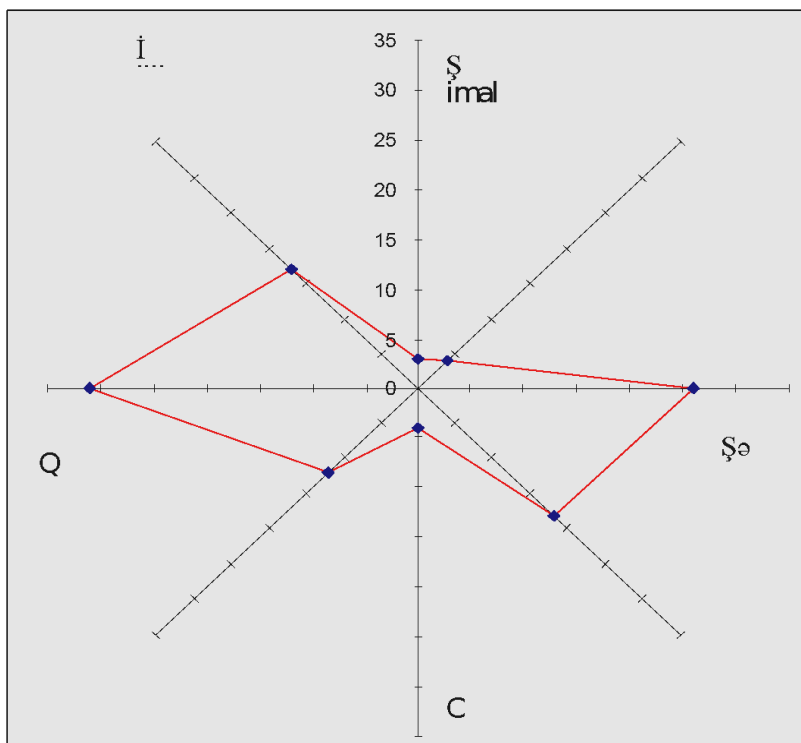
The annual precipitation is characterized by dry summers and relatively rainy autumns (37% of annual precipitation). According to the observations of the Gizil Burun (Siyazan) meteorological station in the table above, the average amount of precipitation is 308 mm. Monthly precipitation and air temperature are shown in the figure below.

Figure 5-2 Annual Air Temperature and Precipitation



High relative humidity is observed in the cold season (83-84%) and the lowest in the summer (64-66%). The annual course of absolute humidity coincides with air temperature, as humidity extremes coincide with those of air temperature (maximum in July-August – 20.3-20.4 mb, and minimum in January-February – 6.1 mb).

Figure 5-3 Annual Wind Rose



As can be seen from the figure above, north-western winds prevail in the region, accounting for 42%. The average wind speed during the year is 4.1-5.0 m/s. The number of days of strong wind (≥ 15 m/s) is 51 a year.

5.3.2 Influences on Air Quality

Air quality and in particular instances of poor air quality are influenced less by geographical considerations and more by proximity to pollution sources (e.g., cities, highways and industrial facilities). Typically, the air shed closer to a pollution source is of poorer quality than at a greater distance (due to pollutant dispersion), however air quality at a particular location is generally dependant on weather conditions particularly wind direction and wind strength; which has a large effect on the direction and dispersion of the pollutant plume.

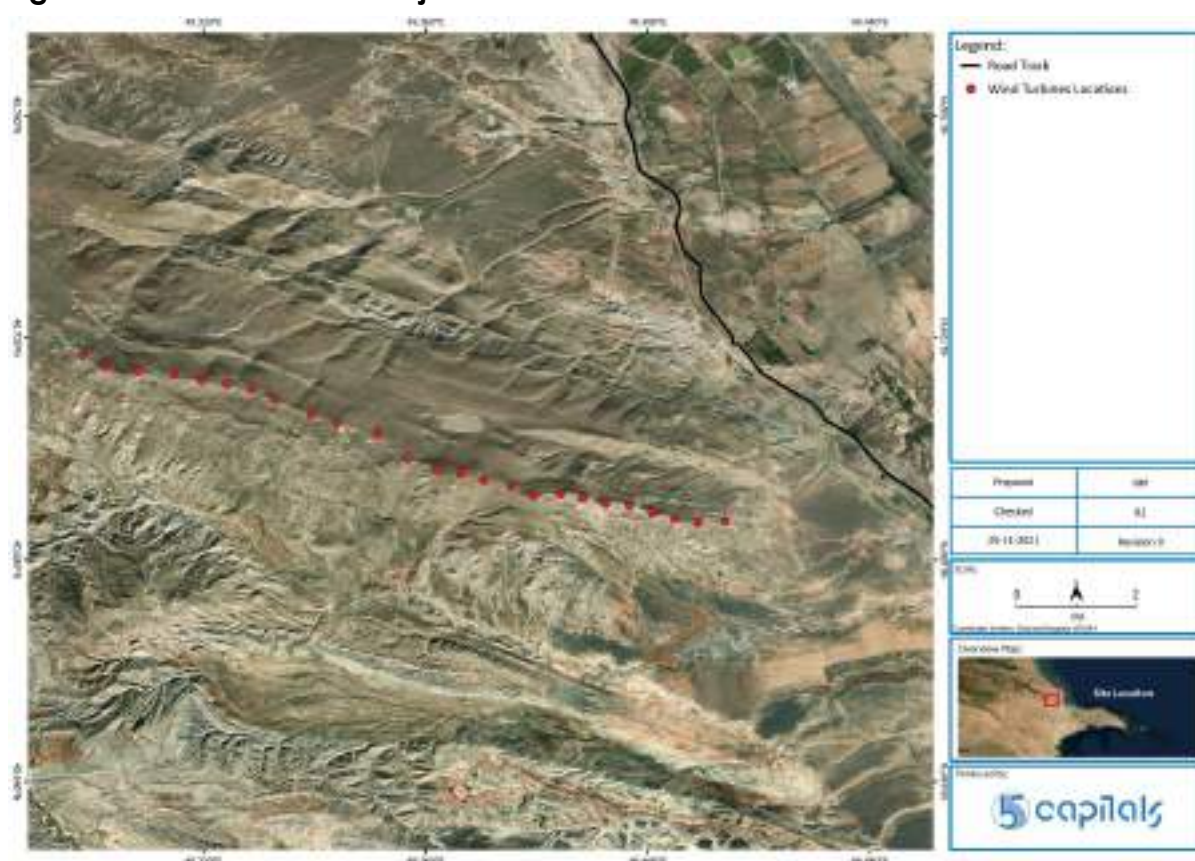
The Project site is located in a remote area and based on site visits and review of satellite imagery, there are no anthropogenic influences in the Project area.

During the site visit undertaken to date, there were no visible sources of air emissions (such as point sources) at the site or in the immediate vicinity. Due to the isolation of the site, it is not expected that agricultural influences (such as use of fertilisers and pesticides) will play a role on air quality either. There were also no olfactory signs of air quality degradation whilst on the site.

A road track is located approximately 1.67 km to 9.7 km from the east of the site. This road runs parallel to the E119 (M1) highway. The E119 highway is located to the east at a distance of approximately 5.5 km to 12.8 km from the closest (K27) and furthest (K4) wind turbines.

Primary point sources of emissions are well away from the site. The only source of emission will be mobile emissions from vehicles that use the highway, emissions from the road track and emissions from dirt access roads in the Project area. Emissions from the highway and local track road are unlikely to be distinguishable from background concentrations at the Project site.

Figure 5-4 Location of the Project Site in Relation to the Road Track

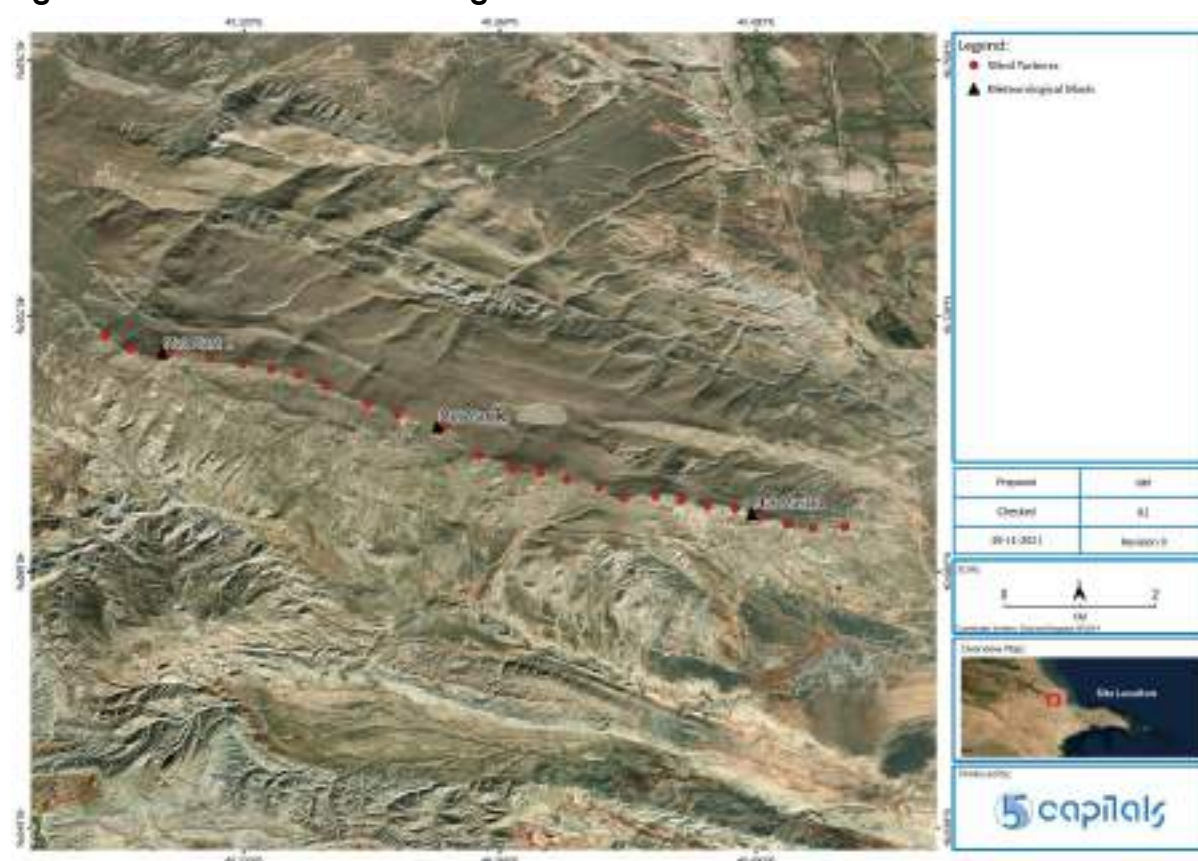


ACWA Power installed three (3) meteorological masts at the Project site to record wind data and other climatic variables. The coordinates and main characteristics of the meteorological masts are described in the table below. Information collected from these masts will be used to prepare a wind resource assessment.

Table 5-13 Meteorological Masts

MET MAST	MAST 1	MAST 2	MAST 3
Easting (UTM)	357023	360629	364746
Northing (UTM)	4508405	4507054	4505466
Elevation	670	532.1	400
Duration	12 months	12 months	12 months

Figure 5-5 Location of Meteorological Masts at Khizi 3



5.3.3 Ambient Air Quality Monitoring

AMBIENT AIR QUALITY MONITORING METHODOLOGY

To get an indication of the ambient air quality at the project area, continuous monitoring was undertaken at one (1) location from 24th April 2021 to 4th May 2021 using a mobile monitoring station. Only one location was monitored due to the remote location of the Project site and the inability to access certain areas in the Project area. The mobile monitoring vehicle is equipped with analysers was used to monitor ambient concentrations of sulphur dioxide (SO₂), nitrogen dioxide (NO₂), Particulate Matter (PM₁₀ & PM_{2.5}) and ozone (O₃). This mobile monitoring equipment was obtained from the Hydrometeorology and Monitoring Center of Ministry of Ecology and Natural Resources (MENR) of Republic Azerbaijan and the monitoring campaign was undertaken by the local consultant; Ecoenergy LLC.

The station was supplied with electricity from local power supply network. The vehicle is equipped with Uninterruptible Power Supply (UPS) that provides emergency power to the equipment for a few hours in case if the power from local network fails. This site is located approximately 20 m from local track road. During the monitoring, meteorological conditions were also recorded. The monitoring campaign ran continuously for a period of ten (10) days to ensure that conditions could be benchmarked with hourly and 24-hourly standards, as well as observing any diurnal fluctuations in ambient air quality, or influences due to local weather

conditions. Calibration certificates of the analysers used are presented in Appendix D. The air quality monitoring location is presented in the figure and table below.

Figure 5-6 Ambient Air Quality Monitoring Location



Table 5-14 Ambient Air Quality Monitoring Location

ID	CO-ORDINATES	
	NORTHING	EASTING
KS-1	4507522	368636

AMBIENT AIR QUALITY MONITORING RESULTS

The 24-hour average results are presented in the table below showing concentration of SO₂, NO₂, PM₁₀, PM_{2.5}, O₃ and meteorological data. These results have been compared with Azerbaijan, WHO and EC ambient air quality standards.

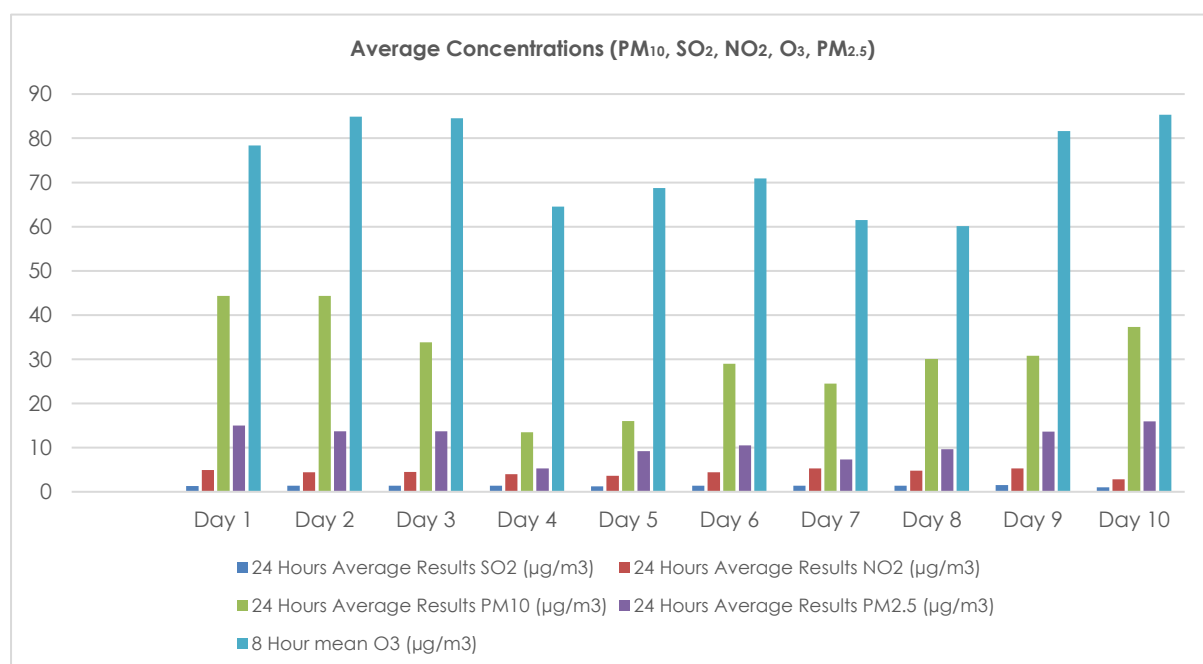
All the measured pollutants were found to have average ambient air values within Azerbaijan, WHO and EU standards as shown in Table and Figure below.

Table 5-15 24 Hours Average Ambient Air Quality Result Obtained at KS-1 (unless otherwise stated)

DAYS	24 HOURS AVERAGE RESULTS				8 HOUR MEAN	24 HOURS AVERAGE RESULTS			
	SO ₂ (μG/M ³)	NO ₂ (μG/M ³)	PM ₁₀ (μG/M ³)	PM _{2.5} (μG/M ³)	O ₃ (μG/M ³)	TEMP °C	RH %	WS (M/s)	WD (°)
DETECTION LIMIT	1.5 PPB	0.4 PPB	1 (μG/M ³)	1 (μG/M ³)	0.5 PPB	-	-	-	-
Day 1	1.3	4.9	44.3	15.0	78.4	15.3	66.1	2.1	172.4
Day 2	1.4	4.4	44.3	13.7	84.9	14.8	63.9	2.3	173.9
Day 3	1.4	4.5	33.8	13.7	84.5	14.8	69.9	5.9	217.9
Day 4	1.4	4.0	13.5	5.3	64.5	13.8	71.8	5.1	180.7
Day 5	1.2	3.6	16.0	9.2	68.7	16.4	58.1	5.4	167.4
Day 6	1.4	4.4	29.0	10.5	70.9	16.1	60.9	2.0	173.4
Day 7	1.4	5.3	24.5	7.3	61.5	15.4	78.6	1.4	178.4
Day 8	1.4	4.8	30.0	9.6	60.1	16.5	82.1	2.7	150.0
Day 9	1.5	5.3	30.8	13.6	81.6	16.7	67.2	1.9	166.4
Day 10	1.0	2.8	37.3	15.9	85.3	20.9	52.5	3.5	168.9
Azerbaijan	50	40	-	-	-	-	-	-	-
WHO	20	-	50	25	100	-	-	-	-
EU Directive	125	-	50	-	120	-	-	-	-

Note: RH – Relative Humidity, WS.- Wind Speed, WD- Wind direction.

Figure 5-7 24 Hour Average Concentrations Obtained at KS-1



Sulphur dioxide (SO₂)

The measured 24-hour average concentrations were found to be well below the Azerbaijan, WHO and EU 24-hour limit for SO₂. The measured 24-hour average SO₂ concentrations ranged from a minimum of 1.0 µg/m³ on Day 10 (from 3/5/2021 to 4/5/2021), to a maximum of 1.5 µg/m³ on Day 9 (from 2/5/2021 to 3/5/2021). The hourly average concentrations ranged from 0.4 µg/m³ to 6.8 µg/m³, with the maximum hourly concentration recorded at Day 7.

Figure 5-8 SO₂ 24 Hour Average Results

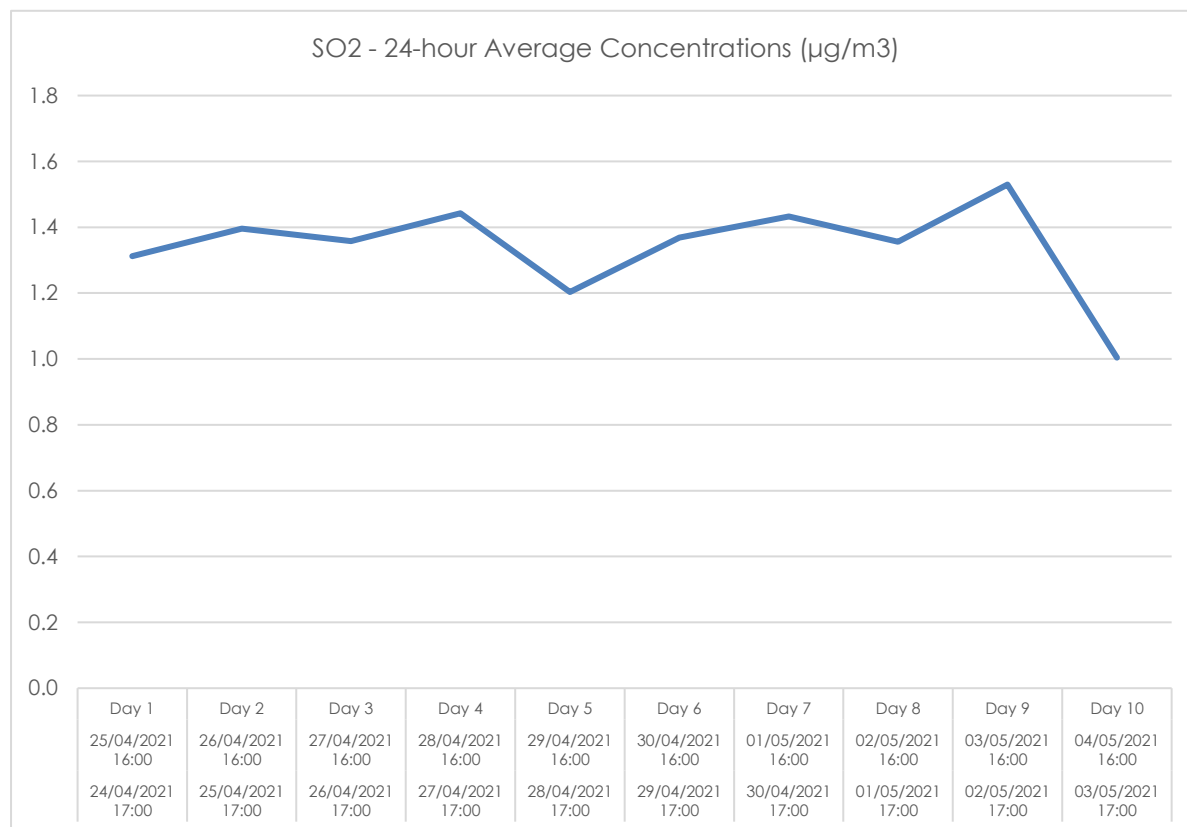
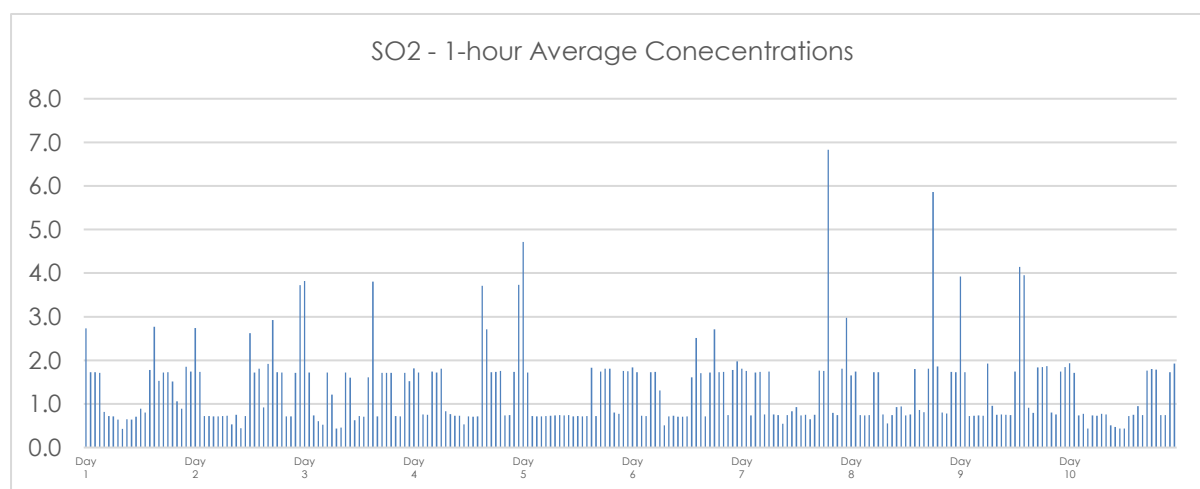


Figure 5-9 SO₂ 1-Hour Average Results



Nitrogen dioxide (NO₂)

The 24-hour average results show that nitrogen dioxide concentrations are well below the required Azerbaijan limit. The measured 24-hour average NO₂ concentrations ranged from a minimum of 2.8 µg/m³ on Day 10 (from 3/5/2021 to 4/5/2021), to a maximum of 5.3 µg/m³ on Days 7 and 9. The hourly average concentrations ranged from 0.4 µg/m³ to 6.8 µg/m³, with the maximum hourly concentration recorded at Day 7. The hourly maximum concentration was recorded on Day 8 at 11:00 am with a concentration of 28.9 µg/m³. Similar peaks were recorded on Days 7 (6:00 am) and 9 (12:00 pm), with concentrations of 27.8 µg/m³ and 28 µg/m³ respectively.

Figure 5-10 NO₂ 24 Hour Average Results

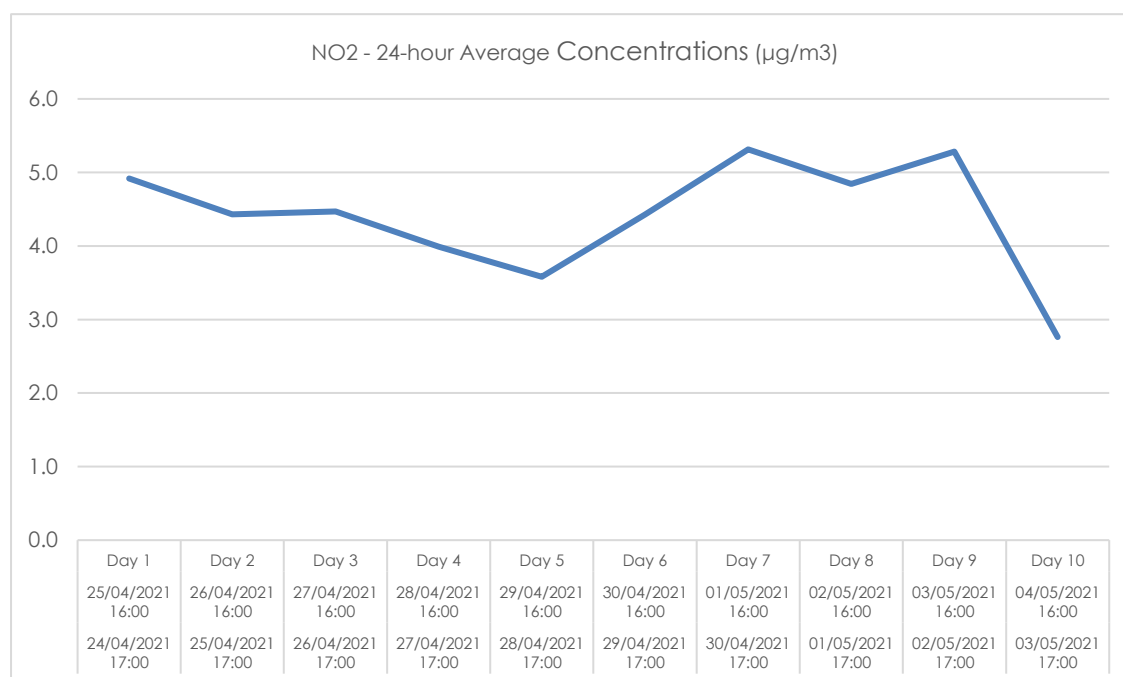
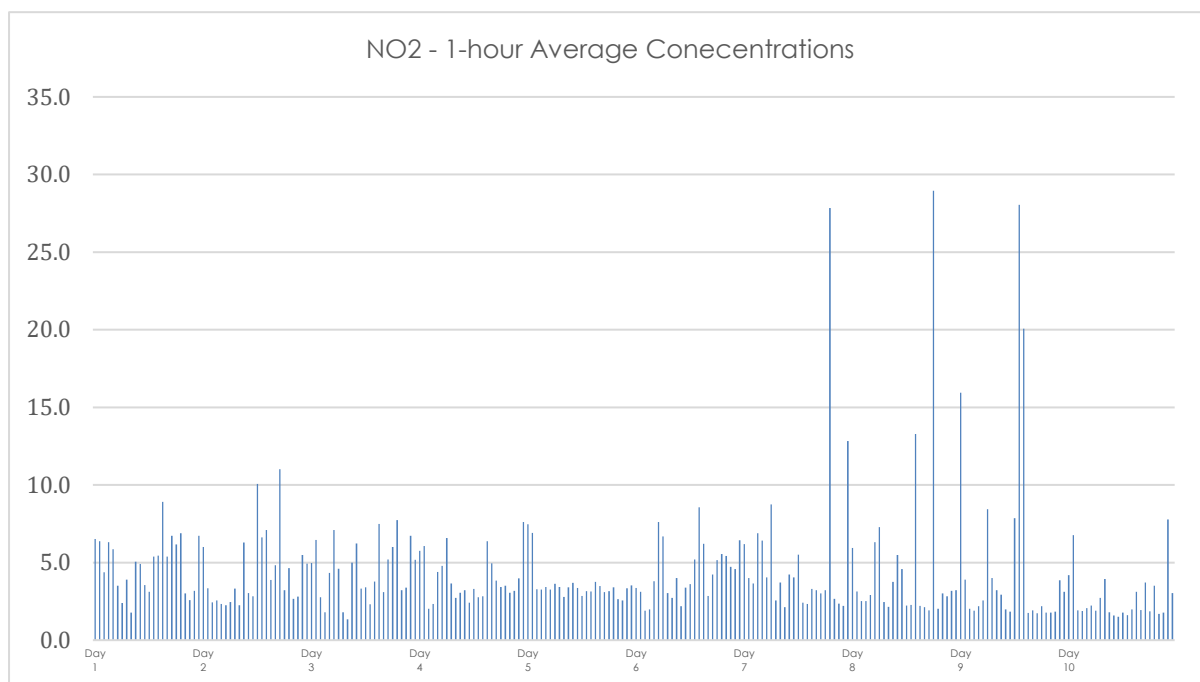


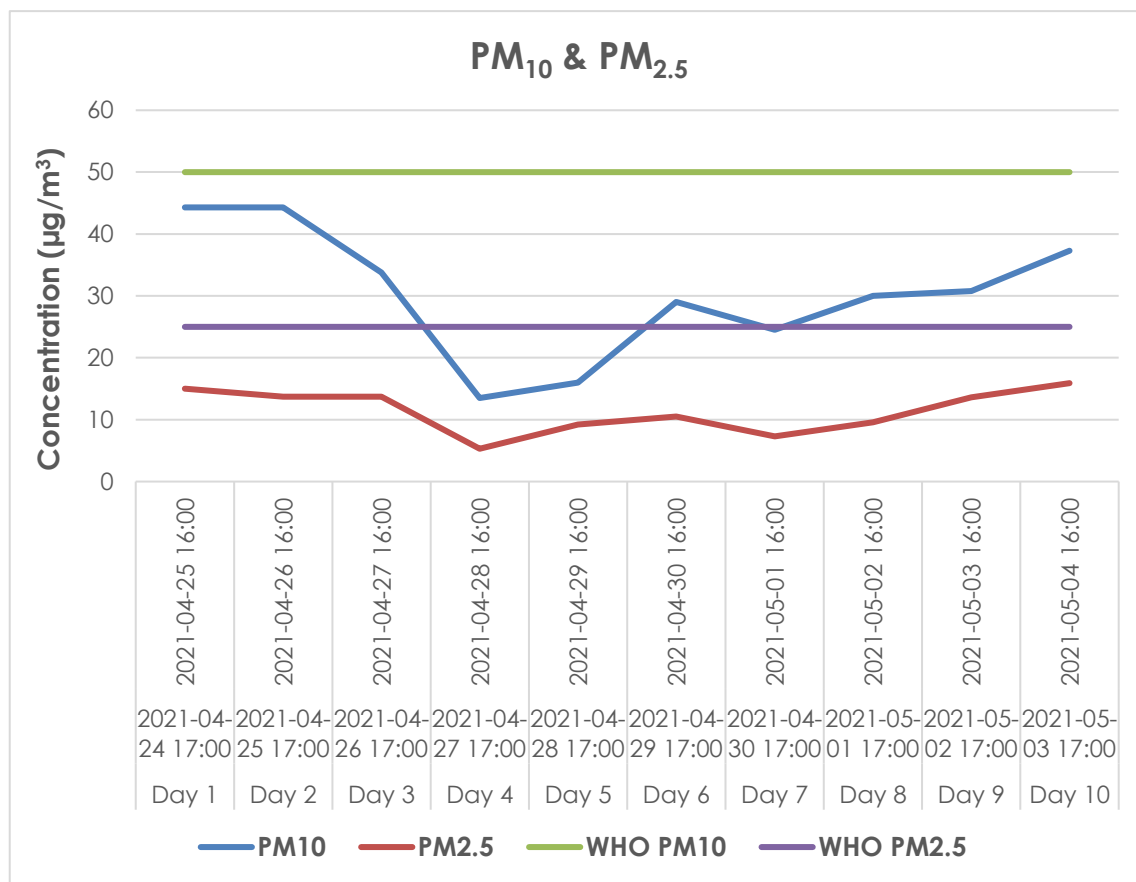
Figure 5-11 NO₂ 1-Hour Average Results



Particulate Matter (PM₁₀ and PM_{2.5})

The average 24-hourly monitoring results obtained for both PM₁₀ and PM_{2.5} were found to be well below the maximum allowable limits of 50µg/m³ and 25µg/m³ established by WHO. Given that Particulate Matter concentration in the country is usually high, the low concentration of both pollutants (PM₁₀ and PM_{2.5}) provides an indication of good air quality in the project area.

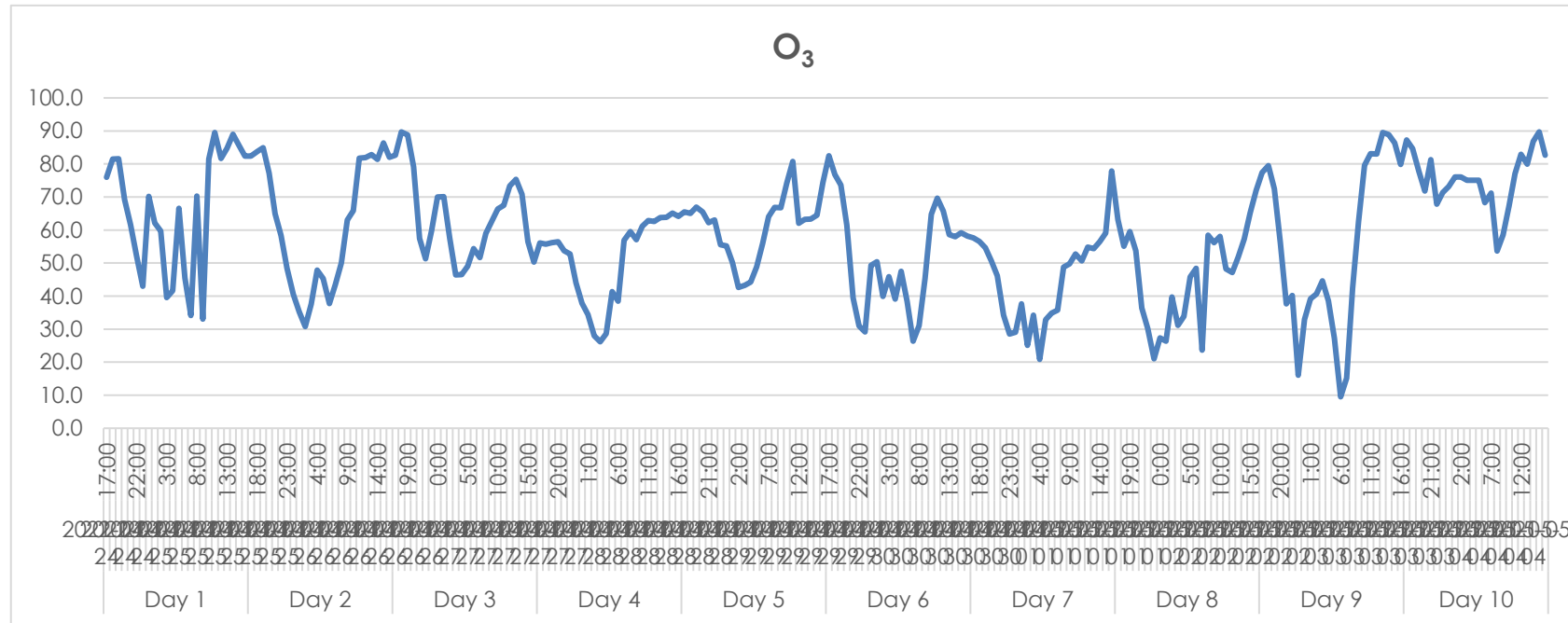
Figure 5-12 Average 24-Hourly Concentration of PM₁₀ and PM_{2.5} as Compared Against WHO Standards



Ozone (O₃)

The maximum 8 hour mean result was 85.3 µg/m³, which was recorded on Day 10. Comparison of the results obtained with European Commission Directive and WHO ozone standard concentration of 120 µg/m³ and 100µg/m³ respectively showed that the concentration of ozone within the Project site was below the 8-hourly standard throughout the ten (10) days monitoring period.

Figure 5-13 Hourly Concentration of Ozone

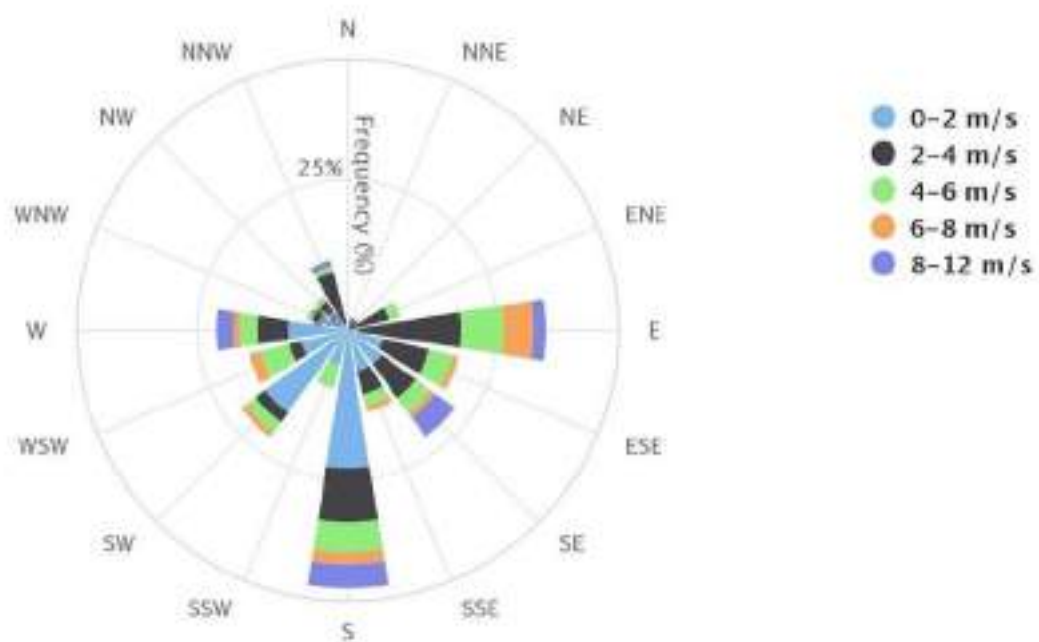


During the monitoring period, the concentration of ozone was noted to be low during the early morning hours and begins to increase during the daytime until it reaches its peak before decreasing. This elevated concentration in ozone level during the daytime period can be said to be due to the sun being at its strongest at the time of increase resulting in an increase in the chemical reactions between the oxides of nitrogen (NOx) and VOC.

Meteorological Condition

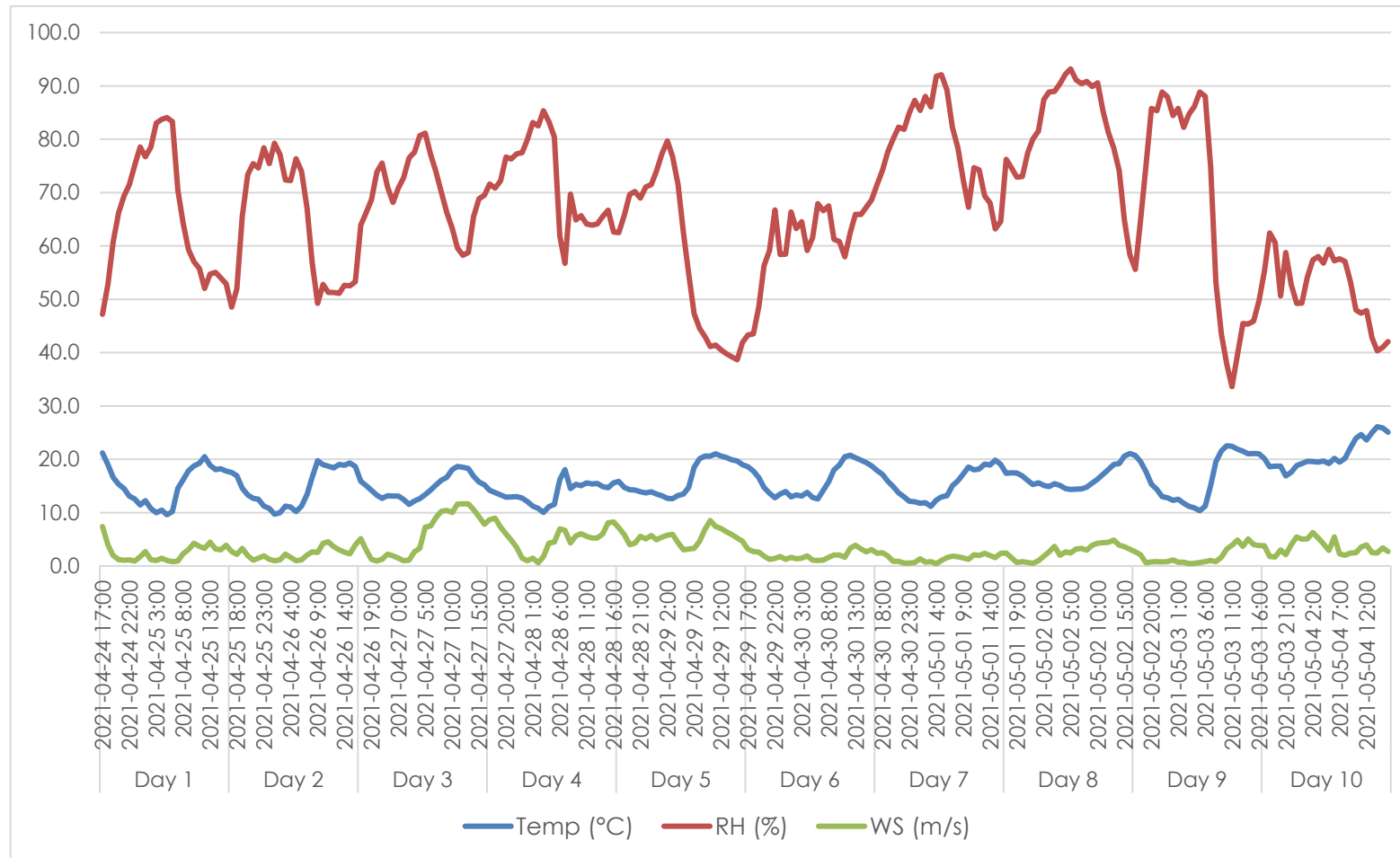
During the ten (10) days monitoring period, wind speed ranged between 0.4 m/s to 11.6 m/s. The wind rose diagram presented in the figure below shows that the predominant wind direction at the Project site is from the southerly direction.

Figure 5-14 Wind Rose Showing Wind Direction at the KS-1 Monitoring Location



The maximum temperature on each day was recorded between the hours of 09:00am to 17:00pm which is the period of peak sunlight. As temperature increased, relative humidity was noted to decrease as evident in the graph below.

Figure 5-15 Hourly Result of Temperature, Relative Humidity and Wind Speed During the Monitoring Period



5.4 Sensitive Receptors

In relation to ambient air quality impacts from the project, the expected range of impacts are likely to be within a zone of 1km of the Wind Farm and OHTL. A 1km radius has been chosen because the Wind farm and OHTL are not expected to result in any air emissions and this 1km radius is a conservative approach which is considered large enough to account for any worse case scenarios and cumulative effects.

Any impact upon ambient air quality is anticipated to be limited to the construction phase activities such as dust generation during site preparation, excavation works, vehicle movements on unpaved surfaces and exhaust fumes from construction vehicles and equipment use. These activities can only cause impacts to nearby receptors within the area of influence indicated in the Area of Influence sub section above.

The locations of the sensitive receptors are shown in the table and figure below and these were identified from review of satellite imagery and the site visit conducted by 5 Capitals ESIA team and subsequent visits carried out by the local Consultant (Ecoenergy) from March 2020 to July 2021.

Table 5-16 Air Quality Sensitive Receptors

RECEPTOR	RECEPTOR TYPE	APPROXIMATE DISTANCE TO THE NEAREST WTG & OHTL (M)	DESCRIPTION	JUSTIFICATION	SENSITIVITY
Wind Farm					
HR-1	Temporary/ Seasonal Agricultural	487	Temporary shelter and tent located 487 m south of WTG K11	If present during the construction phase, this receptor will be particularly vulnerable to changes in ambient air quality.	Medium
HR-6	Agricultural	950	Farm 950 m from WTG K25	If users of this seasonal farm the construction phase, they will be relatively vulnerable to changes in ambient air quality.	Low
Nearby farms and settlements who use the dirt road	Residential/ Agricultural	In close vicinity of the access road	Potential users of the existing dirt access road	If present during potential road improvements activities, residents of nearby settlements and farmers together with livestock may be particularly vulnerable to changes in ambient air quality	Medium

RECEPTOR	RECEPTOR TYPE	APPROXIMATE DISTANCE TO THE NEAREST WTG & OHTL (M)	DESCRIPTION	JUSTIFICATION	SENSITIVITY
OHTL					
HR-4	Agricultural	795 and 840	A seasonal farm located 795 m east of the Khizi 3 to Yasma OHTL and 840 m east of the Khizi to Pirakuskul	If users of this seasonal farm the construction phase, they will be relatively vulnerable to changes in ambient air quality.	Low
HR-17	Agricultural	690	An agricultural field located 690 m east of the Khizi to Pirakuskul route	If users of the agricultural field are present during the construction phase, they will be relatively vulnerable to changes in ambient air quality.	Low
HR-18	Agricultural	Adjacent and 200	An agricultural field located along the Khizi 3 to Yasma OHTL route and 200 m east of the Khizi to Pirakashkul	If users of the agricultural field are present during the construction phase, they will be relatively vulnerable to changes in ambient air quality.	Medium

Figure 5-16 Air Quality Sensitive Receptors – Wind Farm



Figure 5-17 Air Quality Sensitive Receptors – OHTL



5.5 Potential Impacts, Mitigation, Management & Residual Impact

5.5.1 Construction Phase

As earlier indicated, during the construction of the wind farm and OHTL, local ambient air quality may potentially be affected by increased dust, particularly during the site preparation stage (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 dioxides, carbon monoxide, carbon dioxide, VOCs, particulates and BTEX.

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

- Wind farm site clearance and land clearance along the OHTL corridor;
- Excavations and earthworks, such as ground breaking, cutting, filling, levelling, etc.;
- Vehicle movements on unpaved, or compacted surfaces;
- Particulate matter dispersion from uncovered truckloads;
- Storage and handling of materials and operation of the concrete batching plant;
- Vehicle and Construction equipment emissions (e.g. NO_x, SO_x and CO, CO₂, VOCs, particulates and BTEX) and particulates from vehicles, generators and other mechanical equipment;
- Stored VOCs and other volatile hazardous materials; and
- Odour from temporary wastewater facilities, or containment.

DUST GENERATION

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

- Site/land clearance;
- Excavations and earthworks, such as ground breaking, cutting, filling and levelling;
- Storage and handling of materials and operation of the concrete batching plant;
- Vehicle movements on unpaved, or compacted surfaces; and
- Particulate dispersion from uncovered truckloads.

Dust Emissions from Site Preparation

Dust resulting from excavations and earthworks typically comprises large diameter particles, which settle rapidly and close to the generation source.

According to the screening guidance of the UK's IAQM for construction dust, detailed assessment relating to dust generation is required where there is a 'human receptor' within 350 m of the boundary of the site. With regards to the wind farm project and with respect to the screening criteria above, there are no receptors within 350 m of any WTG as such there is no potential for dust emission as a result of the Wind Farm construction to impact receptors. The nearest receptor to the WTG is HR-1 which is approximately 494 m from K13 WTG.

With regards to the OHTL, the receptor HR-18 is within 350 m of the Khizi 3 to Yasma OHTL and Khizi to Pirakashkul. As such, there is the potential for dust emissions to impact upon this receptor if present at this location during land clearance and 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 southerly direction; based on the meteorological monitoring undertaken for the Project.

Dust Emissions and Particulate Emissions from Movement of Vehicles

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

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 50 m of the route used by construction vehicles on public roads, up to 500 m from the project site entrance.

In the instance of the wind farm and OHTL, there are no receptors within 50 m of the route to be used by construction vehicles. The receptors within 500 m of the wind farm is the seasonal shelter (may be used during dry seasons by nomadic herders) approximately 494 m of K13 WTG and the receptor within 500 m of the OHTL is the agricultural receptor HR-18 located adjacent to the Khizi 3 to Yasma OHTL route and approximately 200m of the Khizi to Pirakashkul. As such there is the potential for impacts relating to dust generation or particulate emissions as a result of increase vehicle movement at the wind farm project entrance and fence line.

The local dirt access road (route 1 described in section 13.3.2) from the highway M2 to the Project site is generally used by framers and settlements surrounding the Project area. This road may require minor construction activities for improvement to accommodate heavy vehicles and trucks accessing the site. These activities may generate dust emissions that may result in impacts to residents of nearby settlements and farmers with livestock if they are present in the vicinity of this road during the road enhancement construction activities. However, these activities are expected to be minimal and restricted to a short period.

Dust Emissions from Operation of the Batching Plant

The batching plant may generate dust emissions primarily from the transfer of cement, sand and aggregates to the plant, trucks loading, mixer loading, and sand and aggregate blowing from storage piles.

According to the screening guidance of the UK's IAQM for construction dust, detailed assessment relating to dust generation is required where there is a 'human receptor' within 350 m of the boundary of the site. With regards to the wind farm project and with respect to the screening criteria above, the nearest receptor is approximately 494 m from K13 WTG. Even though the location of the batching plant is not confirmed yet, the EPC will ensure it is located away from sensitive receptors.

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 and particulate dispersion upon receptors as a storage of batching plant materials

Gaseous Emissions

The principal sources of gaseous emissions to air during construction will be the combustion of fossil fuels from the operation of vehicles, construction equipment and plant. Such vehicles and equipment are likely to include, but not be limited excavators, graders, pavers, cranes, vibratory rollers, batching plant engines, generators, etc. The quantity of gaseous emissions from this equipment will depend on the numbers deployed on site and the hours of operation and efficiency.

Any emissions from the construction vehicles, plant and equipment are expected to mix in ambient air close to the point of origin and are unlikely to be discernible thereby resulting in emissions that are not distinguishable from the background concentrations or emissions that will not result in an exceedance in ambient air quality standards/concentration.

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 200 m from the project boundary and over 50 m from the site access road. In the instance of this Project, there are no receptors within 200 m of the Wind farm site or 50m of the site access road. The agricultural receptor HR-18 is located adjacent to the Khizi 3 to Yasma OHTL route and approximately 200 m of the Khizi 3 to Pirakashkul.

If present in the vicinity, farmers and residents of settlements surrounding the Project area who may potentially use the local dirt access road (route 1 described in section 13.3.2) may be impacted by emissions generated by equipment and vehicles used during the road enhancement activities. However, these activities are expected to be minimal and restricted to a short period.

Considering the ambient air quality of the Project area and distance of permanent human receptors from the Project site, the release of pollutants from vehicles or equipment is not expected to result in distinguishable change in local ambient air quality at receptor locations.

EMISSION OF VOLATILE ORGANIC COMPOUNDS (VOCs)

Small quantity of fuels, paints, solvents and other volatile substances are likely to be required during the construction phase, which will be stored in secure areas within the construction laydown areas. If not adequately contained, such substances have the potential to result in the dispersion of volatile emissions to the immediate air shed. Given that the storage of such volatile substances will be in small volumes, such impacts will be limited to the immediate surrounding area of the Project boundary. However, as there are no receptors directly adjacent to the project site boundary, such impact is not expected.

ODOUR

The construction phase of the project will likely include a number of toilet facilities (including septic tanks) on site for site staff and construction workers. There is the potential for release of odour to the immediate surrounding areas from inappropriate containment and coverage associated with wastewater holding/septic tanks. However, such impacts are likely to be temporary, negligible and limited to the immediate surrounding area.

Table 5-17 Air Quality- Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction (WF & OHTL)

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACT
Dust emissions within 500 m of the project boundary – Generated as a result of site preparatory works and movement of vehicles on unpaved surfaces and storage of batching plant materials	Minor Negative	Seasonal shelter for herders (HR-1; Wind Farm)	Medium	Minor	- Any land grading, excavations and moving of uncovered waste/materials should be undertaken during periods of low winds (e.g. <15 km/h is recommended as a threshold when a review of works is conducted). - Daily review of weather updates, to give warning of likely strong winds to assist with the management of windblown dust. - All dust generating activities will cease during periods of high winds conditions (15km/h). - Where sand and other dusty materials are transported to the site, trucks will not be overloaded and will be appropriately covered / sheeted to avoid losses en-route. - Cement and other fine powders should be sealed or covered after use, stored and transported in enclosed or banded containers. - Notice will be provided to the sensitive receptors near the site and access road as early as possible (minimum one-week notice) if there will be activities that might generate a lot of dust. - Dusty material stockpiles (i.e. any fine sands and powders) dust generating activities (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 to Minor
	Minor Negative	Agricultural Receptor (HR-18; OHTL)	Medium	Minor		Negligible to Minor
	Negligible Negative	Nearby farms and settlements who use the dirt road (if present in the vicinity during road enhancement activities)	Medium	Negligible to Minor		Negligible

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACT
					- Vehicle routes will be clearly demarcated and appropriate signage displayed around the site. - Internal roads inside the project site will be compacted as it reduces vehicular power consumption. - Vehicle speed on all site roads and along the access road into the site will be restricted to 20km/h. - Wetting down of any unpaved site roads and access roads (during potential enhancement construction activities) in order to reduce dust generation. - Project workers will be provided with full PPE kit including dust masks. - No burning of wastes will be allowed onsite. - 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. - Concrete batching plant mitigation measures: - o Locate the concrete batching plant away from sensitive receptors (>500m). - o Ensure the storage areas of sand and aggregates have at least three sides enclosure. - o Ensure cement tanker/silos are fully enclosed systems. - o Ensure cement, sand and aggregates are transferred and weighed within enclosed structures and conveyors.	

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACT
					- o Ensure concrete mixers to be fully enclosed. - o Wet down materials when required to reduce dust generation. - o Perform regular maintenance of the plant and equipment.	
Gaseous Emissions – From exhaust of vehicles	Minor Negative	Agricultural Receptor (HR-18; OHTL)	Medium	Minor	• 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 should be provided for drivers in designated waiting, loading and unloading areas to prevent drivers waiting in vehicles. • There will be pre-requisite requirements of site vehicles to ensure no black smoke before entering site and that any identified machinery or vehicles with black smoke will	Negligible

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACT
					require maintenance and re-assessment before it is returned. Perform regular maintenance of the vehicles, equipment and batching plant.	
Emission of VOCs and other hazardous volatiles	No Change	Seasonal shelter for herders (HR-1; Wind Farm)	Medium	Neutral	- Hazardous materials stored and used on site with potential gas emissions (e.g. VOCs) will be located in well-ventilated, but secure low-risk areas, away from major transport routes - Volatile fuels and chemicals 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. - Fires and material burning will not be allowed on the Project site	Neutral
	No Change	Agricultural Receptor (HR-18; OHTL)	Medium	Neutral		Neutral
Odour from onsite sanitary facilities	No Change	Seasonal shelter for herders (HR-1; Wind Farm)	Medium	Neutral	- Adequate and sufficient sanitary facilities for site workers must be provided. - Effective cleaning and maintenance of toilets to be undertaken to avoid odour dispersion. - All septic tanks must be sealed and fully functioning. - Septic tanks must be operated and maintained according to manufacturer recommendations.	Neutral
	No Change	Agricultural Receptor (HR-18; OHTL)	Medium	Neutral		Neutral

5.5.2 Operational Phase

The proposed project is associated with the generation of renewable energy, hence there are no permanent (on-going) fuel combustion requirements or any other associated air emissions directly from the WF. Emergency diesel generator(s) will be supplied to provide power in case of malfunctioning or disconnection from the grid, however this will not be used except in emergency situations only (which feasibly may not occur). As such, no specific air pollution emissions sources other than those from the operation of vehicles are anticipated during the operational phase of the Project. Emergency diesel generator(s) shall be provided to maintain safe auxiliary power supply in case of blackout conditions. As the operation of the wind farm and OHTL will not include combustion related activities, they will be no direct emissions to the local air-shed.

OPERATIONAL VEHICLE EMISSIONS

Although the operation and maintenance requirements of the wind farm will necessitate limited use of vehicles and delivery/removal vehicles along access roads, emissions from these vehicles will be minor and unlikely to result in a discernible impact at receptor location

OHTL

Impacts on air quality are not expected during the operational phase of the OHTL.

Table 5-18 Air Quality – Impact Significance, Mitigation & Management Measures and Residual Impacts – Operation (WF and OHTL)

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACT
Gaseous Emissions from Vehicles and emergency diesel generator	Negligible Negative	Seasonal shelter for herders (HR-1; Wind Farm)	Medium	Negligible to Minor	• Appropriate quality of fuel used – Fuel of an internationally compliant standard to be sourced through a licensed supplier. • Limit unnecessary usage of vehicles – No unnecessary idling. • Planned inspection and maintenance of project vehicles and mobile equipment will be undertaken annually to ensure worthiness. • Emissions from vehicles should be free from significant black smoke - remedial measures shall be taken if this is observed. • Implement regular maintenance program of vehicles, and keep documentary evidence.	Negligible
	Negligible Negative	Agricultural Receptor (HR-18; OHTL)	Medium	Negligible to Minor		Negligible

5.6 Monitoring

The EPC Contractor and the O&M Company will undertake air quality monitoring 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'.

Table 5-19 Air Quality Monitoring Requirements (WF & OHTL)

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION
Construction			
Dust Generation & Dispersion	Dust	Visual observation for dust emissions to be undertaken on a daily basis. To be monitored quantitatively if generation is considered to be excessive or complaints are received.	Access Road to the Project site, OHTL construction area. Construction site and laydown areas. Dispersion to external receptors from point of generation.
			Batching Plant
Emissions from engines	Vehicle Emissions	Visual assessment of emissions to be undertaken on a daily basis while vehicles and equipment are in use and annual inspection of vehicles. This will include an inspection during the initial acceptance criteria of such vehicles to site.	All non-road vehicles and engines
Sanitary Facilities & Hazardous Material stores	Odour & VOCs	Daily olfactory observations – 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, and work fields. All hazardous material, chemical and fuel stores.

6 NOISE AND VIBRATION

6.1 Standards and Regulatory Requirements

6.1.1 National Requirements

Presidential Decree No. 796 on approval of the rules regarding negative impacts of noise pollution on the environment and well-being of the population includes the following standards.

Table 6-1 National Noise Standards

NOISE LIMITS, dBA		AREA	REFERENCE
LAEQ	LAMAX		
45	60	Areas of micro-districts and groups of residential buildings, rest homes, boarding houses, recreation areas of social service institutions for the elderly and people with disabilities, areas of preschool, general and other educational institutions.	QOST 12.1.003-83 UDK 534.835.46:658.382.3:006.354; Gost 12.1.036-81 ST

6.1.2 Lenders Requirements

EUROPEAN (EBRD) STANDARDS

The European Commission Environmental Noise Directive (Directive 2002/49/EC) relating to the assessment and management of environmental noise is the main EU instrument to identify noise pollution levels and to trigger the necessary action both at Member State and at EU level. The Directive applies to noise to which humans are exposed, particularly in built-up areas, in public parks or other quiet areas in an agglomeration, in quiet areas in open country, near schools, hospitals and other noise-sensitive buildings and areas. It is important to note, however, that the Directive does not set limit or target values, nor does it prescribe the measures to be included in the action plans, thus leaving those issues at the discretion of the competent Member State authorities.

ADB AND EPFI's

Financial institutions are likely to require adherence to WHO noise standards as detailed in IFC EHS Guidelines, which stipulate a maximum threshold of 70 dB(A) at industrial and commercial receptors during daytime. It is noted that if EBRD are a lender, they may require compliance with European Union noise standards, although IFC requirements are usually acceptable to most lenders.

Table 6-2 World Bank Ambient Noise Level Guidelines

RECEPTOR	ONE HOUR LAEQ (DBA)	
	DAYTIME (7AM-10PM)	NIGHT (10PM-7AM)
Residential, Institutional, Educational	55	45
Industrial, Commercial	70	70
Guideline values are for noise levels measured out of doors.		

Source: World Bank EHS General Guidelines, 2007.

Noise impacts should not exceed the levels presented in the previous table or result in a maximum increase in background levels of 3 dB at the nearest sensitive receptor location off-site.

Furthermore, the following requirements have also been specified in the IFC 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; and,
- Medical hearing checks on workers exposed to high noise levels should be performed periodically.

Noise Requirements for Wind Projects

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

In terms of construction noise during noise producing activities such as construction of roads and turbine foundations and erection of turbines, etc, the guideline makes reference to the General EHS Guidelines for noise acceptable levels as presented in Table above.

For operational noise, the IFC EHS Guidelines for Wind Energy include principles for the assessment of sound from wind turbines, which include the following (World Bank/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 of 35 decibels (dB) (A) at a wind speed of 10 meters/second (m/s) at 10 m 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 receptor 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: (i) ETSU, Report ETSU-R-97, "The Assessment and Rating of Noise from Wind Farms" (1997); and (ii) Institute of Acoustics (IOA), "A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise", 2013. (iii) D. McLaughlin, "Wind Shear and Its Effect on Wind Turbine Noise Assessment," Acoustics Bulletin, July/August 2012, 39-42 (2012).

6.2 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 1000 m 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 and vibration impacts during operation, the expected range of impacts are likely to be within 2.5 km of any WTG (conservatively based on IFC EHS Wind Energy recommendation + 500 m).

6.3 Baseline

The undeveloped and remote nature of the Project site means that there are very limited (if any) sources in the project footprint likely to result in anthropogenic sources of noise or vibration.

HISTORICAL DATA

No historical monitoring data for either ambient noise or ground vibration for the project or surrounding areas was found to be available.

BASELINE NOISE SURVEY

A baseline noise survey was undertaken on the 17th and 19th May 2021 at six (6) locations, as shown in the below table and figure. A Class 1 RION NL-52 Sound Level Meter was used for the surveys and the device was calibrated using a RION NC-75 Calibrator.

Figure 6-1 Baseline Noise Monitoring Locations

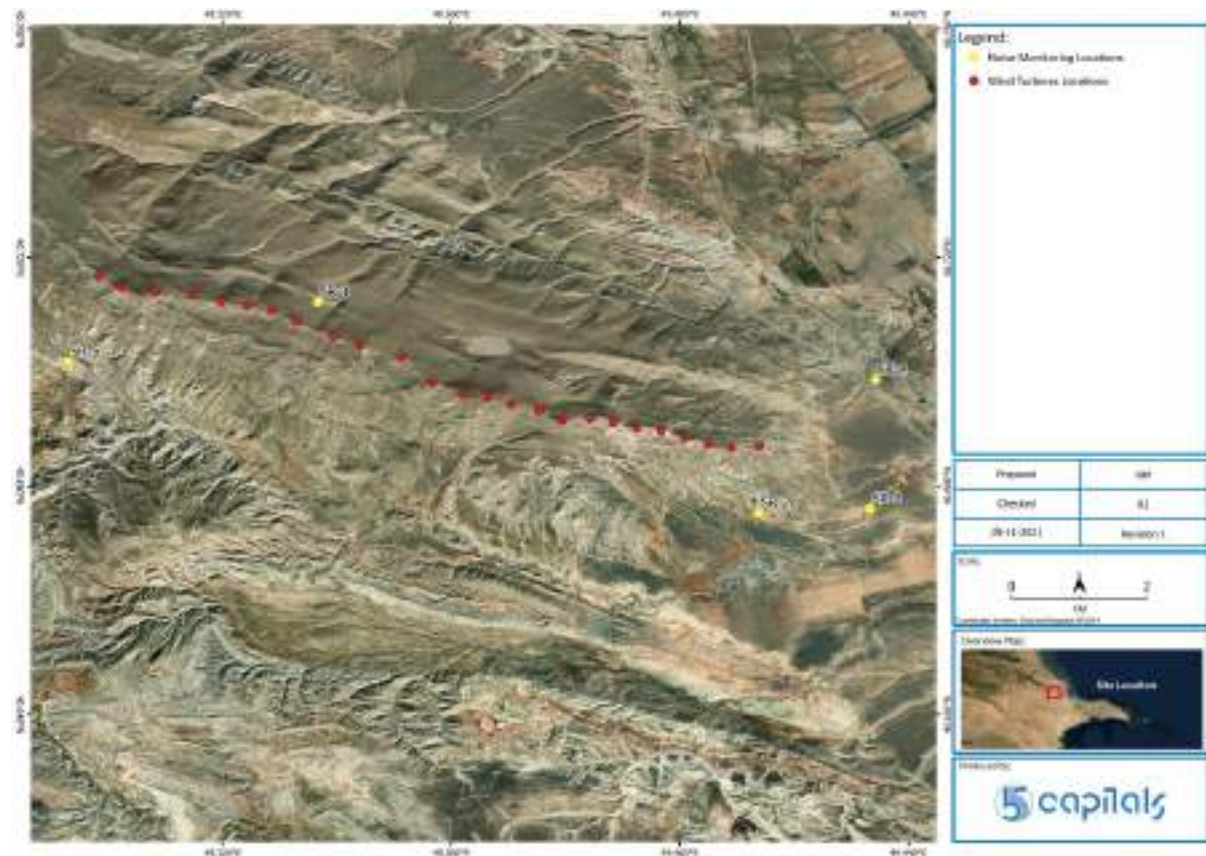


Table 6-3 Baseline Noise Survey Locations

LOCATION	COORDINATES	DESCRIPTION
SR-1	40.712270 49.336694	A small area located 506 m east of WTG K13 with a small tent and shelter, which may be used by a seasonal herder. No permanent structures were observed. A temporary/seasonal shelter for farmers which is used for herding activities.
SR-2	40.675306 49.413794	This farm is abandoned and not been in use since 2015.
SR-3	40.675985 49.433311	A sheep farm located 1,939 m southeast of WTG K36. The farmland is leased from the State and includes on average 450 sheep.
SR-4	40.698637 49.434249	A sheep farm located 1,801 m northeast of WTG K36. The farmland is not leased (informal user) and includes on average 300 sheep.
SR-5	40.701799 49.292998	Cattle and sheep farms located approximately 1,633 m from WTG K5 and 2691 m from WTG K9. The farmer is leasing land from the government.
Lake	40.706360 49.368386	A dried-up lake which during the March 2019 site visit was mud, with an area of salt. Grazing was observed in this area.

The noise monitoring results were analysed for the following parameters, LA_{eq} , LA_{max} , LA_{min} , LC_{peak} , the results of the noise monitoring are provided in the below table.

All of the recorded noise levels exceed the national limits. The highest LA_{eq} was recorded at the Lake monitoring location, which has no external noise sources. It is assumed that the relatively high LA_{eq} reading is a result of the average wind speed, which was recorded as 11.9 m/s. Similarly, the LA_{eq} reading was the lowest at the location that had the lowest average wind speed (SR-3; 2.3 m/s). These observations highlight wind as the main source of noise at the Project site.

Table 6-4 Noise Monitoring Results

LOCATION	DATE & TIME	NATIONAL LIMIT	LA _{EQ}	LA _{MAX}	LA _{MIN}	LC _{PEAK}	NOTES
SR-1 (HR-1)	19/05/21 12:26 – 13:28	45	56.9	77.9	26.6	114.1	Sound of cattle and conversations in the distance. Average wind speed: 5.3 m/s
SR-2	17/05/21 19:55 – 21:05	45	48.1	69.3	25.3	107.4	Average wind speed: 3.3 m/s
SR-3 (HR-5)	17/05/21 16:10 – 17:13	45	46.9	66.8	24.5	105.9	Sound of crickets and conversations in the distance Average wind speed: 2.3 m/s
SR-4 (HR-4)	19/05/21 10:34 – 11:39	45	59.9	91.6	23.6	102.8	Sound of roosters, chickens and a passing airplane Average wind speed: 2.6 m/s
SR-5 (HR-10)	19/05/21 14:37 – 15:38	45	56.2	78	29.2	105	Sound of conversation Average wind speed: 5.9 m/s
Lake	17/05/21 18:31 – 19:33	45	64.4	75.1	47.7	113.7	Average wind speed: 11.9 m/s

Additional Noise Survey

The baseline measured noise levels were undertaken at an early stage of the process and were meant to assess areas for potential construction noise impacts. Further surveys of longer duration have been undertaken which have been utilised for the purposes of the operational noise of the WTG (the regression analysis is presented in the operational noise impact section) and this data can also be utilised for the baseline and construction noise assessment. All monitoring locations undertaken during both surveys are shown in the Figure below.

Figure 6-2 Noise Monitoring Locations



For further information, longer sample data either continuously over a day/night or data samples over several days was undertaken at various locations for the Project. The summary noise level data is presented in the following table.

Table 6-5 Additional Noise Monitoring Results

LOCATION	DATES	DAY / NIGHT	LAEQ	LAMAX	LA90
SR1	20/06/21 to 23/06/21	Day	42.8	55.3	31.2
SR5	24/06/21 to 27/06/21	Day	37.2	51.2	24.4
SR9	22/06/21 to 29/06/21	Day	48.8	65.7	45.1

OHTL BASELINE NOISE SURVEY

Baseline noise monitoring was undertaken at ten locations along the OHTL routes associated with the Khizi-3 and Area 1 WF. The ten locations are shown in the following table and figure.

Figure 6-3 OHTL Baseline Noise Monitoring Locations

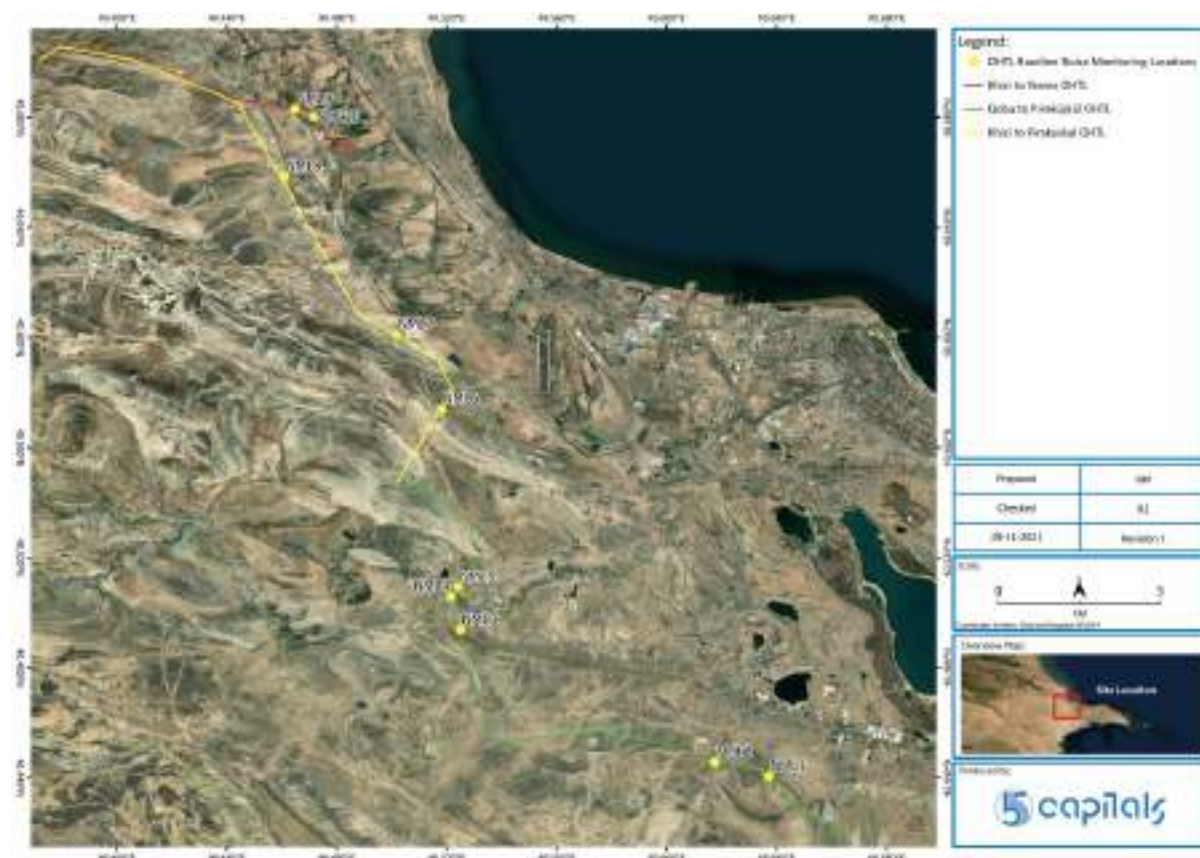


Table 6-6 OHTL Baseline Noise Monitoring Locations

LOCATION	COORDINATES	DESCRIPTION
NML1	40.440598 49.637127	Individual farmstead
NML2	40.445581 49.617500	Army base
NML3	40.493794 49.524848	Almond orchard with dwellings
NML4	40.505788 49.521611	Individual farmstead
NML5	40.509297 49.524072	Poultry farm
NML6	40.574028 49.518102	Construction material plant
NML7	40.601084 49.501655	Individual farmstead
NML8	40.658507 49.460862	Individual farmstead
NML9	40.683116 49.464781	Individual farmstead
NML10	40.680414 49.471635	Individual farmstead

This report will discuss the locations relevant to the Khizi OHTLs (represented by the red and blue lines on the previous figure), these are NML6 – NML10. Noise measurements were taken for 45 minutes at both day and nighttime hours.

The majority of the noise monitoring results are within limits and as can be seen from the table below, the ones that do show exceedance were in periods of high wind speed i.e., >10 m/s.

Figure 6-4 OHTL Noise Monitoring Results

LOCATION	DATE & START TIME	NATIONAL LIMIT	LA _{EQ}	LA _{MAX}	LA _{MIN}	LC _{PEAK}	NOTES
NML6	27-06-2021 12:40	65	45	84.4	24.2	112.4	Wind speed: 5 m/s
	11-07-21 22:20	55	32.2	48.6	23.4	81.1	Wind speed: 2.4 m/s
NML7	27-06-2021 11:15	50	49	64.2	35.1	96	Wind speed: 4.8 m/s
	11-07-21 21:00	45	40.5	67.3	29.7	92.7	Wind speed: 2.9 m/s
NML8	09-07-21 14:10	50	57.9	85.6	29.9	111.3	Wind speed: 11.9 m/s
	07-07-21 00:47	45	47.3	65.8	34.4	109.1	Wind speed: 13.6 m/s
NML9	27-06-2021 07:49	50	44.7	60.4	33.1	83.6	Wind speed: 4.7 m/s
	06-07-21 22:40	45	64.6	94.3	38.4	105.5	Wind speed: 12.6 m/s
NML10	27-06-2021 09:15	50	40.4	60	27	77	Wind speed: 3.8 m/s
	06-07-21 23:39	45	57	79.1	39.1	102.7	Wind speed: 12.9 m/s

6.4 Sensitive Receptors

Locations of the sensitive receptors within the Area of Influence were identified from the review of satellite imagery and the site visit conducted in November 2019 by 5 Capitals ESIA team and subsequent visits carried out by Ecoenergy and 5 Capitals from March 2020 to July 2021.

Figure 6-5 Noise and Vibration Sensitive Receptors (Construction Phase)

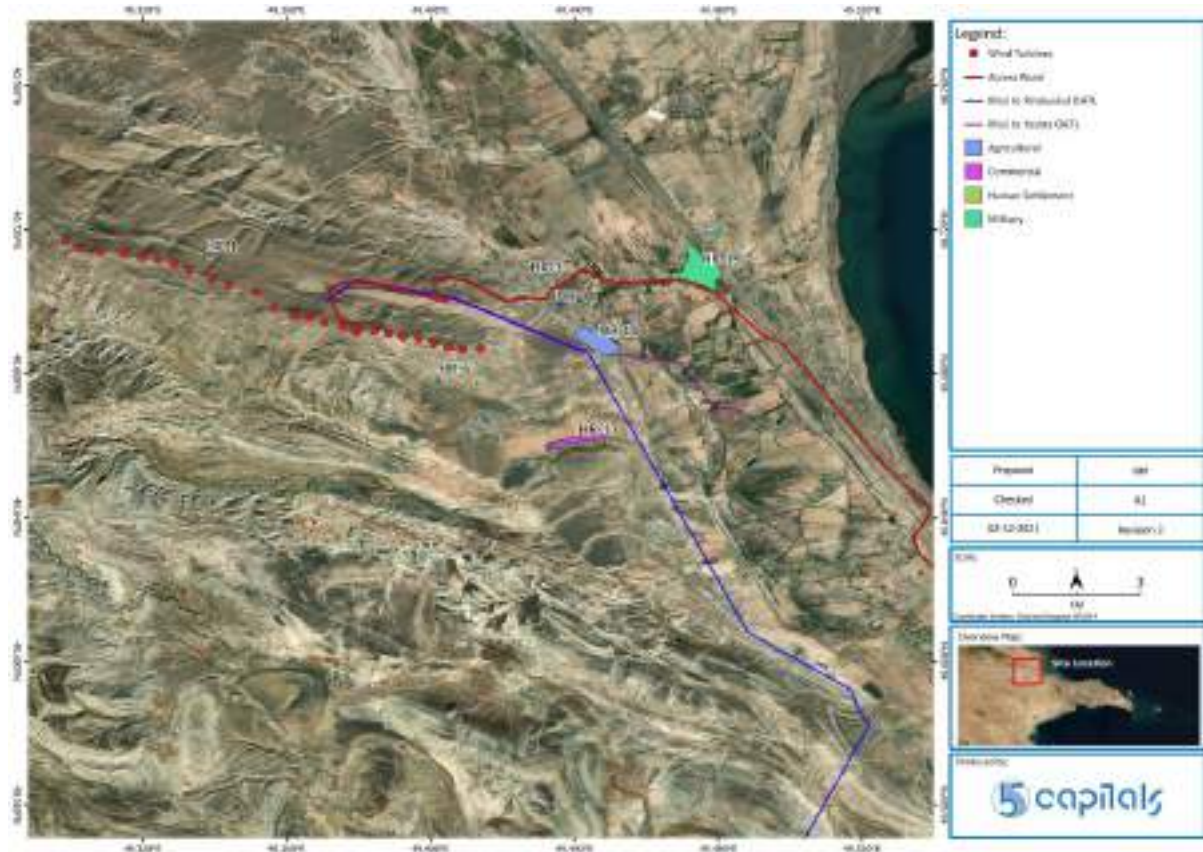


Table 6-7 Noise and Vibration Sensitive Receptors (Construction Phase)

RECEPTOR	RECEPTOR TYPE	DESCRIPTION	JUSTIFICATION	SENSITIVITY
Construction				
HR-1	Seasonal shelter/tent	Herders are occasional users of the land, and their presence is temporary only during specific times	If this receptor is present during the construction and operational phases, it is considered to have a low sensitivity due to its temporary and proximity to the project footprint including WTGs during the grazing period.	Low
HR-3	Agricultural (Seasonal)	A farm located 600 m from the access road	The farm will be susceptible to construction noise impacts	Medium
HR-4	Agricultural (Seasonal)	A seasonal farm located 795 m east of the Khizi 3 to Yasma OHTL and 840 m east of the Khizi to Pirakuskul OHTL	If users of this seasonal farm the construction phase, they will be relatively vulnerable to noise impacts	Medium
HR-6	Agricultural (Seasonal)	A seasonal farm located 950 m from nearest WTG	The farm will be susceptible to construction noise impacts	Medium
HR-17	Agricultural (Seasonal)	Poultry Farm with numerous buildings enclosed by a fence	Workers at the poultry farm are susceptible to noise impacts.	Medium
HR-18	Agricultural (Seasonal)	An agricultural field located along the Khizi 3 to Yasma OHTL route and 200 m east of the Khizi to Pirakashkul OHTL	If users of the agricultural field are present during the construction phase, they will be relatively vulnerable to changes in noise levels.	Medium
HR-19	Military	Yasma Military Compound immediately adjacent to the access road	The military compound will be susceptible to construction noise impacts as it is believed that the military may stay here overnight.	Medium
Nearby farms and settlements who use the dirt road	Residential/ Agricultural	Potential users of the existing dirt access road	If present during potential road improvements activities, residents of nearby settlements and farmers together with livestock may be susceptible to construction noise impacts.	Medium

6.5 Potential Impacts, Mitigation, Management & Residual Impact

6.5.1 Construction Phase

CONSTRUCTION SITE NOISE

Construction activities will likely result in temporary and short duration increases in the noise and vibration levels emanating from the site, access roads, batching plant and the laydown areas; dependent on the type of works being undertaken. Noise will be generated by construction and propagated to the surrounding areas via a range of processes. Pertinent construction activities at the project site in relation to noise are likely to include:

- Road preparation / construction for the transport of turbines to the site;
- Site Preparation (e.g., earthworks, compaction);
- Foundation construction;
- Operation of the concrete batching plant;
- Vehicle movements, particularly the movement of the turbines to site;
- Turbine erection and assembly, which includes tower assembly, hub, rotor and nacelle lift and rotor assembly; 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. All of these impacts may have a negative effect on the amenity of receptors within 1 km of the Project site.

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 table below as obtained from 'British Standards: Code of practice for noise and vibration on construction and open sites' (BS 5228-1:2009).

Table 6-8: Noise Level of Typical Construction Equipment

Equipment	BS 5228-1:2009 Reference	Sound Pressure Level dB (A)
Excavation and Foundation Works		
Wheel loader	Table C.6, 28	76
Backhoe excavator	Table C.2,3	78
Crawler bulldozer	Table C.6,29	88
Road roller	Table C.2, 38	79
Dump truck	Table C.2, 30	79
Diesel Generator	Table C.4, 84	74

Equipment	BS 5228-1:2009 Reference	Sound Pressure Level dB (A)
Truck	Table C.4, 62	66
Turbine Assembly Works		
Main Crane (1200t)	Table C.4,38	78
Auxiliary Crane (80t)	Table C.4,39	77
Unload Crane (50t)	Table C. 4, 46	67
Forklift	Table D.7 96	77
Truck	Table C.4, 62	66
Batching Plant		
Concrete Mixer Truck	Table C.4, 20	80
Large Concrete Mixer	Table C.4, 22	76

The BS 5228-1:2009 does not include specific noise data for operation of batching plants. The plant will potentially include hoppers, conveyor belts and mixers that may create noise impacts, however, the main source of noise from the operation of the batching plant will potentially be the operation vehicles and cement mixer trucks, therefore sound pressure levels for cement trucks have been included in the previous table for reference.

The accumulation of noise from the above activities can introduce potential impacts for receptors at different construction phases as discussed below. The following details of expected noise impacts as a function of distance from the construction sites, has been provided for reference.

Excavation and Foundation Works

Where all equipment is operating at the same location for 50% of the working day, the continued cumulative noise level would be 86.6 dB(A) as perceived at 10 m distance.

Table 6-9 Noise (Excavation and Foundation Works) Attenuation by Distance

Distance from Source	Predicted Noise Level
Source Noise: 86.6 dB(A) (at 10 m)	
10	86.6
50	71.2
100	63.6
500	46.2
1000	38.6

Turbine Erection and Assembly Works

Where all equipment is operating at the same location for 50% of the working day, the continued cumulative noise level would be 79.4 dB(A) as perceived at 10 m distance.

Table 6-10 Noise (Turbine Erection and Assembly Works) Attenuation by Distance

Distance from Source	Predicted Noise Level
Source Noise: 79.4 dB(A) (at 10 m)	
10	79.4
50	63.9
100	56.4
500	38.9
1000	31.4

The initial excavation and foundation works are likely to generate the highest consistent magnitude of noise and vibration impacts. Such activities which will include direct interactions with the site soils for items such as compaction and ground improvement. Where the hard ground is encountered, this may require heavy equipment for the ground-breaking.

SR-1 (HR-1) is the closest receptor to a wind turbine at 487 m distance. While it is recognised that it is possible that construction noise may emanate from closer than the nearest turbine location, for example due to temporary lay down facilities or access roads, 487 m has been used as the basis for the below construction noise assessment. The cumulative noise level has been assessed at SR-1 below. Other receptors such as the impacts to construction workers are assessed qualitatively.

Table 6-11 Noise Impacts at Receptors

Fixed Receptor	Baseline noise level (dB(A))	Anticipated Construction Noise* at Receptor Location Due to Construction Works & distance attenuation (dBA)	Cumulative Noise Level at Receptor Location (dBA)	Change from Baseline (dBA)
SR-1 / (HR-1)	42.8	46.4 (Based on 487 m separation)	48.0	+0.4 dB(A)

**Considers the worst-case phase of construction in terms of noise impacts.*

As is evident from the above table, the construction noise will result in a 5.2 dB(A) increase on the receptor in worst-case scenarios. This exceeds the IFC limit of not increasing background levels about 3 dB at the nearest sensitive receptor off-site.

However, as construction impacts are temporary and, in some cases, may need to be assessed differently to permanent noise features, the following assessment is deemed more suitable.

Significance of Construction Noise Impacts

Paragraph E.3.2 of BS5228 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 5 dB), 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 6-12 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 L _{Aeq} 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 L _{Aeq} 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 applicable significance tables.

The daytime baseline noise investigation result of 42.8 dB(A) at SR-1 means that a Category A (daytime limit of 65 dB(A) and a nighttime limit of 45 dB(A)) is implemented as per BS5228-1. As evident from the above table, the noise increase at SR-1 will not lead to exceedances of day and evening time but the nighttime level will be exceeded.

Noise Impacts to Site Workers

Site workers will be exposed to varying levels of noise depending on their specific roles and activities being conducted. 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 result in health impacts, for example hearing damage.

VEHICULAR NOISE AND TRANSPORT OF TURBINES

The addition of temporary construction vehicles on access roads and within the site will likely result in temporary increases in traffic which will consequently result in an increase to noise levels at receptors, with reduced impacts at receptors further than 1 km to the construction site and access road boundaries. Impacts due to vehicular noise will vary due to the phasing of works and the timing of vehicular movements, which affect both vehicle flows and the percentage of heavy vehicles. In addition to construction vehicles, the transport of the wind turbines will require specialist heavy-goods vehicles (HGV) which can lead to noise impacts at nearby receptors.

Access roads into the Project site are shown in the following figure, the receptors within 1000 m of the access roads are HR-3, HR-4 and HR-19.

Figure 6-6 Access Roads and Noise Receptors



VIBRATION

Certain construction processes, particularly those involved with excavation and foundation works, e.g. breaking, 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 from its source, hence impacts from vibration

are not expected to be discernible at receptors located over 200 m away from the Project site and access roads. The only receptors within 200 m of the access roads is HR-19.

With respect to the fauna, noise and vibration associated with construction may trigger a flight response; this is assessed further in Biodiversity Section.

Table 6-13 Noise and Vibration Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACT
Construction Noise from Site, Access Road and OHTL	Moderate Negative	Seasonal shelter / tent (HR-1)	Very Low	Minor	- Where practical, night-time works will be avoided. - 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. - Consideration of noise fences, or other methods to attenuate construction noise, will be required close to non-mobile equipment such as generators or at boundaries for key receptors. - 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. - Acoustic covers on machine engines to remain closed at all times (as applicable). - Third parties will have access to a grievance mechanism in order to make any complaints regarding noise during the construction phase. - The concrete batching plant shall be located as far as reasonably practicable from sensitive receptors. - Avoid idling of cement mixer trucks and vehicles.	Negligible to Minor
	Minor Negative	Agricultural Receptors (HR-3, HR-4, HR-6, HR-17, HR-18, HR-19)	Medium	Minor		Negligible
	Minor Negative	Yasma Military Compound (HR-19)	Medium	Minor		Negligible
	Negligible Negative	Nearby farms and settlements who use the dirt road (if present in the vicinity during road enhancement activities)	Medium	Negligible to Minor		Negligible
	Moderate Negative	Construction Workers	Medium	Moderate	- As applicable, H&S risk assessments shall include considerations of noise. - Output of H&S risk assessments for specific noisy activities, shall include the delineation and demarcation of high noise areas and applicable Personal Protective Equipment (PPE). The outcomes of	Minor

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACT
					such risk assessments shall be incorporated into method statements and relate to permit to work processes.	
Vehicular Noise from Access Route	Moderate Negative	Receptors within 1000 m of access roads (HR-3, HR-4 and HR-19)	Medium	Moderate	- Speed limits established in the Traffic Management Plan will be adhered to. - Review vendor specifications and accept site plant & vehicles, in particular heavy vehicles, based on noise generation (as far as practical). - The movement of heavy vehicles during the night will be avoided wherever practical. - Delivery vehicles will be prohibited from waiting outside the site with their engines running (consideration of driver waiting room with heating/AC). - Ensure any applicable permits are in place for deliveries to the site and for any works performed outside normal working hours. - Where available in country, audible reversing alarms with broadband noise (white noise) should be preferred over tone alarms (beeping), to limit external disturbance to communities.	Minor
Vibration	Negligible Negative	Receptors within 200 m of Access Road (HR-19)	Medium	Negligible to Minor	- The EPC Contractor will, at all times, carry out all works in such a manner to keep any disturbance from vibration to a minimum. - Wherever practical, all vibratory generating equipment and activities shall be sited away from the asset boundary. - Vibrating equipment/machinery will be switched off when not in use.	Negligible

6.5.2 Operation Phase

WIND TURBINE NOISE

Overview

During the operation of the wind farm, wind turbines produce noise through a number of different mechanisms, which can be roughly grouped into mechanical and aerodynamic sources. The major mechanical components include the gearbox, generator, and yaw motors, each of which produces its own characteristic sounds. Other mechanical systems, such as fans and hydraulic motors, can also contribute to the overall acoustic emissions. Mechanical noise is radiated by the surface of the turbine and by openings in the nacelle housing. The interaction of air and the turbine blades produces aerodynamic noise through a variety of processes as air passes over and past the blades.

When wind speeds are high, noise tends not to be a problem since any noise generated is masked by wind-induced noise effects, particularly that of trees and vegetation being blown. However, at lower wind speeds or in particular sheltered locations, the wind-induced background noise may not be sufficient to mask any noise generated by wind turbines. At these low speeds, the generated noise levels may be so low as to generate very little impact.

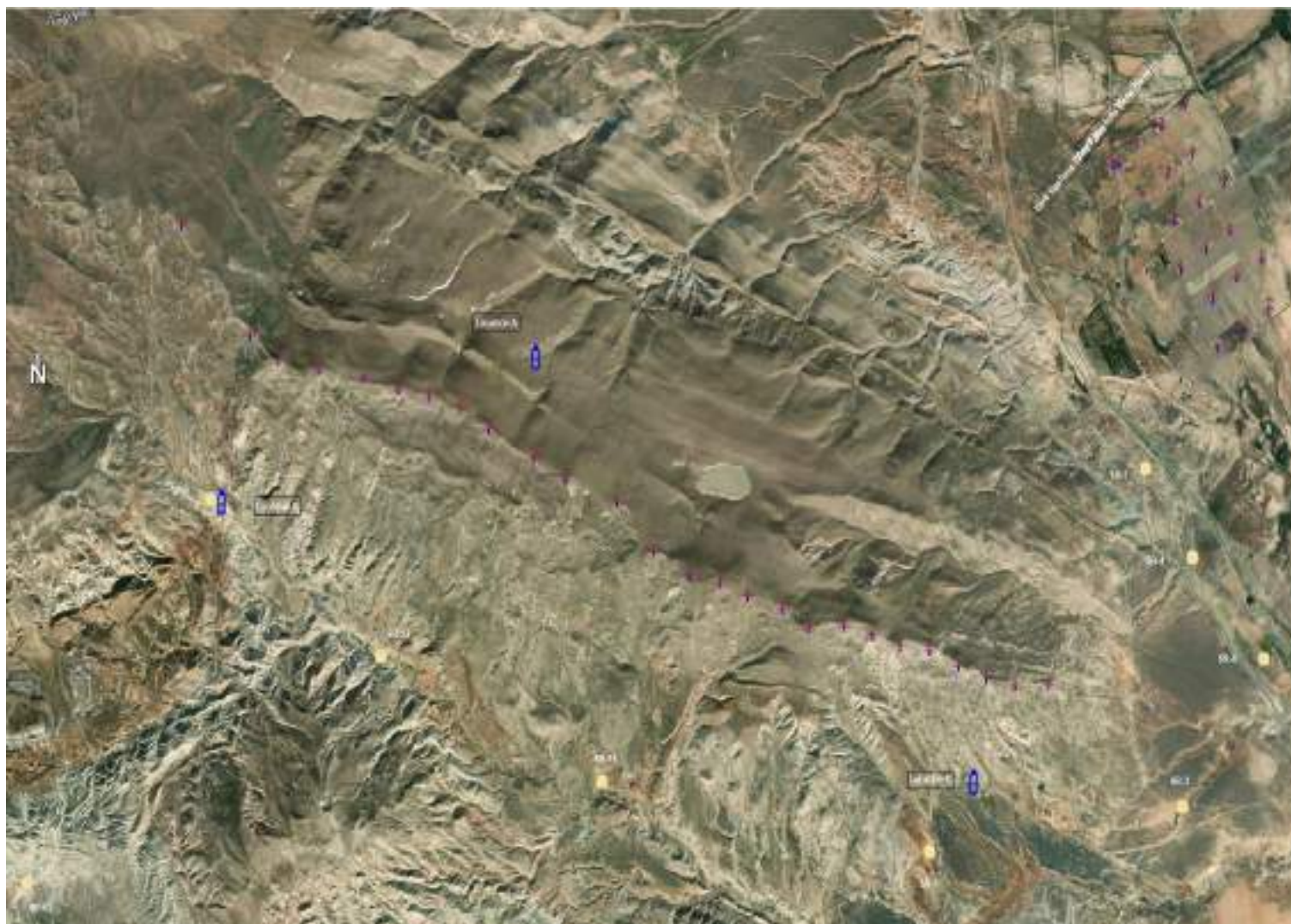
The noise assessment has been undertaken in accordance with the World Bank Group/International Finance Corporation's (IFC) environmental guidelines on Wind Energy.

The 162.5MW wind farm (Khizi 3 WF) will comprise of 25 Envision turbines (6.5MW) and ancillary equipment. The assessment also considers the cumulative effects of the existing Yeni Yashma Wind Farm. The Yeni Yasma Farm comprises of 20 Fuhrlander FL 2500 WTGs with total capacity of 50MW. The general site location the receptors are presented in in Figure and Table in Section above 'Sensitive Receptors'.

Table 6-14 Noise and Vibration Sensitive Receptors (Operation Phase)

RECEPTOR	LOCATION WGS84 (ZONE 39N) UTM	NEAREST WTG	DISTANCE TO NEAREST WTG, M	ABSOLUTE HEIGHT AT RECEPTOR, M	DESCRIPTION
SR-3	367593,4503969	K27	2052	100	A sheep farm with residential facilities
SR-4	367717,4506483	K27	2154	29	A sheep farm with residential facilities
SR-8	368579,4505462	K27	2619	40	Farm with residential facilities
SR-5	355790,4507056	K5	1641	369	Cattle and sheep farms with residential facilities
SR-6	364519,4503524	K25	1889	172	Cattle farm with residential facilities
SR-7	367145,4507373	K27	2452	24	Livestock farm (sheep and cattle) with residential facilities
SR-11	360543,4504223	K16	2361	194	Sheep farm with residential facilities
SR-12	357857,4505488	K11	2643	252	Cattle and sheep farms with residential facilities
SR-13	353566,4503210	K5	6091	437	A sheep farm with residential facilities

Figure 6-7 Operational Noise and Vibration Sensitive Receptors and Background Monitoring Locations



For the purposes of the assessment all nearby human settlements and ecological sites are considered to be noise sensitive as shown in Table above.

Noise Assessment Criteria

World Bank Group/IFC

The Environmental, Health and Safety' Guidelines for Wind Energy (2015) sets the following screening criteria for wind farms:

"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 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 of 35 decibels (dB) (A) at a wind speed of 10 meters/second (m/s) at 10 m 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."*

The EHS Guidelines for Wind Energy (2015) do not provide a noise limit other than the screening limit and therefore the general IFC guidance has been applied in common with other such projects.

The IFC / World Bank Environmental, Health, and Safety General Guideline (1.7 Noise (2007) is therefore applied for the Area 1 Wind Farm project and presented Table below.

Table 6-15 IFC/World Bank Group Noise Level Guideline (adopted from WHO guidance)

RECEPTOR	L _{Aeq,T} (dB)	
	DAYTIME 07:00 – 22:00	NIGHT TIME 22:00 – 07:00
Residential, Institutional, Educational	55	45
Industrial, Commercial	70	70

The above guideline values are expressed in terms of L_{Aeq,T} and for the comparison with the L_{A90,T} parameter used for the preliminary assessment, a correction of -2 dB has to be applied (the limit for residential use is therefore 53 dB L_{A90,T} during the day and 43 dB L_{A90,T} during the night).

The above noise limits can be revised to allow for a 5 dB increase over ambient noise levels in the following manner:

- Daytime: The higher of 53 dB(A) or 5 dB(A) above the prevailing day-time background noise level;
- Night-time: The higher of 43 dB(A) or 5 dB(A) above the prevailing night-time background noise level. Good practice is not to normally exceed the absolute noise criteria or the background noise level by 5 dB.

NATIONAL STANDARDS OF AZERBAIJAN

Decree No. 796 (2008), 'Norms of vibration and noise pollution adversely affecting the environment and human health' are set out Table below. The MENR have confirmed that the relevant applicable standard for the project is set out in Row 16 of Table 2.3. That is, the noise limit (externally) is 45 dB LAeq,T either during the day or night.

N	PURPOSE OF ROOMS	DAY TIME	SOUND PRESSURE LEVELS IN MEDIUM GEOMETRIC FREQUENCY (Hz) OCTAVE BANDS, DB								OVERALL SOUND LEVEL	MAXIMUM LEVEL
			63	125	250	500	1K	2K	4K	8K	LAeq,T DB	
			4	5	6	7	8	9	10	11	12	13
1	Living rooms of buildings (apartments)	Day	59	48	40	34	30	27	25	23	35	50
		Night	51	39	31	24	20	17	14	13	25	40
			43	52	45	39	35	32	30	28	40	55
			55	44	31	29	25	22	20	18	30	45
2	Living rooms of hotels, dormitories, rest and boarding houses	Day	67	57	49	44	40	37	35	33	45	60
		Night	59	48	40	34	30	27	25	13	35	50
3	Living rooms of social service institutions, preschools and boarding schools for the elderly and people with disabilities	Day										
		Night	63	52	45	39	35	32	30	38	40	55
			55	44	35	29	25	22	20	18	30	45
4	Work rooms and booths in administrative buildings, scientific institutions and organizations	Day	71	61	54	49	45	42	40	38	50	65
5	Chambers of hospitals and sanatoriums	Day Night	59	48	40	34	30	27	25	23	35	50
			51	39	31	24	20	17	14	13	25	40
6	Operating rooms of hospitals	Night	55	44	35	29	25	22	20	18	30	45
7	Doctors' room of medical institutions	Day	59	48	40	34	30	27	25	23	35	50
8	Classrooms of educational institutions, educational offices, auditoriums of educational institutions, conference halls, reading rooms, meeting (discussion, meeting) rooms	Day	63	52	45	39	35	32	30	28	40	55
9	Halls of hotels, dormitories, rest and boarding houses	Day	71	61	54	49	45	42	40	38	50	60
10	Cafe, restaurant, dining halls	Day	75	66	59	54	50	47	45	43	55	65
11	Trade halls of shops, passenger halls of railway stations and airports	Day	79	70	63	58	55	52	50	49	60	70
12	Areas directly adjacent to hospital and sanatorium buildings	Day	67	57	49	44	40	37	35	33	45	60
		Night	59	48	40	34	30	27	25	23	35	50
13	Areas directly adjacent to residential, polyclinic and outpatient buildings, dispensaries, rest homes, boarding houses, social service institutions for the elderly and disabled, preschool, general and other educational institutions, libraries	Night										
			75	66	59	54	50	47	45	44	55	70
			67	57	49	44	40	37	35	33	45	60

N	PURPOSE OF ROOMS	DAY TIME	SOUND PRESSURE LEVELS IN MEDIUM GEOMETRIC FREQUENCY (Hz) OCTAVE BANDS, DB								OVERALL SOUND LEVEL	MAXIMUM LEVEL
			63	125	250	500	1K	2K	4K	8K	L _{Aeq,T} DB	L _{Amax} DB
14	Areas directly adjacent to hotels and hostels	Day	79	70	63	59	55	53	51	49	60	75
		Night	71	61	54	49	45	42	40	39	50	65
15	Recreation areas of hospitals and sanatoriums	Day	76	59	48	40	34	30	27	25	23	35
16	Areas of micro-districts and groups of residential buildings, rest homes, boarding houses, recreation areas of social service institutions for the elderly and people with disabilities, areas of preschool, general and other educational institutions	Day	67	57	49	44	40	37	35	33	45	60

The above guideline values are expressed in terms of L_{Aeq,T} and for the comparison with the L_{A90,T} parameter used for the preliminary assessment, a correction of -2 dB has to be applied.

For the purposes of this assessment, the above Azerbaijani noise limits can be revised to allow for a 5 dB increase over the background noise levels in a manner similar to that presented in paragraph above (IFC/World bank Level Guidelines).

Methodology

The calculation methodology for assessment purposes is outlined in International Standard ISO 9613-2:1996 ('Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation'). The standard specifies an engineering method for calculating noise at a known distance from a variety of sources under meteorological conditions favourable to sound propagation. The standard defines favourable conditions for light downwind propagation where the wind blows from all the turbines to the receiver(s) within an angle of +/-45 degrees from a line connecting each turbine to each receiver, at wind speeds between approximately 1 m/s and 5 m/s, measured at a height of 3 m to 11 m above the ground. Equivalently, the method accounts for average propagation under a well-developed moderate ground based thermal inversion. In this respect, it is noted that at the wind speeds relevant to noise levels from wind turbines, atmospheric conditions do not favour the development of thermal inversions throughout the propagation path from the source to the receiver. The general calculation method considers the following attenuation corrections:

- Geometric divergence;
- Air absorption;
- Reflecting obstacles;
- Screening;
- Vegetation; and

- Ground reflections.

Attenuation due to the above factors is applied to the sound power levels of the noise sources to derive the resulting noise levels at the receptors.

Wind turbines are sound sources with special characteristics, such as wind speed dependent sound power levels, high source heights etc., which require special considerations. These parameter adjustments are chosen in combination (see Table 2.3) to give a more reliable calculation methodology.

Table 6-16 ISO9613 Parameters used in the Preliminary Noise Assessment

CALCULATION PARAMETER ISO 9613	OBSERVATION
Agr = -3 (Geometrical divergence)	Normal correction for wind farms
Cmet = 0 (Metrological corrections)	Normal correction for wind farms (downwind propagation)
Terrain obstacles correction = 0 (site specific)	Normal correction for wind farms (site specific for a worst-case assessment)
Temperature = 10 ⁰ C; Relative Humidity = 70%	Normal correction for a worst-case assessment for sound propagation.
Correction of results from L _{Aeq,T} to L _{A90,T} by -2dB.	Normal correction in the UK and some other countries but not universally applied by all countries.
For propagation of turbine sound to a receptor across a valley with a concave profile, a correction of +3 dB must be applied.	Normal correction for wind farms.
Ground Absorption Factor, G=0.5	Normal correction for wind farms in the UK, Germany, NZ and Australia.

Noise Survey

As mentioned earlier, criteria based upon the ambient noise levels at reference speeds (e.g. 10 m/s at 10m) are routinely applied with an allowance of 5 dB above the prevailing noise level or the criteria presented in Tables above (whichever is the highest).

Background noise monitoring was conducted by the local consultant (Ecoenergy) at three (3) locations (Locations A, B & C) in lieu of the human settlements/ecological sites shown in Figure above. The monitoring survey duration was between 15th June 2021 and 15th July 2021. Ten-minute intervals were recorded, with the LA90,10min readings synchronised with the site's wind mast data to determine background noise levels.

Background ambient noise measurements have been undertaken in line with the guidance in "A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise" by Institute of Acoustics (IOA). The monitoring survey duration was between 1

June and 13 July 2021. The survey was undertaken at the locations shown in the below table and figure. The noise measurement equipment used in the survey include:

- RION NL-52 Class 1 noise meter with NC-75 Class 1 calibrator and All-Weather WS-15 Windscreen; and
- Cirrus Optimus+ Green CR:171A Class 1 noise meter with CR:515 Class 1 Acoustic Calibrator and MK:170 Outdoor Microphone + UA:253 windshield WS76 external windshield.

The noise measurement equipment used during the surveys were calibrated at the start and end of the measurement period. No significant drift in calibration was found to have occurred on the sound level meter. The equipment set up for the background noise survey is shown in the below figure.

Figure 6-8 Background Noise Measurement Equipment



Noise equipment were placed on a tripod in the vicinity of the receptor, further than 3.5 m from any reflective surface, within 20 meters of receptor's dwelling and 1.3 - 1.4 m above the ground.

The regression analysis of the monitored noise levels is presented below (for a reference wind speed at 10m/s and a height of 10m). As observed over the course of the monitoring survey, it was evident that there was, apart from wind noise, an absence of any other significant noise source(s).

Figure 6-9 Regression Analysis for all Monitoring Locations



The derived background noise limits are shown below in Table below.

Table 6-17 Derived Background Noise Limits

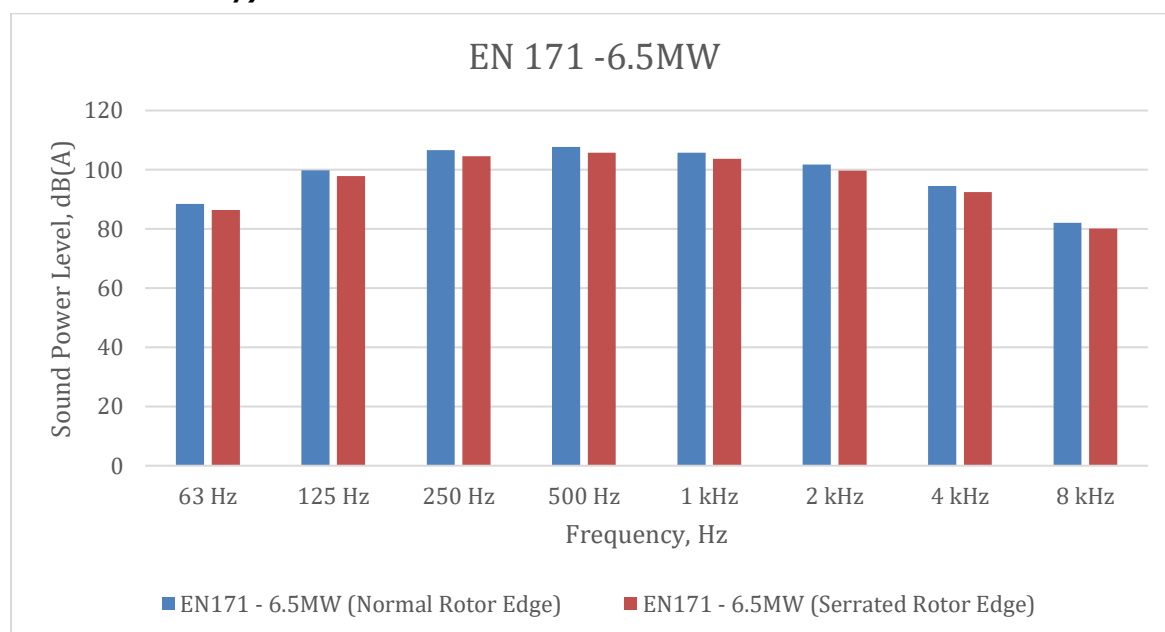
LOCATION	NOISE LEVEL AT REFERENCE WIND SPEED (10 M/S AT 10M), $L_{A90,T}$ DB	DERIVED CRITERIA BASED ON BACKGROUND NOISE LEVELS, $L_{A90,T}$ DB (10 M/S). SEE PARAGRAPH 2.8.
		DAY/NIGHT
SR-3	37	43
SR-4	37	43
SR-8	37	43
SR-5	31	43
SR-6	37	43
SR-7	37	43
SR-11	31	43
SR-12	31	43
SR-13	31	43

Noise Assessment

Turbine Data

The sound power levels of the turbines in octave bands are presented below in Figure below for the hub height wind speed of 10m/s. The hub heights of the EN171 turbine are at 100m relative to the ground.

Figure 6-10 Octave Data for the turbines (hub height, 10m/s, not adjusted for uncertainty)



All the above sound power levels are not guaranteed by the manufacturer and therefore, for the purposes of noise modelling, an uncertainty of +2 dB has been applied for a worst-case assessment. The +2 dB addition to the sound power levels is in accordance with good practice

guidance and is routinely applied for wind farm projects where there is no manufacturer's warranty. After preliminary discussions with ACWA Power (the developer), all turbines have been modelled with normal non-serrated rotor edges.

Other Acoustic Considerations

The WBG/IFC guidelines do not consider other factors such as tonality. It is understood from the turbine manufacturer's advice that tonality will not be an issue for receptors beyond 300m from the nearest turbine. For receptors within 300m of a turbine, a tonal penalty of 5 dB is applied as per normal international guidance.

CALCULATION OF NOISE LEVELS AT RECEPTORS (MODELLING RESULTS)

Noise levels at the receptors has been calculated using the noise-modelling suite IMMI2021 (recognised by the European Union and the UK Government), in accordance with the ISO 9613 prediction methodology (applied with the above-mentioned calculation modifications).

In addition to the uncertainty adjusted turbine sound power levels used in the calculations, the model also considers the effects of the topographical conditions throughout the area as well as applying a light downwind propagation correction to represent worst case. The model considers the noise 'emission' of each turbine and calculates the accumulative noise level at each receptor in accordance with the ISO9613 methodology discussed above.

The topography model was obtained from the (Space) 'Shuttle Radar Topography Mission', (SRTM), at 30m resolution. Turbine layout supplied by the client is presented in Appendix B. Noise levels have been calculated at the first-floor height (4m above ground). None of the receptors fit the 'concave' profile and therefore further corrections have not been added.

The results of the noise model (for Khizi 3 WF) are shown below in Table below. The difference in ground level to the first floor is not significant due to the high noise sources and therefore long slant distances as well as long horizontal distances and the limitations imposed on the ISO9613 methodology as set out in Table above (Table for ISO9613 Parameters used in the Preliminary Noise Assessment).

Table 6-18 Noise Levels at Receptors - First Floor (4m above ground)

RECEPTOR	LOCATION	NEAREST TURBINE	DISTANCE TO NEAREST TURBINE	5M/s	6M/s	7M/s	8M/s	9M/s	10M/s
			(M)	LA90,T DB					
SR-3	367593,4503969	K27	2052	26.9	29.3	32.7	35.5	36.9	37.2
SR-4	367717,4506483	K27	2154	26.7	29.2	32.5	35.3	36.8	37.0
SR-8	368579,4505462	K27	2619	24.3	26.8	30.1	33.0	34.4	34.7

RECEPTOR	LOCATION	NEAREST TURBINE	DISTANCE TO NEAREST TURBINE	5M/s	6M/s	7M/s	8M/s	9M/s	10M/s
			(M)	LA90,T DB					
SR-5	355790,4507056	K5	1641	30.2	32.6	36.0	38.8	40.2	40.5
SR-6	364519,4503524	K25	1889	31.2	33.7	37.0	39.9	41.3	41.6
SR-7	367145,4507373	K27	2452	26.6	29.0	32.4	35.2	36.6	36.9
SR-11	360543,4504223	K16	2361	29.2	31.6	35.0	37.8	39.2	39.5
SR-12	357857,4505488	K11	2643	28.6	31.1	34.4	37.3	38.7	39.0
SR-13	353566,4503210	K5	6091	17.0	19.4	22.8	25.6	27.0	27.3

For the Khizi 3 WF project, compliance with the relevant criteria is set out in Table below.

Table 6-19 Compliance with IFC/Derived Background Noise Assessment Limits (10m/s)

RECEPTOR	COMPLIANT WITH THE INITIAL IFC 35 DB LA90,T CRITERION	COMPLIANT WITH THE IFC GENERAL DAYTIME 53 DB CRITERIA (LA90,T) OR DERIVED BACKGROUND NOISE LIMITS?	COMPLIANT WITH THE IFC GENERAL NIGHT-TIME 43 DB CRITERIA (LA90,T) OR DERIVED BACKGROUND NOISE LIMITS?	COMPLIANT WITH THE AZERBAIJAN NATIONAL LIMITS FOR THE DAY OR TIME (43 DB LA90,T) CRITERIA OR DERIVED BACKGROUND NOISE LIMITS?	RECEPTOR CLASSIFICATION
SR-3	N	Y	Y	Y	A sheep farm with residential facilities
SR-4	N	Y	Y	Y	A sheep farm with residential facilities
SR-8	Y	Y	Y	Y	Farm with residential facilities
SR-5	N	Y	Y	Y	Cattle and sheep farms with residential facilities
SR-6	N	Y	Y	Y	Cattle farm with residential facilities
SR-7	N	Y	Y	Y	Livestock farm (sheep and cattle) with

RECEPTOR	COMPLIANT WITH THE INITIAL IFC 35 DB $L_{A90,T}$ CRITERION	COMPLIANT WITH THE IFC GENERAL DAYTIME 53 DB CRITERIA ($L_{A90,T}$) OR DERIVED BACKGROUND NOISE LIMITS?	COMPLIANT WITH THE IFC GENERAL NIGHT-TIME 43 DB CRITERIA ($L_{A90,T}$) OR DERIVED BACKGROUND NOISE LIMITS?	COMPLIANT WITH THE AZERBAIJAN NATIONAL LIMITS FOR THE DAY OR TIME (43 DB $L_{A90,T}$) CRITERIA OR DERIVED BACKGROUND NOISE LIMITS?	RECEPTOR CLASSIFICATION
					residential facilities
SR-11	N	Y	Y	Y	Sheep farm with residential facilities
SR-12	N	Y	Y	Y	Cattle and sheep farms with residential facilities
SR-13	Y	Y	Y	Y	A sheep farm with residential facilities

As can be seen from Table above, two (2) receptors are below the WBG/IFC's initial 35 dB $L_{A90,T}$ criterion and further detail studies including noise surveys have been undertaken for the remaining receptors. However, as discussed earlier, the WBG/IFC General guidelines as well as the derived background noise level criteria (based upon the Azerbaijan National Limits) apply during the day or night. All of receptors comply with the either the day/night-time criteria set out by WBG/IFC General Guidelines, or the criteria derived from the background noise levels and therefore mitigation measures are not required

It should also be noted that the noise output of a turbine varies with the wind speed and therefore the noise climate attributable to the wind farm will not always be at a worst-case output at 10 m/s or higher. All receptors are seasonal farms are considered to have 'Low' sensitivity, as they are not permanent dwellings and not occupied all year round. The magnitude of impact is anticipated to be Negligible, with an unmitigated significance of Negligible.

OHTL OPERATIONAL NOISE

Corona noise is the most common noise associated with transmission lines and is heard as a crackling or hissing sound. Corona is the breakdown of air into charged particles caused by the electrical field at the surface of conductors. The noise varies with both weather and voltage of the line, and most often occurs in conditions of heavy rain and high humidity.

The operation of the electrical transformers will also result in a low magnitude humming with the area of impact expected to be less than 100 m from source. HR-18 is the only receptor within 100 m of the OHTL routes, as shown in the below figure it is within 100 m of both the Khizi to Yashma and the Khizi to Pirakashkul routes.

Figure 6-11 HR-18 and the OHTL Routes



Table 6-20 Noise and Vibration Impact Significance, Mitigation & Management Measures and Residual Impacts – Operation

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACT
Wind Turbine Noise	Negligible	Receptors (Seasonal farms)	Low	Negligible	Third parties/ herders/farmers will have access to a grievance mechanism in order to make any complaints regarding noise during the operation phase.	Negligible to Minor
OHTL Operational Noise	Minor Negative	HR-18	Medium	Minor	No mitigation measures are proposed; however, a grievance mechanism will be established and in the case of complaints, appropriate mitigation measures may be implemented.	Minor

6.6 Monitoring Requirements

The minimum expected requirements for noise 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.

Table 6-21 Noise Monitoring Requirements

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION
Construction			
Day time noise	LAeq, LA90, LA10, Lpeak	Weekly for 1-hour periods throughout construction	HR-1; HR-3; HR-4; HR-6
Night time noise			HR-7; HR-18 and HR-19

7 BIODIVERSITY

7.1 Standards and Regulatory Requirements

7.1.1 National Requirements

National laws that govern protection of biodiversity include:

- Law of the Azerbaijan Republic on Specially Protected Natural Territories and Objects No. 840-IQ.
- Law of Azerbaijan Republic on Fauna No. 675-IQ.
- Law of the Republic of Azerbaijan on Fauna;
- Law of the Republic of Azerbaijan on Specially Protected Natural Areas and Objects;
- Law of the Republic of Azerbaijan on Addition to the Law of the Republic of Azerbaijan "On Specially Protected Natural Areas and Objects"; and
- Law of the Republic of Azerbaijan on accession to the European Convention for the Protection of Wildlife and the Natural Environment of Europe;
- UNEP EUROBATS Guidelines for consideration of bats in wind farm projects Revision 2014 (awaiting formal adoption).

7.1.2 Lenders Requirements

EBRD

EBRD PR6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources establishes general requirements for the conservation of biodiversity and sustainable management of living natural resources covering aspects such as the assessment of issues and impacts on biodiversity.

Where applicable, the Project will follow the EBRD's E&S Eligibility Criteria for On-Shore Wind Power Projects. This includes targets set out by the EU Biodiversity Strategy including the Habitats Directive 92/43/EEC, the Birds Directive 2009/147/EC, the Bern Convention (June 1979) and EU Regulation 1143/2014 on Invasive Alien Species.

Baseline studies will conclude with a critical habitat assessment to determine if any features in the project area qualify as priority biodiversity features or critical habitat. This assessment answers the basic question, "how important is the study area for conservation and what PR6 requirements will apply?" and does not consider specific impacts at this stage of analysis.

PR6 defines critical habitat and priority biodiversity features as:

Critical Habitat: The most sensitive biodiversity features; which comprise one of the following: (i) highly threatened or unique ecosystems; (ii) habitats of significant importance to endangered or critically endangered species; (iii) habitats of significant importance to endemic or geographically restricted species; (iv) habitats supporting globally significant migratory or congregatory species; (iv) areas associated with key evolutionary processes; or (v) ecological functions that are vital to maintaining the viability of biodiversity features described in this paragraph

Priority Biodiversity Features (PBF) : This concept replaces the previous definition of natural habitat used by the EBRD (in the 2008 ESP) and encompasses a sub-set of biodiversity that is particularly irreplaceable or vulnerable, but at a lower priority level than critical habitats; which include (i) threatened habitats; (ii) vulnerable species; (iii) significant biodiversity features identified by a broad set of stakeholders or governments (such as Key Biodiversity Areas or Important Bird Areas); and (iv) ecological structure and functions needed to maintain the viability of priority biodiversity features.

The criteria used by the EBRD's PR6 to define critical habitat built on and are closely aligned with those used by the International Finance Corporation Performance Standard 6 (IFC PS6). PR6 also explicitly includes ecological functions that are vital for maintaining the viability of critical habitat features.

EPFI'S

The assessment of impacts upon terrestrial ecology will be made with due reference to the IFC Performance Standard 6 on Biodiversity Conservation and Sustainable Natural Resource Management which 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, reclaimed coastal zones, and reclaimed wetlands".

7.2 Critical Habitat Assessment (CHA)

'Critical Habitat' is a concept applicable to several international financial lending institutions, designed to enable the identification of areas of high biodiversity value in which development would be particularly sensitive and require special attention. The concept has been developed in consultation with numerous international conservation organisations and thus takes into account many pre-existing conservation approaches, such as Key Biodiversity Areas, Important Bird Areas, and Alliance for Zero Extinction Sites. This comprehensive approach has meant that it has seen high levels of interest and uptake.

The concept is further defined in the following documents:

- European Bank for Reconstruction and Development (EBRD) Performance Requirement 6 (PR6) Biodiversity Conservation and Sustainable Management of Living Natural Resources
- International Finance Corporation (IFC) IFC Performance Standard 6 (PS6) on Biodiversity Conservation and Sustainable Management of Living Resources.
- Asian Development Bank (ADB) Safeguard Policy Statement (SPS) 2009, ADB Environment Safeguards A Good Practice Sourcebook Draft Working Document
- A number of multilateral banks have policies closely aligned with PS6, and more than 75 private banks signed up to the Equator Principles have an implicit commitment to PS6.

The objective of undertaking a Critical Habitat Assessment (CHA) is to arrive at definitive conclusions regarding whether or not the area where a development has been proposed meets the definitions of a Critical Habitat, per the classifications set out in EBRD PR6, IFC PS6, and ADB guidelines following the criteria and processes for CHA described therein.

A Critical Habitat Assessment was undertaken utilizing a multi-stage approach:

- Stage One: CHA Screening Report, which screened for all possible species and ecological elements that may be present in the project region; it was determined that three potential species of concern merited further review, Steppe Eagle, Greater Spotted Eagle, Eastern Imperial Eagle, Saker Falcon, Egyptian Vulture, and Sociable Lapwing.
- Stage Two: Targeted CHA Report, which investigated in-depth information on the identified species of concern and extrapolated population quantities to determine if criticality was triggered. It was determined that Sociable Lapwing

did not trigger criticality but that Steppe Eagle is present in numbers high enough to trigger criticality.

- Stage Three: Recommendations to fulfil CHA Requirements Presentation, which was provided to the project proponent. This included design and operation mitigation recommendations for the wind turbines as well as recommendations relevant to the OHTL off-taker. The same mitigation measures have been incorporated into the ESIA.

Refer to Appendix H for the full CHA reports and presentation.

The outcomes of the CHA indicated that there are a number of critical species as well as priority biodiversity features (refer to CHA and/or baseline section for details). As a result, a Biodiversity Action Plan must be prepared, which will include:

- Dedicated Species Action Plans for critical species which outlines the baseline conditions, potential impacts, and management protocols to ensure that no net positive gain (NPG) is in place; and
- Identification of the full list of Priority Biodiversity Features, along with the strategy to ensure No Net Loss (NNL) requirements are met for all PBFs; and
- Biodiversity Monitoring and Evaluation Programme; which provides the overview of the various monitoring and reporting mechanisms that will be in place to track the progress of various management measures that are in place to achieve NNL and NPG.

7.3 Area of Influence and Ecologically Appropriate Area of Analysis (EAAA)

The area of influence is the area within which project activities may affect receptors. As different aspects carry differing spatial extents, the Aol varies considerably.

The area of influence for **Habitat Loss** impacts is inclusive of the full project construction and operation footprint, including associated facilities, laydown areas, and any existing or new roads utilised for incoming and outbound transport.

The area of influence for **Direct Mortality** impacts is inclusive of the full project construction and operation footprint, including associated facilities, laydown areas, and any existing or new roads utilized for incoming and outbound transport, as well as the airspace of the wind farm.

The area of influence for **Habitat Fragmentation and Disturbance** impacts extends beyond the footprint of the project inclusive of 1km buffer for terrestrial biodiversity elements and a 20km buffer for birds and bats, to account for the phenomenon of barrier effect.

The area of influence for **Displacement** impacts extends beyond the footprint of the project inclusive of a 1km buffer for terrestrial biodiversity elements and a 20km buffer for birds and bats, 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 1km buffer, to account for (1) potential invasive spread and (2) secondary impacts caused by displacement of less competitive fauna into adjacent areas.

The area of influence for dust, gaseous emissions, noise and vibration, external lighting and accidental spills (contamination) are described in the relevant Sections of this ESIA Report.

7.4 Observation and Baseline Conditions

Azerbaijan lies at a biogeographic crossroads where the flora and fauna of at least three biogeographic provinces converge, resulting in high levels of biodiversity; representatives include species typical of Europe, Central Asia, and Asia Minor. The varied terrain and climatic conditions contribute to a diversity of ecosystems and species.

The Caucasus region has been identified by the World Wide Fund for Nature as one of the Global 200 Ecoregions based on criteria such as species richness, levels of endemism, taxonomic uniqueness, unusual evolutionary phenomena, and global rarity of major habitat types. It has been identified by Conservation International as a global “hotspot” — one of the 25 most biologically rich and most endangered terrestrial ecosystems in the world.

7.4.1 Ecosystems, Habitats and Plant Communities

REGIONAL CONTEXT

Azerbaijan can be divided into the following five broad ecosystem complexes, all of which contribute to the high levels of biodiversity represented in the country (Unknown, 2014):

- Forest ecosystems;
- Freshwater, wetland and swamp ecosystems;
- Grassland and semi-desert ecosystems;
- High mountain ecosystems; and
- Marine and coastal ecosystems.

The Project site is located on the hilltops of Greater Caucasian Mountain range in the Khizi region, approximately 55km Northwest of Baku. The project falls within a mix of grassland and semi-desert ecosystems as well as high mountain ecosystems.

Figure 7-1 Project Ecosystems

Azerbaijan has more than 4,500 plant species, which represents 66% of all those found in the Caucasus (Flora, 2020).

Semi-desert habitats are dominated by wormwood (*Artemisia fragrans*), either alone or associated with saltwort (*Salsola* spp) or *Bothriochloa*. Pockets of more typical desert vegetation also occur in this area.

Steppe vegetation occurs in the lowlands and foothills around 300 to 700 m and is largely the result of human influence on woodland and shrub habitats. The dominant species are grasses (*Bothriochloa* spp). Rich floristic communities have developed in the *Bothriochloa ischaemum*/*Glycyrrhiza glabra* steppes of the lowlands. On the foothill slopes, *Bothriochloa ephemerosa* is mixed with other grasses such as *Festuca sulcata* and *Stipa* spp. Thorny shrubs, notably Christ's Thorn (*Paliurus spina-christii*), are typical.

Ephemeras prevail in the plant varieties in this section of the Caucasian mountains in March – April. There are well-known rare and near-extinct varieties among them. The following table lists the species of threatened plants known for Azerbaijan.

Table 7-1 Azerbaijan Species on IUCN Red List of Threatened Plants

CHEMUNIS INTERNATIONAL INC.

Azerbaijan Species on IUCN Red List of Threatened Plants

Family	Species	Status
Asteraceae	<i>Nectaroscordum tripedale</i>	I
	<i>Nectaroscordum dioscoridis</i>	I
Orchidaceae	<i>Ophrys caucasica</i>	I
	<i>Ophrys oestifolia</i>	I
	<i>Himantoglossum formosum</i>	I
Cruciferae	<i>Pseudovasicaria digitata</i>	I
Labiatae	<i>Stachys talyschensis</i>	En/Ex
Rosaceae	<i>Pyrus raddiana</i>	I
Umbelliferae	<i>Smyrniopsis aucheri</i>	I
Compositae	<i>Cladochaeta candidissimus</i>	I
	<i>Steptomerphus czerspanovi</i>	I
Leguminosae	<i>Vavilova formosa</i>	I
	<i>Astragalus bakumensis</i>	I
Gramineae	<i>Triticum araratlicum</i>	I
	<i>Sesale vavilovi</i>	I
	<i>Sipa polia</i>	I
Buxaceae	<i>Buxus colchica</i>	I
Polygonaceae	<i>Calligonum bakumense</i>	I
Liliaceae	<i>Fritillaria grandiflora</i>	I
	<i>Lilium fedeleburi</i>	I
Gentianaceae	<i>Gentiana lagodechiana</i>	R
Iridaceae	<i>Iris acutifolia</i>	En
	<i>Iris camillae</i>	I
	<i>Iris ibetica</i>	I
Hymenophyllaceae	<i>Omithogalum arxatum</i>	I
	<i>Omithogalum hyrcanum</i>	I
Pinaceae	<i>Pinus brutia var. eldarica</i>	R
Primulaceae	<i>Primula juliae</i>	I

I = Indeterminate; R = Rare; En = Endangered; En/Ex = Endangered/Extinct

SURVEY METHODOLOGY

In order to provide site-specific baseline information on habitats and flora species, ecology surveys were carried out as per the below.

Surveying Techniques:

- The botany survey included a project site walkover, including 'zigzag' transects, focusing especially on areas sheltered from direct wind with less grazing pressure which are more likely to have rare and endemic specimens. Identification was performed utilizing reference publications.
- Habitat mapping was done via remote sensing of satellite imagery and ground-truthed during botany survey; and
- Each segment of the OHTL alignment was surveyed along the proposed routes using transects 12-25 km.

Coverage & Timing/Dates:

- Khizi WF area (including BOP, laydown and substation) was surveyed from May to June, 2020;
- Khizi BOP area was surveyed from April 21 till May 07, 2021;

- Khizi - Yashma OHTL Route (12km) was surveyed in June 2021;
- Khizi-Pirakashkul OHTL Route (25km) was surveyed in June and July 2021; and
- Pirakashkul-Gobu OHTL Route (25km) was surveyed in June 2021.

A detailed methodology is available in the following Baseline Reports, provided within Appendix F.

RESULTS

The below provides a summary of the findings. Detailed Results are available in the following Baseline Reports, provided within Appendix F.

Habitats

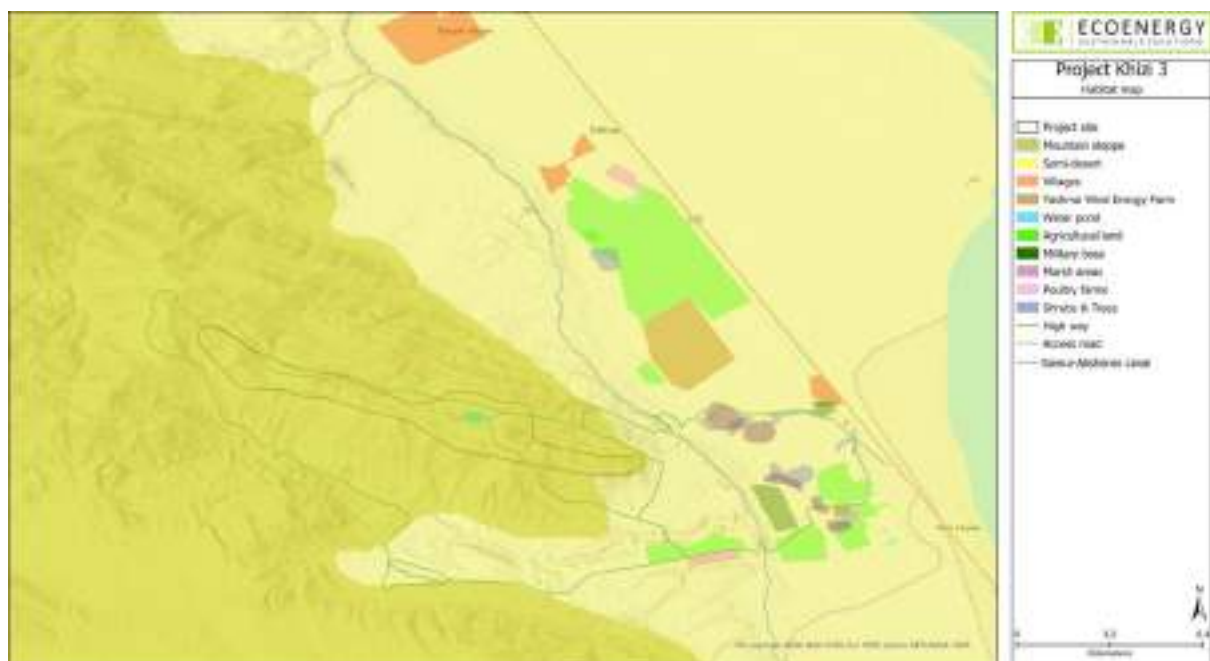
The ecosystems that the WF, BOP and Laydown footprints encompass include:

- Lowland steppe, characterized by a mix of common flora species and occasional rare and endemic ephemeral specimens;
- Highland mountain habitat, characterized by semi-arid climatic conditions;
- Salt depressions/ salt ponds, which can provide potential mudflat/wetland-like habitat

Additionally, the associated OHTL corridors passes through:

- Pockets of forest habitat, as well as
- Modified agricultural habitat.

Figure 7-2 Habitat Map



WF and BOP Flora

At the cumulation of surveying, a total of 183 species were found in the area, of which 13 are considered threatened plant species. Two (2) species are listed as Endangered in the National Red Data Book. A total of 9 are endemic to Azerbaijan, with a further 26 of the recorded species being range-restricted to the Caucasus region. As per EBRD PR6 criteria, *Acantholimon schemahense*, *Alcea kusariensis*, *Astragalus caspicus*, *Cirsium sprigosum*, *Erodium schemachense*, *Hypericum karjagini*, *Hypericum theodori*, *Linaria schirvanica*, *Onobrychis vaginalis*, *Thymus hadzhievii* and *Viola caucasica* are classified as PBFs.

Threatened and endemic species are captured in the following table.

Table 7-2 Summary of Threatened and endemic species

Species	Abundance on Site	Range (Endemic / Regional / Transcontinental)	Status	Listing Reference
<i>Alcea kusariensis</i> Iljin.	Occasional	Transcontinental	EN B1ab(v)+B2ab(v) & NE	Az Red Book & IUCN
<i>Asyneuma campanuloides</i> Bornm.	Rare	Transcontinental	NT	Az Red Book
<i>Atropa caucasica</i> Kreyer.	Rare	Transcontinental	VU B1b(i,iii) & NE	Az Red Book & IUCN
<i>Iris acutiloba</i> C.A.Verz.	Rare	Transcontinental	VU A2b(iii); B1ab(iii) & EN B2ab(iii) c(v)	Az Red Book & IUCN
<i>Orchis caspia</i> Trautv.	Rare	Transcontinental	VU A2c+3cd	Az Red Book
<i>Punica granatum</i> L.	Rare	Transcontinental	VU B1ab (i,ii,iii,v)+2ab(i,ii,iii,v)	Az Red Book
<i>Pyrus salicifolia</i> Pall.	Occasional	Transcontinental	NT & NE	Az Red Book & IUCN
<i>Viola caucasica</i> Kolenat.	Rare	Transcontinental	EN B2ab(ii,iii,iv) & NE	Az Red Book & IUCN
<i>Acantholimon schemahense</i> A.Grosch.	Abundant	Endemic	VU D2 & NE	Az Red Book & IUCN
<i>Cladochaeta candidissima</i> M.B.	Rare	Regional	VU A2c+3c; B1ab(i,iii,iv) & NE	Az Red Book & IUCN
<i>Linaria schirvanica</i> Fom.	Rare	Endemic	NE & VU B1 ab(i,ii,iii) +2ab(ii,iii,iv)	Az Red Book & IUCN
<i>Ophrys caucasica</i> G.Woron.	Rare	Regional	VU A2c+3c	Az Red Book
<i>Pulsatilla albana</i> (Stev.)	Rare	Regional	NT	Az Red Book

Species	Abundance on Site	Range (Endemic / Regional / Transcontinental)	Status	Listing Reference
<i>Anthemis fruticulosa</i> M.B.Fl.	Rare	Regional		
<i>Astragalus caspicus</i> M.B.Fl.	Frequent	Endemic		
<i>Centaurea salicifolia</i> M.B.Boiss.	Occasional	Regional		
<i>Cerastium multiflorum</i> C.A.Mey.	Rare	Regional		
<i>Cirsium lappaceum</i> M.B.Fl.	Rare	Regional		
<i>Cirsium sprigosum</i> M.B.Fl.	Rare	Endemic		
<i>Crambe gibberosa</i> Rupr.	Occasional	Regional		
<i>Draba incompta</i> Stev.	Rare	Regional		
<i>Erodium schemachense</i> A.Grossh.	Rare	Endemic		
<i>Gysophila capitata</i> M.B.	Rare	Regional		
<i>Hypericum karjagini</i> Rzazade.	Rare	Endemic		
<i>Hypericum theodori</i> Woron.	Rare	Endemic		
<i>Lotus caucasicus</i> Kupr.	Rare	Regional		
<i>Merendera eichleri</i> Boiss.	Rare	Regional		
<i>Medicago caucasica</i> Vass.	Rare	Regional		
<i>Medicago glutinosa</i> M.B.	Rare	Regional		
<i>Minuartia caucasica</i> Ad.	Rare	Regional		
<i>Nonnea rosea</i> M.B.	Occasional	Regional		
<i>Onobrychis vaginalis</i> C.A.Mey	Occasional	Endemic		
<i>Ornithogalum schmalhauseni</i> Albov.	Rare	Regional		
<i>Ranunculus crassifolius</i> A.Grossh.	Rare	Regional		
<i>Salsola nodulosa</i> Ilgin.	Rare	Regional		
<i>Scorzonera biebersteinii</i> Lipsch.	Rare	Regional		

Species	Abundance on Site	Range (Endemic / Regional / Transcontinental)	Status	Listing Reference
<i>Scrophularia grossheimii</i> Schischk.	Rare	Regional		
<i>Scrophularia variegata</i> M.B.	Rare	Regional		
<i>Scutellaria orientalis</i> L.	Rare	Regional		
<i>Serratula transcaucasica</i> D.Sosn.	Rare	Regional		
<i>Sorbus caucasica</i> Zins.	Rare	Regional		
<i>Taraxacum praticolum</i> Schischk.	Rare	Regional		
<i>Thymus hadzhievii</i> A.Grossh.	Abundant	Endemic		

The locations of these species are provided in the following maps.

Figure 7-3 Vegetation Map of Azerbaijan Endemics

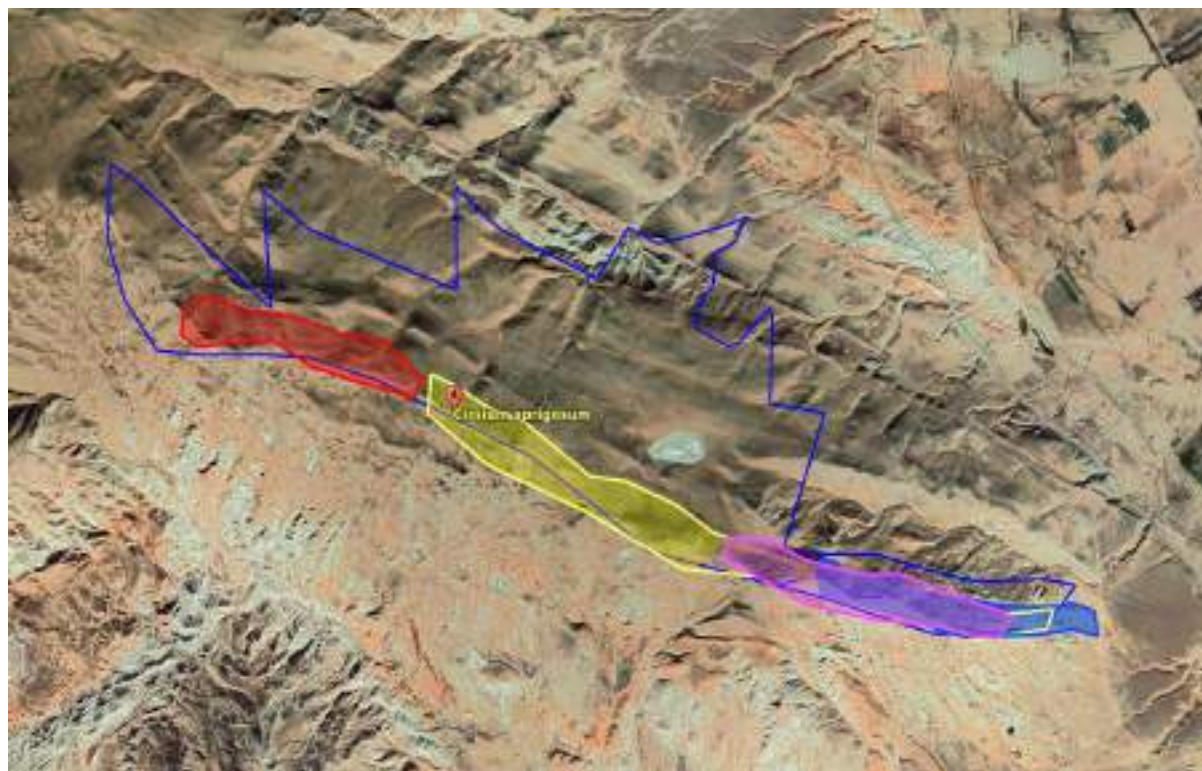


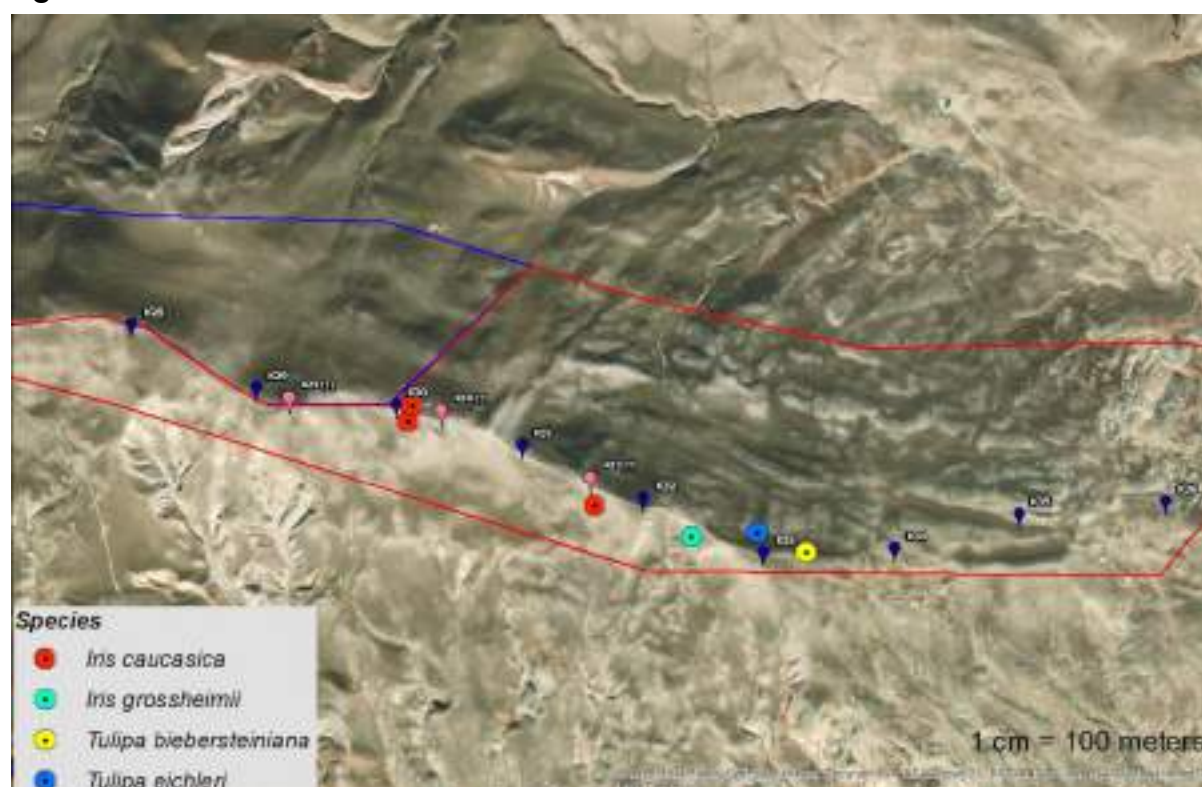
Figure 7-4 Locations of Azerbaijan Endemics



Figure 7-5 Threatened Flora Locations



Figure 7-6 Threatened Flora Locations



All other species recorded are considered to be common, and the majority of accessible areas have been degraded due to grazing pressures.

OHTL Flora – Segment 1 Khizi -Yashma

A total of 45 species were recorded in Segment 1 Khizi- Yashma, of which 2 species; *Acanthoimon schemachense* and *Alcea kusariensis* are listed as a threatened species Azerbaijan Red data Book. *Alcea kusariensis* is a nationally endangered species and thus qualifies as a PBF as per EBRD PR6 requirements. Being range restricted endemic species *Acanthoimon schemachense*, *Astragalus caspicus* and *Thymus hadzhievii* also qualify as PBF. Threatened and endemic species are captured in the following table.

Table 7-3 Summary of Threatened and Endemic Species in Segment 1

SPECIES	ABUNDANCE ON SITE	RANGE (ENDEMIC / REGIONAL / TRANSCONTINENTAL)	STATUS	LISTING REFERENCE
<i>Acanthoimon schemachense</i>	Rare	Azerbaijan	VU D2	AzRDB
<i>Aegilops trunsialis</i>	Frequent	-	-	-
<i>Aegilops squarrosa</i>	Frequent	-	-	-
<i>Aegilops umbellulata</i>	Frequent	-	-	-
<i>Alcea kusariensis</i>	Rare	-	EN B1ab(v)+B2ab(v)	AzRDB
<i>Alhagi pseudalhagi</i>	Occasional	-	-	-
<i>Allium albidum</i>	Rare	-	-	-

SPECIES	ABUNDANCE ON SITE	RANGE (ENDEMIC / REGIONAL / TRANSCONTINENTAL)	STATUS	LISTING REFERENCE
<i>Allium moschatum</i>	Rare	-	-	-
<i>Amaranthus deflexus</i>	Rare	-	-	-
<i>Agropyron cristatum</i>	Frequent	-	-	-
<i>Arabidopsis pumila</i>	Rare	-	-	-
<i>Artemisia fragrans</i>	Frequent	-	-	-
<i>Astragalus aureus</i>	Frequent	-	-	-
<i>Astragalus caspicus</i>	Frequent	Azerbaijan	-	-
<i>Bromus brizaeformis</i>	Rare	-	-	-
<i>Bromus squarrosus</i>		-	-	-
<i>Capparis herbacea</i>	Rare	-	-	-
<i>Centaurea reflexa</i>	Occasional	-	-	-
<i>Centaurea squarrosa</i>	Rare	-	-	-
<i>Centaurea soistitialis</i>	Rare			
<i>Consolida divaricata</i>	Rare	-	-	-
<i>Cousinia orientalis</i>	Rare	-	-	-
<i>Crupina crupinastrum</i>	Rare	-	-	
<i>Echium italicum</i>	Rare	-	-	
<i>Eryngium caucasicum</i> (<i>Biebersteinum</i>)	Occasional	-	-	-
<i>Ephedra distachya</i>	Rare	-	-	
<i>Galium rythenicum</i>	Rare	-	-	
<i>Helichrysum undulatum</i>	Occasional	-	-	-
<i>Helminthia echinoides</i>	Rare			-
<i>Kalidium caspicum</i>	Frequent	-		-
<i>Lactuca saligna</i>	Rare	-	-	-
<i>Limonium scoparium</i>	Rare	-	-	-
<i>Lycium ruthenicum</i>	Rare	-	-	
<i>Nigella arvensis</i>	Rare	-	-	-
<i>Onopordon acanthium</i>	Occasional	-	-	-
<i>Onopordon heteracanthum</i>	Rare	-	-	-
<i>Poa bulbosa</i>	Occasional	-	-	-
<i>Phlomis pungens</i>	Occasional	-	-	-
<i>Reaumuria hypericoides</i> (<i>alternifolia</i>)	Rare	-	-	-
<i>Salsola incanescens</i>	Occasional	-	-	-
<i>Scutellaria orientalis</i>	Rare	Caucasus	-	-
<i>Selene conoidea</i>	Rare	-	-	-
<i>Stipa pulcherrima</i>	Occasional	-	-	-
<i>Teucrium pollium</i>	Rare	-	-	-
<i>Thymus hadzhievii</i>	Rare	Azerbaijan	-	-

Figure 7-7 AzRDB Threatened Species Recorded along Segment 1

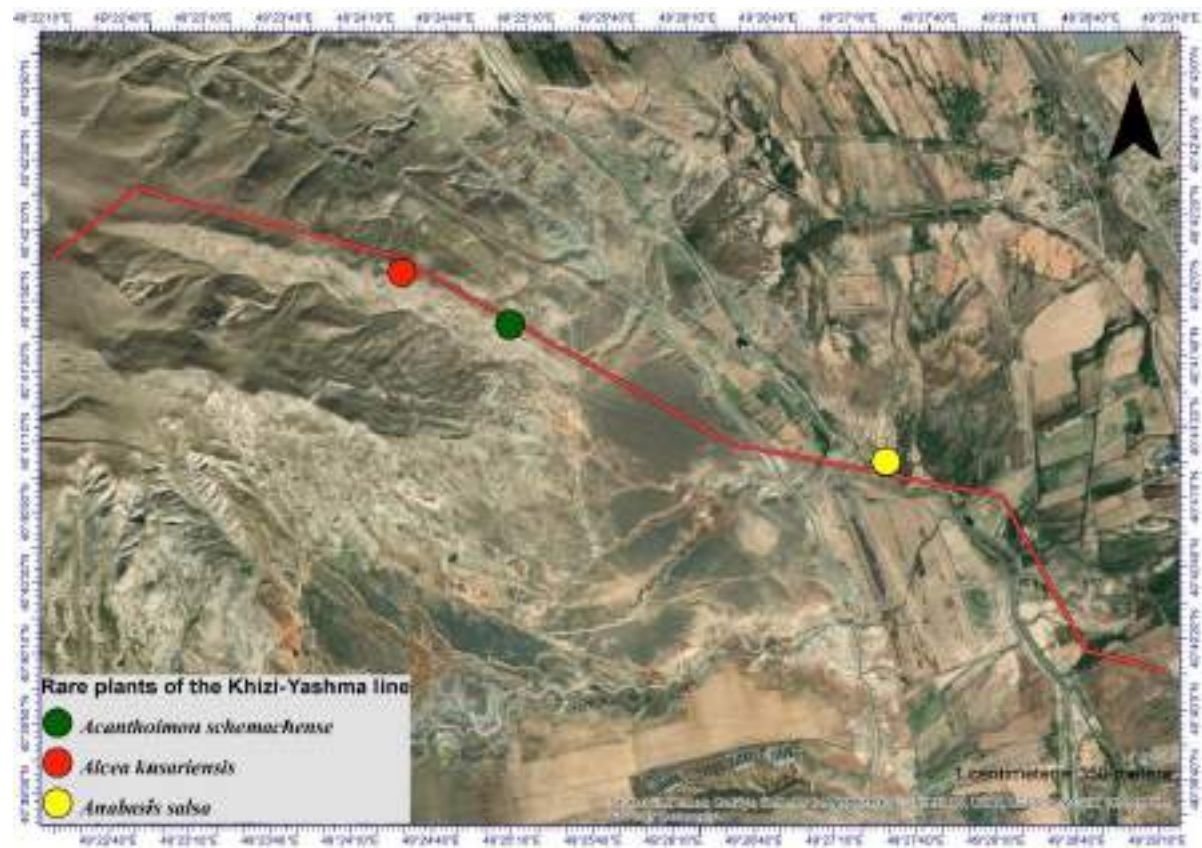


Figure 7-8 Location of Flora Species Endemic to Azerbaijan along Segment 1

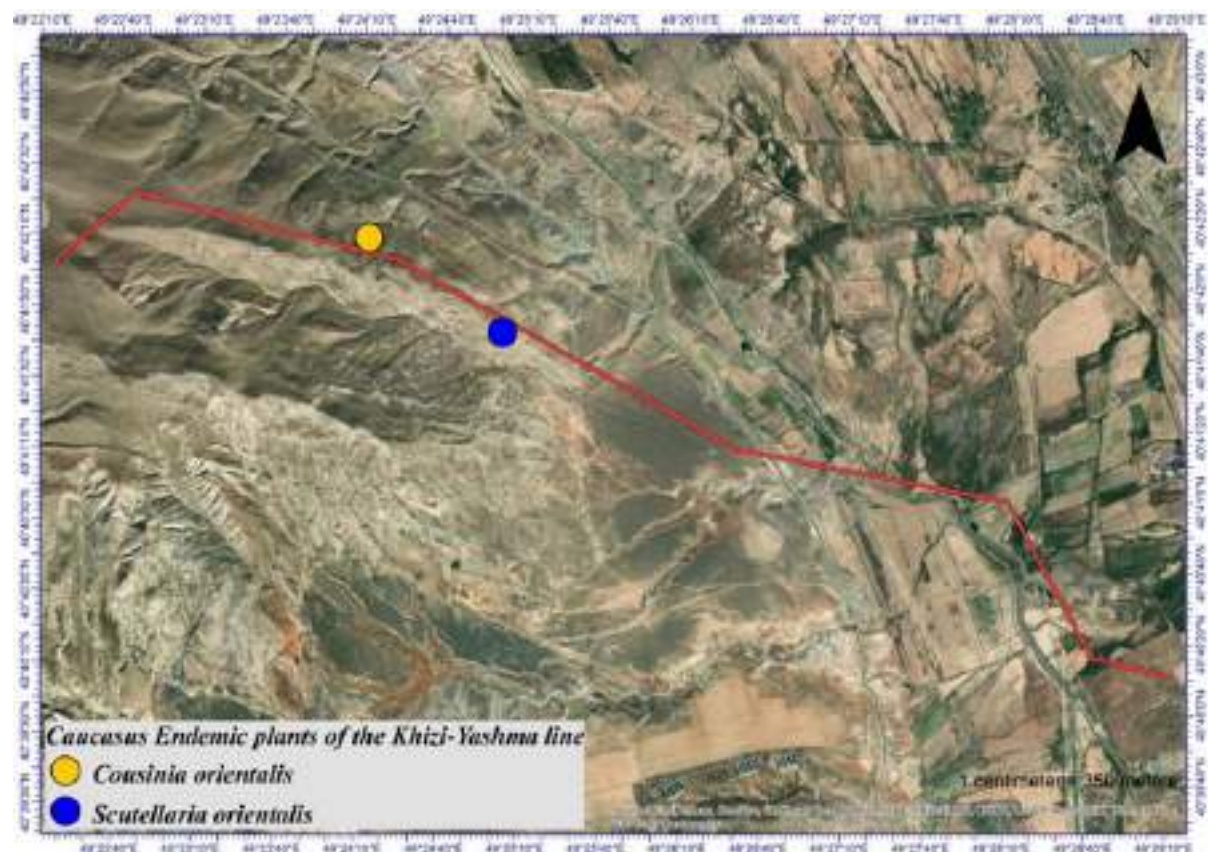
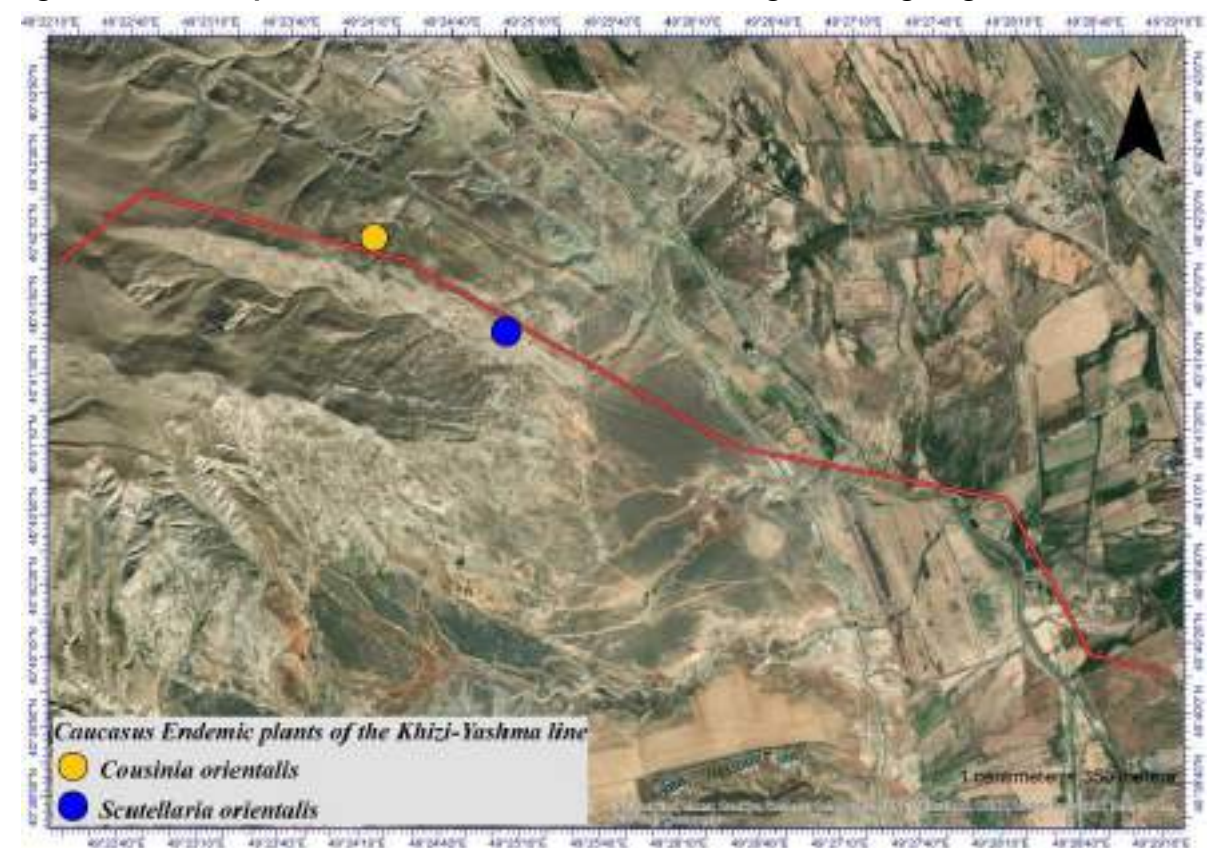


Figure 7-9 Flora Species Endemic to the Caucasus Region along Segment 1



OHTL Flora – Segment 2 (Khizi-Pirakashkul)

A total of 45 species were recorded in Segment 2 (Khizi- Pirakashkul), of which 2 species; *Acanthoimon schemachense* and *Alcea kusariensis* are listed as a threatened species Azerbaijan Red data Book. *Alcea kusariensis* is a nationally endangered species and thus qualifies as a PBF as per EBRD PR6 requirements. Being range restricted endemic species *Acanthoimon schemachense*, *Astragalus caspicus* and *Thymus hadzhievii* also qualify as PBF. Threatened and endemic species are captured in the following table.

Table 7-4 Summary of Threatened and Endemic Species in Segment 2

SPECIES	ABUNDANCE ON SITE	RANGE (ENDEMIC / REGIONAL / TRANSCONTINENTAL)	STATUS	LISTING REFERENCE
<i>Acanthoimon schemachense</i>	Rare	Azerbaijan	VU D2	AzRDB
<i>Aegilops trunialis</i>	Frequent	-	-	-
<i>Aegilops squarrosa</i>	Frequent	-	-	-
<i>Aegilops umbellulata</i>	Frequent	-	-	-
<i>Alcea kusariensis</i>	Rare	-	EN B1ab(v)+B2ab(v)	AzRDB
<i>Alhagi pseudalhagi</i>	Occasional	-	-	-
<i>Allium albidum</i>	Rare	-	-	-
<i>Allium moschatum</i>	Rare	-	-	-
<i>Amaranthus deflexus</i>	Rare			
<i>Agropyron cristatum</i>	Frequent	-	-	-
<i>Arabidopsis pumila</i>	Rare	-	-	-
<i>Artemisia fragrans</i>	Frequent	-	-	-
<i>Astragalus aureus</i>	Frequent	-	-	-
<i>Astragalus caspicus</i>	Frequent	Azerbaijan	-	-
<i>Bromus brizaeformis</i>	Rare	-	-	-
<i>Bromus squarrosus</i>		-	-	-
<i>Capparis herbacea</i>	Rare	-	-	-
<i>Centaurea reflexa</i>	Occasional	-	-	-
<i>Centaurea squarrosa</i>	Rare	-	-	-
<i>Centaurea soistitialis</i>	Rare			
<i>Consolida divaricata</i>	Rare	-	-	-
<i>Cousinia orientalis</i>	Rare	-	-	-
<i>Crupina crupinastrum.</i>	Rare	-	-	
<i>Echium italicum</i>	Rare	-	-	
<i>Eryngium caucasicum</i>	Occasional	-	-	-
<i>Ephedra distachya</i>	Rare	-	-	
<i>Galium rythenicum</i>	Rare	-	-	
<i>Helichrysum undulatum</i>	Occasional	-	-	-
<i>Helminthia echinoides</i>	Rare			-

SPECIES	ABUNDANCE ON SITE	RANGE (ENDEMIC / REGIONAL / TRANSCONTINENTAL)	STATUS	LISTING REFERENCE
<i>Kalidium caspicum</i>	Frequent	-		-
<i>Lactuca saligna</i>	Rare	-	-	-
<i>Limonium scoparium</i>	Rare	-	-	-
<i>Lycium ruthenicum</i>	Rare	-	-	
<i>Nigella arvensis</i>	Rare	-	-	-
<i>Onopordon acanthium</i>	Occasional	-	-	-
<i>Onopordon heteracanthum</i>	Rare	-	-	-
<i>Poa bulbosa</i>	Occasional	-	-	-
<i>Phlomis pungens</i>	Occasional	-	-	-
<i>Reaumuria hypericoides</i>	Rare	-	-	-
<i>Salsola incanescens</i>	Occasional	-	-	-
<i>Scutellaria orientalis</i>	Rare	Caucasus	-	-
<i>Selene conoidea</i>	Rare	-	-	-
<i>Stipa pulcherrima</i>	Occasional	-	-	-
<i>Teucrium pollium</i>	Rare	-	-	-
<i>Thymus hadzhievii</i>	Rare	Azerbaijan	-	-

Figure 7-10 AzRDB Threatened Species Recorded along Segment 2



Figure 7-11 Location of Flora Species Endemic to Azerbaijan along Segment 2



Figure 7-12 Flora Species Endemic to the Caucasus Region along Segment 2



OHTL Flora – Segment 3 (Pirakashkul-Gobu)

A total of 57 species were recorded along the OHTL segment 3 (Pirakashkul-Gobu), of which *Anabasis salsa* is considered as a rare and threatened species (VU) in the Azerbaijan Red Data Book. Threatened and endemic species are captured in the following table. Being range restricted endemic species *Astragalus shemachensis* and *Thymus karjaginii* qualify as PBFs as per EBRD PR6 requirements.

Table 7-5 Summary of Threatened and Endemic Species in Segment 3

SPECIES	ABUNDANCE ON SITE	RANGE (ENDEMIC / REGIONAL / TRANSCONTINENTAL)	STATUS	LISTING REFERENCE
<i>Abutilon theophrasti</i>	Rare	-	-	
<i>Achillea millefolium</i>	Rare	-	-	
<i>Agrostis stolonifera</i>	Frequent	-	-	
<i>Agropyron cristatum</i>	Frequent	-	-	
<i>Airoanthemum hispanicum</i>	Rare	-	-	
<i>Allium rubellum</i>	Rare	-	-	
<i>Alhagi pseudalhagi</i>	Occasional	-	-	
<i>Anabasis salsa</i>	Occasional	-	VU A2cd+3cd	AzRDB
<i>Anabasis aphylla</i>	Occasional	-	-	
<i>Anisantha rubens</i>	Frequent	-	-	
<i>Artemisia caucasica</i>	Frequent	-	-	
<i>Artemisia fragrans</i>	Frequent	-	-	
<i>Astrodaucus orientalis</i>	Rare	-	-	
<i>Astragalus shemachensis</i>	Frequent	Azerbaijan	-	
<i>Atraphaxis spinosa</i>	Rare			
<i>Avena ventricosa</i>	Frequent	-	-	
<i>Capparis herbacea</i>	Occasional	-	-	
<i>Centaurea iberica</i>	Rare	-	-	
<i>Centaurea reflexa</i>	Occasional	-	-	
<i>Centaurea squarrosa</i>	Rare	-	-	
<i>Chenopodium foliosum</i>	Rare			
<i>Consolida divaricata</i>	Rare	-	-	
<i>Cousinia cynaroides</i>	Occasional	-	-	
<i>Cousinia orientalis</i>	Rare	Caucasus	-	
<i>Cuscuta australis</i>	Rare	-	-	
<i>Cynodon dactylon</i>	Frequent	-	-	
<i>Eremopyrum triticeum</i>	Frequent			
<i>Eryngium caucasicum</i>	Occasional	-	-	
<i>Euphorbia glareosa</i>	Rare	-	-	
<i>Halocnemum strobilaceum</i>	Frequent	-	-	
<i>Hordeum hystrix</i>	Frequent	-	-	

SPECIES	ABUNDANCE ON SITE	RANGE (ENDEMIC / REGIONAL / TRANSCONTINENTAL)	STATUS	LISTING REFERENCE
<i>Hordeum leporinum</i>	Frequent	-	-	
<i>Kalidium caspicum</i>	Frequent	-	-	
<i>Limonium scoparium</i>	Rare	-	-	
<i>Lycium ruthenicum</i>	Rare	-	-	
<i>Picris strigosa</i>	Rare	-	-	
<i>Phalaris bulbosa</i>	Frequent	-	-	
<i>Phlomis pungens</i>	Frequent	-	-	
<i>Phragmites communis</i>	Occasional	-	-	
<i>Poa bulbosa</i>	Occasional	-	-	
<i>Polygonum argyrocoleum</i>	Rare	-	-	
<i>Psyllostachis spicata</i>	Rare	-	-	
<i>Reaumuria hypericoides</i>	Rare	-	-	
<i>Salsola dendroides</i>	Occasional	-	-	
<i>Salsola ericoides</i>	Occasional	-	-	
<i>Salsola soda</i>	Occasional	-	-	
<i>Setaria viridis</i>	Frequent	-	-	
<i>Spinacia tetrandra</i>	Rare	-	-	
<i>Stipa pelliata</i>	Occasional	-	-	
<i>Suaeda microphylla</i>	Rare	-	-	
<i>Tamarix hohenacheri</i>	Occasional	-	-	
<i>Tamarix ramosissima</i>	Occasional	-	-	
<i>Teucrium pollium</i>	Rare	-	-	
<i>Thymus karjagii</i>	Occasional	Azerbaijan	-	
<i>Tragopogon graminifolius</i>	Rare	-	-	
<i>Typha domingensis</i>	Occasional	-	-	
<i>Xanthium spinosum</i>	Rare	-	-	

Figure 7-13 AzRDB Vulnerable Species *Anabasis salsa* Recorded along Segment 3



Figure 7-14 Location of Flora Species Endemic to Azerbaijan along Segment 3



Figure 7-15 Location of Flora Species Endemic to the Causcaus Region

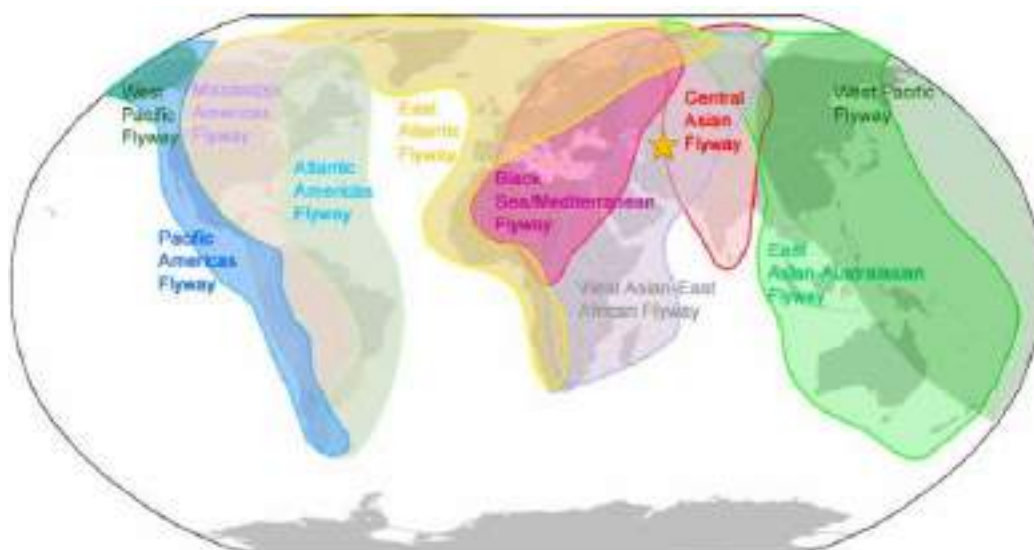


7.4.2 Birds

REGIONAL CONTEXT

The project lies within the Black Sea/Mediterranean Flyway and West Asian-East African Flyway.

Figure 7-16 Global Migratory Flyways



Additionally, three Important Bird Areas (IBAs) are within 15-25 km of the project site. These include:

- Yashma Island;
- Alty Agach area; and
- Mount Kargabazar and Mount Gush-gaya.

Figure 7-17 IBAs within 30km



These IBAs are known for migratory birds and breeding raptors of high conservation status. In particular, Yashma Island consists of species staging areas which indicates that these species may pass through the project site during the migratory periods.

Figure 7-18 IBA Trigger Criteria – Yashma Island

Yashma Island						AZ033
Summary Text account Data table and detailed info Map References and further resources						
IBA Criteria						
Year of most recent IBA criteria assessment: 2005						
Populations of IBA trigger species						
Species	Current IUCN Red List Category	Season	World of estimate	Population estimate	IBA Criteria Triggered	
Tufted Duck <i>Aythya fulgens</i>	LC	winter	1996-2004	1,000-24,753 individuals	A4, B11	
Common Coot <i>Fulica atra</i>	LC	winter	1996-2004	400-1,000 individuals	B11	
Domestic Pheasant <i>Phasianus torquus</i>	NT	passage	1996-2004	22 individuals	A1	
Pygmy Cormorant <i>Micropepla pygmaea</i>	LC	winter	1996-2004	20-57 individuals	A1	
Slender-billed Curlew <i>Numenius tenuirostris</i>	CR	passage	1996	1 individuals	A1, B11	
Common Tern <i>Sterna hirundo</i>	LC	breeding	1996-2004	1,100 breeding pairs	B11	
Sandwich Tern <i>Thalasseus sandwichensis</i>	LC	breeding	1996-2004	1,235 breeding pairs	B11	
All Species group - waterbirds	n/a	passage	1996	20,000-50,000 individuals	A4B	

Note: This table presents the IBA criteria triggered and the species that triggered them at the time of assessment; the current IUCN Red List category may vary from that which was in place at that time.

Figure 7-19 IBA Trigger Criteria – Alty Agach National Park



Figure 7-20 IBA Trigger Criteria – Mount Kargabazar and Mount Gush-gaya



A number of species are listed as CR, EN as per the Global IUCN Red List, and have spatial distributions which overlap with the site. Migratory and congregating species such as migratory shorebirds and waterbirds are anticipated to potentially occur based on the migratory flyway as well as presence of IBAs within 100km of the project site. Over 270 species of birds are possibly present based on spatial distribution data, many of which are migratory and 14 of which are listed as Vulnerable or Near Threatened.

Table 7-6 Threatened Species Potentially Occurring in Project Region (as per IUCN Red List)

Common Name	Latin Name	IUCN Global Red List Category	Azerbaijan Red Book Category
Egyptian Vulture	<i>Neophron percnopterus</i>	Endangered	
Steppe Eagle	<i>Aquila nipalensis</i>	Endangered	Endangered
White-headed Duck	<i>Oxyura leucocephala</i>	Endangered	
Sociable Lapwing	<i>Vanellus gregarius</i>	Critically Endangered	
Saker Falcon	<i>Falco cherrug</i>	Endangered	
Cinereous Vulture	<i>Aegypius monachus</i>	Near Threatened	Near Threatened
Eastern Imperial Eagle	<i>Aquila heliaca</i>	Vulnerable	Vulnerable

Common Name	Latin Name	IUCN Global Red List Category	Azerbaijan Red Book Category
Greater Spotted Eagle	<i>Clanga clanga</i>	Vulnerable	
Pallid Harrier	<i>Circus macrourus</i>	Near Threatened	
Common Pochard	<i>Aythya ferina</i>	Vulnerable	
Ferruginous Duck	<i>Aythya nyroca</i>	Near Threatened	
Lesser White-fronted Goose	<i>Anser erythropus</i>	Vulnerable	
Marbled Teal	<i>Marmaronetta angustirostris</i>	Vulnerable	
Red-breasted Goose	<i>Branta ruficollis</i>	Vulnerable	
Velvet Scoter	<i>Melanitta fusca</i>	Vulnerable	
Northern Lapwing	<i>Vanellus vanellus</i>	Near Threatened	
European Turtle-dove	<i>Streptopelia turtur</i>	Vulnerable	
Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	Near Threatened	
Meadow Pipit	<i>Anthus pratensis</i>	Near Threatened	
Great Bustard	<i>Otis tarda</i>	Vulnerable	
Little Bustard	<i>Tetrax tetrax</i>	Near Threatened	
Dalmatian Pelican	<i>Pelecanus crispus</i>	Near Threatened	Vulnerable
Caucasian Grouse	<i>Lyrurus mlokosiewiczi</i>	Near Threatened	
Black-tailed Godwit	<i>Limosa limosa</i>	Near Threatened	
Eurasian Curlew	<i>Numenius arquata</i>	Near Threatened	
Great Snipe	<i>Gallinago media</i>	Near Threatened	
Redwing	<i>Turdus iliacus</i>	Near Threatened	
Black Kite	<i>Milvus migrans</i>	Least Concern	Vulnerable
Booted Eagle	<i>Hieraaetus pennatus</i>	Least Concern	Near Threatened
Golden Eagle	<i>Aquila chrysaetos</i>	Least Concern	Vulnerable
Griffon Vulture	<i>Gyps fulvus</i>	Least Concern	Vulnerable
Long-legged Buzzard	<i>Buteo rufinus</i>	Least Concern	Vulnerable
White-tailed Sea-eagle	<i>Haliaeetus albicilla</i>	Least Concern	Vulnerable
Lesser Kestrel	<i>Falco naumanni</i>	Least Concern	Vulnerable
Bearded Vulture	<i>Gypaetus barbatus</i>	Near Threatened	Near Threatened
Lesser Spotted Eagle	<i>Clanga pomarina</i>	Least Concern	Vulnerable

SURVEY METHODOLOGY

Given the potential for threatened species and the sensitivity of birds to wind farm developments, baseline surveying was undertaken utilising the Scottish Natural Heritage (SNH) guideline methods to provide adequate data for numerical collision risk modelling. This included year-round coverage to ensure seasonal changes due to migration and breeding were captured as well.

Surveying Techniques:

- Vantage Point (VP) surveying: Methodology is based on the best international practice in the sector particularly referring to the guidelines of Scottish National Heritage for birds' survey. Selection of VPs was based on the visibility criteria to provide at least 2 km radius of visibility for survey team particularly over WTGs. At each visit to VP, three (3) hour of monitoring was carried out at each VP with four (4) people watching the birds' activities. Visibility area at each VP is divided into 2 arcs with 2 persons covering each arc during the sessions. Following data and behaviour of birds are recorded during the sessions:
 - Weather conditions (air temperature, wind direction and speed);
 - The list of registered species;
 - Quantity of each species;
 - Direction of flight;
 - Flight mode (Gliding or Flapping);
 - Time of exposure within the risk zone;
 - Time duration outside the risk zone;
 - Time counting of birds presence in risk zone with 15 second intervals; and
 - Height and direction of flight of birds in VP zone.
- Breeding Bird surveying, including nest searches comprised breeding bird walkover mapping survey to quantify bird flight activity. The survey areas were chosen to include all areas within the potential zone of ornithological influence of the Development. The breeding bird survey areas included a corridor wide along the proposed route of electrical connections and the site boundaries of wind turbines, and plus a 500m buffer for the main breeding bird surveys (the core breeding bird survey area), where possible and no terrain constraints (i.e. the steep terrain limiting access and posing safety risk to the surveyors). All birds heard or seen in the survey areas were recorded and any evidence of breeding activity was documented. Large birds like raptors seen at a distance up to approximately 500m from the survey areas were recorded too. During the survey, each watch, two recording methods are used to record data: focal bird sampling and activity summaries;
- OHTL segments were surveyed at 6 vantage points (VP). In addition to VP surveying of the three segments of the OHTL alignment, transects of 4km each were also employed. The width of each line transect was between 100 (for small like Passerine birds) and 500 m (for larger birds). 252 hours of VP survey and 56 hours of line transect survey were undertaken over the three segments of the OHTL alignment.

Coverage & Timing/Dates:

- Khizi WF area was surveyed via VP surveys during Spring (2020 and 2021), Winter 2021 and Autumn (2020 and planned 2021 for new VP);
- Khizi WF area, BOP and Laydown area breeding bird surveys were conducted during Summer 2020 and Summer 2021;
- Khizi - Yashma OHTL Route was surveyed in June 2021;
- Khizi-Pirakashkul OHTL Route was surveyed in June & July 2021;
- Pirakashkul-Gobu OHTL Route was surveyed in June 2021;
- Further breeding surveys are currently ongoing throughout the Spring 2022 period to cover more extensively the WF area as well as a 5km buffer.
- Additional VP surveys are being undertaken throughout Spring 2022 to capture more detailed migration data and the CRM will be subsequently updated once the.

Table 7-7 Bird Surveys (2020 – 2021)

SURVEY	MONITORING PERIOD	SURVEY EFFORT
Bird Spring Migration Survey (2020) – WF VP Survey	28 March to 6 May 2020	VP Survey: 166 hours
Bird Breeding Survey (2020) – Khizi WF area	June 2020 (5, 9, 11, 16 and 18 June 2020)	Transect Survey: 25 hours
Bird Autumn Migration Survey (2020) – WF VP Survey	10 September to 11 December 2020	VP Survey: 60 hours
Bird Winter Survey (2020) – WF VP Survey	30 December 2020 to 8 March 2021	VP Survey: 245 hours
Bird Spring Migration Survey (2021)- WF VP Survey	17 March to 20 April 2021	VP Survey: 109 hours
Bird Breeding Survey (2021) – Khizi WF, BOP WF VP Survey Summer 2021	26 and 29 June 2021	Transect Survey: 10 Hours
	04 May to 28 June 2021	VP Survey: 132 Hours
Bird Surveys along OHTL Route (VP Survey and transects)	July – August 2021	VP Survey -252 hours; Line transect – 56 hours
	September - December 2021	VP Survey -252 hours; Line transect – 48.5 hours
Bird Spring Migration Survey (2022) – WF VP Survey	Ongoing	VP Survey
Bird Breeding Survey (2022) – Khizi WF area	Ongoing	Nesting Survey

Surveying Locations

Initially, four (4) Vantage Points (VPs) were selected for the project area which are shown in the Figure below.

In November 2020, an additional VP (VP X7) was added to cover the new WTGs around the dry lake based on revised WTG Layout. As of 23rd February 2021, it has been confirmed that Western Extension Area (WTG X51 to X59) is no longer being considered as part of the WF, therefore VP monitoring (VPX6 and VPX5) have been stopped. Locations of current VPs are shown in Figure below.

Table 7-8 Coordinates of VPs

VP	UTM	ELEVATION
VP X 1	39 T 355839 4509315	708 m
VP X2	39 T 365269 4505245	390 m
VP X3	39 T 359162 4507770	683 m
VP X 4	39 T 363100 4505764	503 m
VP X 7 (new VP added in November 2020)	39 T 362492 4507569	437 m
Cancelled VPs		
VP X 5 (stopped)	39 T 362492 4507569	1014 m
VPX 6 (stopped)	39 T 352241 4507085	867 m

Figure 7-21 All VPs for WF



Figure 7-22 Spring 2022 VPs



OHTL Locations

Figure 7-23 OHTL Segments 1 Khizi-Yashma (Red), Segment 2 Khizi- Pirakashkul (Blue) & Segment 3 Gobu-Pirakeshkul (Green)



A detailed methodology is available in the following Baseline Reports, provided within Appendix F

RESULTS

The below table provides a summary of the findings. Detailed Results are available in Baseline Reports, provided within Appendix F.

Wind Farm – Vantage Point Monitoring

In total, 381.38 hours of surveying was undertaken, over 5 Vantage Points and 5 seasons.

A total of 10 species of elevated global status were recorded as well as 26 additional species with elevated national status.

Four species are globally listed as endangered: Steppe Eagle, Pallas's Fish Eagle and Saker Falcon and Egyptian Vulture.

The following table provides a summary for nationally and globally listed (threatened) species that were recorded during VP surveys of Khizi 3.

Table 7-9 VP Survey Results Spring 2020 to Summer 2021

Scientific Name	English Common Name	National Status	IUCN status	VP Observations				
				Spring		Summer 2021	Autumn 2020	Winter 2021
				2020	2021			
Tier 1								
<i>Neophron percnopterus</i>	Egyptian Vulture	VU	EN	2	5	12		
<i>Aquila nipalensis</i>	Steppe Eagle	CR	EN	80	57		7	6
<i>Haliaeetus leucoryphus</i>	Pallas's Fish-Eagle	-	EN		1			
<i>Falco cherrug</i>	Saker Falcon	EN	EN				1	
Tier 2								
<i>Ciconia nigra</i>	Black Stork	CR		1				
<i>Pelecanus crispus</i>	Dalmatian Pelican	VU	NT					4
<i>Pandion haliaetus</i>	Osprey	EN			1			
<i>Gypaetus barbatus</i>	Bearded Vulture	NT	NT	6			11	12
<i>Pernis apivorus</i>	European Honey-Buzzard	VU		26	36	20		
<i>Pernis ptilorhynchus</i>	Oriental Honey-Buzzard	VU				6		
<i>Aegypius monachus</i>	Cinereous Vulture	NT	NT	336	313	33	318	1226
<i>Gyps fulvus</i>	Eurasian Griffon	VU		1474	323	21	628	665
<i>Gyps</i> or <i>Aegypius</i>	Unidentified Vulture			229	11	1	223	172
<i>Circaetus gallicus</i>	Short-toed Snake-Eagle	LC			3	6		
<i>Hieraaetus pennatus</i>	Booted Eagle	NT		4	1	9	2	
<i>Aquila heliaca</i>	Imperial Eagle	VU	VU	1				1
<i>Aquila chrysaetos</i>	Golden Eagle	VU		26	20	1	4	9
<i>Circus macrourus</i>	Pallid Harrier		NT		2		1	
<i>Accipiter brevipes</i>	Levant Sparrowhawk	VU		2				
<i>Milvus migrans</i>	Black Kite	VU		1	1		3	3
<i>Haliaeetus albicilla</i>	White-tailed Eagle	VU						7
<i>Buteo rufinus</i>	Long-legged Buzzard	VU		38	98	62	2	12
<i>Falco naumanni</i>	Lesser Kestrel	VU		28	78	256	133	
<i>Falco vespertinus</i>	Red-footed Falcon	NT	NT		1		2	
<i>Falco columbarius</i>	Merlin	LC			1			

Scientific Name	English Common Name	National Status	IUCN status	VP Observations				
				Spring		Summer 2021	Autumn 2020	Winter 2021
				2020	2021			
<i>Falco subbuteo</i>	Eurasian Hobby	LC				2	1	
<i>Falco biarmicus</i>	Lanner Falcon	LC			1	8		2
<i>Falco peregrinus</i>	Peregrine Falcon	VU			1			2
Tier 3								
<i>Circus aeruginosus</i>	Eurasian Marsh-Harrier			1	3		1	1
<i>Circus cyaneus</i>	Hen Harrier			1	7		2	2
<i>Circus pygargus</i>	Montagu's Harrier			3	3	10	1	
<i>Accipiter nisus</i>	Eurasian Sparrowhawk				6			2
<i>Buteo lagopus</i>	Rough-legged Hawk			4			1	
<i>Buteo buteo</i>	Common Buzzard			57	7	5		
<i>Falco tinnunculus</i>	Eurasian Kestrel			75	59	10	6	17

A total of 150 Steppe Eagles were recorded over the five seasons. Steppe Eagle was registered at highest densities during the spring seasons, followed by autumn, with the least birds per survey hour registered during the winter season. The average number of birds per survey hour were 5x higher in spring seasons than any other season.

Only a single Saker Falcon was recorded over the full monitoring period in the autumn, and a single Pallas's Fish-eagle likewise in the spring.

A total of 19 Egyptian Vultures were recorded over the five seasons. The vast majority were recorded during the summer season. Some were registered in the spring and none were registered in the autumn and winter periods.

Of the 7 species listed as Vulnerable and Near Threatened globally, two vulture species stand out: the Bearded Vulture, of which 29 individuals were recorded over the full monitoring periods, as well as Cinereous Vulture, of which 2,226 were recorded over the surveying period. Bearded Vulture was recorded with highest bird per survey hour rates in the autumn and winter, followed by spring >none were recorded in the summer. Cinereous Vulture were recorded with highest bird per survey hour in the winter, with half the numbers recorded in spring and summer seasons.

Of the remaining species which are considered LC globally but are listed on the Azerbaijan Red Data Book:

- A total of 212 Long-legged Buzzards were recorded; autumn and winter saw the lowest rate of birds/survey hour, followed by a substantial increase in summer with highest numbers recorded in spring.
- A total of 3,111 Griffon Vultures were recorded; lowest numbers were recorded in summer, with higher numbers recorded in spring, autumn and winter.
- A total of 495 Lesser Kestrels were recorded; high numbers of birds/survey hour were recorded in summer and autumn, followed by spring, with none recorded in the winter period.

CHA findings show the project area is a critical habitat for the Steppe Eagle. Though the Egyptian Vulture, Pallas's Fish Eagle and Saker Falcon occur in the project area, the CHA found that these species do not occur in the project area at abundances high enough to trigger criticality for endangered species. However, as per EBRD PR6 GN6, these species satisfy Criterion ii for Priority Biodiversity Feature (supports <0.5% of global population of an EN species;) for which mitigation will be addressed in the ecological impact assessment.

All species recorded during the baseline surveys listed as Vulnerable on the IUCN Red List and/or CR/EN on the Azerbaijan Red Data Book qualify as PBF's. Black Kite, Booted Eagle, Griffon Vulture, White-tailed Sea-eagle, Lesser Kestrel, Bearded Vulture, European Honey Buzzard, and Short-toed Eagle were designated as PBFs under the EBRD PBF criteria (iii) – 'Significant biodiversity features of identified by a broad set of national stakeholders'. Further analysis of the potential PBFs is underway.

The following tables provide the results of the ongoing Spring 2022 VP surveying effort.

Table 7-10 March 2022 VP Survey Results

Species	March				
	VP1	VP2	VP3	VP4	VP PF
Tier 1					
Egyptian Vulture					
Steppe Eagle		12	6		
Saker Falcon					
Sociable Lapwing					
Tier 2					
Little Bustard					
Black Stork					
Great White Pelican					
Dalmatian Pelican					
Osprey					
Bearded Vulture					
European Honey-Buzzard			1		
Oriental Honey-buzzard					
Cinereous Vulture	5	14	42	11	20
Eurasian Griffon		10	54	2	18

Species	March				
	VP1	VP2	VP3	VP4	VP PF
Vulture sp.					111
Eagle sp.			1		
Short-toed Snake-Eagle					
Booted Eagle					
Imperial Eagle					
Golden Eagle					
Pallid Harrier					
Levant Sparrowhawk					
Black Kite					
White-tailed Eagle					
Long-legged Buzzard		1	2		
Lesser Kestrel		8			
Red-footed Falcon					
Merlin					
Eurasian Hobby					
Lanner Falcon					
Peregrine Falcon					
Tier 3					
Lesser Spotted Eagle					
Eurasian Marsh-Harrier					
Hen Harrier			1		1
Montagu's Harrier					
Eurasian Sparrowhawk					
Goshawk			2		
Rough-legged Hawk					
Common Buzzard					
Short-eared Owl					
Eurasian Kestrel	1	1	3	7	4

Table 7-11 April 2022 VP Survey Results

Species	April				
	VP1	VP2	VP3	VP4	VPPF
Tier 1					
Egyptian Vulture					
Steppe Eagle	5	2	4		3
Saker Falcon					
Sociable Lapwing					
Tier 2					
Little Bustard					
Black Stork					
Great White Pelican					
Dalmatian Pelican					
Osprey					

Species	April				
	VP1	VP2	VP3	VP4	VPPF
Bearded Vulture					
Buzzard sp.	2				2
European Honey-Buzzard					
Oriental Honey-buzzard					
Cinereous Vulture	29	13	14	21	167
Eurasian Griffon	27	10	6	8	18
Vulture sp.	55		3		50
Eagle sp.					1
Short-toed Snake-Eagle					
Booted Eagle					
Imperial Eagle	1				1
Golden Eagle	1				
Pallid Harrier					
Levant Sparrowhawk					
Black Kite		2			
White-tailed Eagle					
Long-legged Buzzard	9	15	1	7	1
Lesser Kestrel	36	61	17	16	12
Red-footed Falcon		1			
Merlin			4		
Eurasian Hobby					
Lanner Falcon	1		1	1	1
Peregrine Falcon					
Falcon sp.	3				
Tier 3					
Lesser Spotted Eagle					
Eurasian Marsh-Harrier					4
Hen Harrier				1	4
Montagu's Harrier					
Eurasian Sparrowhawk					
Goshawk					
Rough-legged Hawk					
Common Buzzard	2				
Short-eared Owl					
Kestrel sp.			3		
Eurasian (Common) Kestrel	1	19		3	3

Breeding Birds

Surveying during Summer 2020 and Summer 2021 included nest searches and transects focused on identifying breeding birds. Only one possible Lesser Kestrel colony was identified. CHA findings designate this species as a PBF.

Figure 7-24 Breeding Colonies and Nests



Further breeding surveys are currently ongoing to cover more extensively the WF area as well as a 5km buffer.

OHTL – Segment 1 Khizi- Yashma

The following table summarizes the threatened species recorded during VP bird survey undertaken at Segment 1 Khizi-Yashma line. Refer to Appendix F for detailed species list and survey findings.

CHA found that criticality was triggered for one IUCN endangered species; Steppe Eagle.

The following are designated as PBFs - Osprey, Cinereous Culture, Griffon Vulture, White-tailed Eagle, Golden Eagle, Imperial Eagle, Short-toed Snake Eagle, Long-legged Buzzard, Lanner Falcon and Lesser Kestrel..

As per EBRD PR6 requirements these species qualify as PBFs for which impacts mitigation and monitoring measures will be provided in the impact assessment.

Table 7-12 VP Survey OHTL Segment 1 (Khizi-Yashma) Threatened Birds

LATIN NAME	ENGLISH NAME	RDB	IUCN	SUMMER	AUTUMN
<i>Ardea purpurea</i>	Purple Heron	LC		2	
<i>Pandion halietus</i>	Osprey	EN		1	
<i>Aegypious monachus</i>	Cinereous Vulture	NT	NT	3	3

LATIN NAME	ENGLISH NAME	RDB	IUCN	SUMMER	AUTUMN
<i>Gyps fulvus</i>	Griffon Vulture	VU		4	5
	Vulture sp.				1
<i>Haliaeetus albicilla</i>	White tailed eagle	LC			2
<i>Aquila chrysaetos</i>	Golden eagle	LC		2	112
<i>Aquila heliaca</i>	Imperial Eagle	VU	VU		5
<i>Aquila nipalensis</i>	Steppe eagle	CR	EN		3
<i>Circaetus gallicus</i>	Short-toed Snake Eagle	LC		5	
	Eagle sp.				1
<i>Buteo rufinus</i>	Long-legged buzzard	EN		34	10
<i>Falco naumanni</i>	Lesser Kestrel	VU		81	2
<i>Falco subbuteo</i>	Hobby	LC		1	0
<i>Falco biarmicus</i>	Lanner falcon	LC		14	1

OHTL – Segment 2 Khizi-Pirakashkul

The following table summarizes the threatened species recorded during the VP bird survey undertaken along the Khizi-Pirakashkul route. Refer to Appendix F for detailed species list and survey findings.

CHA found that criticality was triggered for IUCN endangered species; Steppe Eagle. The following are designated as PBFs - Dalmatian Pelican, Cinereous Culture, Griffon Vulture, White-tailed Eagle, Golden Eagle, Egyptian Vulture, Imperial Eagle, Short-toed Snake Eagle, Long-legged Buzzard, Honey Buzzard, Peregrine Falcon, Lesser Kestrel, Saker Falcon and Little Bustard .

Further assessment of the project's impacts on these species will provide mitigation, management and monitoring measures aligned with international best practice and CHA requirements.

Table 7-13 VP Survey OHTL Segment 2 (Khizi-Perikashkul) Threatened Birds

LATIN NAME	ENGLISH NAME	RDB	IUCN	SUMMER	AUTUMN
<i>Pelecanus crispus</i>	Dalmatian Pelican	VU	NT		42
<i>Pandion halietus</i>	Osprey	EN		4	1
<i>Aegypious monachus</i>	Cinereous Vulture	NT	NT	6	122
<i>Gyps fulvus</i>	Griffon Vulture	VU		0	78
<i>Neophron percnopterus</i>	Egyptian Vulture	VU	EN	15	0
	Vulture sp.				26
<i>Haliaetus albicilla</i>	White tailed eagle	LC			3
<i>Aquila chrysaetos</i>	Golden eagle	LC			6
<i>Aquila heliaca</i>	Imperial Eagle	VU	VU		5
<i>Aquila nipalensis</i>	Steppe eagle	CR	EN	3	21
<i>Circaetus gallicus</i>	Short-toed Snake Eagle	LC		8	3
	Eagle sp.				2
<i>Accipiter gentilis</i>	Goshawk	LC			3
<i>Buteo rufinus</i>	Long-legged buzzard	EN		39	38
<i>Pernis apivorus</i>	Honey buzzard	VU	LC		5
<i>Falco naumanni</i>	Lesser Kestrel	VU		93	10
<i>Falco subbuteo</i>	Hobby	LC			1
<i>Falco peregrinus</i>	Peregrine Falcon	EN		1	2
<i>Falco biarmicus</i>	Lanner falcon	LC		11	6
<i>Tetrax tetrax</i>	Little Bustard	NT	NT		471

OHTL – Segment 3 Pirakashkul-Gobu

The following table summarizes the threatened species recorded during the VP bird survey undertaken at Segment 3 Pirakashkul-Gobu. Refer to Appendix F for detailed species list and survey findings.

CHA found that criticality was triggered for IUCN endangered species; Steppe Eagle. The following are designated as PBFs - Dalmatian Pelican, Cinereous Culture, Griffon Vulture, Egyptian Vulture, Imperial Eagle, Short-toed Snake Eagle, Long-legged Buzzard, Lesser Kestrel, Saker Falcon and Little Bustard..

Further assessment of the project's impacts on this species will provide mitigation, management and monitoring measures aligned with international best practice and CHA requirements.

Table 7-14 Survey OHTL Segment 3 (Pirakashkul-Gobu) Threatened Birds

LATIN NAME	ENGLISH NAME	AzB	IUCN	SUMMER	AUTUMN
<i>Pelecanus onocrotalus</i>	Dalmatian pelican	VU	NT		38
<i>Cignus olor</i>	Mute swan	LC			12
<i>Aegypius monachus</i>	Cinereous Vulture	NT	NT	1	108
<i>Gyps fulvus</i>	Griffon Vulture	VU			59
<i>Neophron percnopterus</i>	Egyptian Vulture	VU	EN	6	0
	Vulture sp.			2	29
<i>Aquila heliaca</i>	Imperial Eagle	VU	VU		3
<i>Aquila nipalensis</i>	Steppe eagle	CR	EN		5
<i>Circus gallicus</i>	Short-toed Snake Eagle	LC		1	0
<i>Accipiter gentilis</i>	Goshawk	LC			2
<i>Buteo rufinus</i>	Long-legged buzzard	EN			10
<i>Falco naumanni</i>	Lesser Kestrel	VU		69	0
<i>Falco cherrug</i>	Saker Falcon	EN	EN	5	
<i>Tetrax tetrax</i>	Little Bustard	NT	NT		717
<i>Recurvirostra avosetta</i>	Pied avocet	LC			3

Other

There is an operating poultry farm approximately 3.4km away from the nearest turbine. The poultry farm appears to regularly dump carcasses and other waste materials in an open area behind the farm; these conditions are attractive to a variety of vultures, which regularly visit the farm for foraging.

Figure 7-25 Location of Poultry Farm



A series of surveys during the summer of 2020 recorded over 20 Black Vultures, a Griffon Vulture, and over 10 Bearded Vultures.

It is not certain if the presence of the farm is contributing to the high numbers of vulture flyovers within the Khizi WF area, as this could only be confirmed via a specified tagging research study.

Collisions with Existing Power Lines

During the VP survey of the OHTL alignment, records were made of bird species observed on and around existing OHTLs in the survey area.

A couple of species; Lesser Kestrel and Hooded Crow were observed using different parts of electric pylons for perching and nesting.

During the summer survey, two carcasses were recorded along the Pirkashkul-Gobu segment near the Lake Shoruchtepe; Long Legged Buzzard and a Raven. A wing of a Caspian Gull was also recorded on an existing power line.

During the autumn OHTL survey, 46 carcasses and bird remains were registered along the Pirkashkul-Gobu segment. Among these one Griffon Vulture, one Black Vulture, one unidentified Eagle species, and 5 Common kestrels were recorded. The following tables and map shows the location and species observed during the carcass search.

Table 7-15 Location and Species of Carcasses Recorded during Autumn OHTL Survey

ENGLISH NAME	LATIN NAME	GPS COORDINATES	SUBTOTAL MMW1	GPS COORDINATES	SUBTOTAL MMW-2	TOTAL
Great white Egret	<i>Ardea alba</i>			0384009E 4477936N	[1]	1
Black Vulture	<i>Aegypius monachus</i>	0376793 4479240	[1]			1
Griffon Vulture	<i>Gyps fulvus</i>	379267 4479600	[1]			1
Eagle sp.				0382956 4478433	[1]	1
Kestrel	<i>Falco tinnunculus</i>	0376414 4479187 0379104 4479451 0380073 4479621 0379527 4479383 0379766 4479595	[5]			5
Caspian Gull	<i>Larus cachinnans</i>	0375602 4479940 0375491 4480343 0379175 4479481 0379293 4479479 0379766 4479595 0378262 4479419	[6]	0386102 4475823 0384219 4477795 0384596 4477548 0386000 4475878 0385964 4475878 0386309 4475696 0383886 4477895 0384615 4477791 0384657 4477482 0384611 4477545 0384984 4475719 0385196 0383950 4477965 4476494	[13]	19
Rock Dove	<i>Columba livia</i>	0379199 4479481 0379947 4479617	[2]	0384962 4477018 0384954 4476892	[2]	4
Calandra Lark	<i>Melanocorypha calandra</i>	3786134 4479633 0377622 4479451	[2]			2
Lark sp.		0376793 4479240 378892 378892	[2]			2
Rook	<i>Corvus frugilegus</i>			0385975 4475934 0383886 4477895	[2]	2
Starling	<i>Sturnus vulgaris</i>	0378364 4479623	[1]	384537 4477638	[1]	2
Wader sp.				0384419 4477704	[1]	1
Passerine sp				383839 4477927 0383806 4478001 0384416 4477709	[3]	3
Birds sp.		0379364 4479478 0379883 4479562	[2]			2
Totals			[22]		[24]	46

Figure 7-26 Red Line indicates Pirakashkul-Gobu Segment passing by Lake Shoruchteppe (dotted line)

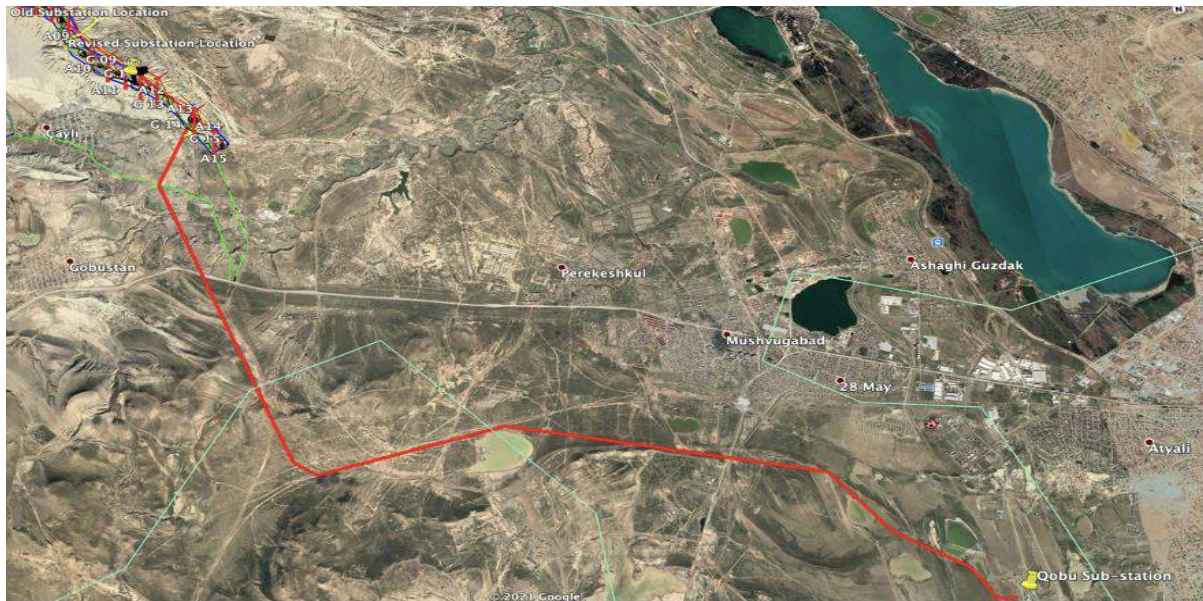


Figure 7-27 Location of Bird carcasses and Remains Recorded during Autumn OHTL Survey



The following table lists the incidental sightings of threatened birds observed during the Autumn OHTL transect survey for bird mortality due to existing OHTLs. Refer to Appendix F for detailed species list and survey findings.

Table 7-16 Incidental Bird Sightings during the Autumn OHTL Survey

LATIN NAME	ENGLISH NAME	AZB	IUCN	MMW1	MMW2
<i>Ciconia nigra</i>	Black stork	CR		1	0
<i>Aegypious monachus</i>	Cinereous Vulture	NT	NT	29	2
<i>Gyps fulvus</i>	Griffon Vulture	VU		41	0
<i>Neophron percnopterus</i>	Egyptian Vulture	VU	EN	0	1
	Vulture sp.			0	1
<i>Aquila heliaca</i>	Imperial Eagle	VU	VU	1	0
<i>Aquila nipalensis</i>	Steppe eagle	CR	EN	2	0
	Eagle sp.			2	0
<i>Milvus migrans</i>	Black Kite	VU		1	0
<i>Buteo rufinus</i>	Long-legged buzzard	VU		2	0

7.4.3 Bats

REGIONAL CONTEXT

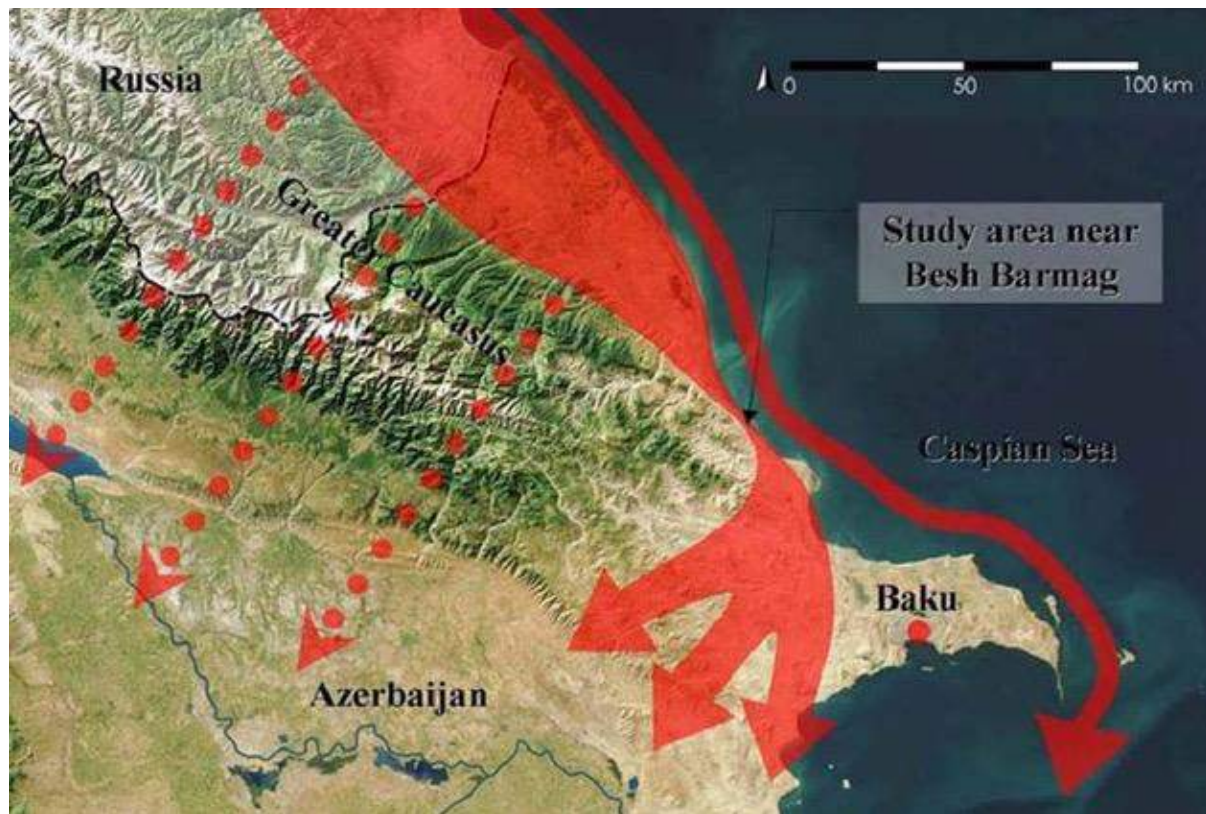
The following text has been extracted from the “Diverse Bat Fauna of Azerbaijan”¹ which provides an overview of bat fauna within Azerbaijan.

“The bat fauna southwest of Azerbaijan in the Minor Caucasus Range is especially unusual and diverse. The Common Pipistrelle (*Pipistrellus pipistrellus*), a species whose preferred habitat includes forest and cultured landscapes, is widespread, as is Kuhl's Pipistrelle (*P. kuhli*), ordinarily found in deserts or dry and mountainous steppes and almost exclusively inhabiting human dwellings. Other common species are Serotine Bats (*Eptesicus serotinus*), Greater Horseshoe Bats (*Rhinolophus ferrumequinum*), Lesser Horseshoe Bats (*R. hipposideros*), Lesser Mouse-eared Bats (*Myotis blythi*), and Geoffrey's Bats (*M. emarginatus*), all of which inhabit caves as well as buildings. Although widely distributed in Azerbaijan, several species of horseshoe bats are severely endangered or extirpated in other parts of Europe.

The proposed site is located on the northern shores of the Azerbaijani sector of the Caspian Sea between the Caspian Lowland and the south-western end of the Greater Caucasus Mountains. It is located within a broad route known to be used by migratory bats *Pipistrellus nathusii*, *Nyctalus noctula* and *Vespertilio murinus*.

¹ <https://www.batcon.org/article/the-diverse-bat-fauna-of-azerbaijan-a-report-from-the-soviet-union/>

Figure 7-28 Migratory Movements of Bats



SURVEY METHODOLOGY

In order to provide site-specific baseline information on bat species, surveys were carried out as per the below.

Surveying Techniques:

- Roost searches to identify colonies and roosting location for WF areas;
- Surveys targeting potential swarming and migration movements using active bat detectors and mist net deployment for catch and release; and
- Deployment of passive acoustic detectors in the WF area.

Coverage and timing/dates are shown in the Table below:

- WF area/BOP: the WF and BOP area was surveyed during Spring, Summer, and Autumn 2020 via a combination of mist-netting, manual searches, and acoustic monitoring; and
- OHTL: Late Spring and Summer 2021 (23, 28 May; 18-20, 25-27 June; 3-5, 24-26 July; 8, 21, 22 August 2021); surveying included transects with active acoustic detectors.

Table 7-17 Passive Detectors

NAME	COORDINATES	LOCATION (WF / EXT / OTHER) + MAST NO. IF APPLICABLE	INSTALLATION HEIGHT OF MICROPHONE	START DATE - Installed	END DATE - decommissioned	TOTAL RECORDING NIGHTS
ANABAT MK1 2020	40.691315 / 49.388158	Mast No 1	35m	Sep 4, 2020	Oct 26, 2020	25
ANABAT MK2 2020	40.691315 / 49.388158	Mast No 2, btw X14-X15	22m	Jul 14, 2020	Oct 15, 2020	39
ANABAT MK2 2021	40.691315 / 49.388158	Mast No 2	44m	April 19, 2021	October 12, 2021	142
ANABAT MK3 2021	40.701783/49.353525	Mast No 3	41m	April? 2021	September 29, 2021	63

Surveying Locations:

The below showcases the transects utilized for bat surveys as well as the locations of the detectors.

Figure 7-29 Active Monitoring Transects and Passive Detectors Locations Khizi 3





Figure 7-30 Locations of Mist Netting & Roost Search Physical Inspections – Khizi 3 WF



Figure 7-31 Active Monitoring Transects – OHTL



A detailed methodology is available in the Baseline Reports, provided within Appendix F.

RESULTS

The below provides a summary of the findings. Detailed Results are available in Baseline Reports, provided within Appendix F.

Wind Farm & BOP

The results of the combined bat survey efforts are provided in the below sections and Tables.

PASSIVE DETECTOR – BAT ACTIVITY INDEX

A total of 12 species were identified by Kalidescope Pro software and example sonograms for each were manually checked. One species have been flagged by the bat expert as a potential mistakes, *Tadarida teniotis*, as this species is not anticipated to occur within the area.

- *Eptesicus serotinus*;
- *Hypsugo savii*;
- *Nyctalus noctule*;
- *Nyctalus leisleri*;

- *Plecotus auratus*;
- *Vespertilio murinus*;
- *Barbastella capsica*;
- *Pipistrellus kuhlii*;
- *Pipistrellus nathusii*;
- *Rhinolophus ferrumequinum*; and
- *Tadarida teniotis*.

Table 7-18 Overall BAI (Passive Detector)

Monitor Location and Season	Minimum BAI	Maximum BAI
ANABAT MK 1, Summer/Autumn	0.02	0.81
ANABAT MK 2, Summer/Autumn	0.01	0.69
ANABAT MK 2, Spring/Summer	0.01	2.71
ANABAT MK 3, Spring/Summer	0.01	0.47

Table 7-19 Active Transects – contacts/hour by month

Month	Average Contacts per Hour
April	3.00
May	5.35
June	1.98
July	1.83
August	2.50
September	4.38
October	2.33

Late spring (May) and early autumn (September) saw the relative highest amount of activity. This could be related to migration pass-through or alternatively breeding activity.

Table 7-20 Active Transects – contacts/hour by month

Species	MISTNET 1 Capture (No. Ind)	MISTNET 2 Capture (No. Ind)	MISTNET 3 Capture (No. Ind)	MISTNET 4 Capture (No. Ind)	MISTNET 5 Capture (No. Ind)
<i>P.kuhlii</i>	0	1	0	0	18
<i>P.nathusii</i>	0	0	0	0	1
<i>M.alcathoe</i>	0	0	0	0	1

The majority of individuals were caught by mist net at location 5, which is located relatively far from the wind farm location.

PHYSICAL INSPECTIONS FOR ROOSTS

No roosts or likely roosts were found within the WF area. Roosting areas were found along the water canal in Physical Inspection locations 1, 2 and 3, including species *M. alcaethoe* and *Rh. Ferrumequinum*, as well as two additional species, *M. mystacinus*, and *M. emargiinatus*.

CONCLUSION

Table 7-21 Recorded from Khizi 3 WF Surveys

Scientific name	Common name	Status ARDB / IUCN	Survey Capture	Other Notes
<i>Rhinolophus ferrumequinum</i>	Greater horseshore bat	RDB /LC	Passive detector, roost (outside of WF area)	Summer roost - at Ph.inspection sites 1-7
<i>M. emargiinatus</i>	Geoffroy's bat	RDB /LC	roost search only (outside of WF area)	
<i>M. mystacinus</i>	Whiskered bat	No/LC	roost search only (outside of WF area)	
<i>Myotis alcaethoe</i>	Alcaethoe bat	DD /LC	mist netting and roosts found (outside of WF area)	Summer roost - at Ph.inspection sites 1-7
<i>Plecotus auritus</i>	Brown long-eared bat	No/LC	Passive detector	
<i>Barbastella caspica</i>	Eastern barbastelle	RDB /LC	Passive detector	
<i>Nyctalus noctula</i>	Lesser noctule	No/LC	Passive detector	
<i>Nyctalus leisleri</i>	Common noctule	No/LC	Passive detector	
<i>Pipistrellus nathusii</i>	Nathusius's pipistrelle	No/LC	Passive detector; mist netting	Summer roost - at Mistnet point 3 etc.
<i>Pipistrellus kuhlii</i>	Kuhl's pipistrelle	No/LC	Passive detector; mist netting	Summer roost - at Mistnet point 3 etc.
<i>Hypsugo savii</i>	Savii's pipistrelle	No/LC	Passive detector	
<i>Vespertilio murinus</i>	Particolored bat	No/LC	Passive detector	
<i>Eptesicus serotinus</i>	Serotine bat	No/LC	Passive detector	

Scientific name	Common name	Status ARDB / IUCN	Survey Capture	Other Notes
<i>Tadarida teniotis</i>	European free-tailed bat	RDB/LC	Passive detector	

OHTL

The results of the OHTL bat survey efforts are provided in the below table.

Table 7-22 Results-Bat Survey - Species Registered during Surveying along OHTL 2021

N	Scientific name	Line 1 (Gobu-Pirakashkul)	Line 2 (Khizi-Yashma)	Line 3 (Khizi-Pirekeshkul)
		observed, and/or recorded on hand-detector		
1	<i>Rhinolophus ferrumequinum</i>	+	+	+
2	<i>Myotis emarginatus</i>		+	
3	<i>Myotis mystacinus</i>		+	
4	<i>Myotis alcathoe</i>	+	+	+
5	<i>Myotis blythii</i>	+		
6	<i>Plecotus auritus</i>	+	+	+
7	<i>Barbastella caspica</i>	+	+	+
8	<i>Pipistrellus nathusii</i>	+	+	
9	<i>Pipistrellus kuhlii</i>	+	+	+
10	<i>Eptesicus serotinus</i>	+	+	+

The most abundant species of the study area are *P.kuhlii*, *E. serotinus*, *M.alcathoe*. All three bats are widespread, and roosts are often associated with urban areas, manmade structures.

All bat species recorded in the project area are insectivorous species. An insectivorous bat can eat anywhere between 300 and 3000 insects a night, depending on size of the bat and the size of the insects. As such, they are the primary biological control of night flying insect populations and are considered as keystone species that qualify as PBFs.

7.4.4 Mammals

REGIONAL CONTEXT

Some 106 species of mammals have been recorded in Azerbaijan, three (3) of which are introduced species. Mammals from seven orders are represented: Insectivores (13 species in three families), Chiroptera (bats; 27 species), Lagomorpha (rabbits and hares; 2 species), Rodentia (rodents; 36 species), Carnivora (carnivores; 19 species, including one species from the suborder Pinnipeda). The most widespread species of mammal in Azerbaijan include the water rat (*Arvicola terrestris*), gray rat (*Rattus norvegicus*), wolf (*Canis lupus*), jackal (*C. aureus*), fox (*Vulpes vulpes*), stone martin (*Martes foina*), badger (*Meles meles*) and wild boar (*Sus scrofa*).

Table 7-23 List of Rare and Threatened Mammals of Azerbaijan

Table 1. List of Rare and Threatened Mammals of Azerbaijan

Common Name	Species	ARDB	IUCN
Mediterranean Horseshoe Bat	<i>Rhinolophus euryale</i>	+	VU
Greater Horseshoe Bat	<i>Rhinolophus ferrumequinum</i>		Lr/cd
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>		VU
Mehely's Horseshoe Bat	<i>Rhinolophus mehelyi</i>		VU
Barbastelle bat	<i>Barbastella barbastellus</i>		VU
Bechstein's bat	<i>Myotis bechsteini</i>		VU
Geoffroy's Bat	<i>Myotis emarginatus</i>		VU
Lesser Noctule Bat	<i>Nyctalus leisleri</i>		Lr/nt
European Free-Tailed bat	<i>Tadarida teniotis</i>	+, U	
Schreiber's Long-Fingered Bat	<i>Miniopterus schreibersi</i>	+, U	Lr/nt
Caspian Tiger	<i>Panthera tigris virgata</i>	+, U	
Striped Hyaena	<i>Hyaena hyaena</i>	+, U	
Eurasian Lynx	<i>Felis lynx orientalis</i>	+	
Leopard	<i>Felis pardus tullianus</i>	+, U	
Wild Cat	<i>Felis libica caudata</i>	+	
Red Manul	<i>Otocolobus manul ferrugineous</i>	+, U	Lr/nt
Caspian Seal	<i>Phoca caspica</i>		VU
Marbled Polecat	<i>Vormela peregusna</i>	+, U	
Persian Gazelle	<i>Gazella subgutturosa</i>	+, U	Lr/nt
Chamois	<i>Rupicapra rupicapra caucasica</i>	+	VU
Wild Goat	<i>Capra aegagrus aegagrus</i>	+, U	VU
E. Caucasian Tur	<i>Capra cylindricornis</i>		VU
Argali	<i>Ovis ammon</i>	+, U	VU
Mouflon	<i>Ovis orientalis gmelinii</i>		VU
Long-tailed Marmot	<i>Marmota caudata</i>		Lr/nt
Persian Squirrel	<i>Sciurus anomalus</i>		Lr/nt
Armenian Birch Mouse	<i>Sicista armenica</i>		CR
N. Birch Mouse	<i>Sicista betulina</i>		Lr/nt
	<i>Calomyscus urartensis</i>		Lr/nt
Snow Vole	<i>Chionomys nivalis</i>		Lr/nt
Harvest Mouse	<i>Micromys minutus</i>		Lr/nt
Fat Dormouse	<i>Myoxus glis</i>		Lr/nt

SURVEY METHODOLOGY

In order to provide site-specific baseline information on terrestrial mammal species, ecology surveys were carried out as per the below.

Surveying Techniques:

- Transects carried out during day-time and night-time surveys
- Incidental sightings and records (visual and audible)
- Indirect records of tracks, burrows, droppings, and shelters
- Use of headlight and spotlighting during nocturnal surveying
- Burrow entrance counts to establish abundance of rodent species

Coverage & Timing/Dates:

- Khizi WF area was surveyed from May to October 2020;
- Khizi WF BOP was surveyed in May 2021;

- Khizi - Yashma OHTL Route was surveyed in June to Aug 2021;
- Khizi-Pirakashkul OHTL Route was surveyed in June to Aug 2021; and
- Pirakashkul-Gobu OHTL Route was surveyed in June to Aug 2021.

A detailed methodology is available in Baseline Reports, provided within Appendix F.

RESULTS

The below provides a summary of the findings. Detailed Results are available in Baseline Reports, provided within Appendix F.

Wind Farm

Mammals Recorded

A total of 2 insectivores, 5 rodents, 1 lagomorph and 3 carnivores were recorded. Additionally, the globally Vulnerable Goitered Gazelle was recorded to occur (listed on Azerbaijan Red Data Book as Critically Vulnerable). As per EBRD PR6 criteria this species qualifies a PBF.

Table 7-24 List of Mammals Recorded at Wind Farm

Scientific name	Common name	STATUS	Abundance
<i>Erinaceus concolor</i>	White- breasted hedgehog	LC	Rare
<i>Hemiechinus auritus</i>	Long-eared hedgehog	LC	Rare
<i>Allactaga elater</i>	Small five-toed jerboa	LC	abundant
<i>Allactaga williamsi</i>	Williams's jerboa	LC	Rare
<i>Cricetulus migratorius</i>	Grey dwarf hamster	LC	Rare
<i>Meriones libycus</i>	Libyan jird	LC	abundant
<i>Microtus socialis</i>	Social vole	LC	Rare
<i>Lepus europaeus</i>	European hare		abundant
<i>Canis aureus</i>	Golden jackal	LC	abundant
<i>Canis lupus</i>	Grey wolf	LC	Rare
<i>Vulpes vulpes</i>	Red fox	LC	abundant
<i>Gazella sugutturosa</i>	Goitered Gazelle	VU (AzRDB)	Rare

OHTL Segment 1 Khizi- Yashma

A total of 3 insectivores, 5 rodents, 1 lagomorph, and 3 carnivores were recorded. All species recorded are listed as LC on the IUCN Red List as well as the Azerbaijan Red Data Book. The following table summarizes the findings from the mammal survey undertaken at Segment 1.

Table 7-25 List of Mammals Recorded at OHTL Segment 1 Khizi-Yashma

SCIENTIFIC NAME	COMMON NAME	STATUS
<i>Erinaceus concolor</i>	White-breasted Hedgehog	LC, Non RDB
<i>Hemiechinus auritus</i>	Long-eared Hedgehog	LC, Non RDB
<i>Crocidura guldenstaedti</i>	Gueldenstaedt's Shrew	LC, Non RDB
<i>Allactaga elater</i>	Small Five-toed Jerboa	LC, Non RDB
<i>Allactaga williamsii</i>	Williams' Jerboa	LC, Non RDB
<i>Cricetulus migratorius</i>	Grey Dwarf Hamster	LC, Non RDB
<i>Meriones libycus</i>	Libyan Jird	LC, Non RDB
<i>Microtus socialis</i>	Social Vole	LC, Non RDB
<i>Canis aureus</i>	Golden Jackal	LC, Non RDB
<i>Canis lupus</i>	Grey Wolf	LC, Non RDB
<i>Vulpes vulpes</i>	Red Fox	LC, Non RDB
<i>Lepus europaeus</i>	Brown Hare	LC, Non RDB

OHTL Segment 2 Khizi-Pirakashkul

A total of 3 insectivores, 5 rodents, 1 lagomorph, and 3 carnivores were recorded. All species recorded are listed as LC on the IUCN Red List as well as the Azerbaijan Red Data Book. The following table summarizes the findings from the mammal survey undertaken along Segment 2 of the OHTL.

Table 7-26 List of Mammals Recorded at OHTL Segment 2 Khizi-Pirakashkul

SCIENTIFIC NAME	COMMON NAME	STATUS
<i>Erinaceus concolor</i>	White-breasted Hedgehog	LC, Non RDB
<i>Hemiechinus auritus</i>	Long-eared Hedgehog	LC, Non RDB
<i>Crocidura guldenstaedti</i>	Gueldenstaedt's Shrew	LC, Non RDB
<i>Allactaga elater</i>	Small Five-toed Jerboa	LC, Non RDB
<i>Allactaga williamsii</i>	Williams' Jerboa	LC, Non RDB
<i>Cricetulus migratorius</i>	Grey Dwarf Hamster	LC, Non RDB
<i>Meriones libycus</i>	Libyan Jird	LC, Non RDB
<i>Microtus socialis</i>	Social Vole	LC, Non RDB
<i>Canis aureus</i>	Golden Jackal	LC, Non RDB
<i>Canis lupus</i>	Grey Wolf	LC, Non RDB
<i>Vulpes vulpes</i>	Red Fox	LC, Non RDB
<i>Lepus europaeus</i>	Brown Hare	LC, Non RDB

OHTL Segment 3 Pirakashkul-Gobu

A total of 2 insectivores, 3 rodents, 1 lagomorph, and 3 carnivores were recorded. Additionally, the globally Vulnerable Goitred Gazelle was recorded to occur (listed on Azerbaijan Red Data Book as Critically Vulnerable). CHA found that this species did not occur in abundances to trigger criticality. However being a VU species, the gazelle qualifies as a PBF as per EBRD PR6 criteria.

The following table summarizes the findings from the mammal survey undertaken at Segment 3 of the OHTL.

Table 7-27 List of Mammals Recorded at OHTL Segment 3 Pirakashkul-Gobu

SCIENTIFIC NAME	COMMON NAME	STATUS
<i>Erinaceus concolor</i>	White-breasted Hedgehog	LC, Non RDB
<i>Hemiechinus auritus</i>	Long-eared Hedgehog	LC, Non RDB
<i>Allactaga elater</i>	Small Five-toed Jerboa	LC, Non RDB
<i>Meriones libycus</i>	Libyan Jird	LC, Non RDB
<i>Microtus socialis</i>	Social Vole	LC, Non RDB
<i>Canis aureus</i>	Golden Jackal	LC, Non RDB
<i>Vulpes vulpes</i>	Red Fox	LC, Non RDB
<i>Lepus europaeus</i>	Brown Hare	LC, Non RDB
<i>Gazella subgutturosa</i>	Goitered gazelle	VU, RDB

7.4.5 Herptiles

REGIONAL CONTEXT

There are 52 species of reptiles found in Azerbaijan. Most of these species are found in semi-desert areas. Few are found in other lowlands or mountainous areas.

Ten species of amphibians from five families are recorded in Azerbaijan. These amphibian species live in a variety of landscapes, depending on their ability to adapt to harsh environments, and their different nutrient needs. They are commonly found in plains, semi desert habitats and the mountain foothills, where six species occur. Few species are found in deserts, high mountains or alpine meadows.

Table 7-28 List of Rare and Threatened Reptiles and Amphibians of Azerbaijan

Table 3. List of Rare and Threatened Reptiles and Amphibians of Azerbaijan

Reptiles	ARDB	IUCN	Amphibians	ARDB	IUCN
<i>Testudo graeca iberia</i>	+, U	VU	<i>Triturus vulgaris</i>	+	
<i>Testudo horsfieldii</i>		VU	<i>Triturus cristatus</i>	+	
<i>Emys orbicularis</i>		Lr/nt	<i>Pelobates syriacus</i>	+, U	
<i>Agama rudrata</i>	+, U		<i>Pelodytes caucasica</i>	+, U	
<i>Phrynocephalus helioscopus</i>	+, U		<i>Bufo verrucosissimus</i>	+	
<i>Mabuya aruata</i>	+		<i>Hyla arborea</i>		Lr/nt
<i>Abiepharus bivittatus</i>	+				
<i>Elaphe longissima</i>	+, U				
<i>Elaphe situla</i>		DD			
<i>Natrix megaloccephala</i>		VU			
<i>Phrynosaurus melanocephalus</i>	+, U				
<i>Vipera kaznakovi</i>		EN			
<i>Vipera xanthina</i>	+, U				

SURVEY METHODOLOGY

In order to provide site-specific baseline information on herptile species, ecology surveys were carried out as per the below.

Surveying Techniques:

- A series of transects and quadrats were undertaken to identify the species present and provide an indication of relative abundance and population density; and
- Early morning and evening surveys were conducted in line with highest herptile activity.

Coverage & Timing/Dates:

- Khizi WF area was surveyed during May/June 2020 and September/October 2020;
- Khizi BOP area was surveyed during May and June 2021;
- OHTL Segments were surveyed during June-July 2021; and
- OHTL Segments were surveyed during June-July 2021.

A detailed methodology is available in Baseline Reports, provided within Appendix F.

RESULTS

The below provides a summary of the findings.

Wind Farm and BOP

Surveys registered under mentioned three species of amphibians and eight species of reptiles during the studies conducted in the daytime by route survey on the territory of the project:

- Eastern Spadefoot (*Pelobates syriacus*) is widespread in arid climates. The digger leads a sedentary lifestyle, mostly in soft, sometimes hard clay soils. It is disturbed along the Caspian Sea coast in the south-east (from Astara to Salyan), in the north-east (from Davachi to Khachmaz) and Nakhchivan AR.
- A single adult individual of the Eastern Spadefoot was recorded at night around a water spring about 400 m from point X13. It is an endemic species listed as Vulnerable in the Azerbaijan Red Data Book.
- CHA found the Eastern Spadefoot Toad does not trigger criticality or qualify as a PBF
- Mediterranean turtle (*Testudo graeca*) is a species widely dispersed throughout the country and mainly in the eastern part of Azerbaijan. It is found in semi-desert or desert landscapes. It mainly leads a nocturnal lifestyle, but sometimes it is also observed in the daytime. Population in Khizi seems to be small and recorded only twice during field surveys in May-June. Both adult females were observed at X 04 where vegetation was dense.

- During the autumn survey, burrows of hibernating individuals were recorded. Individuals mainly prefer southeastern slopes and foothills with favorable climatic conditions, dense vegetation and low slope.
- The carcasses of predated individuals were recorded in the survey area.
- A total of 5 individuals were recorded during the 13-day study in spring and autumn (2 adult females on the ground, 2 adult females in the shelter, and 1 predated).
- As per the CHA criteria, the Mediterranean turtle (*Testudo graeca*) is classified as a PBF.

Table 7-29 List of herptiles recorded during the herpetology baseline survey

Scientific name	Type	STATUS	WF Abundance	BOP Abundance
<i>Pelobates syriacus</i>	Toad	LC (IUCN) and VU Az Red Data Book)	1	
<i>Bufo variabilis</i>	Toad	LC (IUCN)	-	
<i>Testudo graeca</i>	Tortoise	VU (Az Red Book & IUCN)	5	1
<i>Pelophylax ridibundus</i>	Lizard	LC (IUCN)		
<i>Ophisops elegans</i>	Snake	LC (IUCN)	22	
<i>Eirenis collaris</i>	Snake	LC (IUCN)	12	3
<i>Xerotyphlops vermicularis</i>	Snake	LC (IUCN)	8	1
<i>Eryx jaculus</i>	Snake	LC (IUCN)	1	
<i>Natrix tessellata</i>	Snake	LC (IUCN)	1	
<i>Malpolon insignitus</i>	Snake	LC (IUCN)	3	
<i>Mesobutus eupeus</i>	Scorpion	LC (IUCN)		2

Figure 7-32 Survey Area - Reptiles





Reptile activity is typically highest in early summer, from late May to mid-July.

OHTL Segment 1 Khizi – Yashma

A total of 4 reptiles species and one amphibian were recorded over the OHTL survey of the segment Khizi-Yashma. All species, except one are recorded are listed as LC on the IUCN Red List as well as the Azerbaijan Red Data Book. The exception, a testudine species; European Pond Turtle *Emys orbicularis* is recorded as NT on the IUCN Red list. The following table summarizes the findings from the herptile survey undertaken along Segment 1 of the OHTL.

Table 7-30 List of Reptiles recorded along the OHTL Segment 1 Khizi – Yashma

<i>Ophisops elegans</i>	Snake-eyed Lizard	LC	-	2
<i>Malpolon insignitus</i>	Eastern Montpellier Snake	LC	-	1
<i>Pelophylax ridibundus</i>	Marsh Frog	LC	-	2
<i>Emys orbicularis</i>	European Pond Turtle	NT	-	1
<i>Macrovipera lebetina obtusa</i>	Lebetine Viper	LC	-	1

OHTL Segment 2 Khizi – Pirakashkul

A total of 8 reptile species and one amphibian were recorded over the OHTL survey of the segment Khizi – Pirakashkul. Five of the reptile species belonged to the families Lacertidae, Viperidae, Psammophiidae and Columbridae of the order Squamata. All species, except two are recorded are listed as LC on the IUCN Red List as well as the Azerbaijan Red Data Book. The exceptions, two testudine species; European Pond Turtle *Emys orbicularis* recorded as NT and Mediterranean Tortoise *Testudo graeca* recorded as VU on the IUCN Red list. As per EBRD

PR6, the Mediterranean Tortoise qualifies as a PBF. The following table summarizes the findings from the herptile survey undertaken along Segment 2 of the OHTL.

Table 7-31 List of Reptiles recorded along the OHTL Segment 2 Khizi – Pirakashkul

<i>Ophisops elegans</i>	Snake-eyed Lizard	LC	-	6
<i>Malpolon insignitus</i>	Eastern Montpellier Snake	LC	-	1
<i>Pelophylax ridibundus</i>	Marsh Frog	LC	-	4
<i>Emys orbicularis</i>	European Pond Turtle	NT	-	1
<i>Macrovipera lebetinus obtusa</i>	Lebetine Viper	LC	-	2
<i>Eirenis collaris</i>	Collared Dwarf Snake	LC,	-	1
<i>Dolichophis schmidtii</i>	Red-bellied Racer	LC	-	2
<i>Testudo graeca</i>	Mediterranean Tortoise	VU	AzRDB	1

OHTL Segment 3 Pirakashkul – Gobu

A total of 8 reptiles species and one amphibian were recorded over the OHTL survey of the segment Pirakashkul – Gobu. Five of the reptile species belonged to the families Lacertidae, Viperidae, Psammophiidae and Columbridae of the order Squamata. All species, except two are recorded are listed as LC on the IUCN Red List as well as the Azerbaijan Red Data Book. The exceptions, two testudine species; European Pond Turtle *Emys orbicularis* recorded as NT and Mediterranean Tortoise *Testudo graeca* recorded as VU on the IUCN Red list. These species as also listed on Annex 1 of Resolution 6 of the Bern Convention. As per EBRD PR6, the Mediterranean Tortoise qualifies as a PBF. The following table summarizes the findings from the herptile survey undertaken along Segment 3 of the OHTL.

Table 7-32 List of Reptiles recorded along the OHTL Segment 3 Pirakashkul-Gobu

<i>Ophisops elegans</i>	Snake-eyed Lizard	LC	-	10
<i>Malpolon insignitus</i>	Eastern Montpellier Snake	LC	-	1
<i>Pelophylax ridibundus</i>	Marsh Frog	LC	-	2
<i>Emys orbicularis</i>	European Pond Turtle	NT	-	1
<i>Macrovipera lebetinus obtusa</i>	Lebetine Viper	LC	-	1
<i>Tenuidactylus caspius</i>	Caspian Bent-toed Gecko	LC	-	1
<i>Testudo graeca</i>	Mediterranean Tortoise	VU	AzRDB	2

7.4.6 Invertebrates

REGIONAL CONTEXT

The entomofauna of Azerbaijan is highly diverse as well as rich in regional endemism.

In August 2013, the 2nd edition of the Red book of Azerbaijan was published. The Red Book contains updated information on the status of rare, threatened and endangered wild plant and animal species for the entire territory of the country. The current version of the Red Book lists 223 species of fauna (including 74 insect species). This represents a significant increase in the number of rare, threatened and endangered species that were recorded in the 1st edition of the 'Red Book of Azerbaijan' (1989) - 108 animal species and 140 plant species. An upcoming third edition is being completed, which includes *Saga ephippigera*, which was recorded during Khizi invertebrate surveying efforts.

SURVEY METHODOLOGY

In order to provide site-specific baseline information on herptile species, ecology surveys were carried out as per the below.

Surveying Techniques:

- A series of transects and quadrats were undertaken to identify the species present and provide an indication of relative abundance and population density;
- Two (2) transects were undertaken at the Khizi-Yashma and Khizi-Pirakashkul Segments. 4 transects were undertaken at the Pirakashkul-Gobu Segments; and
- Sweep netting and manual collection were used, as conditions were not favourable for deployment of pit traps.

Coverage & Timing/Dates:

- Khizi WF area was surveyed during May, June and July 2020;
- Khizi BOP area were surveyed during May and June 2021; and

-
- OHTL segments were surveyed during July .

A detailed methodology is available in Baseline Reports, provided within Appendix F.

RESULTS

The below provides a summary of the findings.

Wind Farm

Fieldwork in the Khizi-3 area showed that entomofauna in this site is represented by 61 species belonging to 8 orders (Orthoptera – 15 species, Mantodea - 2 species, Blattodea 1, Hemiptera 1, Hymenoptera-2 species, Coleoptera – 23 species, Neuroptera 3, Lepidoptera - 14 species). According to abundance registered in the studied site 7 species are rare (*Saga ephippigera* Fischer von Waldheim, 1846, *Empusa pennicornis* (Pallas, 1773, *Polyphaga aegyptiaca* (Linnaeus, 1758), *Zygaena (Mesembrynus) brizae shemachensis* (Holik & Sheljuzhko, 1955), *Zygaena (Agrumenia) loti* ((Denis & Schiffermuller), 1775), *Jordanita* sp. 1, *Jordanita* sp. 2), 14 are not abundant and 40 are abundant.

Among insects species recorded in the Khizi-3 project site *Saga ephippigera* is a threatened species that is likely to be listed as VU in the 3rd edition of Azerbaijan Red Data book. As per CHA criteria this species does not qualify as a PBF. Survey recorded a rather dense population of the *S. ephippigera* in the Khizi-3.

The locations where *Saga ephippigera* were noted are located as per the below map.

Figure 7-33 Location Map of Saga Ehippiger



OHTL Segment 1 Khizi – Yashma

A total of 24 species of 16 orders and 7 families of the phylum Arthropoda were recorded during the OHTL Entomology survey of Segment 1 Kizhi-Yashma. *Saga ehippiger* is a threatened species that is likely to be listed as VU in the 3rd edition of Azerbaijan Red Data book. As per CHA criteria this species does not qualify as a PBF. All species recorded during the survey are listed as LC on the IUCN Red List.

Table 7-33 Summary of Threatened and Endemic Species in Segment 3

ORDER	FAMILY	SPECIES
Odonata	Libellulidae	<i>Orthetrum coerulescens</i>
		<i>Orthetrum brunneum</i>
		<i>Crocothemis erythraea</i>
	Coenagrionidae	<i>Ischnura elegans</i>
Orthoptera	Tettigoniidae	<i>Saga ehippiger</i>
	Acrididae	<i>Calliptamus barbarus barbarus</i>
		<i>Sphingonotus savignyi</i>
		<i>Sphingonotus coerulipes</i>
		<i>Dociostaurus maroccanus</i>
	Pamphagidae	<i>Asiotmethis muricatus muricatus</i>
	Dericorythidae	<i>Dericorys tibialis</i>
Mantodea	Mantidae	<i>Bolivaria brachyptera</i>
Hymenoptera	Formicidae	<i>Cataglyphis aenescens</i>
		<i>Messor laboriosus</i>
		<i>Messor caducus</i>

	Mutillidae	<i>Dasytaphrus maura arenaria</i>
	Vespidae	<i>Polistes</i> sp.
	Pompilidae	<i>Cryptocheilus (Cryptocheilus) annulatus</i>
	Sphecidae	<i>Podalonia affinis</i> <i>Spheg flavipennis</i>
Lepidoptera	Pieridae	<i>Colias hyale</i>
Coleoptera	Tenebrionidae	<i>Dissonomus picipes</i>
	Carabidae	<i>Acinopus</i> sp.
Blattodea	Corydiidae	<i>Polyphaga aegyptiaca</i>

OHTL Segment 2 Kizhi-Pirakashkul

A total of 25 species of 15 orders and 7 families of the phylum Arthropoda were recorded during the OHTL Entomology survey of Segment 2 Kizhi-Pirakashkul. *Bubopsis andromache* is a threatened species listed as VU in the Azerbaijan Red Data book. It is not recorded on the IUCN Red List.

Table 7-34 Arthropod Species Recorded during the Entomology Survey of Segment 2

FAMILY	ORDER	SPECIES
Odonata	Libellulidae	<i>Orthetrum coerulescens</i>
		<i>Orthetrum brunneum</i>
		<i>Crocothemis erythraea</i>
	Coenagrionidae	<i>Ischnura elegans</i>
Orthoptera	Acrididae	<i>Acrida bicolor</i>
		<i>Calliptamus barbarus barbarus</i>
		<i>Sphingonotus savignyi</i>
		<i>Sphingonotus coerulipes</i>
		<i>Dociostaurus maroccanus</i>
	Pamphagidae	<i>Asiotmethis muricatus muricatus</i>
	Dericorythidae	<i>Dericorys tibialis</i>
Mantodea	Mantidae	<i>Bolivaria brachyptera</i>
Hymenoptera	Formicidae	<i>Cataglyphis aenescens</i>
		<i>Messor laboriosus</i>
		<i>Messor caducus</i>
	Mutillidae	<i>Dasytaphrus maura arenaria</i>
	Pompilidae	<i>Cryptocheilus (Cryptocheilus) annulatus</i>
	Vespidae	<i>Polistes</i> sp.
	Sphecidae	<i>Podalonia affinis</i>
		<i>Spheg flavipennis</i>
Coleoptera	Tenebrionidae	<i>Adesmia fischeri</i>
		<i>Dissonomus picipes</i>
	Carabidae	<i>Acinopus</i> sp.
Neuroptera	Ascalaphidae	<i>Bubopsis andromache</i>
Lepidoptera	Sphingidae	<i>Hyles zygophylli</i>

OHTL Segment 3 Pirakashkul-Gobu

A total of 19 species of 11 orders and 4 families of the phylum Arthropoda were recorded during the OHTL Entomology survey of Segment 3 Pirakashkul-Gobu. No threatened species were recorded along the OHTL segment.

Table 7-35 Arthropod Species Recorded during the Entomology Survey of Segment 3

FAMILY	ORDER	SPECIES
Orthoptera	Acrididae	<i>Acrida bicolor</i>
		<i>Calliptamus barbarus barbarus</i>
		<i>Sphingonotus savignyi</i>
		<i>Sphingonotus coerulipes</i>
		<i>Dociostaurus maroccanus</i>
	Pamphagidae	<i>Asiotmethis muricatus muricatus</i>
	Dericorythidae	<i>Dericorys tibialis</i>
Mantodea	Mantidae	<i>Bolivaria brachyptera</i>
Hymenoptera	Formicidae	<i>Cataglyphis aenescens</i>
		<i>Messor laboriosus</i>
		<i>Messor caducus</i>
	Mutillidae	<i>Dasylabris maura arenaria</i>
	Pompilidae	<i>Cryptocheilus (Cryptocheilus) annulatus</i>
	Vespidae	<i>Polistes sp.</i>
	Sphecidae	<i>Podalonia affinis</i>
		<i>Sphex flavipennis</i>
Coleoptera	Tenebrionidae	<i>Adesmia fischeri</i>
		<i>Dissonomus picipes</i>
	Carabidae	<i>Acinopus sp.</i>

7.5 Sensitive Receptors

The following overview table groups the sensitivity / value of ecological receptors that may be impacted by project works.

In order to account for potential species that may be present in as-yet unsurveyed portions (OHTL) the most sensitive group (Birds) had potential sensitive species included as well as recorded species.

All other species recorded during surveys but which are not listed in the sensitive receptor table, are considered to be of Low/lower value.

- Impacts on Low/Lower value species are not anticipated to be significant; and
- Mitigation for higher value receptors will also alleviate impacts on these lower value receptors.

Therefore, these Low/lower value species have not been listed out in detail and the impact assessment section will not include assessments on these receptors.

Table 7-36 Sensitive Receptors (Biodiversity)

Group	Receptor(s)	Area	Justification	Value
Habitat	Lowland Steppe	All	Lowland steppe is an integral habitat forming the semi-desert ecosystems of Azerbaijan. It supports a variety of Caucasus region species and is heavily degraded and diminishing regionally.	High
	Highland Mountain	All	Highland Mountain is an integral habitat forming the semi-desert ecosystems of Azerbaijan. It supports a variety of Caucasus region species and is heavily degraded and diminishing regionally.	High
	Salt Ponds / Depressions	All	Salt Ponds provide resources for a variety of fauna as a water source and foraging ground.	High
	Forest woodland	OHTL	Wooded habitats are increasingly fragmented and removed and are considered critically threatened in the region.	High
	Modified agricultural	OHTL	Modified agricultural habitat would typically be considered as Lower value. However, the Sociable Lapwing which is known to migrate through the region is dependent upon modified agricultural habitat. As it is a critically endangered species, modified agricultural habitat in this region is therefore also classed as high value.	High
Endangered Flora (PBF)	<i>Alcea kusariensis</i> ; <i>Viola caucasica</i>	WF, BOP, OHTL	Listed as endangered in the Azerbaijan Red Data Book. PBF as per EBRD PR6 requirements.	Very High
Vulnerable Flora (PBF)	<i>Acantholimon schemahense</i> ; <i>Atropa caucasica</i> ; <i>Cladochaeta candidissima</i> ; <i>Iris acutiloba</i> ; <i>Iris grossheimii</i> ; <i>Ophrys caucasica</i> ; <i>Orchis caspai</i> ; <i>Punica granatum</i> ; <i>Tulipa biebersteiniana</i> ; <i>Tulipa eichleri</i>	WF, BOP, OHTL	Listed as vulnerable in the Azerbaijan Red Data Book.	Medium

Group		Receptor(s)	Area	Justification	Value
Near Threatened Flora (PBF)		<i>Asyneuma campanuloides</i> ; <i>Pulsatilla albana</i> ; <i>Pyrus salicifolia</i> ; <i>Iris caucasica</i> ; <i>Festuca ovina</i>	WF, BOP; Laydown	Listed as near threatened in the Azerbaijan Red Data Book.	Medium
Non-Threatened Endemic Flora (PBF)		<i>Astragalus brachytropis</i> Stev. <i>Astragalus denudatus</i> Stev. <i>Astragalus evgemi</i> L. <i>Astragalus polyphyllus</i> Bge. <i>Bellevalia albana</i> G.Woron <i>Bellevalia fomini</i> Woronow. <i>Bellevalia Wilhelmsii</i> Stev. <i>Carduus seminudus</i> M.B.ex. Willd. <i>Centaurea Fisheri</i> Willd. <i>Centaurea kobstanica</i> Tzvel. <i>Centaurea transcaucasica</i> <i>Iris lineolata</i> Trautv. <i>Onobrychis Bobrovii</i> A.Grossh. <i>Onobrychis iberica</i> A.Grossh. <i>Rubia transcaucasica</i> A.Grossh. <i>Scorzonera lanata</i> L. <i>Taraxacum desertorum</i> Schischk. <i>Tragopogon filifolius</i> Boiss. <i>Tragopogon serotinus</i> D.Sosn <i>Trifolium sachokianum</i> A.Grossh. <i>Agrostis alba</i> <i>Allium albidum</i> <i>Astragalus denudatus</i> <i>Capparis herbacea</i> <i>Centaurea reflexa</i> <i>Salsola incanescens</i>	WF, BOP; Laydown	Although not threatened, regionally range-restricted and endemic; PBF as per EBRD PR6 requirements.	Medium
Endangered Birds	Highly Sensitive Raptors	Egyptian Vulture (PBF) Steppe Eagle (Critical) Saker Falcon (PBF)	WF & OHTL Confirmed Possible in all areas	Listed as critically endangered or endangered on IUCN Red List. The Egyptian Vulture is a Edge of Extinction Species.	Very High

Group		Receptor(s)	Area	Justification	Value
				CHA designated Steppe Eagle as CH and Egyptian Vulture and Saker Falcon as PBFs Perching raptors and large-bodied birds are particularly vulnerable to wind farm and transmission line developments.	
	Highly Sensitive Waterbirds	White-headed Duck (PBF) Sociable Lapwing (PBF)	Not Confirmed but Possible in all areas	Listed as critically endangered or endangered on IUCN Red List. Though not recorded during the baseline survey, classified as PBF as per EBRD PR 6 criteria Large-bodied birds and gregarious species are particularly vulnerable to wind farm and transmission line developments.	Very High
Threatened Birds	Sensitive Raptors	Cinereous Vulture Eastern Imperial Eagle (PBF) Greater Spotted Eagle (PBF) Pallid Harrier	Not Confirmed but Possible in all areas	Listed as vulnerable or Near threatened on the IUCN Red List. Eastern Imperial Eagle and Greater Spotted Eagle are PBFs as per EBRD PR6 requirements. Perching raptors and large-bodied birds are particularly vulnerable to wind farm and transmission line developments.	High
	Sensitive Waterbirds	Dalmatian Pelican (PBF) Common Pochard (PBF) Ferruginous Duck Lesser White-fronted Goose (PBF) Marbled Teal (PBF) Red-breasted Goose Velvet Scoter Northern Lapwing Eurasian Oystercatcher Black-tailed Godwit Eurasian Curlew Great Snipe	Not Confirmed but Possible in all areas	Listed as vulnerable or near threatened on IUCN Red List. Some species are designated as PBFs as per EBRD PR6 requirements. Large-bodied birds and gregarious species are particularly vulnerable to wind farm and transmission line developments.	High

Group		Receptor(s)	Area	Justification	Value
		Black Stork (PBF)			
	Sensitive Groundbirds	Great Bustard (PBF) Little Bustard (PBF) Caucasian Grouse	Not Confirmed but Possible in all areas	Listed as vulnerable (PBF as per EBRD PR6 requirements) or near threatened on IUCN Red List. Poor fliers such as ground birds are particularly vulnerable to wind farm and transmission line developments.	High
	Songbirds/Allies	European Turtle-dove (PBF) Meadow Pipit Redwing	Not Confirmed but Possible in all areas	Listed as vulnerable (PBF as per EBRD PR6 requirements) or near threatened on IUCN Red List. Smaller passerines and allies are less sensitive to wind farm and transmission line development comparatively to larger-bodied raptors, waterbirds and ground-birds.	High
	Nationally Threatened Raptors	Osprey (PBF) Long-legged Buzzard (PBF) Peregrine Falcon (PBF) Golden Eagle (PBF)	Not Confirmed but Possible in all areas	Listed as Cr or EN under Azerbaijan Red Data Book. PBF as per EBRD PR6 requirements	High
Non-threatened Raptors		Black Kite (PBF) Booted Eagle (PBF) Griffon Vulture (PBF) White-tailed Sea-eagle (PBF) Lesser Kestrel (PBF) Bearded Vulture (PBF) European Honey Buzzard (PBF) Short-toed Eagle (PBF) Lesser-spotted Eagle	WF & OHTL Confirmed Possible in all areas	Classified as Least Concern on the global IUCN Red List, but listed as vulnerable or near-threatened under Azerbaijan Red Data Book. CHA designates some species as PBF's. Perching raptors and large-bodied birds are particularly vulnerable to wind farm and transmission line developments.	
Threatened Bats (PBF)		Greater horseshoe bat (Confirmed) Geoffroy's bat European free-tailed bat	Possible	Bats are known to be particularly vulnerable to wind developments. These species are also listed in the Azerbaijan Red Data Book. These species play an important ecological function the top-down	High

Group		Receptor(s)	Area	Justification	Value
				control of insect population. Keystone Species; classified as PBFs	
Non-threatened Bats (PBF)		Whiskered bat(Confirmed) Alcaho bat (Confirmed) Brown long-eared bat (Confirmed) Eastern barbastelle (Confirmed) Lesser noctule Common noctule Giant noctule Nathusius's pipistrelle (Confirmed) Kuhl's pipistrelle (Confirmed) Savii's pipistrelle Particolored bat Serotine bat (Confirmed) Eptesicus species Noctule species	WF BOP, OHTL	Bats are known to be particularly vulnerable to wind developments. However, these species are generally common and widespread. These species play an important ecological function the top-down control of insect population. Keystone Species; classified as PBFs	
Threatened Mammals		Goitered Gazelle (PBF)	WF/BOP/OHTL Confirmed	This species is listed as critically endangered in the Azerbaijan Red Data Book and Vulnerable on the IUCN Red List. However, gazelle and other terrestrial, mobile mammals are not considered to be especially effected by wind developments, as wind farms and turbines have relatively lesser habitat loss and mortality than other types of developments.	High
Non-threatened Mammals	Carnivores	<i>Vulpes vulpes</i> <i>Canis aureus</i> <i>Canis lupus</i>	WF/BOP /OHTL Confirmed	These carnivores act as top-down control on prey populations and help control disease. However these species are not threatened or endemic and are common and widespread.	Medium

Group		Receptor(s)	Area	Justification	Value
	Insectivores	<i>Erinaceus concolor</i> <i>Hemiechinus auritus</i>	WF/BOP /OHTL Confirmed	Hedgehogs are an important top-down control for various invertebrate populations. However these species are not threatened or endemic and are common and widespread.	Medium
	Lagomorph	European Hare	WF/BOP /OHTL Confirmed	Rabbits are an important prey species for many carnivores and raptors. However these species are not threatened or endemic and are common and widespread.	Medium
	Rodents	<i>Cricetulus migratorius</i> (Grey dwarf hamster) <i>Allactaga elater</i> (Small five-toed jerboa) <i>Allactaga williamsi</i> (Williams's jerboa) <i>Meriones libycus</i> (Libyan jird) <i>Microtus socialis</i> (Social vole)	WF/BOP /OHTL Confirmed	Rodents are an important prey species and also contribute to soil health via burrow aeration and vegetation spread via seed banking. However these species are not threatened or endemic and are common and widespread.	Medium
Threatened Herptiles		<i>Testudo graeca</i> (PBF)	WF/BOP /OHTL Confirmed	This tortoise is listed as VU on IUCN Red List PBF species a per EBRD PR6. As a burrowing reptile, this species will be at risk of earthworks during construction period.	High
		<i>Emys orbicularis</i>	OHTL Confirmed	This tortoise is listed as NT on IUCN Red List As a burrowing reptile, this species will be at risk of earthworks during construction period.	High
		<i>Pelobates syriacus</i>	WF Confirmed	This toad species is listed as Vulnerable on the Azerbaijan Red Data Book. It is an endemic species	

Group		Receptor(s)	Area	Justification	Value
Non-threatened Herptiles	Amphibians	<i>Bufo variabilis</i> / <i>Bufo viridis</i>	WF/BOP/ OHTL Confirmed	These species are not threatened or endemic and are common and widespread.	Medium
	Lizards	<i>Ophisops elegans</i>	WF/BOP OHTL Confirmed	These species are not threatened or endemic and are common and widespread.	Medium
	Snakes	<i>Eirenis collaris</i> <i>Xerotyphlops vermicularis</i> <i>Eryx jaculus</i> <i>Natrix tessellate</i> <i>Malpolon insignitus</i>	WF/BO OHTL P Confirmed	These species are not threatened or endemic and are common and widespread.	Medium
Threatened Invertebrates		<i>Saga ephippigera</i>	WF/BOP /OHTL Confirmed	A rare species of giant bush cricket, a carnivorous species that feeds on insects typically harmful to agriculture. Will be listed in the 3 rd edition of the Azerbaijan Red Data Book.	High
Non-threatened Invertebrates		Orthoptera (Grasshoppers/Locust/Crickets) Mantodea (Mantis) Hymenoptera (Wasps/Bees/Ants) Blattodea (Cockroaches/Termites) Hemiptera (Aphids/Cicadas/Shield Bugs) Coleoptera (Beetles) Neuroptera (Lacewings/Antlions) Lepidoptera (Butterflies/Moths)	WF/BOP /OHTL Confirmed	Some of the species found are important predators whilst others are important pollinators. However these species are not threatened or endemic and are common and widespread.	Medium

7.6 Potential Impacts, Mitigation, Management & Residual Impact

7.6.1 Construction Phase

HABITAT LOSS, FRAGMENTATION AND DEGRADATION

Habitat Loss

Clearing, grading, excavation and other earthworks during early construction stages results in habitat loss over the construction footprint of the project, including temporary structures, lay-down areas, and new and existing roads used for incoming and outbound traffic.

Habitat loss 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 utilize the converted land which restricts available habitat regionally. Ecosystem function likewise will be degraded or lost.

A worse case conservative buffer of 50 meters has been applied across the full Balance of Plant (substations, roads/ cables) to encompass the footprint as well as a buffer for construction activity. The resulting calculation shown in Table below are together with a more stringent buffer which the EPC would be instructed to maintain with only selected areas identified where a wider buffer is required.

Table 7-37 Habitat Loss

HABITAT	HABITAT LOSS BASED ON 50 M BUFFER FOR ALL WF COMPONENTS	HABITAT LOSS BASED ON 50 M FOR WTGs AND 10 M FOR BOP AND ACCESS ROAD (WORST CASE)
Semi Desert	2.97 km ²	0.12 km ²
Agricultural Land	0.05 km ²	<0.01 km ²
Marsh Area	0.256 km ²	<0.01 km ²
Exposed Vegetation (shrubs & trees)	0.11km ²	< 0.01 km ²
Mountain Steppe	2.38km ²	0.81 km ²

Table 7-38 Natural Habitat Loss

HABITAT	HABITAT LOSS BASED ON 30 M BUFFER FOR ALL WF COMPONENTS	HABITAT LOSS BASED ON 50 M FOR WTGs AND 10 M FOR BOP AND ACCESS ROAD
Semi Desert	2.97	0.12
Marsh Area	0.256	0.01
Exposed Vegetation (shrubs & trees)	0.11	0.01
Mountain Steppe	2.38	0.81

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**, however, the **overall magnitude** of habitat loss is anticipated to be relatively minimal compared to the **overall extent** of the available habitats.

Table 7-39 Significance of Habitat Loss

RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Semi desert	High	Minor	Minor to moderate
Agricultural Land	Medium	Minor	Negligible to Minor
Marsh area	High	Minor	Minor to moderate
Shrubs & Trees	High	Minor	Minor to moderate
Mountain steppe	High	Minor	Minor to moderate

However, maintaining strict requirements to **minimize** 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**.

The EPC contractor **will commit** to the post-construction restoration of all affected areas to natural habitat conditions to achieve No Net Loss post construction. The exact scope and methodology will be detailed in a Restoration Action Plan. This reduces the spatial extent of the impact and thus reduces the magnitude of impact where possible.

Table 7-40 Residual Significance of Habitat Loss

RECEPTOR	VALUE/ SENSITIVITY	MAGNITUDE	RESIDUAL
Semi desert	High	Negligible	Minor
Agricultural Land	Medium	Negligible	Negligible to Minor
Marsh area	High	Negligible	Minor
Shrubs & Trees	High	Negligible	Minor
Mountain steppe	High	Negligible	Minor
Semi desert	High	Negligible	Minor

BIODIVERSITY LOSS – DIRECT MORTALITY, LOWERED REPRODUCTION AND SURVIVORSHIP

Clearing, Excavation, Earthworks

Clearing of existing vegetation will result in direct loss and mortality of removed specimens. Further, wildlife such as burrowing rodents and herptiles 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 possible to occur.

Thus, the magnitude of impact is considered as Moderate. The Value/Sensitivity is as per the Sensitive Receptor Table. The matrix was applied to arrive at the qualitative Significance of the Unmitigated impact. The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-41 Significance of Construction Earthworks Impact

Receptor	Value/Sensitivity	Magnitude	Significance
Endangered Flora	Very High	Moderate	Major
Threatened Flora	High	Moderate	Moderate to Major
Near-threatened Flora	Medium	Moderate	Moderate
Non-threatened Flora	Medium	Moderate	Moderate
Greek Tortoise	High	Moderate	Moderate to Major
Non-threatened Herptiles	Medium	Moderate	Moderate
<i>Saga ephippigera</i>	High	Moderate	Moderate to Major
Non-threatened Inverts	Medium	Moderate	Moderate
Non-threatened Rodents	Medium	Moderate	Moderate

However, the following mitigation measures will be implemented:

- Pre-construction survey and translocation of endangered and threatened flora. The timings and exact methodology for relevant species is defined in the Flora Conservation Action Plan.
- Seed-collection of endangered and threatened flora for use in restoration activities post-construction. The timings and exact methodology for relevant species is defined in the Flora Conservation Action Plan.
- Post-construction restoration via seeding, re-planting, and landscaping with native, high-value species. Details will be provided in the Restoration Action Plan.
- Relocation of threatened reptiles, European Pond Turtle and Greek Tortoise away from the construction corridor. This will be undertaken via pre-construction survey to identify viable release sites, relocation efforts during the optimal season (late spring/early summer), and in areas considered to be attractive, reptile-exclusion fencing will be erected to prevent re-colonization of the construction corridor. The detailed methodology is provided in the Reptile Relocation Plan.

For non-threatened species such as other herptiles and small mammals, a chance-find procedure will be included within the CESMP to provide general guidance on dealing with animals found in the active construction area. There will be a full-time Ecologist on site as part of the EPC Contractor's team to carry out any such required translocations (as well as implement and supervise all biodiversity related construction management and monitoring measures).

With the above measures, the **residual** significance is presented in the following table.

Table 7-42 Residual Significance of Construction Earthworks Impact

Receptor	Value/Sensitivity	Magnitude	Residual
Endangered Flora	Very High	Negligible	Minor
Threatened Flora	High	Negligible	Minor
Near-threatened Flora	Medium	Negligible	Negligible to minor
Non-threatened Flora	Medium	Negligible	Negligible to minor
Greek Tortoise	High	Negligible	Minor
Non-threatened Herptiles	Medium	Minor	Minor
<i>Saga ephippigera</i>	High	Negligible	Minor
Non-threatened Inverts	Medium	Minor	Minor
Non-threatened Rodents	Medium	Minor	Minor

Vehicle Collisions

Wildlife can be runover or collide with motorized vehicles and equipment.

Vehicle-related death from trucks and machinery are less of a concern for larger mammals such as Gazelle, Wolf, Fox and Jackal which are more likely to disperse in time to avoid collision (as the site vehicles will be traveling under speed restrictions (20km/hr) and large equipment movement such as cranes and turbine parts will be very slow).

Small to medium sized wildlife such as hare, hedgehog and rodents, tortoise, lizards, snakes and amphibians as well as invertebrates have a higher chance of mortality from vehicular and machinery collisions. This could also apply to endangered, threatened and non-threatened raptors which may scavenge from road-kill.

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 Negligible. The Value/Sensitivity is as per the Sensitive Receptor Table. The matrix was applied to arrive at the qualitative Significance of the Unmitigated impact. The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-43 Significance of Construction Vehicular Collision Impact

Receptor Group	Value/Sensitivity	Magnitude	Significance
Endangered Raptors	Very High	Minor	Moderate to Major
Threatened Raptors	High	Minor	Minor to moderate
Threatened Ground birds	High	Minor	Minor to moderate
Non-threatened Raptors	Medium	Minor	Minor
Goitered Gazelle	High	Negligible	Minor
Non-threatened Carnivores	Medium	Negligible	Negligible to minor
Non-threatened Mammals (non-carnivores)	Medium	Minor	Minor
Greek Tortoise	High	Minor	Minor to moderate
Non-threatened Herptiles	Medium	Minor	Minor
<i>Saga ephippigera</i>	High	Negligible	Minor
Non-threatened Invertebrates	Medium	Minor	Minor

However, the following mitigation measures will be implemented to reduce the impacts:

- Strict speed controls (20km/hr) 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; and
- Protocol for removal of any road-kill carcasses immediately upon observation to at least 10 meters away from the access road.
- These measures shall be captured in the CESMP and shall be implemented and monitored by the Ecologist on Site.

With the above measures, the **residual** significance is presented in the following table.

Table 7-44 Residual Significance of Construction Vehicular Collision Impact

Receptor	Value/Sensitivity	Magnitude	Residual
Endangered Raptors	Very High	Negligible	Minor
Threatened Raptors	High	Negligible	Minor
Threatened Ground birds	High	Negligible	Minor
Non-threatened Raptors	Medium	Negligible	Negligible to minor
Goitered Gazelle	High	No change	Neutral
Non-threatened Carnivores	Medium	No change	Neutral
Non-threatened Mammals (non-carnivores)	Medium	Negligible	Negligible to minor
Greek Tortoise	High	Negligible	Minor
Non-threatened Herptiles	Medium	Negligible	Negligible to minor
<i>Saga ephippigera</i>	High	Negligible	Minor
Non-threatened Invertebrates	Medium	Negligible	Negligible to minor

"Take" (Poaching, Hunting, Gathering)

Presence of site workers may lead to increased hunting, poaching, or gathering on site. Flora and vegetative matter may 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 Moderate to Minor. The Value/Sensitivity is as per the Sensitive Receptor Table. The matrix was applied to arrive at the qualitative Significance of the Unmitigated impact. The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-45 Significance of Construction "Take" Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Flora	Very High	Moderate	Major
Threatened Flora	High	Moderate	Moderate to Major
Near- and Non-threatened Flora	Medium	Moderate	Moderate
Endangered Birds	Very High	Minor	Moderate to Major
Threatened Birds, Greek Tortoise	High	Minor	Minor to moderate
Non-threatened Mammals, Herptiles, Raptors, Songbirds	Medium	Minor	Minor

However, the following mitigation measures will be implemented to reduce the impacts:

- Strict controls forbidding the hunting, gathering, poaching or otherwise disturbance of any flora or fauna on site, included in induction training;
- Staff training such as toolbox talks on specific species of concern such as Greek Tortoise, snakes, hares etc which might otherwise be hunted or killed.
- These measures shall be captured in the CESMP and shall be implemented and monitored by the Ecologist on Site

With the above measures, the **residual** significance is presented in the following table.

Table 7-46 Residual Significance of Construction “Take” Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	RESIDUAL
Endangered Flora	Very High	Negligible	Minor
Threatened Flora	High	Negligible	Minor
Near- and Non-threatened Flora	Medium	Negligible	Negligible to minor
Endangered Birds	Very High	Negligible	Minor
Threatened Birds, Greek Tortoise	High	Negligible	Minor
Non-threatened Mammals, Herptiles, Raptors, Songbirds	Medium	Negligible	Negligible to minor

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 long-term and irreversible, with a possible likelihood.

Thus, the magnitude of impact is considered as Minor. The Value/Sensitivity is as per the Sensitive Receptor Table. The matrix was applied to arrive at the qualitative Significance of the Unmitigated impact. The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-47 Significance of Construction Littering Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Birds	Very High	Minor	Moderate to Major
Threatened Birds, Bats, Mammals, Herptiles, Invertebrates	High	Minor	Minor to moderate
Non-threatened Birds, Bats, Mammals, Herptiles, Invertebrates	Medium	Minor	Minor

However, the following mitigation measures can will be implemented to reduce the 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 and shall be implemented and monitored by the Ecologist on Site.

With the above measures, the **residual** significance is presented in the following table.

Table 7-48 Residual Significance of Construction Littering Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	RESIDUAL
Endangered Birds	Very High	Negligible	Minor
Threatened Birds, Bats, Mammals, Herptiles, Invertebrates	High	Negligible	Minor
Non-threatened Birds, Bats, Mammals, Herptiles, Invertebrates	Medium	Negligible	Negligible to minor

Disturbance

The presence of anthropogenic activity is disturbing to many sensitive species, which can result in reduced survivorship, reproductive success, and ultimately, population decline.

Species particularly sensitive include the shy Goitered Gazelle and Bustard species, although most wildlife which is not already habituated to anthropogenic disturbance is anticipated to be negatively affected.

Disturbance especially impacts on the reproductive success of breeding birds, which may abandon breeding attempts, or desert nests or colonies if disturbance levels are unacceptable. Disturbance may also impact important biodiversity features such as dens, caves/bat roosts, and other areas where fauna congregate.

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 Moderate to Minor. The Value/Sensitivity is as per the Sensitive Receptor Table. The matrix was applied to arrive at the qualitative Significance of the Unmitigated impact. The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-49 Significance of Construction Disturbance Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Birds	Very High	Moderate	Major
Threatened Birds	High	Moderate	Moderate to Major
Non-threatened Birds	Medium	Minor	Minor
Threatened Bats	High	Minor	Minor to moderate
Non-threatened Bats	Medium	Minor	Minor
Threatened Mammals (Goitered Gazelle)	High	Moderate	Moderate to Major
Non-threatened Mammals (carnivores)	Medium	Moderate	Moderate
Non-threatened Mammals (non-carnivores)	Medium	Minor	Minor
Greek Tortoise	High	Moderate	Moderate to Major
Non-threatened Herptiles	Medium	Moderate	Moderate

However, the following mitigation measures will be implemented to reduce the impacts:

- Minimize construction footprint buffer zones and temporary laydown areas.
- Avoid disturbance during sensitive ecological periods, particularly breeding season of sensitive species of concern. The Breeding Birds Protection Plan provides exact methodology and details on the seasonal timings and distance of no-go buffers which should be utilized.

With the above measures, the **residual** significance is presented in the following table.

Table 7-50 Residual Significance of Construction Disturbance Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	RESIDUAL
Endangered Birds	Very High	Negligible	Minor
Threatened Birds	High	Negligible	Minor
Non-threatened Birds	Medium	Negligible	Negligible to minor
Threatened Bats	High	Negligible	Minor
Non-threatened Bats	Medium	Negligible	Negligible to minor
Threatened Mammals	High	Negligible	Minor
Non-threatened Mammals (carnivores)	Medium	Negligible	Negligible to minor
Non-threatened Mammals (non-carnivores)	Medium	Negligible	Negligible to minor
Greek Tortoise	High	Negligible	Minor
Non-threatened Herptiles	Medium	Negligible	Negligible to minor

BIODIVERSITY DISPLACEMENT

Dispersal and Competition

Shy species may be displaced away from the project area, having potentially indirect secondary impacts on adjacent territories via increased competition for resources compromising population stability, causing ecosystem imbalances.

However, the surrounding areas on a landscape level support similar habitat types and are not constrained by large-scale urban or industrial developments. Therefore, it is not anticipated that displaced individuals will have a significant impact on adjacent ecosystems.



Proliferation of Generalists

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. The Value/Sensitivity is as per the Sensitive Receptor Table. The matrix was applied to arrive at the qualitative Significance of the Unmitigated impact. The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-51 Significance of Construction Proliferation Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Fauna	Very High	Moderate	Major
Threatened Fauna	High	Moderate	Moderate to Major
Non-threatened Fauna	Medium	Moderate	Moderate

However, the following mitigation measures will be implemented to reduce the 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.
- No provision of food waste for feral cats and dogs
- These measures shall be captured in the CESMP and shall be implemented and monitored by the Ecologist on Site.

With the above measures, the residual significance is presented in the following table.

Table 7-52 Residual Significance of Construction Proliferation Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	RESIDUAL
Endangered Fauna	Very High	Negligible	Minor
Threatened Fauna	High	Negligible	Minor
Non-threatened Fauna	Medium	Negligible	Negligible to minor

BIOSECURITY RISKS

Introduced Flora / 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 utilize the reduced native vegetation for foraging or shelter.

The magnitude and unmitigated significance calculations are presented in the table below. 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 Major (for flora) to Moderate (for fauna). The Value/Sensitivity is as per the Sensitive Receptor Table. The matrix was applied to arrive at the qualitative Significance of the Unmitigated impact. The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-53 Significance of Introduced Pathogen/Invasive Species Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Flora	Very High	Major	Major
Threatened Flora	High	Major	Major
Near- and Non-threatened Flora	Medium	Major	Moderate to Major
Endangered Fauna	Very High	Moderate	Major
Threatened Fauna	High	Moderate	Moderate to Major
Non-threatened Fauna	Medium	Moderate	Moderate

However, the following mitigation measures will be implemented to reduce the 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 Waste Management Plan will also include waste water management protocols.

- These measures shall be captured in the CESMP and shall be implemented and monitored by the Ecologist on Site.
- On-site ecologist will monitor for any invasive species in the cleared areas which, if found, will be removed to prevent potential spread beyond the construction area.

With the above measures, the **residual** significance is presented in the following table.

Table 7-54 Residual Significance of Introduced Pathogen/Invasive Species Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	RESIDUAL
Endangered Flora	Very High	Negligible	Minor
Threatened Flora	High	Negligible	Minor
Near- and Non-threatened Flora	Medium	Negligible	Negligible to minor
Endangered Fauna	Very High	Negligible	Minor
Threatened Fauna	High	Negligible	Minor
Non-threatened Fauna	Medium	Negligible	Negligible to minor

ENVIRONMENTAL QUALITY

Air Quality

Dust can coat vegetation, reducing photosynthesis and respiration ability, causing desiccation. Emissions of pollutants such as NO_x, SO_x, PM and CO can lower survivorship and increase susceptibility of affected wildlife to disease.

This direct 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. The Value/Sensitivity is as per the Sensitive Receptor Table. The matrix was applied to arrive at the qualitative Significance of the Unmitigated impact. The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-55 Significance of Construction Air Pollution Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Flora	Very High	Minor	Moderate to Major
Threatened Flora	High	Minor	Minor to moderate
Near- and Non-threatened Flora	Medium	Minor	Minor
Endangered Fauna	Very High	Minor	Moderate to Major
Threatened Fauna	High	Minor	Minor to moderate
Non-threatened Fauna	Medium	Minor	Minor

However, the following mitigation measures will be implemented to reduce the impacts:

- Refer to air quality control measures.
- All tracks will be damped down to reduce risk of dust and this will be checked daily.
- These measures shall be captured in the CESMP and shall be implemented and monitored by the Ecologist on Site.

With the above measures, the **residual** significance is presented in the following table.

Table 7-56 Residual Significance of Construction Air Pollution Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	RESIDUAL
Endangered Flora	Very High	Negligible	Minor
Threatened Flora	High	Negligible	Minor
Near- and Non-threatened Flora	Medium	Negligible	Negligible to minor
Endangered Fauna	Very High	Negligible	Minor
Threatened Fauna	High	Negligible	Minor
Non-threatened Fauna	Medium	Negligible	Negligible to minor

Noise

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 species.

This direct impact has moderate-high intensity, with a regional spatial extent, is long-term and reversible, with a certain likelihood.

Thus, the magnitude of impact is considered as Major (for birds) and Moderate (for others). The Value/Sensitivity is as per the Sensitive Receptor Table. The matrix was applied to arrive at the qualitative Significance of the Unmitigated impact. The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-57 Significance of Construction Noise Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Birds	Very High	Major	Major
Threatened Birds	High	Major	Major
Non-threatened Birds	Medium	Major	Moderate to Major
Threatened Bats	High	Moderate	Moderate to Major
Non-threatened Bats	Medium	Moderate	Moderate
Threatened Mammals (Goitered Gazelle)	High	Moderate	Moderate to Major
Non-threatened Mammals (non-carnivores)	Medium	Moderate	Moderate

However, the following mitigation measures will be implemented to reduce the impacts:

- Refer to noise control measures;
- Avoid disturbance during sensitive ecological periods, particularly breeding season of sensitive species of concern. The Breeding Birds Protection Plan provides exact methodology and details on the seasonal timings and distance of no-go buffers which should be utilized;
- Install temporary acoustic barriers around large generators, Best Available Technology (BAT) and Best Management Practices (BMP) within construction methodology to reduce noise, especially intermittent noise, as much as possible.
- These measures shall be captured in the CESMP and shall be implemented and monitored by the Ecologist on Site.

With the above measures, the **residual** significance is presented in the following table.

Table 7-58 Residual Significance of Construction Noise Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	RESIDUAL
Endangered Birds	Very High	Negligible	Minor
Threatened Birds	High	Negligible	Minor
Non-threatened Birds	Medium	Negligible	Negligible to minor
Threatened Bats	High	Negligible	Minor
Non-threatened Bats	Medium	Negligible	Negligible to minor
Threatened Mammals (Goitered Gazelle)	High	Negligible	Minor
Non-threatened Mammals (non-carnivores)	Medium	Negligible	Negligible to minor

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 work areas and not across the wider area or along access roads, thereby limiting lighting to relatively small areas, where night work is required.

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 Moderate to Major. The Value/Sensitivity is as per the Sensitive Receptor Table. The matrix was applied to arrive at the qualitative Significance of the Unmitigated impact. The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-59 Significance of Construction Lighting Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Birds	Very High	Moderate	Major
Threatened Birds	High	Moderate	Moderate to Major
Non-threatened Birds	Medium	Moderate	Moderate
Threatened Bats	High	Major	Major
Non-threatened Bats	Medium	Major	Moderate to Major
Threatened Mammals (Goitered Gazelle)	High	Moderate	Moderate to Major
Non-threatened Mammals	Medium	Moderate	Moderate
Threatened Herptiles (Greek Tortoise)	High	Moderate	Moderate to Major
Non-threatened Herptiles	Medium	Major	Moderate to Major
Threatened Invertebrates (Saga ephippigera)	High	Moderate	Moderate to Major
Non-threatened Invertebrates	Medium	Moderate	Moderate

However, the following mitigation measures will be in place, to minimize 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.
- These measures shall be captured in the CESMP and shall be implemented and monitored by the Ecologist on Site.

With the above measures, the **residual** significance is presented in the following table.

Table 7-60 Residual Significance of Construction Lighting Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	RESIDUAL
Endangered Birds	Very High	Negligible	Minor
Threatened Birds	High	Negligible	Minor
Non-threatened Birds	Medium	Negligible	Negligible to minor
Threatened Bats	High	Negligible	Minor
Non-threatened Bats	Medium	Negligible	Negligible to minor
Threatened Mammals (Goitered Gazelle)	High	Negligible	Minor
Non-threatened Mammals	Medium	Negligible	Negligible to minor
Threatened Herptiles (Greek Tortoise)	High	Negligible	Minor

Non-threatened Herptiles	Medium	Negligible	Negligible to minor
Threatened Invertebrates (Saga ephippigera)	High	Negligible	Minor
Non-threatened Invertebrates	Medium	Negligible	Negligible to minor

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, but with an unlikely likelihood.

Thus, the magnitude of unmitigated impact is considered as Moderate. The Value/Sensitivity is as per the Sensitive Receptor Table. The matrix was applied to arrive at the qualitative Significance of the Unmitigated impact. The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-61 Significance of Construction Contamination Risk Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Species	Very High	Moderate	Major
Threatened Species	High	Moderate	Moderate to Major
Non-threatened Species	Medium	Moderate	Moderate

However, the following mitigation measures will be implemented to reduce the impacts:

- Refer to hazardous materials control measures, emergency action plan and spill prevention and clean up measures, which shall be detailed in the CESMP.

With the above measures, the **residual** significance is presented in the following table.

Table 7-62 Residual Significance of Construction Contamination Risk Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	RESIDUAL
Endangered Species	Very High	Negligible	Minor
Threatened Species	High	Negligible	Minor
Non-threatened Species	Medium	Negligible	Negligible to minor

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**. The Value/Sensitivity is as per the Sensitive Receptor Table. The matrix was applied to arrive at the qualitative Significance of the Unmitigated impact. The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-63 Significance of Soil Compaction Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Flora	Very High	Moderate	Major
Threatened and Endemic Flora	High	Moderate	Moderate to Major
Near-threatened Flora	Medium	Moderate	Moderate
Non-threatened Flora	Medium	Moderate	Moderate

However, the following mitigation measures will be in place, to minimize the magnitude of potential impact:

- Minimise construction footprint. This measure has been implemented;
- Strict controls to prevent driving out of designated corridors;
- Habitat restoration post-construction inclusive of topsoil replacement if beneficial or soil filling where deemed necessary to promote regrowth.
- The EPC contractor will commit to the post-construction restoration of all affected areas to natural habitat conditions. The exact scope and methodology will be detailed in a Restoration Action Plan.
- These measures reduce the spatial extent, intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

With the above measures, the residual significance is presented in the following table.

Table 7-64 Residual Significance of Soil Compaction Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Flora	Very High	Negligible	Minor
Threatened and Endemic Flora	High	Negligible	Minor
Near-threatened Flora	Medium	Negligible	Negligible to Minor
Non-threatened Flora	Medium	Negligible	Negligible to Minor

7.6.2 Operational Phase

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.

Neither the wind farm nor the OHTL will be fenced; therefore, there will be no physical barriers to movement. However, turbines may deter migratory birds who exhibit macro-scale avoidance behaviour; longer migratory movements can increase stress and lower survivorship of migrants that expend more energy to navigate around wind farms.

The OHTL may result in fragmentation for species that exhibit strong avoidance behaviour.

Migratory raptors do not exhibit macro-avoidance behaviour; (in fact, this is the reason that migratory raptors are at high risk for turbine collision); thus habitat fragmentation from the presence of migratory movement barriers is not considered to apply to raptors.

The project site does not represent a migratory corridor bottleneck for waterbirds as evidenced by habitat mapping and survey results. Other species known and/or anticipated to occur are not thought to be likely barred from movement throughout the habitat patch by the operation of the project. Therefore, the magnitude of the potential habitat fragmentation impact has been determined to be Negligible.

Table 7-65 Significance of Habitat Fragmentation Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Birds	Very High	Negligible	Minor
Threatened Birds	High	Negligible	Minor
Non-threatened Birds	Medium	Negligible	Negligible to minor
Threatened Mammals (Goitered Gazelle)	High	Negligible	Minor
Non-threatened Mammals (carnivores)	Medium	Negligible	Negligible to minor
Non-threatened Mammals (non-carnivores)	Medium	Negligible	Negligible to minor
Threatened Herptiles (Greek Tortoise)	High	Negligible	Minor
Non-threatened Herptiles	Medium	Negligible	Negligible to minor
Threatened Invertebrates (Saga ephippigera)	High	Negligible	Minor
Non-threatened Invertebrates	Medium	Negligible	Negligible to minor

BIODIVERSITY LOSS, LOWERED SURVIVORSHIP & REPRODUCTIVE SUCCESS

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 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.
- 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.

Quantitative assessment was undertaken by utilizing a Collision Risk Model (CRM) developed as per SNH Guidelines, using *Band et. al* predictive modelling. (Detailed methodology and results for the CRM is available in Interim Bird Report, Appendix F).

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 CRM for the species of concern is presented below.

Table 7-66 Collision Risk Modelling

English Common Name	Using most realistic CA values for each season	
	Collisions/ year	Years to 1 collision
Tier 1		
Egyptian Vulture	0.01345	74
Steppe Eagle	0.2187	4
Pallas's Fish-Eagle	0.001444	692
Saker Falcon	0.003148	317

English Common Name	Using most realistic CA values for each season	
	Collisions/ year	Years to 1 collision
Tier 2		
Black Stork	0.005179	193
Dalmatian Pelican	0.02058	48
Osprey	0.000466	2145
Bearded Vulture	0.1078	9
European Honey-Buzzard	0.3953	2
Oriental Honey-Buzzard	0.08353	11
Cinereous Vulture	8.429	<1
Eurasian Griffon	13.20	<1
Unidentified Vulture ²	26.80	<1
Short-toed Snake-Eagle	0.009353	106
Booted Eagle	0.06550	15
Imperial Eagle	0.002621	381
Golden Eagle	0.1305	7
Pallid Harrier	0.09816	10
Levant Sparrowhawk	0.01383	72
Black Kite	0.09862	10
White-tailed Eagle	0.05220	19
Long-legged Buzzard	0.8516	1
Lesser Kestrel	32.79	<1
Red-footed Falcon	0.1449	6
Merlin	0.001217	821
Eurasian Hobby	0.01150	86
Lanner Falcon	0.02301	43
Peregrine Falcon	0.002654	376
Tier 3		
Eurasian Marsh-Harrier	0.07784	12
Hen Harrier	0.1317	7
Montagu's Harrier	0.1696	5
Eurasian Sparrowhawk	0.05191	19
Rough-legged Hawk	0.04416	22
Common Buzzard	0.2559	3
Eurasian Kestrel	9.319	<1

² The VP survey data included numerous observations ascribed to "vulture sp." that were likely either Eurasian Griffon or Cinereous Vulture. Therefore, we modelled collision risk in "Unidentified Vulture" using bird measurements and characteristics intermediate between Eurasian Griffon and Cinereous Vulture.

No tier 1 target bird species are predicted to experience collisions more frequently than one fatality per 4 years under the most likely collision avoidance rate scenarios modelled. Three tier 2 target species are predicted to experience more than one fatality per year under the most likely collision avoidance rate scenarios modelled (Cinereous Vulture – 8.4 fatalities predicted per year; Eurasian Griffon – 13.2 fatalities predicted per year; and Lesser Kestrel – 32.8 fatalities predicted per year). Predicted fatality levels for these species may have potential to impact regional populations of these species, and therefore may warrant special consideration in the biodiversity management planning for the Project. Among tier 3 target bird species, only the Eurasian Kestrel, a widespread and abundant species that does not have elevated conservation status at the national or international levels, was predicted to experience more than one collision per year under the most likely collision avoidance scenarios modelled (9.3 collisions per year).

The magnitude of impact of collision has been qualitatively assigned as per the below table, taking into consideration the predicted number of collision fatalities.

Table 7-67 Significance of Bird Turbine Collision Impact

RECEPTOR	VALUE	MAGNITUDE	SIGNIFICANCE
Egyptian Vulture	Very High	Negligible	Minor
Steppe Eagle	Very High	Minor	Moderate to Major
Pallas's Fish-Eagle	Very High	Negligible	Minor
Saker Falcon	Very High	Negligible	Minor
Black Stork	Medium	Negligible	Negligible to Minor
Dalmatian Pelican	High	Negligible	Minor
Osprey	Medium	Negligible	Negligible to Minor
Bearded Vulture	High	Minor	Minor to Moderate
European Honey-Buzzard	Medium	Moderate	Moderate
Oriental Honey-Buzzard	Medium	Minor	Minor
Cinereous Vulture	High	Major	Major
Eurasian Griffon	Medium	Major	Moderate to Major
Short-toed Snake-Eagle	Medium	Negligible	Negligible to Minor
Booted Eagle	Medium	Minor	Minor
Imperial Eagle	High	Negligible	Minor
Golden Eagle	Medium	Minor	Minor
Pallid Harrier	High	Minor	Minor to Moderate
Levant Sparrowhawk	Medium	Negligible	Negligible to Minor
Black Kite	Medium	Minor	Minor
White-tailed Eagle	Medium	Minor	Minor
Long-legged Buzzard	Medium	Moderate	Moderate
Lesser Kestrel	Medium	Major	Moderate to Major
Red-footed Falcon	High	Minor	Minor to moderate

RECEPTOR	VALUE	MAGNITUDE	SIGNIFICANCE
Merlin	Medium	Negligible	Negligible to Minor
Eurasian Hobby	Medium	Negligible	Negligible to Minor
Lanner Falcon	Medium	Negligible	Negligible to Minor
Peregrine Falcon	Medium	Negligible	Negligible to Minor
Eurasian Marsh-Harrier	Low / Lower	Minor	Negligible to Minor
Hen Harrier	Low / Lower	Minor	Negligible to Minor
Montagu's Harrier	Low / Lower	Minor	Negligible to Minor
Eurasian Sparrowhawk	Low / Lower	Minor	Negligible to Minor
Rough-legged Hawk	Low / Lower	Minor	Negligible to Minor
Common Buzzard	Low / Lower	Minor	Negligible to Minor
Eurasian Kestrel	Low / Lower	Major	Minor to Moderate

Species with potential Moderate to Major collision impact significance include Steppe Eagle, Cinereous Vulture, Eurasian Griffon, and Lesser Kestrel.

Earlier iterations of the wind farm design included an extension of area to the west, where the number of bird flights recorded during VP surveys were higher. These areas were flagged as high risk and the WTG layout was subsequently amended to avoid those areas. The number of WTG's have decreased from 49 to 25 which reduces both the footprint and subsequent habitat loss and risks to Tier 1 avifauna. Iterations of the WF layout is provided in Section 2 and reasoning for changes in the layout in Section 2.1.4.4.

This was following the mitigation hierarchy of "Avoidance" as the optimal mitigation measure.

The following mitigation measures will also 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
- The turbine towers shall be painted black from ground level until the beginning of the rotor swept area; a single blade shall be painted black from the tip to halfway up the blade to reduce motion smear and increase visibility of moving turbines to birds.
- Upfront Shut-down on Demand (SDOD) will be in place for Egyptian Vulture, Steppe Eagle, Saker Falcon, Greater Spotted Eagle, and Eastern Imperial Eagle.** This means that turbines will be stopped when any of these species approach WTGs within a risk radius (currently being defined). The mechanism of SDOD will be observer-led for a timeframe of 3 years at the end of which necessity to extend SDOD time frame and/or upscale mitigation will be determined in consultation with the lenders. The exact methodology for SDOD will be detailed in the Collision Risk Management Plan (CRMP).
- A **Collision Risk Management Plan** will be formulated which includes the following:
 - Acceptable Mortality Thresholds in line with No Net Loss (NNL) for all priority species, which are calculated on the basis of Potential Biological Removal;

- 3 years of Post-Construction Fatality Monitoring (PCFM), 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.
- Species such as Griffon Vulture and Cinereous Vulture shall not be curtailed for upfront. However, should the PBR thresholds be exceeded (as monitored via PCFM) then SDOD will be implemented for these species as well, potentially at particular WTGs or during particular timings of elevated risk.
- Lesser Kestrel shall not be curtailed via SDOD as the small stature and flight behaviour of the species do not lend themselves to effective SDOD. Potential Impacts on Lesser Kestrel shall be mitigated via the following:
 - o Tilling the soil regularly to prevent vegetation growth and invertebrates directly under the rotor swept area has been tested and has shown reduction in fatality of Kestrels. The area with tilled soil will be limited to the construction buffers implemented for WTGs (50m), BOP (10m) access roads (10m) and all other WF components (30m). Therefore, additional habitat loss is not expected to occur due to the implementation of this measure; and
 - o Provision of habitat enhancement (i.e. erection of nest boxes) in an alternate suitable location.
- Additional compensatory measures to offset any net loss may include:
 - o Habitat restoration / etc in alternate areas, especially for species most impacted by turbine strikes. Of particular concern is Steppe Eagle for which Critical Habitat has been triggered.
 - o Providing targeted funding for ecological research project (e.g. a grant to a PhD student for research on species of concern), following discussion with the Ministry of Ecology and Natural Resources of Azerbaijan.
 - o The compensatory and offsetting measures that will be implemented shall be outlined in the Compensation Offset Plan.

These measures reduce the intensity and likelihood of the impact occurring and thus the magnitude of impact is reduced accordingly.

Table 7-68 Residual Significance of Bird Turbine Collision Impact

Receptor	Value	Magnitude	Significance
Steppe Eagle	Very High	Negligible	Minor
Egyptian Vulture	Very High	Negligible	Minor
Saker Falcon	Very High	Negligible	Minor
Cinereous Vulture	High	Minor	Minor to Moderate
Eurasian Griffon	Medium	Minor	Minor
Lesser Kestrel	Medium	Moderate	Moderate

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.
- “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.

Given the above, the below table provides the risk ranking of the species present on site.

Table 7-69 Turbine Collision Risk of Bat Species

SCIENTIFIC NAME	COMMON NAME	FLIGHT ALTITUDE -M	MIGRATORY BEHAVIOUR	COLLISION RISK ESTIMATION ³
<i>Rhinolophus ferrumequinum</i>	Greater horseshoe bat	10m to few hundred	Sedentary	Low
<i>Myotis emarginatus</i>	Geoffroy's bat	Up to 15 in the canopy	Sedentary	Low
<i>Myotis mystacinus</i>	Whiskered bat	Up to 15 in the canopy	Sedentary	Low
<i>Myotis alcaethoe</i>	Alcaethoe bat	Up to 15 in the canopy	Sedentary	Low

³ Rodrigues, L., L. Bach, M.-J. Dubourg-Savage, B. Karapandža, D. Kovač, T. Kervyn, J. Dekker, A. Kepel, P. Bach, J. Collins, C. Harbusch, K. Park, B. Micevski, J. Minderman, (2014). Guidelines for consideration of bats in wind farm projects – Revision 2014. EUROBATS Publication Series #6. UNEP/EUROBATS Secretariat, Bonn, Germany, 133pp.

SCIENTIFIC NAME	COMMON NAME	FLIGHT ALTITUDE -M	MIGRATORY BEHAVIOUR	COLLISION RISK ESTIMATION ³
<i>Plecotus auritus</i>	Brown long-eared bat	Up to & above the canopy (foraging and direct flight)	Sedentary	Low
<i>Barbastella caspica</i>	Eastern barbastelle	above the canopy (foraging and direct flight)	Sedentary	Medium
<i>Nyctalus noctula</i>	Lesser noctule	10m to few hundred	Migratory	High
<i>Nyctalus leisleri</i>	Common noctule	above canopy, >25- >50 (foraging & direct flight)	Sedentary	High
<i>Pipistrellus nathusii</i>	Nathusius's pipistrelle	1-20 foraging, 30-50 migration,	Migratory	High
<i>Pipistrellus kuhlii</i>	Kuhl's pipistrelle	1-10m up to few hundred,	Sedentary	High
<i>Hypsugo savii</i>	Savii's pipistrelle	10m to few hundred	Sedentary	High
<i>Vespertilio murinus</i>	Particolored bat	20-40, above canopy (foraging), >40-50 in direct flight	Migratory	High
<i>Eptesicus serotinus</i>	Serotine bat	>25, foraging above canopy, >40-50 in direct flight	Sedentary	Medium
<i>Tadarida teniotis</i>	European free-tailed bat	10-300	Sedentary	High

The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-70 Significance of Bat Turbine Collision Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Greater horseshoe bat	High	Minor	Minor to Moderate
Geoffroy's bat	High	Minor	Minor to Moderate
Whiskered bat	Medium	Minor	Minor
Alcathoe bat	Medium	Minor	Minor
Brown long-eared bat	Medium	Minor	Minor
Eastern barbastelle	High	Moderate	Moderate to Major
Lesser noctule	Medium	Major	Moderate to Major
Common noctule	Medium	Major	Moderate to Major
Major Moderate to MajorNathusius's pipistrelle	Medium	Major	Moderate to Major
Kuhl's pipistrelle	Medium	Major	Moderate to Major
Savii's pipistrelle	Medium	Major	Moderate to Major

Particolored bat	Medium	Major	Moderate to Major
Serotine bat	Medium	High	Moderate to Major
European free-tailed bat	High	Minor	Minor to Moderate

However, the following mitigation measures will be implemented to reduce the impacts:

The following mitigation measures will be implemented to reduce collision risk:

- Prevention of elements that may attract bats, or insects and therefore bats:
 - o All wind turbines, particularly the nacelles, will be designed, constructed and maintained in such a manner that they do not support roosting bats – all the gaps and interstices should be made inaccessible to bats;
 - o Lighting will be used only to meet Health and Safety requirements as needed and where possible will use wavelengths and designs that do not attract insects or bats;
 - o Prevent retention of water that may attract insects in the immediate vicinity.
- Upfront Experimental Curtailment will be in place. This means that half of all turbines (in an alternating pattern) will be curtailed (stopped from spinning) during the following 6-week period when all the following conditions are met:
 - o Time Period: August 15 - October 1
 - o Wind Speed <6m/s
 - o Duration: 2 hours immediately before and after sunset; 2 hours immediately before and after sunrise
- The upfront experimental curtailment will be in place for a total of 3 years. After this time, should there be no significant difference between experimental curtailed turbines and control turbines, the upfront curtailment shall be stopped following consultation with lenders.
- The exact methodology will be detailed in the Collision Risk Management Plan (CRMP). A Collision Risk Management Plan will be formulated which includes the following:
 - o Acceptable Mortality Thresholds for all priority species, which are calculated on the basis of Potential Biological Removal;
 - o 3 years of Post-construction Fatality Monitoring (PCFM), which includes carcass searches, searcher bias trials, and persistence trials, and correction factors to be applied for estimating fatalities;
 - o Adaptive management program which indicates how curtailment shall be applied and upscaled in the event that fatality monitoring indicates that mortality thresholds are being exceeded.
 - o An "Emergency" trigger shall also be in place to allow the immediate upscaling of curtailment should PCFM result in concerning numbers of mortality at any time.

- o Acoustic monitoring shall be implemented once WTGs are erected to enable monitoring of bat activity once turbines are in place (which can cause behavioural adjustments). The pairing of acoustic data measured from nacelle height with meteorological data can provide valuable insights to further target appropriate curtailment. This shall be further detailed in the CRMP.

With the above measures, the residual significance is Moderate or less for all species.

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 energized 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.

Based on size, behaviour, and records from literature, the following categorizes the electrocution risk of the identified species of concern that may occur within the project site.

Table 7-71 Electrocution Risk of various Bird Species

GROUPING VALUE	SPECIES OF CONCERN (IDENTIFIED/SUSPECTED)	WINGSPAN	PERCHING BEHAVIOUR	ELECTROCUTION RISK (I=UN LIKELY; II=POSSIBLE; III=HIGHLY PROBABLE)
Endangered Birds: Highly Sensitive Raptors (VH Value)	Steppe Eagle	Large	Yes	III
	Egyptian Vulture	Large	Yes	III
	Saker Falcon	Medium	Yes	III
Endangered Birds: Highly Sensitive Waterbirds (VH Value)	White-headed Duck	Medium	No	I
	Sociable Lapwing	Small	No	I
Threatened Birds: Sensitive Raptors (H Value)	Cinereous Vulture	Large	Yes	III
	Eastern Imperial Eagle	Large	Yes	III
	Greater Spotted Eagle	Large	Yes	III
	Pallid Harrier	Medium	Yes	III
Threatened Birds: Sensitive Waterbirds (H Value)	Dalmatian Pelican	Large	No	I
	Common Pochard	Medium	No	I
	Ferruginous Duck	Medium	No	I
	Lesser White-fronted Goose	Medium	No	I
	Marbeled Teal	Medium	No	I

GROUPING VALUE	SPECIES OF CONCERN (IDENTIFIED/SUSPECTED)	WINGSPAN	PERCHING BEHAVIOUR	ELECTROCUTION RISK (I=UN LIKELY; II=POSSIBLE; III=HIGHLY PROBABLE)
	Red-breasted Goose	Medium	No	I
	Velvet Scoter	Medium	No	I
	Northern Lapwing	Small	No	I
	Eurasian Oystercatcher	Medium	No	I
	Great Snipe	Small	No	I
Threatened Birds: Sensitive Groundbirds (H Value)	Great Bustard	Medium	No	I
	Little Bustard	Small	No	I
	Caucasian Grouse	Small	No	I
Songbirds / Allies (M Value)	European Turtle-dove	Small	Yes	II
	Meadow Pipit	Small	Yes	I
	Redwing	Small	Yes	I
Non-threatened Raptors (M Value)	Black Kite	Medium	Yes	III
	Booted Eagle	Large	Yes	III
	Golden Eagle	Large	Yes	III
	Griffon Vulture	Large	Yes	III
	Long-legged Buzzard	Large	Yes	III
	White-tailed Sea Eagle	Large	Yes	III
	Lesser Kestrel	Medium	Yes	III
	Bearded Vulture	Large	Yes	III
	Lesser-spotted Eagle	Large	Yes	III

The magnitude and **unmitigated** significance calculations are presented in the table below.

Table 7-72 Significance of Bird OHTL Electrocuting Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Birds: Highly Sensitive Raptors	Very High	Major	Major
Threatened Birds: Sensitive Raptors	High	Major	Major
Non-threatened Raptors	Medium	Major	Moderate to Major

However, the following mitigation measures can serve to reduce the impacts:

The optimal design mitigation to completely remove electrocution risk is to bury the lines. However, this is not always possible and comes with other associated impacts. Therefore, for above-ground designs, the following integrated measures should be applied:

- Ensure a safe design of the cross arm and related equipment (separate energized conductors and grounded hardware distances by more than largest species wingspan);
- Use suspended insulators and avoid pin and deadend/strain insulators;

- Ensure safe distance (more than the largest species wingspan) 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 should 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.
- Reconfiguration and retrofitting of existing dangerous OHTL in the region by the national utility, Azerenergi, would be a particularly effective compensatory offset with potential net gain benefits for affected species, particularly relevant in the case of Steppe Eagle, for which the project lies within Critical Habitat. The need for this measure will be further explored in the Biodiversity Action Plan and will be detailed in the Compensation Offset Plan if determined to be applicable.
- 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 Post-construction Fatality Monitoring, which includes carcass searches, searcher bias trials, and persistence trials, and correction factors to be applied for estimating fatalities

With the above measures, the **residual** significance is presented in the following table.

Table 7-73 Residual Significance of Bird OHTL Electrocution Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	RESIDUAL
Endangered Birds: Highly Sensitive Raptors	Very High	Negligible	Minor
Threatened Birds: Sensitive Raptors	High	Negligible	Minor
Non-threatened Raptors	Medium	Negligible	Negligible to minor

OHTL Collision - Birds

Thin, dark wires used in overhead transmission lines as well as guylines for weather masts are visually difficult to detect. Bird mortality by collisions with these wires are 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 20-50m altitude, birds flying at night, birds flying in flocks, and / or large and heavy birds of limited manoeuvrability.

Based on morphology, behaviour, and records from literature, the following categorizes the collision risk of the identified species of concern that may occur within the project site (OHTL corridors).

Table 7-74 OHTL Collision Risk of Various Bird Species

Grouping Value	Species of Concern (identified/suspected)	Risky Flight Indicators	Collision Risk (I=un likely; II=possible; III=highly probable)
Endangered Birds: Highly Sensitive Raptors (VH Value)	Steppe Eagle		I
	Egyptian Vulture	Poor Manoeuvrability Large-bodied Migratory	II
	Saker Falcon		I
Endangered Birds: Highly Sensitive Waterbirds (VH Value)	White-headed Duck	Poor Manoeuvrability Migratory	II
	Sociable Lapwing	Migratory Low Altitude	III
Threatened Birds: Sensitive Raptors (H Value)	Cinereous Vulture	Poor Manoeuvrability Large-bodied Migratory	II
	Eastern Imperial Eagle		I
	Greater Spotted Eagle		I
	Pallid Harrier		I
Threatened Birds: Sensitive Waterbirds (H Value)	Dalmatian Pelican	Poor Manoeuvrability Large-bodied Migratory Low Visual Detectability	III
	Common Pochard	Poor Manoeuvrability Migratory	II
	Ferruginous Duck	Poor Manoeuvrability Migratory	II
	Lesser White-fronted Goose	Poor Manoeuvrability	II

Grouping Value	Species of Concern (identified/suspected)	Risky Flight Indicators	Collision Risk (I=un likely; II=possible; III=highly probable)
		Migratory	
	Marbeled Teal	Poor Manoeuvrability Migratory	II
	Red-breasted Goose	Poor Manoeuvrability Migratory	II
	Velvet Scoter	Poor Manoeuvrability Migratory	II
	Northern Lapwing	Migratory Low Altitude	III
	Eurasian Oystercatcher	Migratory Low Altitude	III
	Great Snipe	Migratory Low Altitude	III
Threatened Birds: Sensitive Groundbirds (H Value)	Great Bustard	Poor Manoeuvrability Migratory Low Altitude Low Visual Detectability Nocturnal	III
	Little Bustard	Poor Manoeuvrability Migratory Low Altitude Low Visual Detectability	III
	Caucasian Grouse	Poor Manoeuvrability Migratory Low Altitude Low Visual Detectability	III
Songbirds / Allies (M Value)	European Turtle-dove	Low Altitude	II
	Meadow Pipit	Low Altitude	II
	Redwing	Low Altitude	II
Non-threatened Raptors (M Value)	Black Kite		I
	Booted Eagle		I
	Golden Eagle		I
	Griffon Vulture	Poor Maneuverability Large-bodied Migratory	II
	Long-legged Buzzard		I
	White-tailed Sea Eagle		I
	Lesser Kestrel		I

Grouping Value	Species of Concern (identified/suspected)	Risky Flight Indicators	Collision Risk (I=un likely; II=possible; III=highly probable)
	Bearded Vulture	Poor Maneuverability Large-bodied Migratory	II
	Lesser-spotted Eagle		I

The magnitude and **unmitigated** significance calculations are presented in the table below.

Table 7-75 Significance of Bird OHTL Collision Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Birds, Level III	Very High	Major	Major
Endangered Birds, Level II	Very High	Moderate	Major
Threatened Birds, Level III	High	Major	Major
Threatened Birds, Level II	High	Moderate	Moderate to Major
Non-threatened Birds, Level II	Medium	Moderate	Moderate

However, the following mitigation measures can serve to reduce the impacts:

The optimal design mitigation to completely remove collision risk is to bury the lines. However, this is not always possible and comes with other associated impacts. Therefore, for above-ground designs, the following integrated measures should be applied:

- 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. The OHTL alignment was designed taking into account ecological constraints such as waterbodies, areas with green and vegetated habitat patches thought to be attractive to birds, and generally attempting to keep OHTL corridor within previously disturbed and developed areas as much as possible.
- 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, and be placed 5-10 m apart. Firefly Diverters are considered to be of robust specification to provide the needed visual deterrence required, as it includes UV-light reflectivity and are visible in low-light and low-visibility conditions.

- Reconfiguration and retrofitting of existing dangerous OHTL in the region by the national utility, Azerenerji, would be a particularly effective compensatory offset with potential net gain benefits for affected species, particularly relevant in the case of Steppe Eagle, for which the project lies within Critical Habitat. The need for this measure will be further explored in the Biodiversity Action Plan and will be detailed in the Compensation Offset Plan if determined to be applicable.
- 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 includes the following:
 - Acceptable Mortality Thresholds for all priority species, which are calculated on the basis of Potential Biological Removal;
 - 3 years of Post-construction Fatality Monitoring, which includes carcass searches, searcher bias trials, and persistence trials, and correction factors to be applied for estimating fatalities.

With the above measures, the **residual** significance is presented in the following table.

Table 7-76 Residual Significance of Bird OHTL Collision Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	RESIDUAL
Endangered Birds, Level III	Very High	Negligible	Minor
Endangered Birds, Level II	Very High	Negligible	Minor
Threatened Birds, Level III	High	Negligible	Minor
Threatened Birds, Level II	High	Negligible	Minor
Non-threatened Birds, Level II	Medium	Negligible	Negligible to minor

BIODIVERSITY DISPLACEMENT

Dispersal and Competition

Shy species may be displaced away from the project area, having potentially indirect secondary impacts on adjacent territories via increased competition for resources compromising population stability, causing ecosystem imbalances.

However, the surrounding areas on a landscape level support similar habitat types and are not constrained by large-scale urban or industrial developments. Therefore, it is not anticipated that displaced individuals will have a significant impact on adjacent ecosystems.



ENVIRONMENTAL QUALITY

Noise

Operational noise created by the rotation of the turbines and power generator 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.

The noise studies undertaken for the project site found that existing ambient noise in the overall project location is mostly driven by wind.

Table 7-77 Background noise levels (linear regression)

Wind Speed	Location A	Location B	Location C
2 m/s	20 dB	20 dB	20 dB
8 m/s	35 dB	28 dB	35 dB
10 m/s	35 dB	32 dB	38 dB
10 m/s derived	37 dB at SR closest to turbine (>2,000m)		
10 m/s (modelled)	37.2 dB at SR closest to turbine(>2,000m)		

Although there will be cumulative increase in noise closer to the WTGs, resultant effects on wildlife may be relatively minor. For one, the characteristic of the noise is not intermittent, as it will gradually build up and decrease depending on wind speed, rather than cause short, sporadic sounds. Wildlife have been known to habituate to stable conditions, which can include high ambient operational noise.

Studies show that wildlife behaviour is impacted at dB levels of 40, but this is in contrast to lower background levels. As higher wind speeds are correlated with naturally occurring noise levels of 30 dB and higher, it is not anticipated that the addition of operational turbine noise will be significant on biodiversity.

The magnitude and unmitigated significance calculations are presented in the table below.

Table 7-78 Significance of Operational Noise Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Fauna	Very High	Minor	Moderate to Major
Threatened Fauna	High	Minor	Minor to Moderate
Non-threatened Fauna	Medium	Minor	Moderate
Endangered Fauna	Very High	Minor	Moderate to Major
Threatened Fauna	High	Minor	Minor to Moderate

Long term monitoring of wildlife presence within the WF original boundary to be undertaken.

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.

The magnitude and **unmitigated** significance calculations are presented in the table below.

Table 7-79 Significance of Operational Lighting Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Birds	Very High	Moderate	Major
Threatened Birds	High	Moderate	Moderate to Major
Non-threatened Birds	Medium	Moderate	Moderate
Threatened Bats	High	Major	Major
Non-threatened Bats	Medium	Major	Moderate to Major
Threatened Mammals (Goitered Gazelle)	High	Moderate	Moderate to Major
Non-threatened Mammals	Medium	Moderate	Moderate
Threatened Herptiles (Greek Tortoise)	High	Moderate	Moderate to Major
Non-threatened Herptiles	Medium	Major	Moderate to Major
Threatened Invertebrates (Saga ephippigera)	High	Moderate	Moderate to Major
Non-threatened Invertebrates	Medium	Moderate	Moderate

However, the following mitigation measures will be implemented to reduce the impacts:

- Minimize external lighting as much as possible;
- Ensure lighting is only as bright as needed and duration of lighting to be controlled and minimized as much as possible (use motion detectors etc);
- Lights should be shielded to prevent spill and glare; and
- Longer wavelengths are less disruptive to the majority of wildlife.

With the above measures, the **residual** significance is presented in the following table.

Table 7-80 Residual Significance of Operational Lighting Impact

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	RESIDUAL
Endangered Birds	Very High	Negligible	Minor
Threatened Birds	High	Negligible	Minor
Non-threatened Birds	Medium	Negligible	Negligible to minor
Threatened Bats	High	Negligible	Minor
Non-threatened Bats	Medium	Negligible	Negligible to minor
Threatened Mammals (Goitered Gazelle)	High	Negligible	Minor
Non-threatened Mammals	Medium	Negligible	Negligible to minor
Threatened Herptiles (Greek Tortoise)	High	Negligible	Minor
Non-threatened Herptiles	Medium	Negligible	Negligible to minor
Threatened Invertebrates (Saga ephippigera)	High	Negligible	Minor
Non-threatened Invertebrates	Medium	Negligible	Negligible to minor

7.7 Monitoring & Reporting for Compliance and Performance

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.

7.7.1 Design Phase

The following outline the mitigation requirements during design phase:

- Integration of design mitigation into lighting design and OHTL specifications, painting specifications, and exclusion of roosting and perching opportunities within WTGs.
- Micrositing of project elements where applicable.

7.7.2 Pre-construction

The following outline the mitigation requirements pre-construction:

- Review of Construction Methodology by environmental consultant:
 - o Site Clearance and Layout
 - o Timing and method of works
 - o Lighting Strategy
 - o Solid Waste Management Strategy
- Preparation of Biodiversity Action Plan (BAP), inclusive of:
 - o Species-specific Action Plans, which outlines the CHA process, findings, and illustrates the pathway to net gain for CH species and no-net loss for PBF species,, as well as monitoring requirements for the Biodiversity Monitoring and Evaluation Programme (BMEP).
 - o Preparation of Flora Conservation Action Plan, Breeding Birds Protection Plan, Reptile Relocation Plan, Restoration Action Plan and Compensation Offset Plan.
 - o Preparation of Collision Risk Management Plan (CRMP) and Post-construction Fatality Monitoring Plan
 - o Carry out preconstruction surveys, and implementation of actions as per the above plans.
- Preparation of CESMP, inclusive of:
 - o General Site Controls
 - o Solid Waste Control Plan
 - o Chance Find Procedure
 - o Air Quality Control Plan
 - o Dust Control Plan
 - o Noise Control Plan
 - o Ecology Control Plan
 - o Biosecurity Control Plan
 - o Lighting Control Plan
 - o Hazardous Materials Control Plan
 - o Emergency Action Plans
 - o Spill Prevention and Clean-up Procedures

7.7.3 Construction

The following outline the mitigation requirements during construction:

- The EPC will employ a full-time site-based Ecologist, to ensure that ecology related measures are understood and fully implemented.
- Implementation of CEMP
 - o Daily Checklist
 - o Weekly Inspection
 - o Monthly Reporting
 - o Quarterly Auditing
- Biodiversity Monitoring and Evaluation Programme BMEP

7.7.4 Post-construction

The following outline the mitigation requirements post-construction:

- Biodiversity Monitoring and Evaluation Programme BMEP

7.7.5 Pre-Operation

The following outline the mitigation requirements during operation:

- Preparation and Implementation of OESMP, inclusive of:
 - o General Site Controls
 - o Noise Control Plan
 - o Lighting Control Plan
 - o Collision Risk Management Plan
 - o Post-construction Fatality Monitoring Plan
- Biodiversity Monitoring and Evaluation Programme BMEP

8 SOIL, GEOLOGY & GROUNDWATER

8.1 Standards and Regulatory Requirements

8.1.1 National Requirements

- Water Code of Azerbaijan Republic (approved by Law No. 418-IQ);
- Presidential Decree regarding enactment of the Law of the Azerbaijan Republic on water economy of municipalities; and
- Law on water economy of municipalities.

The national soil quality standards are presented in the table below.

Table 8-1 Azerbaijan Soil Quality Standards

PARAMETER	STANDARD VALUE MAX. CONCENTRATION, MG/KG	REFERENCE	IN FORCE
Arsenic (As)	20	AZS 834-5-2015	2015
Cadmium	0,52-52	AZS 834-5-2015	2015
Chlorine	500-1000	AZS 834-5-2015	2015
Chromium VI	20	AZS 834-5-2015	2015
Poly Aromatic Hydrocarbons	1,5-15	AZS 834-5-2015	2015
Lead (Pb)	10	AZS 834-5-2015	2015
Manganese (Mn)	1500	AZS 834-5-2015	2015
Nickel (Ni)	40	AZS 834-5-2015	2015
Zinc (Zn)	50	AZS 834-5-2015	2015
Tin (Sn)	10	AZS 834-5-2015	2015
Oil	100	AZS 834-5-2015	2015

8.1.2 Lenders Requirements

EBRD

Performance Requirement 3 on Resource Efficiency and Pollution Prevention and Control establishes general requirements for pollution prevention as follows:

- The assessment process must identify technically and financially feasible pollution prevention and control techniques that are best suited to avoid or minimise adverse impacts on human health and the environment. Such techniques will be appropriate to the nature and scale of the project's adverse impacts and issues; and
- The Project must meet the relevant EU substantive environmental standards, where these can be applied at the project level. Where no EU substantive environmental standards at project level exist, the Project will identify, in agreement with the EBRD, other appropriate environmental standards in accordance with GIP.

As there may be no defined soil and groundwater standards for Azerbaijan, it is proposed to benchmark existing soil and groundwater against the Dutch standards.

ADB AND EPFI'S

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

- Avoid or minimize 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.

GOOD INDUSTRY PRACTICE

The Dutch 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 8-2 Dutch Soil and Groundwater Standards

PARAMETERS	SOIL (MG/KG DRY MATTER)		GROUNDWATER (µG/L)	
	TARGET VALUE*	INTERVENTION VALUE	TARGET VALUE	INTERVENTION VALUE
Heavy Metals				
Arsenic	29	76	10	60
Barium	160	-	50	625
Cadmium	0.8	13	0.4	6
Chromium	100	-	1	30
Chromium III	-	180	-	-
Chromium IV	-	78	-	-
Cobalt	-	190	20	100
Copper	36	190	15	75
Lead	85	530	15	75
Mercury	0.3	36 (inorganic) 4 (organic)	0.05	0.3
Molybdenum	3	190	5	300
Nickel	35	100	15	75
Zinc	140	720	65	800
Aromatic Compounds				
Benzene	0.01	1.1	0.2	30
Ethyl benzene	0.03	110	4	150
Toluene	0.01	32	7	1000
Xylene (sum)	0.1	17	0.2	70
Styrene (vinylbenzene)	0.3	86	6	300
Phenol	0.05	14	0.2	2000
Cresols (sum)	0.05	13	0.2	200
Chlorinated Hydrocarbons				
Volatile Hydrocarbons				
monochloroethene (vinyl chloride)	0.01	0.1	0.01	5
dichloromethane	0.4	3.9	0.01	1,000
1,1-dichloroethane	0.02	15	7	900
1,2-dichloroethane	0.02	6.4	7	400
1,1-dichloroethene	0.1	0.3	0.01	10
1,2-dichloroethene (sum)	-	1	0.01	20
Dichloropropanes (sum)	-	2	0.8	80
Trichloromethane (chloroform)	0.02	5.6	6	400
1,1,1-trichloroethane	0.07	15	0.01	300
1,1,2-trichloroethane	0.4	10	0.01	130
Trichloroethene (Tri)	0.1	2.5	24	500

PARAMETERS	SOIL (MG/KG DRY MATTER)		GROUNDWATER (µG/L)	
	TARGET VALUE*	INTERVENTION VALUE	TARGET VALUE	INTERVENTION VALUE
Tetrachloromethane (Tetra)	0.4	0.7	0.01	10
Tetrachloroethene (Per)	0.002	8.8	0.01	40
Chlorobenzenes				
Monochlorobenzene	-	15	7	180
Dichlorobenzenes (sum)	-	19	3	50
Trichlorobenzenes (sum)	-	11	0.01	10
Tetrachlorobenzenes (sum)	-	2.2	0.01	2.5
Pentachlorobenzene	-	6.7	0.003	1
Hexachlorobenzene	-	2.0	0.00009	0.5
Chlorophenols				
Monochlorophenols (sum)	-	5.4	0.3	100
Dichlorophenols (sum)	-	22	0.2	30
Trichlorophenols (sum)	-	22	0.03	10
Tetrachlorophenols (sum)	-	21	0.01	10
Pentachlorophenol	-	12	0.04	3

- **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 Area of Influence

Construction Phase

During construction phase, potential impacts to the geology, soil and groundwater will be limited to the areas within the footprint of works or temporary facilities and works related to associated facilities. Impact to groundwater may also include areas where groundwater can migrate.

Operational Phase

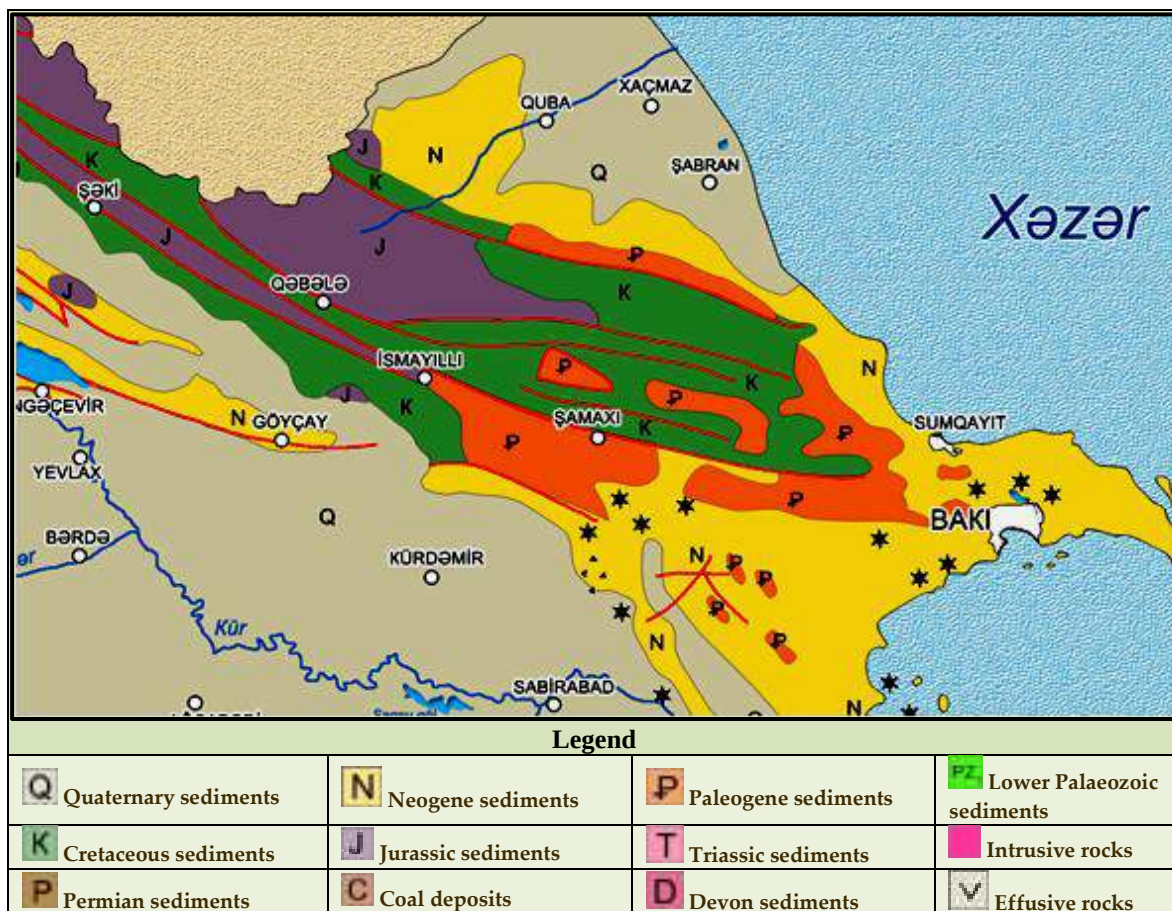
Potential impacts during the operational phase will be limited to areas within footprints of sites, or areas where contaminants can be directly exposed, or runoff to. This may also include areas where groundwater can migrate.

8.3 Baseline

8.3.1 Geological Structure

The territory of the Republic of Azerbaijan is geologically included in the Alpine fold zone. The thickness of the Earth's crust in the Republic of Azerbaijan varies between 38 and 55 km. The maximum thickness is in the Greater Caucasus and minimum thickness is at the foothills of Talysh. Mesozoic as well as Cenozoic eugenic, myogeosynclinal and molassic sediments are the most widespread in the country.

Figure 8-1 Geological Structure of Azerbaijan



8.3.2 Stratigraphy and Lithology

The geological structure of Khizi District includes rocks from the Jurassic period to modern times. In the area from the Atachay to the Keshchay rivers, the topsoil is composed of 5-10 m thick alluvial-deluvial sediments. It should be noted that a layer of 5-7 m layer of the topsoil has been corroded.

The part of the area from the Keshchay to a temporary IDP settlement called Girmizi Bulag passes through the Keshchay anticline in the south-western part of the Beshbarmag height. Lithologically, this area is composed of interlayer clay, gravel sand and rock fragments.

Upper Cretaceous and Lower Cretaceous rocks are spread in the area where it passes through the Tekchay anticline. The Khizi syncline begins from here and stretches southwards. Cretaceous rocks are widespread in this area. Lithologically, these rocks are represented by a mixture of large rock fragments, gravel and river stones.

Modern Quaternary sediments of alluvial, deluvial, and proluvial origin are distributed in river valleys, slopes and plains where root rocks are exposed. Quaternary sediments of marine origin are represented here in the form of alternation of gravel and sandstone with clay. In general, Quaternary sediments along the route are represented by marine and continental facies.

8.3.3 Tectonics and Seismicity

According to the tectonic zoning of the Republic of Azerbaijan, the area covers two large structures: the Caucasus foothill frontal depression and the Greater Caucasus megaanticlinorium.

The project area intersects with the following tectonic structural elements from north to south: the Gusar-Davachi synclinorium, the Tengiz-Beshbarmag anticlinorium, the Shahdag-Khizi synclinorium, the Yashma synclinorium, the Kurkachidag anticlinorium, the Vagvar synclinorium, the Yunusdag anticlinorium, and the Shamakhi-Gobustan synclinorium.

An analysis of the map of strong earthquake epicenters of East Azerbaijan (Figures below) and the manifestation features of these earthquakes shows that no strong earthquakes have been recorded in the territory of Khizi District so far. In general, the main seismic threat to the territory of Khizi District may come from the epicenters of the Shamakhi and Caspian earthquakes.

Figure 8-2 Map of M≥5 Earthquakes Recorded on the Territory of Azerbaijan

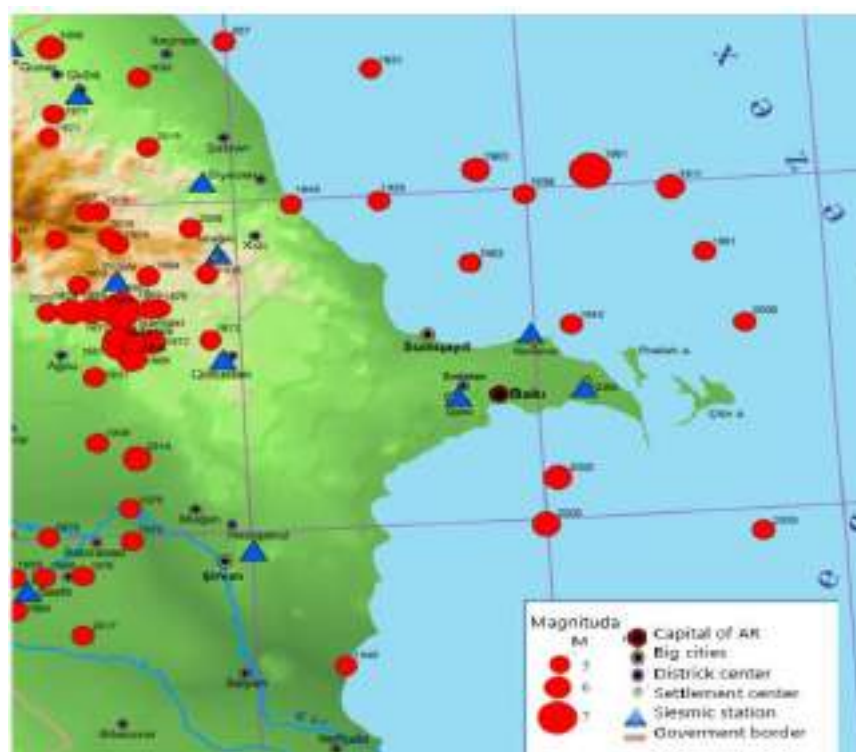
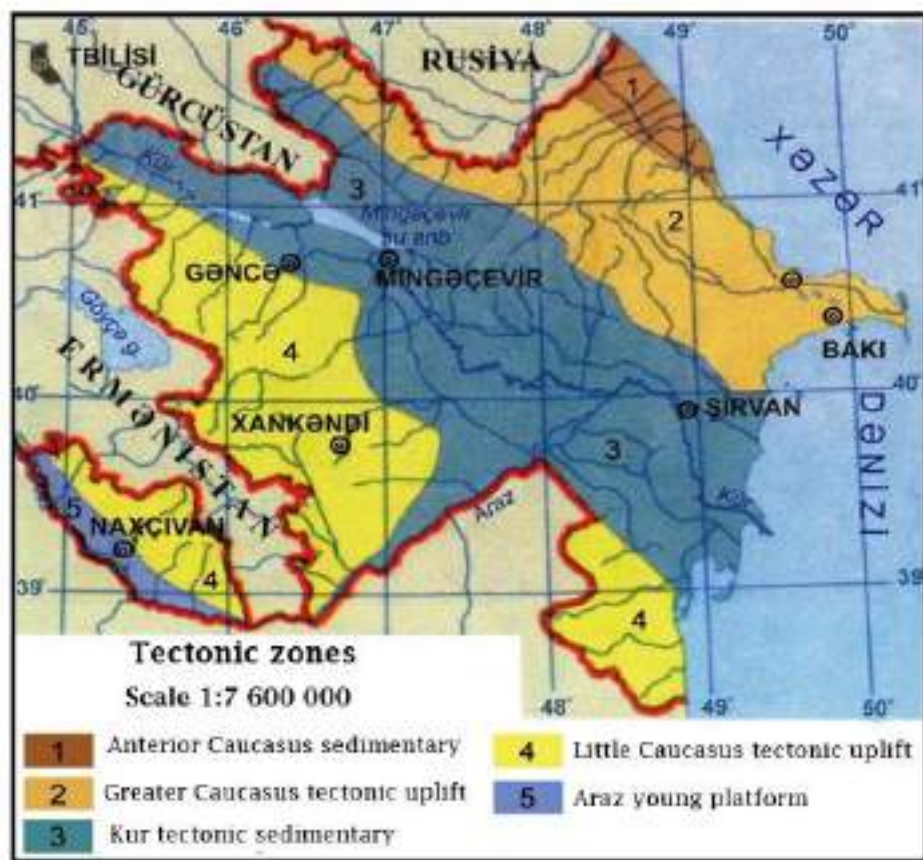


Figure 8-3 Tectonic Zones on the Territory of Azerbaijan



So far, a maximum of 6-point magnitude earthquake has been recorded in Khizi District on the MSK-64 scale. These seismic tremors were mainly caused by earthquakes in Shamakhi District. A strong ($M=6.2$) earthquake recorded in the Caspian Sea in 1963 was also felt in Khizi District with a magnitude of 6 points.

8.3.4 Geomorphology

Khizi District is included in the Davachi-Gilazi geomorphological region. This geomorphological unit is a lowland and foothill region consisting of low ridges, hilly strata and stepped (terraced) foothills of the southeastern end of the Greater Caucasus.

The ridges and depressions that make up large landforms of the terrain are small-scale morphological structures. Tectonic structures are well reflected in the terrain. The anticlinal ridges include Varafta, Beshbarmag, Gaynarcha and Shuduk, while syncline depressions include Keshchay, Tugchay and Rustov.

Tertiary and Cretaceous rocks (Jurassic Beshbarmag) are surfacing at the Gilazi cape and other areas. "Dubrar" limestone rocks stand out at the Beshbarmag ridge. Large pieces of these rocks are scattered on the slopes and foothills.

Arid-denudation forms of terrain and ravines are widespread in the part of the area southeast of Atachay.

The following physical and geological processes and manifestations are encountered in the project area: surface washing, ravine erosion, karsts, mudflows and mud volcanoes.

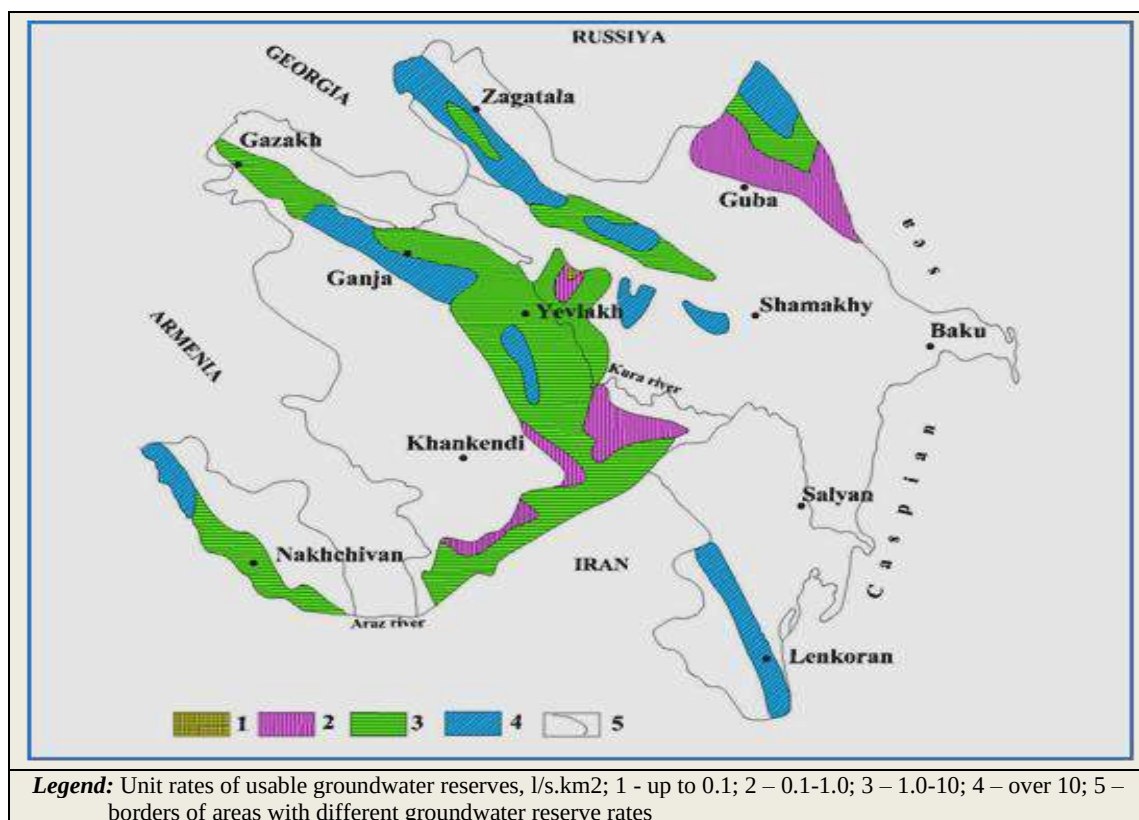
8.3.5 Orography and Terrain

One of the most specific characteristics of the Azerbaijan topography is the direct reflection of its large geotectonic structural features. The following basic orographic elements that simultaneously serve as its large morphostructural units are isolated in the Azerbaijan terrain. The main morphostructural units of Azerbaijan are the Gusar sloping plane and the Samur-Davachi lowland, the Greater Caucasus, the Lesser Caucasus, the Kur intermountain Depression (trough), the Garabagh volcanic upland, the near-Araz Ridges; the Middle Araz Depression, and the Talysh Mountains.

This is a detailed topographic map of the Caucasus region, showing Georgia, Armenia, Azerbaijan, and parts of the Russian Federation (Dagestan). The map uses color shading to represent elevation, with red indicating high altitudes and green indicating lower altitudes. Major cities like Baku, Yerevan, and Tbilisi are marked. The Caspian Sea is visible to the east.

- Coastal – an altitude of 200 m below sea level. It is characterized by a dry climate close to the dry steppe and semi-desert type;
- A foothill plain located between 200 and 1,000 m above sea level. The climate is temperate and the amount of precipitation varies from month to month throughout the year; and
- Mountainous – an area 1,000 m high and above. It has a moderate-cold climate.

Groundwater is very rare in Khizi District and this depends on the lithological composition of the surface.

Figure 8-5 Groundwater Map in Azerbaijan

In general, the territory of Khizi District has sparse groundwater distribution. This zone is characterized by unfavourable conditions for the use of groundwater.

8.3.7 Project Site Conditions

The proposed site is a greenfield site and based on the site visit carried out till date, there were no evidence of previous land uses within the project area. Potential sources or instances of soil pollution was also not observed.

In addition, the Project area has no infrastructure including roads, telecommunications equipment, drainage networks or other engineered structures, services, commerce or facilities.

GEOLOGY

Geotechnical site investigation was carried out by ARPA Consulting on behalf of ACWA Power (ARPA, 2021) in order to understand the geological and physical properties of the project site.

A total of six (6) observation points were drilled at the wind farm. Four of these observation points were located at the proposed wind turbine location and drilled to a depth of 50 m. Two were located at the substations and drilled to 25 m depth.

Based on the survey conducted, the degree of exposure of the different geological zones to exogenous geological process is moderate (0.1 – 0.25). Surface erosion (EN) processes, surface runoff and wind erosion are distinctive of elevation and slopes in all areas and are

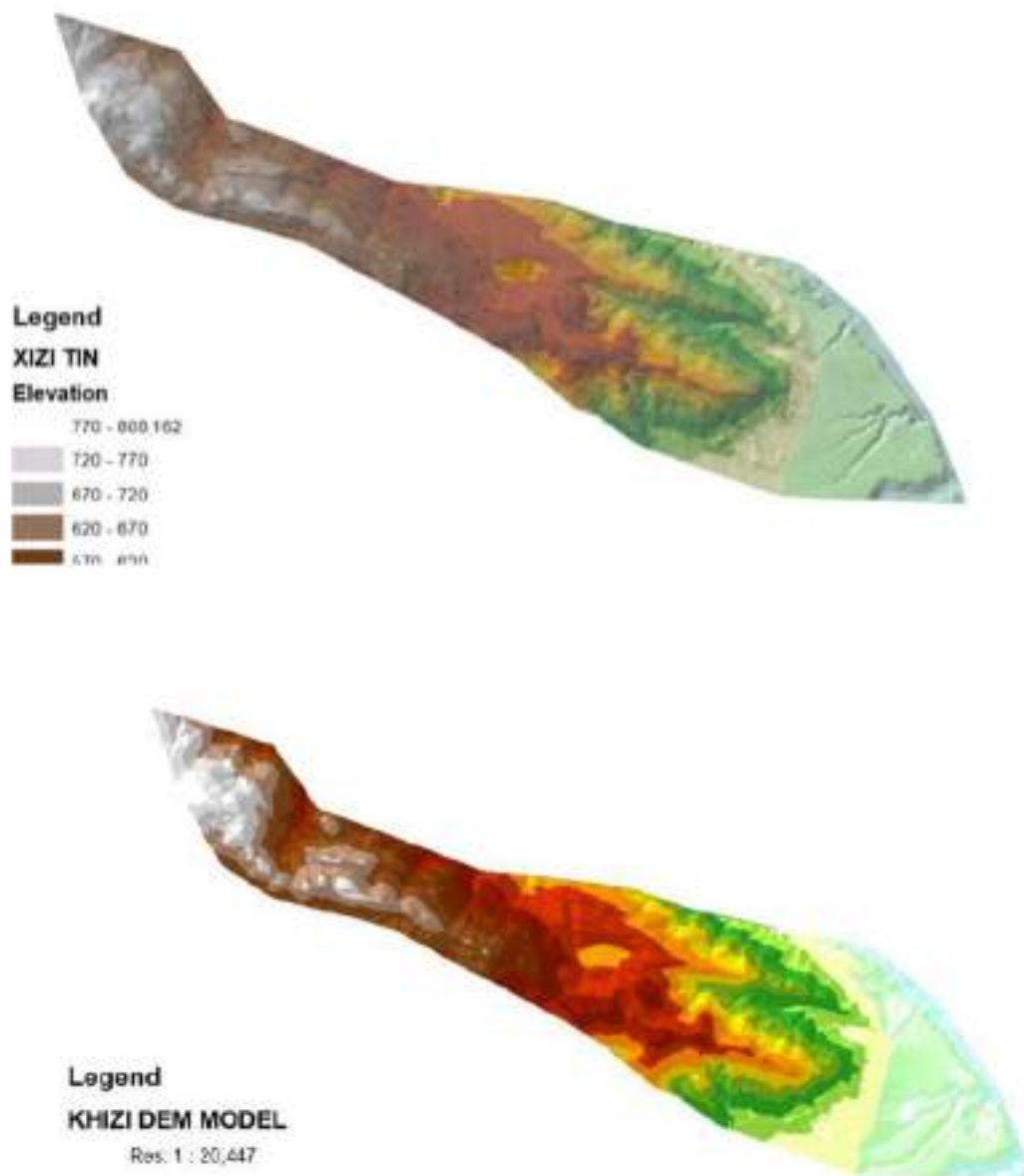
characteristic of the project site. These processes begin at the top of the plateau and proceed in the direction of the surrounding slopes, spreading more and more within the exogenous signs. The surface cracking (E0) caused by other processes can be traced to the erosion of the ravine, which is more common in areas with more slopes and ridges in the syncline zones.

In the outer cornices of the mountainous areas, the processes of erosion and collapses of the rocks (G) were observed

TOPOGRAPHY

According to the Topographical Survey undertaken by ARPA Consulting on behalf of ACWA Power (ARPA, 2021a), the elevation at the project site varies from approximately 630 to 808 m above sea level (asl). The TIN Model and Digital Elevation Model of the topography are presented below.

Figure 8-6 TIN & Digital Elevation Model of the Project Site (ARPA, 2021a)



GROUNDWATER

According to the geotechnical site investigation report, groundwater table was not observed at any level during drilling works at the Project site.

8.3.8 Soil Quality Analysis

WTG, BOP AND LAYDOWN – METHODOLOGY

Soil investigations were carried out as follows:

- **WF area:** A soil investigation was conducted on 19th October 2020 to identify existing soil quality conditions and characteristics at the Project area. During the survey, surface soil samples were collected from five (5) sampling locations as shown in the Figure below. These samples were taken from top 10cm from the surface and were analysed for a suite of physical, chemical, heavy metals and TPH parameters. Locations were selected by dividing the project site into 3 sections from West to East allowing 2 samples for each section. One of the samples is the controller sample. The controller sample is taken 500 m to NE from the Sample 5 and project site. It will be used as a benchmark for baseline analysis during the monitoring stage;
- **Laydown area:** Soil investigation was conducted on 19th May 2021 and 9th June 2021 at the proposed Laydown area. During the survey, surface soil samples were collected from three (3) sampling locations by a certified laboratory (Azecolab).

Four (4) soil samples were collected from each sampling location at a depth of 0.1 m (after scraping away the immediate surface layer). All samples were analysed for concentrations of a suite of physical, chemical, heavy metals and TPH parameters.

Figure 8-7 Location of Soil Samples – WTG and BOP Areas



Figure 8-8 Soil Sampling Locations - Laydown



Table 8-3 Soil Sampling Location - WTG, BOP and Laydown

ID	AREA	SAMPLING DATE	COORDINATES	
			EASTING	NORTHING
1	WF	19 th October 2020	366206	4505278
2	WF	19 th October 2020	363146	4505278
3	WF	19 th October 2020	360130	4507282
4	WF	19 th October 2020	357665.37	4508408.58
5	WF	19 th October 2020	355612.05	4509873.68
6	WF	19 th October 2020	355763	355763
Temp 1	Laydown	19 th May 2021	368619	4504103
Temp 2	Laydown	9 th June 2021	368295	4504424
Temp 3	Laydown	9 th June 2021	368746	4504446

Note: Temp 1, Temp 2 and Temp 3 refers to sampling point 1, 2 and 3 of the temporary laydown area respectively

Figure 8-9 Sampling at the Project Site- WTG, BOP and Laydown



Sample 1, Khizi



Sample 2, Khizi



Sample 3, Khizi





Sample 4, Khizi



Sample 5, Khizi



Sample 6, Khizi (controller)





Temp 1 - Laydown



Temp 2 - Laydown



Temp 3 - Laydown



WTG, BOP AND LAYDOWN – RESULTS

The average result of the soil laboratory analysis is presented in the table below and have been compared with Azerbaijan soil quality standards. Where national standards do not exist for some parameters, comparison have been made with Dutch Soil Quality Standards.

Table 8-4 Soil Analysis Result – WTG, BOP and Laydown

PARAMETERS	UNIT	LOD	AVERAGE RESULT									NATIONAL STANDARD	DUTCH STANDARDS (INTERVENTION VALUE)
			TEMP-1	TEMP-2	TEMP-3	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 4	SAMPLE 5	SAMPLE 6 (CONTROL SAMPLE)		
Bulk Density	g/cm3	-	1.47	1.12	1.17	1.23	1.15	1.16	1.4	1.2	1.37	-	-
Acid Soluble Chloride (Cl)	mg/kg DM	2.1	15300	27000	31800	705	11700	6800	1600	70300	7900	-	-
Acid Soluble Sulfate (SO4)	mg/kg DM	47	8310	48400	47700	23400	2000	22000	11700	22100	4100	-	-
Water Soluble Chloride (Cl)	mg/kg DM	2.1	40.4	49.4	22.5	202	25.3	95.6	55.2	144	38.8	-	-
Water Soluble Sulfate (SO4)	mg/kg DM	10	101	165	52.5	895	105	182	141	371	100	-	-
pH	pH unit	-	8.07	7.92	7.98	7.95	7.75	7.62	7.87	7.75	7.69	-	-
Total Organic	%dm	0.1	6.36	5.95	5.69	8.06	6.53	6.69	6.79	9.23	6.17	-	-
Carbonates	%dm	-	29.4	25.3	23.7	36.2	39.9	30.9	19.9	23.3	25.6	-	-
TOC (Organic carbon)	%dm	0.14	0.58	2.25	1.86	1.29	2.17	2.12	1.26	1.64	1.63	-	-
Total Sulfur (S)	mg/kg DM	20	1858	1382	1344	542	908	653	471	522	251	-	-

PARAMETERS	UNIT	LOD	AVERAGE RESULT									NATIONAL STANDARD	DUTCH STANDARDS (INTERVENTION VALUE)
			TEMP-1	TEMP-2	TEMP-3	SAMPLE 1	SAMPLE 2	SAMPLE 3	SAMPLE 4	SAMPLE 5	SAMPLE 6 (CONTROL SAMPLE)		
Total Phosphorus (P)	mg/kg DM	1.26	448	761	722	536	682	660	461	402	490	-	-
Potassium (K)	mg/kg DM	1.69	11938	12291	10734	10263	10385	8554	13415	11208	8782	-	-
Calcium (Ca)	mg/kg DM	0.54	89663	40868	35360	103160	105188	82496	38175	61223	58380	-	-
Lithium (Li)	mg/kg DM	0.10	34.8	29.9	31.4	33.8	27.3	27.5	60.1	47.2	34.5	-	-
Aluminium (Al)	mg/kg DM	0.63	44536	40594	36593	32550	38388	31439	55561	48101	31012	-	-
Iron (Fe)	mg/kg DM	0.10	32123	34027	35106	31263	28475	29290	40550	35001	35871	-	-
Cobalt (Co)	mg/kg DM	0.48	13.9	18.1	18.4	13.9	13.8	13.7	15.7	14.6	15.3	-	240
Nickel (Ni)	mg/kg DM	0.28	43.5	53.8	57.3	38.6	37.2	39.4	42.4	42.9	40.9	40	
Copper (Cu)	mg/kg DM	0.17	32.2	41.8	41.3	33.7	53.8	48.8	34.1	38.3	44.2	-	190
Zinc (Zn)	mg/kg DM	0.07	84.4	110	109	85.2	83.5	87.4	94.6	91.3	93.4	50	720
Arsenic (As)	mg/kg DM	0.83	6.5	9.77	9.59	5.69	6.46	6.91	6.81	5.75	5.82	20	55
TPH (C10-C40)	mg/kg DM	0.5	5.62	10	7.2	11.1	20.2	14.3	10.6	11.7	9.6	-	-
Note: Detection limits are being confirmed with the laboratory.													

The following summarises the results of the soil investigation:

- The pH of the soil ranges between 7.62 - 8.07 which means the area has a slightly alkaline pH;
- The concentrations of heavy metals were recorded below the established Dutch limit (intervention values). The intervention values indicate the levels above which a risk assessment is required;
- Zinc recorded concentrations above the national standards of 50 mg/kg respectively at all monitoring locations;
- Nickel concentrations exceeded national standards at six (6) locations, three (3) samples at the Laydown area and three (3) within the WF area including the control station;
- Traces of TPH (C10-C40) were detected in all samples.

Although zinc and nickel concentrations were recorded above the national standard, the concentrations are still well below the Dutch Intervention Values. In addition, as advised by the local sub-consultant and the analysis laboratory, the concentrations of Nickel and Zinc recorded were typical of Absheron peninsula soil background levels. As such, this is not considered likely to be as a result of anthropogenic or human influence.

The full sets of the soil analysis results from the laboratory as well as the laboratory certificate are presented in Appendix E.

OHTL – METHODOLOGY

Soil investigations were carried out along the OHTL as follows:

- Khizi – Yashma OHTL: A soil investigation was conducted on 28th June 2021 to identify existing soil quality conditions and characteristics at the Project OHTL areas. During the survey, surface soil samples were collected from one (1) sampling location as shown in the Figure below. These samples were taken from top 10 cm from the surface and were analysed for a suite of physical, chemical, heavy metals and TPH parameters.
- Khizi – Pirakashkul OHTL: A soil investigation was conducted on 29th June 2021 to identify existing soil quality conditions and characteristics at the Project OHTL areas. During the survey, surface soil samples were collected from two (2) sampling locations as shown in the Figure below. These samples were taken from top 10 cm from the surface and were analysed for a suite of physical, chemical, heavy metals and TPH parameters.

Four (4) soil samples were collected from each sampling location at a depth of 0.1 m (after scraping away the immediate surface layer). All samples were analysed for concentrations of a suite of physical, chemical, heavy metals and TPH parameters.

Figure 8-10 Location of Soil Samples – OHTL



Table 8-5 Soil Sampling Location – OHTL

ID	AREA	SAMPLING DATE	COORDINATES	
			EASTING	NORTHING
1	Khizi – Yashma OHTL	28 June 2021	49°29'1.23"	40°40'16.56"
2	Khizi – Pirakashkul OHTL	29 June 2021	49°29'41.26"	40°33'11.99"
3	Khizi – Pirakashkul OHTL	29 June 2021	49°29'31.81"	40°33'18.55"

Figure 8-11 Sampling at the Project Site – OHTL



Sample 1



Sample 2



Sample 3



OHTL AREAS - RESULTS

The average result of the soil laboratory analysis is presented in the table below and have been compared with Azerbaijan soil quality standards. Where national standards do not exist for some parameters, comparison have been made with Dutch Soil Quality Standards.

Table 8-6 Soil Analysis Result – OHTL

PARAMETERS	UNIT	LOD	AVERAGE RESULT			NATIONAL STANDARD	DUTCH STANDARDS (INTERVENTION VALUE)
			OHTL AREA				
			SAMPLE 1	SAMPLE 2	SAMPLE 3		
Bulk Density	g/cm3	-	1.41	1.55	1.16	-	-
Acid Soluble Chloride (Cl)	mg/kg DM	21	6,460	1,590	5,380	-	-
Acid Soluble Sulfate (SO ₄)	mg/kg DM	47	12,100	27,100	74,300	-	-
Water Soluble Chloride (Cl)	mg/kg DM	2.1	199	88.5	28.2	-	-
Water Soluble Sulfate (SO ₄)	mg/kg DM	10	401	460	2,400	-	-
pH	pH unit	-	7.66	7.79	7.66	-	-
Total Organic	%dm	-	7.74	3.71	4.81	-	-
Carbonates	%dm	-	37.0	42.3	29.0	-	-
TOC (Organic carbon)	%dm	0.14	0.86	0.43	0.75	-	-
Total Sulfur (S)	mg/kg DM	20	2,673	2,910	71,000	-	-
Total Phosphorus (P)	mg/kg DM	1.26	721	498	306	-	-
Potassium (K)	mg/kg DM	1.69	10,172	5,779	3,558	-	-
Calcium (Ca)	mg/kg DM	0.54	12,665	15,398	12,545	-	-
Lithium (Li)	mg/kg DM	0.10	35.2	18.2	10.3	-	-
Aluminium (Al)	mg/kg DM	0.63	31,827	16,839	8,509	-	-
Iron (Fe)	mg/kg DM	0.10	27,922	17,133	11,921	-	-
Cobalt (Co)	mg/kg DM	0.48	15.7	7.0	4.67	-	240
Nickel (Ni)	mg/kg DM	0.28	42.9	27.9	30.5	40	210
Copper (Cu)	mg/kg DM	0.17	38.6	13.4	10.2	-	190
Zinc (Zn)	mg/kg DM	0.07	89.4	52.4	42.0	50	720
Arsenic (As)	mg/kg DM	0.83	6.57	3.85	2.34	20	55
TPH (C10-C40)	mg/kg DM	0.5	12.3	3.0	2.05	-	

The following summarises the results of the soil investigation:

- The pH of the soil ranged between 7.66 – 7.88 which means the site has a slightly alkaline pH;
- The concentrations of heavy metals were recorded below the established Dutch limit (intervention values). The intervention values indicate the levels above which a risk assessment is required in order to evaluate whether the site should be cleaned-up and the level of urgency;
- The concentration of Zinc recorded was above the national standards of 50 mg/kg in Sample 1 and 2 but not Sample 3; and
- Nickel concentrations exceeded national standards at the Sample 1 location.

As stated in the soil quality analysis section for the WTG, BOP and laydown areas, the nickel and zinc values are well below Dutch Intervention Values and typical of Absheron peninsula soil background levels.

The full sets of the soil analysis results from the laboratory as well as the laboratory certificate are presented in Appendix E.

8.4 Sensitive Receptors

Table 8-7 Soils, Geology & Groundwater - Receptor Sensitivity

RECEPTOR	SENSITIVITY	JUSTIFICATION
Soil Quality	Low	The soil within the Project site and along the OHTL route is typical of the soil characteristics found in the project area. Hence, it is of low importance and rarity on a local scale.
Groundwater Quality	Low	Based on the regional and local site baseline data provided above, groundwater is sparse in Khizi Region and was not encountered during the geotechnical investigation. Therefore, it is also considered of low importance and rarity on a local scale.

8.5 Potential Impacts, Mitigation, Management & Residual Impact

8.5.1 Construction Phase

Construction activities such as site preparation, civil works, electrical and mechanical works both at the wind farm and along the OHTL corridor can lead to changes in the chemical and physical properties of the local soil as well as groundwater contamination thereby degrading soil and groundwater.

EXCAVATION OR REMOVAL OF SOILS

Excavation activities will be required at the Wind Farm and along the OHTL corridor in order to establish foundations for the wind turbines, building structures and foundation for transmission towers etc. Although such excavation/foundation works will likely be minor and will be limited to relatively small pieces of lands this may result in the interaction with the geology at the area 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 soil compaction activities to provide structural stability for the structures.

SPILLS AND LEAKS ASSOCIATED WITH CONSTRUCTION

Soil 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.

As the wind turbines & OHTL tower/pylons will likely require foundation works, soil quality can be susceptible to contamination from various construction sources, for example, storage and usage of fuels, chemicals and sanitary provision during the construction process. The risk of accidental spillage and leakage of various chemical products is 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.

Secondary impacts to groundwater quality as a result of surface/near surface activities are not expected, especially due to the limited number of hazardous materials that will be used during construction and due to the depth of the groundwater (not encountered during geotechnical survey), it is not expected that any contamination will reach groundwater.

Any risks to soil and groundwater will be managed through the implementation of the project CESMP and associated Management Plans and Procedures.

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 water from the batching plant and cement mixer trucks 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 increases. Potential environmental impacts arising from the generation of hazardous wastes are covered in the Solid Waste and Wastewater Management Chapter of this report.

Table 8-8 Soils, Geology and Groundwater Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction (WF and OHTL)

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
Cross-Contamination of soil during construction	Minor Negative	Soil Quality	Low	Negligible to Minor	- Training - Contractor staff to be able to identify signs of potential contamination (smell of hydrocarbons, staining). - Washing of equipment, machinery and vehicles will only be permitted in designated areas, with impermeable surfaces and dedicated drainage systems that lead to separate sumps or, treatment facilities and/or lined evaporation ponds. - Where concrete washout areas will be established onsite, these areas will be located away from storm drainage and water runoff areas and should 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.	Negligible to Minor
Pollution from Accidental Leaks or Spillage	Minor Negative	Soil Quality	Low	Negligible to Minor	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	Negligible to Minor
	Minor Negative	Groundwater Quality	Low	Negligible to Minor		Negligible to Minor

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
					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. • 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. • All spills and leaks will be reported promptly to the Construction Manager and to be investigated to 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 vehicles/equipment will be within a dedicated depot area at the site, on impermeable surface. • No vehicle or machinery maintenance or repair will be carried out outside the Project boundary. • Availability of suitable containment and spill clean-up materials/equipment at specific	

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
					locations within the project site (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. - The EPC Contractor will develop and implement a Hazardous Materials Control Plan. - The EPC Contractor will obtain relevant permits to store large quantities of hazardous materials such as diesel etc (where necessary) in accordance with Azerbaijan regulations.	
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.	Negligible to Minor
	Minor Negative	Groundwater Quality	Low	Negligible to Minor		Negligible to Minor

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
					- 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 should 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. - The concrete batching plant and the concrete washout area will include drainage directing any cement or concrete washout water towards a designated settling tank. - Concrete waste will be collected from the concrete washout area and stored in a designated construction/concrete waste storage area before transferring offsite. - Implementation of good housekeeping practices during construction activities including procedures and requirements for proper 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.	

8.5.2 Operational Phase

Specific project impacts to soil, geology and groundwater are not expected during the operational phase as the operational process of the wind farm and OHTL will not interact 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.

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. Although these materials may be 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.

OHTL

Specific project impacts to soil, groundwater and geology are not expected during the operational phase.

Table 8-9 Soils, Geology and Groundwater Impact Significance, Mitigation & Management Measures and Residual Impacts – Operation

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Impact Significance	Mitigation and Management Measures	Residual Impacts
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. - O&M Company to ensure 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 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.	Negligible

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Impact Significance	Mitigation and Management Measures	Residual Impacts
					• 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 should be applied. • The O&M will develop and implement a Hazardous Materials Control Plan. • O&M shall obtain relevant permits to transport and dispose any hazardous waste from operational processes.	

8.6 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 8-10 Monitoring Requirements (WF & OHTL)

Monitoring	Parameter	Frequency & Durations	Monitoring Location
Construction			
Soil Quality	Visible spills & leaks of hydrocarbons and other potentially hazardous or chemical pollution sources	Daily visual inspection	The entire Project area and along the access road during construction
Operation			
Soil Quality	Visible spills & leaks of hydrocarbons and other potentially hazardous or chemical pollution sources	On-going monitoring	The entire Project area during operation

9 DRAINAGE & WATER

9.1 Standards and Regulatory Requirements

9.1.1 National Requirements

- Water Code of Azerbaijan Republic of 1997 (approved by Law No. 418-IQ);
- Law of the Azerbaijan Republic on Water Supply and Wastewater No. 723-1Q, 1999;
- Presidential Decree regarding enactment of the Law of the Azerbaijan Republic on water economy of municipalities, 2001; and
- Law on water economy of municipalities, 2001.

9.1.2 Lenders Requirements

EBRD

In accordance with EBRD PR3 on Resource Efficiency and Pollution Prevention and Control, 'The environmental and social assessment process will identify opportunities and alternatives for resource efficiency relating to the project in accordance with GIP. In doing so, the client will adopt technically and financially feasible and cost-effective measures for minimising its consumption and improving efficiency in its use of energy, water and other resources and material inputs as well as for recovering and re-utilising waste materials in implementing the project.'

ADB AND EPFI's

Water Consumption

EPFIs will require compliance with IFC PS3 for Resource Efficiency and Pollution Prevention, which, *'recognizes that increased economic activity and urbanization often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels'*.

With specific regard to water consumption, PS3 requires that client (in addition to applying resource efficiency measures) *'shall adopt measures that avoid or reduce water usage so that the Project's water consumption does not have a significant adverse impact on others. These measures include, but are not limited to, the use of additional technically feasible water conservation measures within the client's operations, the use of alternative water supplies, water consumption offsets to reduce total demand for water resources to within the available supply, and evaluation of alternative project locations.'*

Water Quality

Section 3.1 of the World Bank Group General EHS Guidelines includes a section on water quality and availability, which indicates that Project activities involving wastewater discharges, water extraction, diversion or impoundment should prevent adverse impacts to the quality and availability of groundwater and surface water resources.

Concerning ambient water quality, there are no specific standards, and such quality indicators are based on national standards (if available), or other industry good practice standards.

9.2 Area of Influence

The area of influence includes the surface water bodies within the Project boundaries and those located downstream the Project site runoff areas.

9.3 Observation and Baseline Conditions

9.3.1 Site-based Observations and Desk Based Research

According to the Ministry of Ecology and Natural Resources of Azerbaijan, the Republic Azerbaijan sources of water include an estimated 8,350, 450, and 61 rivers, lakes, and reservoirs respectively. Azerbaijan has four major river basins (FAO, 2008):

- Kura and Araks Rivers, the largest basin in the country;
- Samur River Basin, located in the northeast of the country;
- Caspian Sea coastal river basins in the northeast, between the Samur and Kura River Basins; and
- Caspian Sea coastal river basins in the Lankaran region in the southeast, south of the Kura River Basin.

Based on data published by FAO on the Azerbaijan water profile (FAO, 2008), the internal renewable water resources amounted to about 8.12 km³/year in 2005. Annual surface runoff was estimated to be at 5.96 km³ and groundwater recharge at 6.51 km³, of which 4.35 km³ constitutes the base flow of the rivers. The surface water flow comes from Georgia, Republic of Iran and Armenia. The total renewable surface water resources (RSWR), including incoming and bordering flows, are therefore estimated at 32.52 km³ /year (FAO, 2008).

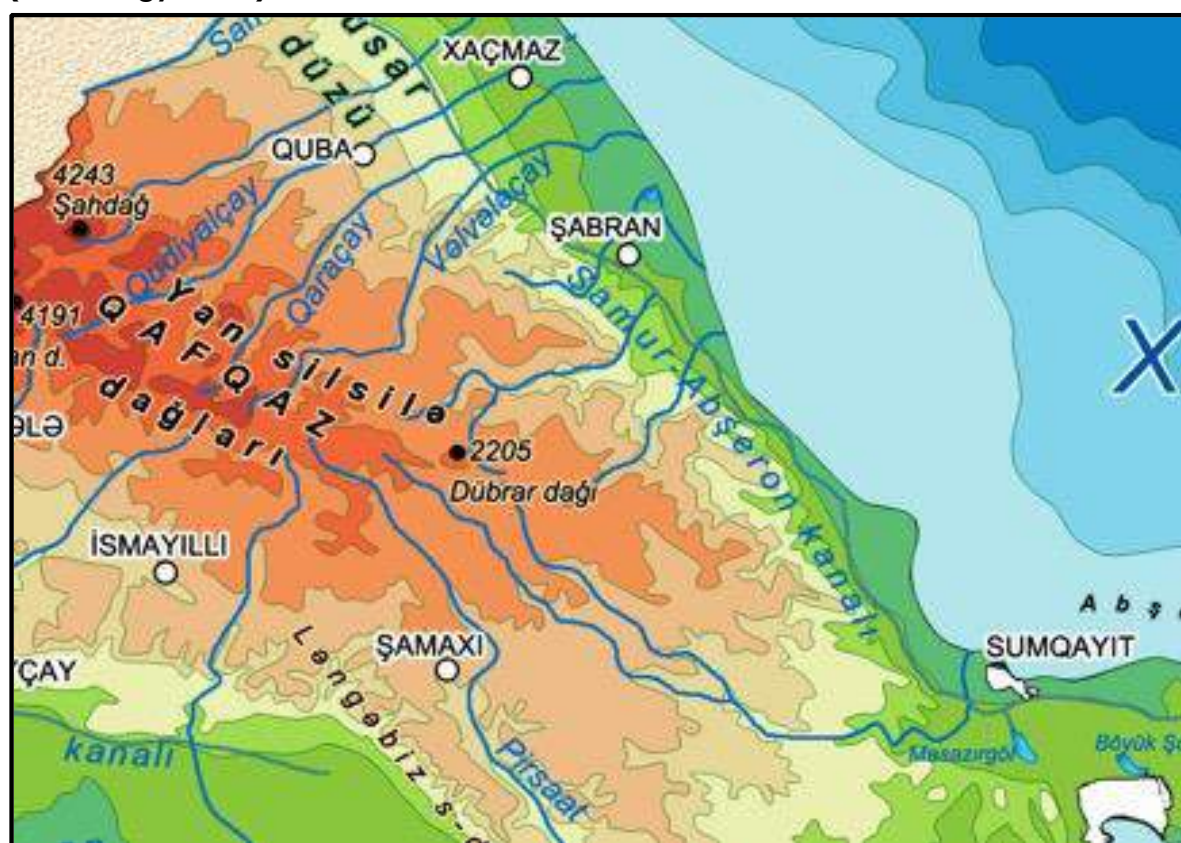
Water is mainly used for agricultural purposes (76.4%), industrial (19.3%) and municipal uses (4.2%).

Table 9-1 Water Use (FAQ, 2008)

Water use			
Water withdrawal			
Total water withdrawal	2005	12 211	10 ⁶ m ³ /yr
- irrigation + livestock	2005	9 330	10 ⁶ m ³ /yr
- municipalities	2005	521	10 ⁶ m ³ /yr
- industry	2005	2 360	10 ⁶ m ³ /yr
• per inhabitant	2005	1 452	m ³ /yr
Surface water and groundwater withdrawal	2005	12 211	10 ⁶ m ³ /yr
• as % of total actual renewable water resources	2005	35	%
Non-conventional sources of water			
Produced wastewater	2005	659	10 ⁶ m ³ /yr
Treated wastewater	2005	161	10 ⁶ m ³ /yr
Reused treated wastewater	2005	161	10 ⁶ m ³ /yr
Desalinated water produced		-	10 ⁶ m ³ /yr
Reused agricultural drainage water		-	10 ⁶ m ³ /yr

The Samur-Absheron canal, the Takhtakorpu-Jeyranbatan canal, the Tugchay river and the Vegverchay river are the most important components of the surface water networks of Khizi Region (Ecoenergy, 2021). The Tugchay river originates 1 km northwest of Garas village, is 38 km long and has a catchment area of 260 km². The river overflows only below Tazakend village where it comes onto the open plain with a varying floodplain of 20-30 to 50-100 m in the lower reaches of the river. The Vegverchay river originates south-east of Interistan mountain, is 23 km long, has a catchment area is 103 km², and has no flood plain (Ecoenergy, 2021).

Figure 9-1 Map Showing Water Bodies in Khizi Region and the Adjacent Territories (Ecoenergy, 2021)



Surface water in the Project area is very limited, with a water harvesting structure and a dry lake which only fills during rainfall events, and no permanent surface water features in the project site. The closest surface water is Takhtakorpu-Jeyranbatan water canal located approximately 2.2 km to the east (from closest WTG) of the project area. The surface water bodies identified within the Project and surrounding areas include (shown in figure below):

- Water spring located 500 m North East from WTG K5 (used by herders and livestock as potable water);
- A natural salty lake of 19.5 ha and feeds by rainwater shown in Figure below (ARPA Consult, 2021). During the March and April bird surveys the lake was dry;
- The Takhtakorpu-Jeyranbatan water canal, located to the east of the project ultimately runs to the Jeyranbatan Reservoir to the north west of Baku. The channel is an engineered open channel/canal that conveys rainwater from the mountainous regions of Azerbaijan. It is the main input of water to the reservoir that provides drinking water while other sections of the channel are used for irrigation.

Figure 9-2 Water Bodies

	
Samur-Absheron Water Channel (ARPA Consult, 2021)	Dried up Lake onsite
	
Water Spring	

Figure 9-3 Surface Water Bodies in the Project Area



9.3.2 Baseline

Water sampling was conducted to characterise and establish the natural baseline at the Project area. The survey was conducted on 21 October, 24 November 2020, and 9 February 2021 for the WF and surrounding areas and on 28 and 29 June 2021 for the OHTL areas. A summary of the surveys conducted and their results are provided in the following sections.

RAINFALL

The project site lies in a semi-desert and dry desert area. The climate is predominantly hot in summer and cold in winter. In summer, the soil temperature reaches 47-48 °C. In winter, the depth of soil freezing does not exceed 0.4 m. The annual precipitation is characterized by dry summers and relatively rainy autumns (37% of annual precipitation). According to the observations of the Gizil Burun (Siyazan) meteorological station, the average amount of precipitation is 308 mm of rainfall every year.

METHODOLOGY

Water samples were taken from three (3) locations within the WF and BOP area and the surrounding area and two (2) location along the OHTL to obtain data. Four (4) water samples were collected from each sampling location and the water samples were stored in appropriate containers and sent to an accredited laboratory for analysis. The table below provides details on the parameters tested and the sampling methods and equipment.

Table 9-2 Water Quality Analysis Equipment and Methods

PARAMETERS	EQUIPMENT	METHOD	DETECTION LIMIT
pH	EcoSense or analogical pH meter	ASTM D1293	-
Conductivity	I98188 HANNA or analogical conductivity meter	EPA 120.1	1.4 uS/cm
Dissolved Oxygen (DO)	DO meter	ASTM D888	0.05 mg/L
Turbidity	Photoelectric Nephelometer	EPA 180.1	0.07 NTU
Total Suspended Solids (TSS)	Filtration and Gravimetry	EPA160.2	2 mg/L
Oil and Grease (HEM)	Gravimetric	EPA 1664B	1.5 mg/L
Arsenic (As)	Inductively Coupled Plasma - Mass Spectrometry (ICP-MS)	EPA6020B	0.02 ug/L
Aluminum (Al)	ICP-MS	EPA6020B	0.11 ug/L
Cadmium (Cd)	ICP-MS	EPA6020B	0.01 ug/L
Copper (Cu)	ICP-MS	EPA6020B	0.11 ug/L
Chromium (Cr)	ICP-MS	EPA6020B	0.02 ug/L
Lead (Pb)	ICP-MS	EPA6020B	0.01 ug/L
Mercury (Hg)	Cold Vapor Atomic Absorption Spectrometry (CVAAS)	EPA245.1	0.05 ug/L

PARAMETERS	EQUIPMENT	METHOD	DETECTION LIMIT
Nickel (Ni)	ICP-MS	EPA6020B	0.02 ug/L
Zinc (Zn)	ICP-MS	EPA6020B	0.02 ug/L
E-Coli	Plate counts	IDEXX COLILERT	1MPN/100mL

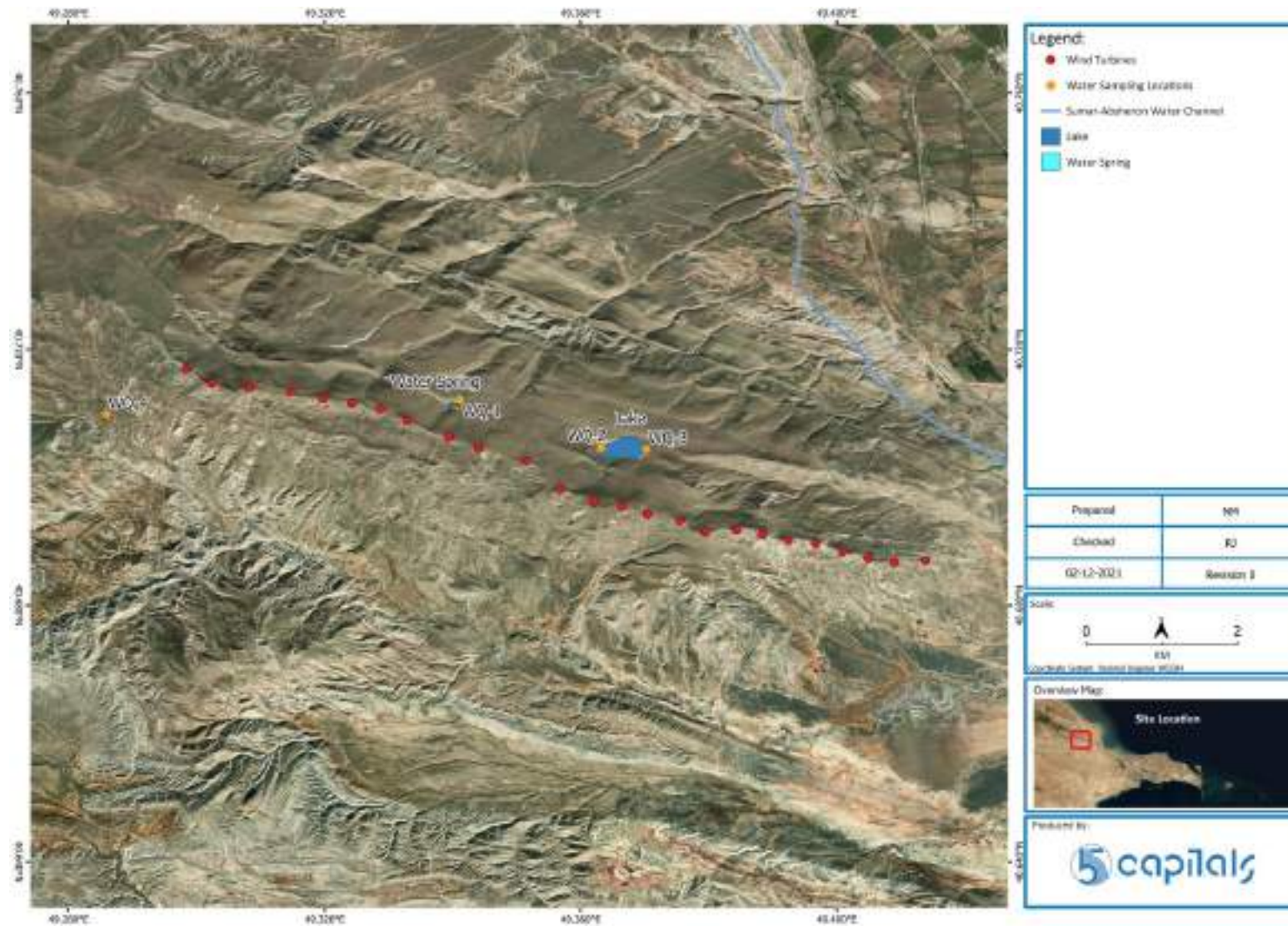
WF AND SURROUNDINGS AREAS – WATER QUALITY SURVEY

The table and figure below provide details on sampling locations selected within and around the WF and Surroundings Areas.

Table 9-3 Location of Water Quality Sampling Sites – WF and Surroundings Areas

SAMPLE LOCATION	SAMPLE ID	SAMPLE DATE	COORDINATES	LOCATION	SAMPLE COLLECTION
1	WQ-01	21 October 2020	40°42'41.66"N 49°20'22.95"E	Water harvesting structure located 500 m North East from X12-WTG	
2	WQ-02 & WQ-03 (2 samples)	24 November 2020	40°42'16.29"N 49°21'53.15"E	Lake within the site	
3	WQ-04	09 February 2021	40°42'14.21"N 49°22'11.10"E	Pond (fills after events of rain)	

Figure 9-4 Location of Water Quality Sampling Sites – WF and Surroundings Areas



WF AND SURROUNDINGS AREAS – WATER QUALITY SURVEY RESULTS

The results below establish the water baseline for the water features within project area. The table below summarises the results of the laboratory analysis.

Table 9-4 Water Quality Analysis Results – WF and Surroundings Areas

Parameter	Unit	WQ-01	WQ-02	WQ-03	WQ-04	National Standards for Potable Water Quality
pH		7.81	8.16	8.19	8.45	6-9
Conductivity	uS/cm	1621	42,330	46,550	874	
Dissolved Oxygen (DO)	mg/L	6.76	6.19	6.2	7.16	
Turbidity	NTU	27.3	276	12.3	35.5	1.5 mg/l
Total Suspended Solids (TSS)	mg/L	18	202	63.8	122	
Oil and Grease (HEM)	mg/L	<1.5	<1.5	<1.5	2.2	
Arsenic (As)	ug/L	0.137	4.19	3.36	2.33	
Aluminum (Al)	ug/L	31.4	14.1	8.98	189	
Cadmium (Cd)	ug/L	<0.01	0.385	0.335	<0.01	
Copper (Cu)	ug/L	1.14	12.4	9.79	13.6	
Chromium (Cr)	ug/L	0.122	0.391	0.241	0.316	
Lead (Pb)	ug/L	0.015	3.2	2.16	0.122	
Mercury (Hg)	ug/L	<0.05	<0.05	<0.05	<0.05	
Nickel (Ni)	ug/L	0.358	3.69	3.86	5.32	
Zinc (Zn)	ug/L	0.839	0.513	0.653	4.13	
E-Coli	MPN/100 ml	770	<1	<1	<1	

Water surface features within project area were sampled to characterise the natural baseline.

All water samples collected were tested for the bacterium E. coli. All samples had < 1 indicating that the bacterium was not detected or absent from these samples, with the exception of sample WQ-01. This water source is used as potable water by seasonal herders and their livestock. Cadmium concentrations were detected only from a water sampled taken from the lake. Turbidity levels recorded levels higher than the national potable water standards.

OHTL – WATER QUALITY SURVEY

Surface water investigations were carried out from ponds along the OHTL as follows:

- Khizi – Yashma OHTL. A surface water investigation was conducted on 28th June 2021 to identify existing water quality conditions and characteristics at the OHTL area. During the survey, water samples were collected from one (1) sampling location as shown in the Figure below.
- Khizi – Pirakashkul OHTL: A surface water investigation was conducted on 28th June 2021 to identify existing water quality conditions and characteristics at the OHTL area. During the survey, water samples were collected from one (1) sampling location as shown in the Figure below.

The table and figure below provide details on sampling locations selected along the OHTL.

Table 9-5 Location of Water Quality Sampling Sites – OHTL

SAMPLE SITE	SAMPLE DATE	COORDINATES	LOCATION	SAMPLE COLLECTION
WQ-01	28 June 2021	40°40'49.52"N 49°28'17.38"E	Pond - located Khizi – Yashma OHTL	
WQ-02	28 June 2021	40°38'53.66"N 49°27'52.05"E	Pond - located Khizi – Pirakashkul OHTL	

Figure 9-5 Location of Water Quality Sampling Sites – OHTL



OHTL – WATER QUALITY SURVEY RESULTS

The results below establish the water baseline for the water features along the OHTL. The table below summarises the results of the laboratory analysis.

Table 9-6 Water Quality Analysis Results – OHTL

Parameter	Unit	WQ-01	WQ-02	National Standards for Potable Water Quality
pH		7.01	8.98	6-9
Conductivity	uS/cm	308	341	
Dissolved Oxygen (DO)	mg/L	6.56	7.84	
Turbidity	NTU	52.7	378	1.5 mg/l
Total Suspended Solids (TSS)	mg/L	20.6	32.8	
Oil and Grease (HEM)	mg/L	<1.5	21.3	
Arsenic (As)	ug/L	0.326	5.94	
Aluminum (Al)	ug/L	15.1	15.7	
Cadmium (Cd)	ug/L	<0.01	<0.01	
Copper (Cu)	ug/L	0.531	2.12	
Chromium (Cr)	ug/L	0.078	0.087	
Lead (Pb)	ug/L	0.135	0.686	
Mercury (Hg)	ug/L	<0.05	0.09	
Nickel (Ni)	ug/L	0.299	3.97	
Zinc (Zn)	ug/L	<0.02	2.0	
E-Coli	MPN/100 ml	17	71	

The bacterium *E. coli* were detected in both samples. The water source is used as potable water by seasonal herders and their livestock. Turbidity levels were also higher than the national potable water standards.

9.3.3 Hydrology Study

According to the hydrology study conducted for Khizi 3 by ARPA Consulting in June 2021, the Project site is part of the Absheron-Gobustan hydrological region, characterized by small seasonal streams in the watershed of small catchments as shown in Figures below.

The region is characterized by a low drainage density of 0.86 km/km² with main flow between March and April and from October till November. This along with high relative humidity and the presence of sparse vegetation, ravines and balkas in the area result in seasonal short-term floods. The Project site includes six catchments with the basins of the streams being partially or fully within the Project area. The largest river is the Vegverchai, covering the Southern part of the Project site. Rainwater comprises 90-95% of the stream that dries up most of the year, particularly downstream. The slopes of the Vegverchai river valley are surrounded by small hills sharply divided by gully, and even though the river has small and temporary flows, floods occurring during winter expand the river basin; the riverbed is shown in Figure (ARPA Consulting, 2021).

Figure 9-6 Local Catchments in the Khizi Plot Site (ARPA Consulting, 2021)

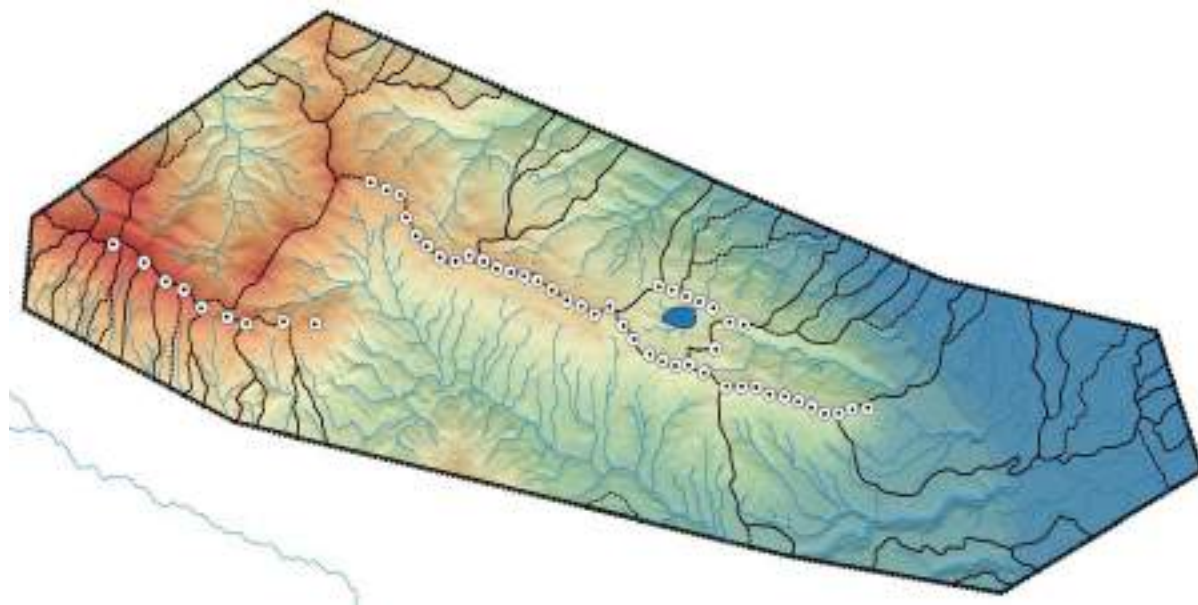


Figure 9-7 Watershed in the Khizi Plot Site (ARPA Consulting, 2021)



Figure 9-8 Riverbed of the Vegverchai in the South Part of the Plot Site (ARPA Consulting, 2021)



Flood and stream discharges of the six river streams in the Project area are shown in the Table below. The flood discharge of the largest basin the Vegverchai is 14.07 m³/s (ARPA Consulting, 2021).

Table 9-7 Catchment Basins and Calculated Average and Flood Discharges (ARPA Consulting, 2021)

STREAM	AREA (KM ²)	FLOW VOLUME (M ³ /DAY)	AVERAGE DISCHARGE (M ³ /s)	FLOOD DISCHARGE (M ³ /s)
Veqverchai River	70.35	15,550	0.18	14.07
Khizilchai River	39.2	8,467	0.089	7.84
Gadiksu River	15.1	3,283	0.038	3.02
Unnamed	7.9	1,728	0.020	1.58
Shordara River	5.01	1,123	0.013	1.02
Kenda River	4.9	1,037	0.012	0.98

In general, the entire region has unstable flow patterns with dry riverbeds in summer and seasonal streams in spring and autumn with local floods.

9.4 Flood Risk

The area is prone to floods according to the Hydrological study prepared for Khizi by ARPA Consulting (2021). The statistical analysis of the rainfall data for 1, 5, 10, 20, 50 and 100-year return period, the analysis of the streams flow pattern and peak discharges, and the rainfall-runoff models of designed long-term and short-term hyetographs (shown below) indicated no flood threat to the wind turbine locations due to the elevation differences between the turbine locations and riverbeds. However, the flood risk assessment indicated risks to the locations of the roads and access routes for the designed turbine locations K44, K6, K14, K16, K28 and K33.

Figure 9-9 Flood Extent and Depth of the Long-Term Rainstorm Event in the Khizi Plot Area (ARPA Consulting, 2021)

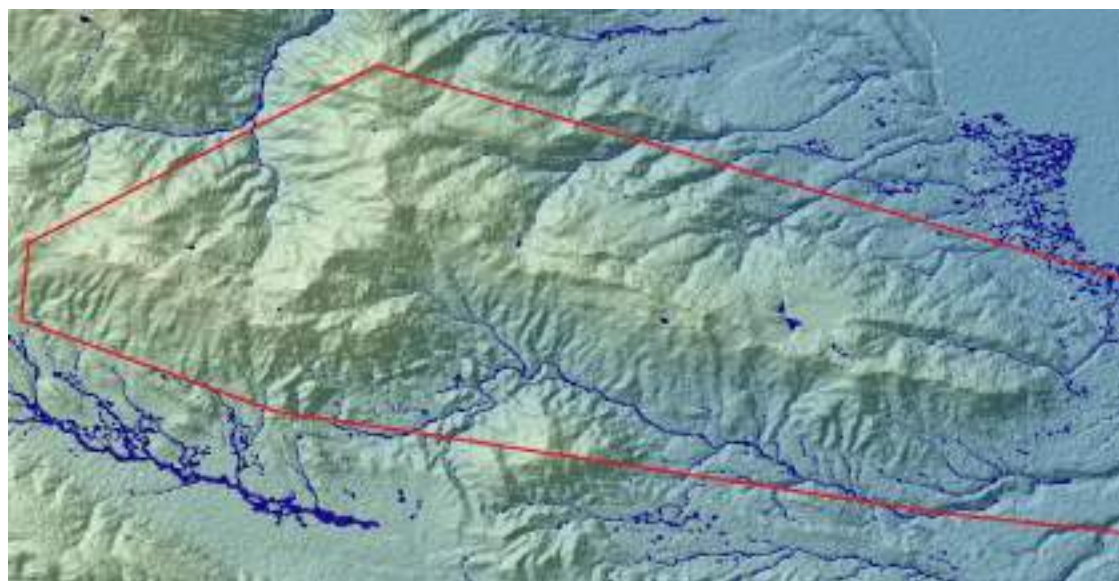
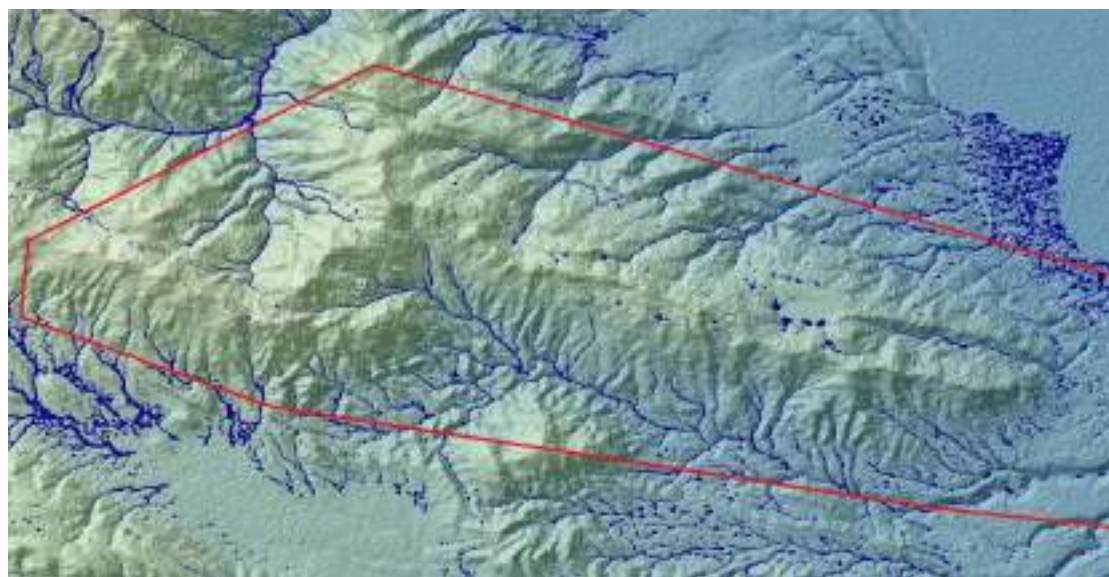


Figure 9-10 Flood Extent and Depth of the Short-Term Rainstorm Event in the Khizi Plot Area (ARPA Consulting, 2021)



9.5 Sensitive Receptors

The identified receptors relating to water and drainage in the Project area are provided in the table below.

Table 9-8 Water and Drainage Receptors

RECEPTOR	RECEPTOR SENSITIVITY	JUSTIFICATION
Samur-Absheron water channel and its users	Medium	The open water channel is located 2.5 km east of the Project and conveys rainwater from the mountainous regions of Azerbaijan, ultimately running to the Jeyranbatan Reservoir to the north west of Baku. Water from the channel is used for drinking and irrigation. Water quantity, quality, lands irrigated and crops, as well as the public health in general may be impacted during construction works.
Runoff areas, lakes and water collection points and ponds external to the Project site	Medium	The runoff areas and any lakes and water collection points and ponds external to the Project site are important for the vegetation in the area as well as the herds and other fauna who use them as a key source of water. The contamination of those water sources can impact vegetation in the area and the health of those animals.
Onsite lake and water collection points and ponds and their users	Low	The lake and water collection points and ponds in the Project site, along access roads, and the OHTL pathway are expected to be used by herds and other fauna in the area as a key source of water. Those may be impacted during construction works.
Water resources	Medium	The potential water use quantities and source during the construction phase are not determined at this stage. The Project demand for water can potentially create a shortage for local communities or an increase in the price of water in the absence of proper management.
Nearby Communities and Infrastructure	Medium	Construction activities can potentially divert water flows away from vegetated areas or result in flooding of downstream runoff areas.

9.6 Potential Impacts, Mitigation, Management & Residual Impact

9.6.1 Construction Phase

During construction, the water environment has the potential to be impacted directly and indirectly by the construction activities. The impacts are anticipated to be temporary and limited to the construction phase and extend to the Project area and runoff areas.

Contamination of Surface Water

During construction, the mismanagement and storage of fuel, chemicals, excavated materials as well as waste and wastewater could introduce the risk of:

- Construction activities for the WF and OHTL will include the transportation of workers, materials and equipment to the site for the installation of the WTGs and OHTL. Some chemicals will be transported to and around the construction areas. Contamination of surface water features could result from the accidental release of oil or fuel from construction vehicles or from spillage of chemicals. Contamination of the lake and water collection points and ponds in the Project site, along access roads, and the OHTL pathway. Those water sources are used by the herds and other fauna as a key source of water. These impacts are adverse in nature but are usually confined to a very limited area. Therefore, the likelihood of a significant spill affecting other than a confined area is considered low and magnitude is minor.
- Contamination of runoff areas and therefore, any lakes and water collection points and ponds external to the Project site and potentially leading to the contamination of the Samur-Absheron water channel during a significant rain event, where a pathway for runoff is directed to these areas. Instances of pollution could result from the wash off of surface pollutants, particularly during the first flush of rainfall. The channel is a valuable water resource to local communities who use it for drinking and irrigation purposes. Water quality may be impacted during construction works which can eventually impact the quality of crops irrigated by it as well as the public health of community members drinking it. The other water sources are important for the vegetation in the area as well as the herds and other fauna who use them as a key source of water, therefore, the contamination of those sources can impact vegetation in the area and the health of those animals.

CONSUMPTION OF WATER

The key uses of water during the construction and commissioning phases are expected to be for personal consumption, domestic use, dust control, batching plant, civil works and commissioning. The main sources of water include water supply from the State Water Agency (Sumgait City Water and canal Department of "Azersu" JSC) and will be supplied to site through tankers.

The estimated water demand for is provided below for the WF.

1. Water Requirement for Wind farm Construction at site (assuming batching plant will be located near the site) (water demand below is for Khizi 3 and Area 1 WFs)

Wind Farm Area

- 37 WTG foundations = 27,750 m³ concrete = 4,165 m³
- Other concrete infrastructure = 3,000 m³ concrete = 900 m³

Substation Area

- Substation base = 2,200 m³ concrete = 660 m³
- Compound area, storage area & water for masonry and plaster = 159 m³

Other Activities

- Waste/washdown/dust suppression/welfare facilities = 1,000 m³
- Allowance for fire protection = 500 m³

The total volume required for the construction works of both WFs is approximately 7,384 m³.

For a construction period of 18 months, the average water requirement per day is estimated to be 13.48 m³. Daily requirement, however, will vary with the volume of concreting to be carried out per day.

2. Water requirement for workers at site (for Khizi 3 WF)

The total potable water requirement for the construction period (18 months) is **397.54 m³** (accounts for 10% contingency).

3. Water requirement for accommodation camp (for Khizi 3 WF)

Based on IFC EBRD Guidance on Workers' Accommodation, 80 to 180 litres per person per day will be available (based on weather conditions). The maximum number of workforce is expected to be 220 workers and assuming an average of 130 l (benchmarked against estimated number for similar WF projects in the Region), the Project would require 28,600 l/day to cover the needs of the workforce (or 28.6 m³/day). For a construction period of 18 months,

the total water demand is approximately 15,650 m³. However, this water will be supplied through the existing municipal or state water network at Sumgait or Baku cities.

Therefore, the total water demand for the project required for the construction site (workers on site and WF construction) is approximately 7,782 m³ water demand for construction of WTG foundations etc is calculated for both projects), which is considered very minimal in comparison to the overall water consumption for Azerbaijan (9,693 million m³ for 2020) (STAT, 2022).

Based on the socio-economic survey, the main source of water in the village is supplied through the municipal water network to which the majority of households are connected and supplied by water for both drinking and domestic use. The water infrastructure was reported to be in bad conditions and water shortage is experienced during summer months and dry seasons. Some villagers also rely on water supplied by Samur-Abshehon water channel.

Given the status of the water supply in the area, the sensitivity is considered Medium, that is water supply is already impacted and further impacts may increase the stress or shortage with a magnitude of Minor (water demand for project site is considered minimal). Therefore, the unmitigated impact is assessed as Minor.

In addition to the above, traffic and nuisance impacts could occur from trucking in potable water from the water source to site. Mitigation measures for the combustion and noise impacts related to this activity are provided in Chapters 5 and 6 in this ESIA.

CHANGE IN NATURAL FLOW OF SURFACE WATER

The construction phase of the proposed Project will result in grading for levelling, foundations, excavations for below ground infrastructures, trenching and backfilling for cables, roads etc. This will result in changes in the direction or the natural flow of surface water from the site and associated facilities which can potentially divert water flows away from vegetated areas or result in flooding resulting in direct impact upon nearby communities and lands. To determine receptors during construction, EPC to undertake a review of the downstream receptors in relation to the Hydrology Report and update as necessary to prevent flooding. In addition, EPC will provide an Erosion and Sediment Control Plan to establish the management control to prevent sediment runoff and flooding prior to clearance of site.

Table 9-9 Drainage and Water Impact Significance, Mitigation & Management Measures and Residual Impacts- Construction

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Contamination from Accidental Leaks & Spills	Minor Negative	Samur-Absheron water channel and its users	Medium	Minor	- Implementation of CESMP, and Emergency Preparedness and Response Plan. - Disposal of excavated materials into the water bodies will be strictly prohibited. - Provisions for the containment of the first flush of storm water will be considered to ensure that the initial runoff from rainfall events does not lead to contamination of the receiving water bodies.	Negligible to Minor
	Minor Negative	Runoff areas, lakes and water collection points and ponds external to the Project site and their users	Medium	Minor	No storage of hazardous chemicals, materials, excavated soil, oils or fuels or waste within 100 m of surface water (e.g. unprotected storm water drains/channels).	
	Minor Negative	Lake and water collection points and ponds within the Project site and their users	Low	Negligible to Minor	- 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 maximum volume stored. - Store all chemicals/materials according to manufacturer's instructions and MSDS. - All machines using oils will have drip trays underneath to capture any oil leaks or drips. - Washing equipment, machinery and vehicles will only be permitted in designated areas, with impermeable surfaces and dedicated drainage systems that lead to separate lined evaporation ponds. - EPC Contractor will develop and maintain an Emergency Response Plan (ERP) and Spill Response and Contingency.	

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					• Maintain an inventory of all potentially hazardous materials and chemicals used and stored on-site. • All spills and leaks will be reported promptly to the HSE Manager and Project Company to be investigated to confirm the cause and put in place appropriate corrective/preventative actions. • Refueling and maintenance of vehicles/equipment (if any) should be within a dedicated area on an impermeable surface. • Availability of suitable containment and spill clean-up materials/equipment at specific locations within the project site (e.g. where refueling is to take place). • Relevant personnel will 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 will be maintained and routinely inspected to ensure the tank, pumps, pipe work and vehicle itself are free from any 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.	

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					- Waste will be stored in dedicated areas and bins that are covered all the time. Waste bins should be emptied regularly to avoid overfilling. - Implement good housekeeping practices and avoid littering at all times. - Regularly inspect the wastewater collection tanks to prevent leakages or overflowing. - No wastewater will be discharged into the surface water bodies in the Project site or its vicinity. - The EPC Contractor will have a grievance mechanism in place that will allow water users to lodge their complaints to concerns regarding any water issues related to the Project. - Any grievances will be addressed in accordance to the SEP and corrective action taken immediately.	
Consumption of water	Minor	Local communities	Medium	Minor	- A Water Management Plan will be implemented to include the following: - Installing smart water management systems (faucets with sensors, water meters, leakage detection systems etc.); - Monitoring water consumption; - Conducting regular maintenance of faucets, plumbing, water tanks etc.; and - Raising awareness on water conservation among workers.	Negligible to Minor

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					- Where the water is sourced from through tankers, the EPC Contractor will engage licensed suppliers and obtain relevant permits. - Where water is sourced from the same water supply system that surrounding communities use, the EPC Contractor will undertake assessment to ensure that the projects water demand does not create a shortage to local communities or drive up the price of water. - The Project workers will be trained on ways to minimise water consumption and to ensure they have an understanding of water resources and wastewater issues. - The EPC Contractor will have a grievance mechanism in place that will allow villagers to lodge their complaints or concerns regarding any water issues related to the Project. Any grievances will be addressed in accordance to the SEP and corrective action taken immediately. - Water storage tanks, pipes, taps etc. will be inspected for leakage and repaired immediately once identified.	

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Change in natural flow of surface water	Minor Negative	Nearby Communities and Infrastructure	Medium	Minor	- To determine receptors during construction, EPC to undertake a review of the downstream receptors in relation to the Hydrology Report and update as necessary to prevent flooding. In addition, EPC to provide an Erosion and Sediment Control Plan to establish the management control to prevent sediment runoff and flooding prior to clearance of site. - The drainage pathways created during construction should take into consideration the existing natural flow of surface water and maintain the existing discharge areas to the surrounding plots to the extent possible to limit reducing water resources at runoff areas. - A robust grievance redress mechanism should be implemented to ensure the concerns of the local community, surrounding landowners and herders are considered and addressed. - Site clearance will be limited to the Project footprint in order to minimise unnecessary stripping of vegetation and reduce erosion.	Negligible to Minor

9.6.2 Operation Phase

Limited impacts are expected from the management and storage of hazardous materials, wastes, and wastewater during operation. However, improper stormwater management can result in significant negative impacts.

ACCIDENTAL LEAKS AND SPILLAGE ASSOCIATED WITH OPERATION

There are limited potential sources of contamination to surface water during the operation phase, however, impacts may result from accidental spills and leaks.

A relatively small volume of hazardous materials may be present in dedicated storage areas. The management, handling, transportation and use of these materials can introduce risks associated with accidental spills and leaks and impacts to water quality, with potential indirect impacts to herds, vegetation and the local community. However, such instances are considered unlikely as all such chemicals and lubricants will be stored inside structures and buildings with impermeable base and where appropriate with secondary containment. This will ensure that any leaks or spills will be fully contained, resulting in a negligible likelihood of impact to water resources.

Inadequate temporary storage and handling of sanitary wastewater prior to being removed for disposal, could also pose a contamination risk, specifically where septic tanks overflow or are not adequately contained.

WATER RUNOFF AND FLOOD RISK

The improper stormwater management, changes in the direction or the natural flow of surface water from the site and its associated facilities, and the increased areas of impermeable surfacing within the Project site can potentially divert water flows away from vegetated areas and herds drinking water source or result in an increase in runoff rates and flooding, thus directly impacting nearby communities and lands.

As stated above, the analysis of long-term and short-term hyetographs indicated no flood threat to the wind turbine locations due to the elevation differences between the turbine locations and riverbeds. However, the flood risk assessment indicated risks to the locations of the roads and access routes for the designed turbine locations K44, K6, K14, K16, K28 and K33.

Table 9-10 Water and Drainage Impact Significance, Mitigation & Management Measures and Residual Impacts -Operation

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Contamination of surface water	Negligible	Surface water quality	Low	Minor to Negligible	• Appropriate training of staff in regard to the handling and response to spill/leak events. • Availability of complete spill kits in place. • Availability of MSDS on-site for any chemicals in use. • O&M Company to ensure that sanitation facilities have effective leak tight plumbing systems and temporary wastewater storages. • Waste should be stored in dedicated areas and bins that are covered all the time. Waste bins should be emptied regularly to avoid overfilling. • Implement good housekeeping practices and avoid littering at all times. • Implement a grievance mechanism that will allow community members and herders to lodge their complaints to concerns regarding any water issues related to the Project. • Any grievances will be addressed in accordance to the SEP and corrective action taken immediately.	Negligible
Water Runoff and Flood Risk	Minor Negative	Project Infrastructure	Medium	Minor	• Adhere to the recommendations of the hydrology study prepared by ARPA Consult in 2021 with respect to road access arrangement and location, the provision of culverts, and other critical infrastructure. • Design and implement a stormwater network and infrastructure for the Project site, access road, and the associated facilities. • The stormwater network should be designed and implemented taking into consideration the existing natural flow of surface water while	Minor to Negligible
	Minor Negative	Surrounding plots, vegetation and nearby communities	Medium	Minor		Minor to Negligible

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					maintaining the existing discharge areas to the surrounding plots to the extent possible. A robust grievance redress mechanism should be implemented to ensure the concerns of the local community, surrounding landowners and herders are considered and addressed in a timely manner.	

9.7 Monitoring

Table 9-11 Water and Drainage Monitoring Requirements

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION
Construction & Operation			
Storage of fuel, chemicals, excavated materials as well as waste and wastewater	Storage and handling as well as visible spills & leaks of potential pollution sources	Daily visual inspection	Storage and handling areas
Water resources	Availability of water for community members using it	If/ when water shortages are reported	Source of water
Infrastructure	Reports of damage due to project related stormwater management	Inspections after storm events	Project site and surrounding areas
Grievances received	Records of grievances, acknowledgement, close out	Daily	Project Site

10 SOLID WASTE & WASTEWATER MANAGEMENT

10.1 Standards and Regulatory Requirements

10.1.1 National Requirements

SOLID WASTE

- Law of Azerbaijan Republic on Industrial and Domestic Waste No. 514-IQ of 1998. It determines the policy for protecting the environment against industrial and municipal waste and reducing impact of hazardous waste. It provides the requirements for managing, recycling, and disposing waste during the design, construction, and operation of Projects.
- Ministerial Decree on Approval of Rules for Hazardous Waste Permit No. 41 of 2003. It sets specific requirements for applying for and obtaining a hazardous waste permit to ensure safe treatment, storage, and disposal of hazardous wastes. As per the Decree, the permit shall include the codes and characteristics of hazardous waste in accordance with the Basel Convention.
- Ministerial Decree on Responsibilities of Waste Collection, Waste Utilization And Waste Disposal of No. 185 of 2008. It sets out the principles of responsibility for waste collection, utilization, and disposal.
- Ministerial Decree on Approval of Rules on Inventory of Wastes Arising from Production Process No. 13 of 2008. It sets the procedures and principles of waste inventory, on the basis of the Basel Convention, to include definition, risk assessment and identification and classification of waste.
- Ministerial Decree on Approval of Rules for Storage of Hazardous Wastes No. 228 of 2016. Sets the provisions related to the storage, handling and disposal of hazardous waste and workers safety.

WASTEWATER

- Law of the Azerbaijan Republic on Water Supply and Wastewater No. 723-IQ of 1999. It regulates wastewater management and requires complying with standards for the discharge of effluent wastewater. The Law consists of seven Sections divided into 72 articles where article two addresses state regulation of water and sewerage while article four addresses the regulation of wastewater discharge.

10.1.2 Lenders Requirements

EBRD

EBRD PR3 on Resource Efficiency and Pollution Prevention and Control establishes general requirements with regards to:

Waste Management

- The Project must strive to avoid the generation of hazardous and non-hazardous waste materials and reduce their harmfulness as far as practicable. Where waste generation cannot be avoided, the waste must be reused, recycled or recovered, or used it as a source of energy. Where waste cannot be recovered or reused, the waste must be treated and disposed of it in an environmentally sound manner;
- The Project must identify technically and financially feasible alternatives for the environmentally sound disposal of any hazardous waste considering the limitations applicable to trans boundary movement; and
- When waste disposal is transferred offsite and/or conducted by third parties, chain of custody documentation to the final destination must be obtained and only contractors that are reputable and legitimate enterprises licensed by the relevant regulatory agencies must be commissioned. The Project must ascertain whether licensed disposal sites are being operated to acceptable standards. Where this is not the case, alternative disposal options must be considered, including the possibility of the Project developing its own recovery and disposal facilities at the project site.

Wastewater

- The Project must seek to minimise water usage in order to minimise wastewater generation; and
- The Project must identify technically and financially feasible techniques for reusing and recycling effluents in accordance with GIP, which should be implemented as part of the project design.

EPFI's AND ADB

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.

The World Bank General EHS Guidelines (2007) establish general requirements for direct or indirect discharge of process wastewater, 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'.

10.2 Area of Influence

The ESIA focuses on the solid waste and wastewater generated during the construction and operation of the Project. The ESIA assesses the individual impacts of the WF and OHTL separately and also cumulative impacts from both are assessed (please refer to CIA Section of this Report for cumulative assessment).

The area of influence mainly covers the local community and farms near to the project area, communities along the transport route (transportation of waste), as well as waste and sewage management and treatment facilities.

10.3 Observations and Baseline Conditions

10.3.1 Solid Waste Management

Historically, around 75% of the country's industries and municipal waste is generated on the Absheron Peninsula classifying Baku and the surrounding areas as pollution hotspots after the Soviet era. Over the past ten years, the World Bank has financed several projects to enhance the environmental conditions in the Absheron Peninsula, those included waste minimization, clean-up and recycling programmes to rehabilitate polluted lands, safely dispose hazardous industrial waste from non-operational enterprises, and improve urban solid and liquid waste management in Capital area (ZOI Environment, 2013). However, solid waste management continue to be a main issue in Azerbaijan with the absence of sufficient infrastructure and services within the majority of urban and rural areas of Azerbaijan.

According to the Country Fact Sheet (CFS), 2017, solid waste collection, transportation, and disposal, as well as landfills and dumpsites operation in Azerbaijan are under the jurisdiction of the Departments of Public Utilities of the Local Executive Authorities (LEAs) of each territory.

The rural areas where almost half the Azerbaijani population lives, are only partially serviced for waste management. Whereas in Greater Baku (Baku city and adjacent areas on the Absheron peninsula), the situation differs. In the Greater Baku region, waste is managed by a state-owned joint stock company, Baku City Executive Power and Tamiz Shahar (Clean City). Baku City Executive Power is responsible for municipal waste collection while Tamiz Shahar is

responsible for post-collection transport and final disposal and for operating Balakhany site that includes a landfill, as well as:

- A 220,000 tonnes capacity sorting facility, with a manual sorting line that allows for recovering 25% of the recyclable waste including metals, paper, plastic, and glass before landfilling; and
- An incinerator with energy recovery, in which most of the MW is incinerated; with the incinerator ashes being used as landfill cover. This is the only waste incinerator in the country.

Sorting at source is not applied and waste re-use and recycling is generally very limited in Azerbaijan. It is estimated that only around 2-5% of the waste collected from the allocated districts reaches the Balakhany landfill and with the exception of Baku, where most of the municipal solid waste is incinerated, nearly all waste is sent to dumpsites within each district, all of which do not meet international standards. In addition, waste is frequently disposed into unauthorized dumpsites.

According to the State Statistical Committee of Azerbaijan, waste generation in 2019 was estimated at 0.9 kg/capita/day. As shown in the table below, municipal waste composed around 62% of the total waste generated in 2019 followed by the manufacturing sector generating 23% of the total waste. With the exception of the mining sector that has a fluctuating waste generation trend, waste generation from the remaining economic activities presented below has generally increased over the past 10 years (STAT, 2019). The services activities and agriculture, fishing and forestry sectors has recorded significantly higher waste quantities in 2019 when compared to 2010. Domestic waste generated in the Absheron Economic Region in 2019 was 279,554 tons out of which only 39 tons were generated in Khizi Region (STAT, 2019).

Table 10-1 Waste Generation based on the Economic Activity (STAT, 2019)

ACTIVITY	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	WASTE GENERATION IN THOUSAND TONS									
Municipal Waste	1,609.3	1,780.5	1,647.1	1,670.9	1354.9	1534.7	1,590.1	1,576.2	1,756.1	2,021.6
Manufacturing	414.6	529.3	868.6	482.3	394.4	576.6	650.5	710.6	743.2	765.4
Mining	247.0	409.5	542.9	334.3	550.0	196.7	644.5	186.6	204.8	208.2
Agriculture, Fishing and Forestry	2.7	9.2	12.3	18.7	18.4	20.0	25.9	21.2	24.2	33.2
Energy	1.6	4.6	11.2	5.6	3.3	4.6	6.2	6.2	4.6	5.7
Construction	0.6	0.6	0.7	1.2	1.1	3.3	1.6	1.6	3.7	2.9

ACTIVITY	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	WASTE GENERATION IN THOUSAND TONS									
Other Service Activities	5.7	55.9	13.9	62.6	63.9	85.3	100.9	252.1	159.5	239.5
Total	2,281.5	2,789.6	3,096.7	2,575.6	2,386	2,421.2	3,019.7	2,754.5	2,896.1	3,276.5

The National Centre for Hazardous Waste Management in Azerbaijan was established in 2004; it has a 250,000 m³ landfill cell with around 42 % of its capacity used for mercury contaminated soil and sludge received from Sumgayit, while the remaining capacity is available for commercial waste disposal (UNCEC, 2011). According to the State Statistical Committee of Azerbaijan, a total of 317,400 tons of hazardous waste were generated in 2019, more than double the quantity generated in 2010 with around 21% of the total hazardous waste generated in 2019 sent for treatment compared to around 42% in 2010 (STAT, 2019).

At the local level, the waste management services including proper waste collection, transportation and disposal are nonexistent. Villagers of Sitalchay and the villages in the Project area manage waste through burying waste in the lands around their homes, burning it, or dumping it outside the village. The waste management facility closest to the Project area is in Sumgayit around 20 km southeast of the Project. This has been confirmed in consultation letters with the Head of the Khizi District Executive Power, received on 7th October 2021, however, based on consultations with the local consultant, this facility is not suitable for waste arising from the Project. The distances and locations of those facilities with respect to the Project site are provided in the following table and figure.

10.3.2 Wastewater Management

Poor wastewater management and lack of facilities are another main issue in Azerbaijan. Considering only a small percentage of the total wastewater generated in the country is treated, this has impacted inland water quality and eventually, the Caspian Sea (ZOI Environment, 2013).

According to the State Statistical Committee, the wastewater network in 2019 covered 37.2% of the population, increasing only by 6% from the coverage reported in 2010. A total of 4,863.2 million m³ of wastewater was generated in Azerbaijan in 2019, out of which the Absheron Economic Region contributes to 5.26%. The Khizi Region generated a total of 30,000 m³ of wastewater in 2019. It was reported that only 4.6% of the generated wastewater in 2019 was treated (STAT, 2019).

Hovsan is the largest municipal Wastewater Treatment Plant (WWTP) in Azerbaijan, processing around 60% of Baku's wastewater volume. In addition, almost 20 smaller WWTP were built along a 100 km coastline northern Absheron peninsula (ZOI Environment, 2013). Sumgayit, the closest

area to the Project site with a WWTP, has been improving its wastewater management and increasing the capacity of its WWTP (ZOI Environment, 2013).

Additional consultation has been conducted with “Azersu” Open Joint Stock Company, and in a letter received on 8th October 2021 they confirmed that, at the local level, there are two sewerage pump stations and one wastewater treatment plant in the territory of the Khizi district and Sumgayit. Also, in a Letter received on 15 March 2022 stated the project area does not include any wastewater sewage system. The state agency is currently constructing a wastewater treatment plant near Khizi and Altiaghaj settlement. Therefore, the Agency confirmed that the wastewater treatment plant in Sumgayit is operational and can be used for the Project. AZERSU stated that the wastewater generated during the construction and operational phases to be collected using septic tanks and transported by a licensed contractor to Sumgayit Wastewater Treatment Plant.

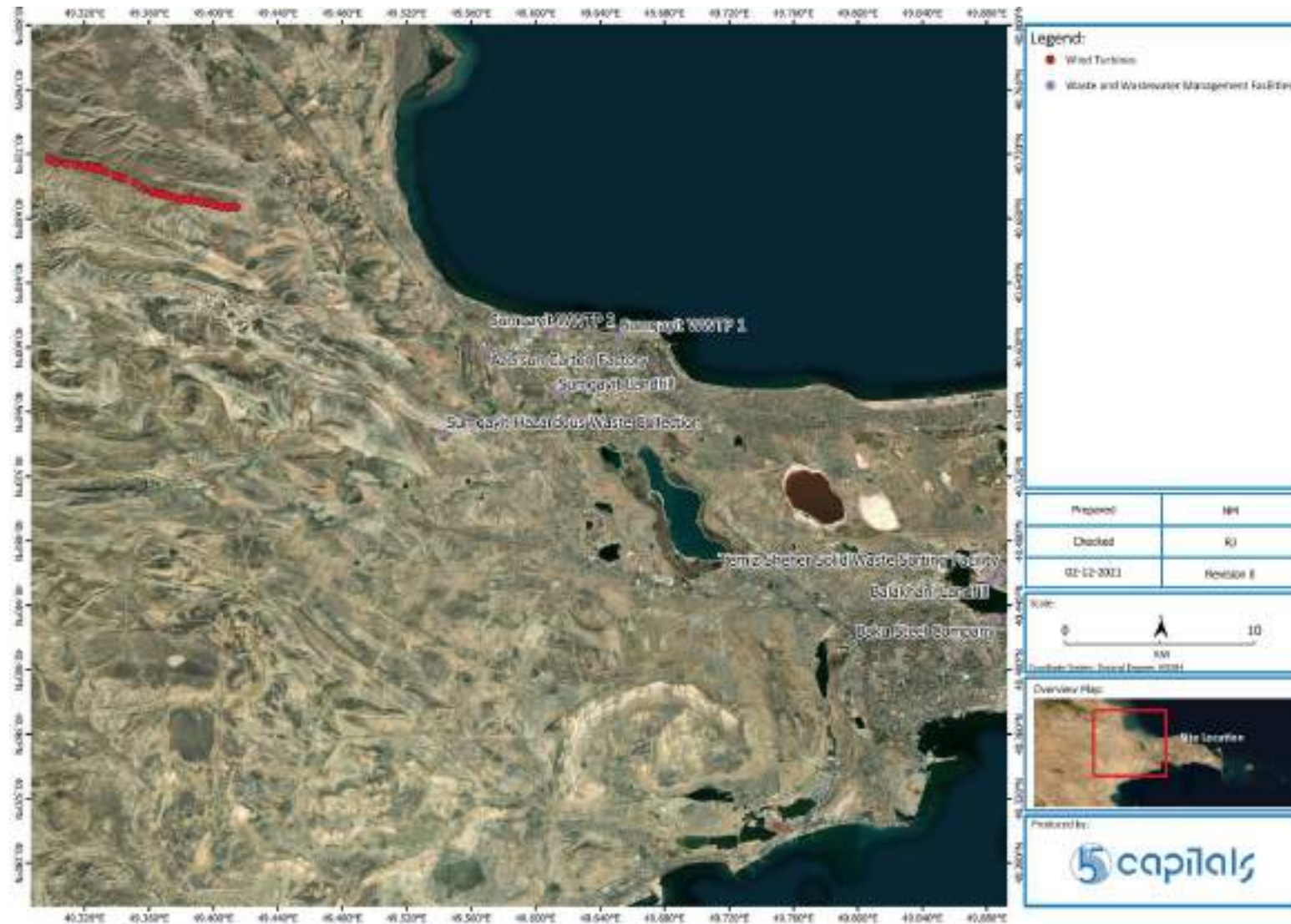
Sitalchay does not have a wastewater network and therefore, sewage is either discharged into excavated pits where wastewater slowly seeps into the ground, or it is discharged into enclosed drainage ditches that convey the sewage from some houses of the village to a nearby Poultry Farm. At the farm, the received domestic wastewater mixes with sewage generated from the farm’s operational activities and is then discharged into the sea without any treatment.

The Wastewater Treatment Plants (WWTPs) closest to the Project area are located in Sumgayit. The distances and locations of those facilities with respect to the Project site are provided in the table and figure below.

Table 10-2 Distance to Nearest Waste and Wastewater Management Facilities

FACILITY	DISTANCE TO PROJECT SITE
Sumgayit Landfill	21 km
Balakhani Landfill	47 km
Temiz Sheher Solid Waste Sorting Facility	47 km
Sumgayit Hazardous Waste Collection Polygon	20 km
Azersun Carton Factory (recycling paper and cardboard)	16 km
Baku Steel Company (Ferrous Metal)	49 km
Sugmayit WWTP1	22 km
Sugmayit WWTP2	19 km

Figure 10-1 Location of Nearest Waste and Wastewater Management Facilities



10.4 Sensitive Receptors

Table 10-3 Waste and Wastewater – Receptor Sensitivity

Receptor	Sensitivity	Justification
Wind Farm, BOP and OHTL		
Soil, Groundwater & Surrounding Environment	Medium	The absence of proper waste and wastewater management may result in contamination of soil and groundwater, as well as the surrounding environment including the marsh areas, irrigation canals, and agricultural lands along the OHTL route.
Waste and Wastewater Management Infrastructure	Medium	The waste and wastewater management infrastructure and facilities are still developing in Azerbaijan in general and are non-existent in the Project area. Therefore, the Project will add pressure to the selected waste and sewage management facilities in other areas.

10.5 Potential Impacts, Mitigation, Management & Residual Impact

10.5.1 Construction Phase

SOLID WASTE

During construction of the Wind Farm, BOP, and the OHTL, waste will be generated during earthworks, construction of access roads and buildings.

Typical construction wastes include concrete, asphalt, scrap steel, glass, plastic, wood, packaging materials and domestic waste from construction workers (i.e. relating to food consumption). Concrete may be found in two forms on the construction site; structural elements containing reinforced concrete, while foundations (such as surface level concrete slabs) have mass non-reinforced concrete.

Solid waste generated from construction activities at the Project site will include the following:

- Non-hazardous waste such as:
 - Waste related to construction processes, including earthworks (such as rubble, soils and potentially rock);
 - Paper/cardboard, plastics, packaging, plastic bottles, glass, scrap metal, excess fill materials, sand, gravel, excess construction materials, concrete, subsoil and rock (not contaminated); and
 - Domestic waste generated by the construction workforce from offices, resting areas, canteens, and accommodation (e.g., food/organic waste, paper trash, cardboard, aluminium, plastic).
- Hazardous waste such as:
 - Batteries (unused), spent filtration cartridges, chemical drums, oil filters, aerosol cans, contaminated metals, empty containers, expired and unused chemicals,

adhesives, machinery lubricants, clean-up materials such as rags, containers and tins with remains of hazardous substances, used spill kits and clean-up materials; and

- Replacement parts from vehicles, plant and equipment such as tyres.
- Residual materials from electrical equipment installation such as Waste Electrical Equipment (WEE).

The amount of solid waste generated will require management planning through the CESMP and a Waste Management Plan to document the appropriate processes for handling, storing, transporting and/or disposing solid waste. Solid waste has the potential to pollute the surrounding environment (i.e. soil and groundwater), cause odour and visual nuisance, encourage pests or result in occupational health and safety issues.

NON-HAZARDOUS SOLID WASTE

Non-hazardous construction waste is typically inert and does not pose a threat to human health or the environment. However, proper management is required in order to reduce associated secondary impacts such as unnecessary resource use, dust emissions, pest control etc.

HAZARDOUS SOLID WASTE

Due to the nature of the project and the construction works being undertaken, there will be a few hazardous materials used. Such materials may result in oil containers waste, transformers cooling oils, used sprays, paints, and contaminated plastic and metallic containers from machinery and maintenance activities, 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 potentially groundwater.

Inappropriate management, storage, handling, transfer or transportation through lack of personnel training on site may lead to accidental spills or leaks to the soil or groundwater 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 or dumpsites. Waste management strategy and planning is therefore critical in order to minimise potential significant effects on sensitive receptors such as soil and groundwater.

The nearest facility is located in Sumgayit approximately 20 km from Khizi 3 Project site. Therefore, it will be important to properly store the waste in designated and secured hazardous waste storage areas at the site until collection to final disposal. These areas will include bunds to contain spillages, secure fencing to control access, proper safety signage, a roof structure to prevent rainwater entering, etc.

In addition, the EPC Contractor will be required to coordinate with the local government to identify licensed waste disposal sites and licensed waste collectors.

LIQUID WASTE/WASTEWATER

Wastewater generated from construction activities at the project site will include the following:

- Sanitary and domestic wastewater generation;
- Wastewater from any vehicles or equipment washing/cleaning and road works;
- Concrete washout water;
- Liquid hazardous waste such as fuels, chemicals, paints, lubricants, solvents, waste oil, hydraulic fluid, resins, waste solvents and thinners, etc.; and
- Storm water runoff events on site.

For sanitary and domestic wastewater, the quantities of sanitary and domestic wastewater can be estimated as an average of 0.1 m³/person/day (100 litres). Assuming the estimated number of construction workers during peak will be 300 personnel, sanitary wastewater is estimated at 30 m³ at peak periods of construction. Wastewater generated on-site will be stored within septic tanks for removal by a licensed wastewater contractor to an authorized wastewater treatment facility. The EPC Contractor will coordinate with the local government for wastewater removal from the site.

It should be noted that the figure of 100 litres/worker/day relates to overall water consumption including at accommodation areas. Such wastewater will be stored within septic tanks on-site, prior to removal by a licensed contractor. Improper handling, storage and transportation of sanitary and domestic wastewater could potentially cause contamination to soil or groundwater resources. The capacity of the WTP is 100,000 m³/day which should be sufficient to meet the needs of the project and other local needs. As stated above, Sitalchay village does not have a wastewater network and therefore, sewage is either discharged into excavated pits where wastewater slowly seeps into the ground, or it is discharged into enclosed drainage ditches.

In the absence of proper stormwater management, stormwater may runoff into areas containing hazardous materials and either leach these into the soil, flow to the runoff areas or carry these off site, potentially contaminating soil, the runoff areas, surrounding lands and reaching the groundwater.

10.5.2 Waste Characterization

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

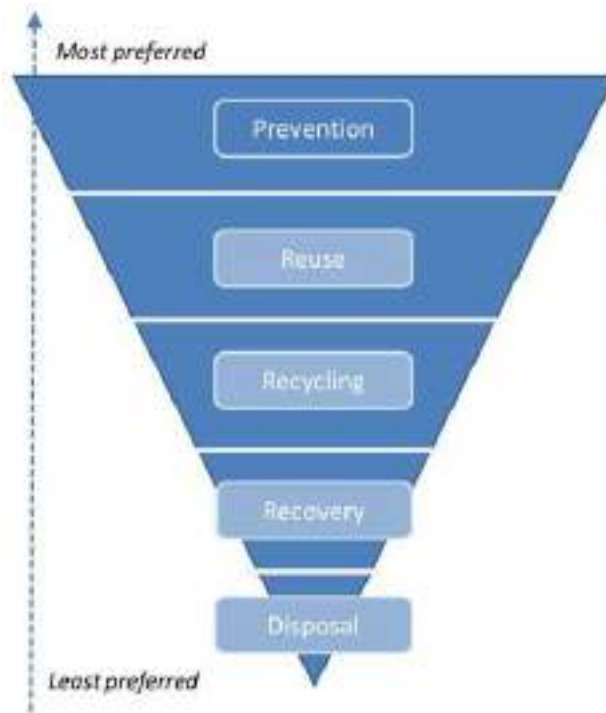
the material poses to human health or the environment. For this Project, waste has been classified into three (3) main categories below.

Table 10-4 Waste Characterization

WASTE CLASSIFICATION	DESCRIPTION
Domestic Waste	Household, commercial, agricultural, governmental, industrial and institutional wastes, which have chemical and physical characteristics similar to those of household such as garbage, 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. In accordance with the Basel Convention, hazardous waste is 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 waste must be segregated, stored, transported and ultimately treated and disposed by approved waste services provider.

10.5.3 Waste Management Hierarchy

The waste management hierarchy illustrates good practice for waste management considerations by ensuring the implementation 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 below 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 main contractor or the proponent for handling, transportation and the disposal of waste.

Figure 10-2 Waste Hierarchy

Source: United Nations Environment Programme

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.

Table 10-5 Waste Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Inappropriate handling, storage, transport, and disposal of non-hazardous solid waste	Moderate Negative	Soil, Groundwater & surrounding environment	Medium	Moderate	- The project 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 will develop a Waste Management Plan to document the appropriate processes for handling, storing, transporting and/or disposing solid waste during construction and commissioning activities. - Domestic solid wastes to be segregated and identified from the other waste streams into separate waste containers/skips clearly to facilitate recycling and reuse. - Waste containers/skips should be clearly labelled and placed in designated waste storage locations. Labels will be waterproof, securely attached, and written in Azeri, English and other languages as required for the workforce. - 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.	Minor

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					- On-going housekeeping training should 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. - Ensure non-recyclable non-hazardous waste is being transported to licensed sanitary landfills and not disposed in open dumpsites. - 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. - Mandatory training program for employees 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.	

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Inappropriate/uncontrolled handling, storage, transport and/or disposal of solid hazardous waste	Moderate Negative	Soil, Groundwater & surrounding environment	Medium	Moderate	- Coordinate with the local government to identify licensed hazardous waste collection service providers and treatment or disposal sites. - 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 and spill response procedures. This area must be placed away from any sources of ignition. - Hazardous waste storage area will be constructed away from drainage system and a rain shelter 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	Minor

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					workforce. 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.	
Inappropriate/uncontrolled handling, storage, transport and/or disposal of sanitary wastewater	Moderate Negative	Soil, Groundwater & surrounding environment	Medium	Moderate	- Contractor to develop and implement a Project Specific Construction Waste Management Plan (CWMP) to include wastewater management in accordance with committed mitigations measures in this ESIA report and provisions of the CESMP. - Develop and maintain a waste inventory to document and track sanitary waste. - Sanitary wastewater tanks should 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 CESMS). - Coordinate with the local government to identify licensed wastewater treatment facilities.	Minor

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					- Engage a licensed wastewater contractor for the periodic emptying of septic tanks and transferring the wastewater to a licensed wastewater treatment plant. - In common with the lender requirements for resource efficiency, 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.	
Increased pressure on non-hazardous and hazardous waste and wastewater management infrastructure	Moderate Negative	Waste and wastewater contractors, recycling facilities, landfills, and WWTPs.	Medium	Moderate	- Contractor to 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. - Reduce and reuse waste to the extent possible. - Coordinate with the local government to identify licensed waste and wastewater treatment facilities. - Engage licensed service providers for transporting, treating and disposing waste and wastewater to ensure the availability of resources and capacity to accommodate waste and wastewater generated by the Project and assess the need to contract multiple service providers.	Minor

10.5.4 Operational Phase

In general, few wastes will be generated during the operation of the Wind Farm. Some of these will be direct products resulting from the operation and maintenance activities. Nevertheless, if these waste streams are not managed and disposed of properly, they can result in significant adverse impacts.

NON-HAZARDOUS SOLID WASTE

The operation of the proposed 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 waste. The quantity of domestic waste will be small given the few anticipated personnel required to operate the Wind Farm. Other solid non-hazardous waste generated during operation will be landscaping waste and uncontaminated replacement parts and packaging.

HAZARDOUS WASTE

This fraction of waste can potentially cause significant adverse impacts on human health and the environment if improperly managed.

Examples of likely hazardous waste streams that may arise during the operation of the Project include the following:

- 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 batteries, waste cables, oily rags, etc.;
- General clean-up materials and solvents from general maintenance of on-site plant and machinery.

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.

There are no licensed hazardous waste disposal facilities currently available in Khizi. Therefore, hazardous waste generated by the Project will most likely be transported by road vehicles to a licensed hazardous waste facility in Sumgayit or 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 to final disposal. These areas will include bunds to contain spillages, secure fencing to control access, proper safety signage, a roof structure to prevent rainwater entering, etc.

In addition, the O&M Company will be required to coordinate with the local government to identify licensed waste disposal sites and licensed waste collectors.

Liquid Waste/ Wastewater

Liquid waste generated from operational activities at the Project site will include the following:

- Sanitary and domestic wastewater generation from operation and maintenance staff;
- Liquid hazardous waste (if any) such as fuels, chemicals, paints, lubricants, solvents, waste oil, hydraulic fluid, resins, waste solvents and thinners, etc.; and
- Storm water runoff on site (if contaminated with hazardous materials).

Sanitary and domestic wastewater will be generated directly from site toilets and kitchen facilities. In the absence of a sewage network in the Project area, all sanitary streams will be directed to the septic tank for collection and disposal by a licensed contractor at an approved wastewater treatment facility.

The improper handling, transport and disposal of hazardous wastes could lead to potential localised contamination of soil and groundwater resources.

Storm water has the potential to run off into areas containing hazardous materials and either leach these into the soil, flow into surface water channels or carry these off the site, potentially contaminating soil, surrounding lands and possibly reaching groundwater resources.

The Waste Characterization and Waste Management Hierarchy provided under sections 10.5.2 and 10.5.3 are applicable to the operation phase and should be taken into consideration for managing waste generated during operation.

Table 10-6 Waste Impact Significance, Mitigation & Management Measures and Residual Impacts – Operation

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Inappropriate handling, storage, transport and disposal of non-hazardous solid waste	Negligible Negative	Soil, Groundwater & surrounding environment	Medium	Negligible to Minor	- The O&M Company are to develop and implement a Project specific Waste Management Plan (WMP) in line with committed mitigation measures in this ESIA report and the provisions of the OESMP. - Training will be provided to employees to ensure awareness of waste management including proper waste; training and orientation on waste minimisation, segregation and good housekeeping practices. - 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 will be clearly labelled and placed in designated waste storage locations. Labels will be waterproof, securely attached, and written in Azeri, English and other languages 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.	Negligible

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					- 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. - Ensure non-recyclable non-hazardous waste is being transported to licensed sanitary landfills and not disposed in open dumpsites. - The Contractor will maintain copies of the waste management licensed on site. - 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	Negligible Negative	Soil, Groundwater &	Medium	Negligible to Minor	Coordinate with the local government to identify licensed hazardous waste	Negligible

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
and/or disposal of solid hazardous waste		surrounding environment			collection service providers and treatment or disposal sites. • 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. • 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 Azeri, English and other languages as required by the workforce. Wherever possible, chemicals will be kept in their original container.	
Inappropriate/uncontrolled handling, storage, transport and/or disposal of sanitary wastewater	Negligible Negative	Soil, Groundwater &	Medium	Negligible to Minor	• Sanitary facilities will be provided with adequately designed underground storage tanks.	Negligible

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
		surrounding environment			- Sanitary wastewater tanks to be properly maintained and inspected to ensure tanks do not overflow or leak. - Locate sanitary wastewater tanks in allocated impervious hard standing areas with bunding capacity of 110% volume of the maximum volume stored. - Coordinate with the local government to identify licensed wastewater treatment facilities. - Engage a licensed wastewater contractor for the periodic emptying of septic tanks and transferring the wastewater to a licensed wastewater treatment plant.	
Increased pressure on non-hazardous and hazardous waste and wastewater management infrastructure	Negligible Negative	Waste and wastewater contractors, recycling facilities, landfills, and WWTPs.	Medium	Negligible to Minor	- The O&M Company are to develop and implement a Project specific Waste Management Plan (WMP) in line with committed mitigation measures in this ESIA report and the provisions of the OESMP. - Reduce and reuse waste to the extent possible. - Engage licensed service providers for transporting, treating and disposing waste and wastewater to ensure the availability of resources and capacity to accommodate waste and wastewater generated by the Project.	Negligible

10.6 Monitoring

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'.

Table 10-7 Waste Management Monitoring Requirements (Construction and Operation)

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION
Inspect and monitor proper handling and storage of waste materials	Check storage areas containment and control procedures as per CESMP/OESMP	Daily	Storage areas at the site
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
Waste Transfers	Record keeping of waste transfer notes	On-going	Locations of waste collection during construction and operational phases.

11 ARCHAEOLOGY AND CULTURAL HERITAGE

11.1 Standards and Regulatory Requirements

11.1.1 National Requirements

Cultural heritage and archaeological remains and artefacts are legally protected in the Republic of Azerbaijan by national legislation which is supported by the various international conventions and recommendations ratified and/or acceded by the Republic. These include the Convention on Protection of World Cultural and Natural Heritage (Paris, 1972), the European Convention on the Protection of the Archaeological Heritage (Valletta, 1992) and UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expressions.

The Ministry of Culture and Tourism of the Republic of Azerbaijan is responsible for the cultural heritage and safeguarding of intangible cultural heritage at national level. The following laws are relevant to the protection of cultural heritage in Azerbaijan:

- Ministerial Decree No. 266 on approval of the rules regarding protection, restoration and use of cultural heritage;
- Law No. 470-IG on protection of the monuments of history and culture; and
- Law No. 840-IQ on protected areas.

Article 3 of Law No. 470 on the protection of the monuments of history and culture stipulates that the 'national legislation of the Republic of Azerbaijan concerning heritage protection comprises the Constitution of the Republic of Azerbaijan, the present Law and other national legislative instruments and international agreements which Republic of Azerbaijan is a party to'.

Article 13 stipulates the protection of monuments discovered during construction and other economic activities.

In addition, Article 14 requires construction projects exceeding one (1) hectare to apply to the relevant executive authorities and the Academy of Sciences of Azerbaijan and allocate funds for initial research of heritage in the areas concerned. Should any archaeological findings be discovered the in areas in question no construction or other economic activities shall be undertaken with no approval by the relevant executive authorities or prior to completion of the scientific research.

These articles of the Law require the sponsor of a new project to apply to a relevant government agency at the stage of feasibility study and provide investigation of the archaeological monument at its own expense. If archaeological features are encountered, it is prohibited to carry out construction without adequate scientific measures and permission from relevant government agencies.

There is legislative arrangement to ensure that the Ministry of Culture is responsible for issuing permits for the excavation of archaeological and heritage sites. Decisions on granting such permissions are approved by the Ministry of Culture following expert feedback from the Institute of Archaeology and Ethnography.

Restoration of architectural monuments may only be carried out on the basis of a license issued by the Ministry of Culture.

The international and regional treaties and conventions ratified by the Republic of Azerbaijan include:

- Convention for Protection of Cultural Heritage in the Event of Military Conflicts. May 14, 1954, The Hague. Ratified by Milli Medjlis (Parliament of Azerbaijan Republic) in April 21, 1993;
- UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property. November 14, 1970, Paris. Ratified by Milli Medjlis (Parliament of Azerbaijan Republic) in September 30, 1997;
- UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage. November 16, 1972, Paris. Ratified by Milli Medjlis (Parliament of Azerbaijan Republic) in December 16, 1993;
- UNIDROIT Convention on Stolen or Illegally Exported Cultural Objects. July, 1995, Roma. Ratified by Milli Medjlis (Parliament of Azerbaijan Republic) in March 2, 2000;
- The Second Protocol of the Hague Convention on Protection of Cultural Property in the Event of Military Conflicts. March 26, 1999. Ratified by Milli Medjlis (Parliament of Azerbaijan Republic) in December 12, 2000; and
- Revised European Convention on Protection of Archaeological Heritage. January 16, 1992. Ratified by Milli Medjlis (Parliament of Azerbaijan Republic) in October 20, 1999.

11.1.2 Lenders Requirements

EBRD

EBRD Performance Requirement 8 recognises the importance of cultural heritage, both tangible and intangible for present and future generations. The aim is to protect cultural heritage and to guide clients in avoiding or mitigating adverse impacts on cultural heritage in the course of their business operations. The clients are expected to be precautionary in their approach to the management and sustainable use of cultural heritage.

ADB

ADB's Safeguard Policy Statement and related Safeguards, include various requirements for cultural resources, both physical (and assumed to include intangible 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.

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.

11.2 Area of Influence

The area of influence for the Project in terms of Archaeology and cultural heritage will cover the project area of the WF (WTGs, roads, cables, and substations) and areas planned to be used during construction phase (laydown area, etc.).

There are no local requirements on buffer zones/ distances set for artefacts and archaeological sites during construction in Azerbaijan. Therefore, consultation letters were sent to Ministry of Culture and Tourism and Institute of Archaeology and Ethnography (AAS IAE) - Azerbaijan National Academy of Science to confirm specific requirements for the Khizi 3 and Area 1 WF projects.

CONSULTATIONS

An email was sent by the local consultant on 4th May 2021 to Ministry of Culture and Tourism to confirm if there are specific requirements for buffer zones/distances around artefacts and archaeological sites within project areas during the construction of the Projects. Copy of the Archaeological Survey Report for Khizi 3 Wind Farm were also provided to the Ministry.

The Ministry provided an official response on 21st June 2021 stating that project should comply with Article 13 and 14 of the Law On Protection of Historic and Cultural Monuments of the Republic of Azerbaijan and *the State Service shall address the project execution related issues if the Archaeology and Ethnography Institute under the Academy of National Sciences of Azerbaijan provides its positive opinion and the security of archaeological monuments found on the site is provided.*

Based on the above, a consultation letter issued on 1st July 2021 with the Academy of Science to confirm the buffer Zone/ distance requirements. A site visit was carried out on 2nd July 2021 by the Academy of Science to determine the buffer zone requirements based on the WF layout.

Response from Ministry of Culture and Tourism (English translation): *"The State Service for Protection, Development, and Restoration of Cultural Heritage under the Ministry of Culture*

has examined your request regarding the requirements on buffer zones of archaeological artifacts during construction of power energy projects implemented by AQUA POWER company in Khizy and Absheron districts. Subject to Clause 13 of the Law On Protection of Historic and Cultural Monuments of the Republic of Azerbaijan, any monument discovered while performing construction works and other businesses, the works shall be immediately suspended, the authority (agency) and scientific institution assigned by competent executive power shall be notified thereof, the authority (agency) and scientific institution shall conduct researches stipulated by Law within two months period and other measures shall be taken. In this case, construction and other business works may be continued at the permit of the authority (agency) assigned by competent executive power at the opinion of the scientific institutions and experts assigned by competent executive power. Further, when laying main engineering communications (oil and gas pipes and etc.) and performing other construction works following Clause 14 of the Law, the authority (agency) and scientific institution assigned by the competent executive power shall be applied to when carrying out the works at the feasibility study phase and funds shall be allocated to conduct preliminary monuments search works. If an archaeological monument is found in the same zone, no construction and business works are authorized without authorization of the authority (agency) assigned by competent executive power and taking necessary scientific measures. Please be informed that the State Service shall address the project execution related issues if the Archaeology and Ethnography Institute under the Academy of National Sciences of Azerbaijan provides its positive opinion and the security of archaeological monuments found on the site is provided."

Academy of Science – Final Letter/ Response

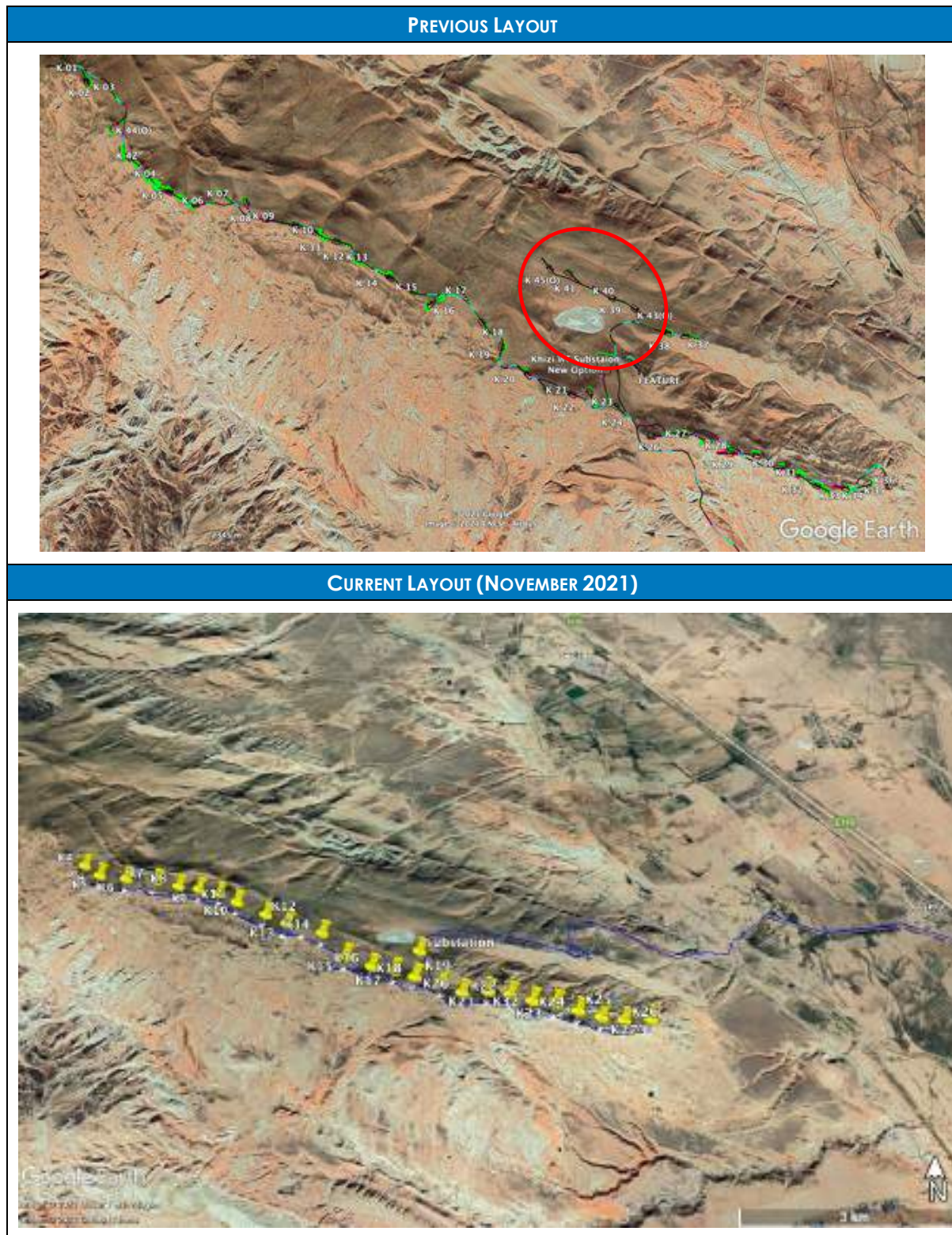
Based on the Final Letter received from Academy of Science on 4th October 2021 and completion of all surveys, the Academy of Science identified archaeological monuments (mounds and graves) at the following WTGs; K39, K39 (T), K40, K43(0) (based on old layout). Two (2) options were proposed in the Letter as follows:

- Option 1: The monuments (graves and mounds) are to be explored by excavation works; or
- Option 2: To relocate the WTG K39, K39(T), K40, K43(0)) by 40-50 m.

This was identified during the 3rd survey undertaken by the Academy; therefore, the WF layout has been revised based on Academy of Science findings and recommendation, The current layout excludes the WTGs and any development east of dry lake as shown in Figure below.

None of the reports or consultation undertaken with both Academy of Science and MOC identified any buffer zones requirements around artefacts and archaeological sites. However ACWA Power has committed to retain a buffer zone of 50m around artefacts and archaeological sites from WTGs during the construction phase.

Figure 11-1 Changes in WTG Layout



11.3 Baseline

11.3.1 Regional Conditions

Azerbaijan is rich in historical sites, monuments and artefacts. It also has archaeological sites dating to periods long before written records began. Archaeologists have recorded monuments of the Palaeolithic, Mesolithic, Neolithic and Eneolithic eras, Bronze and Iron Ages. These include the oldest settlements of the Stone Age - Azykh and Taglar, the monuments of the Kura-Araks culture, rock drawings of Gobustan and sites dating back to Antiquity and Middle Ages.

Azerbaijan is also rich in the cultural remains of later developed social states, such as various settlements, caravanserais, defensive walls and burial grounds. It has always been an important trade route, both east to west and north to south, but it was mainly during the Middle Ages that many of the important trading centres developed.

Azerbaijan has many archaeological monuments of international importance. There are many sites that can be classified as being of national significance and important at a local level.

The Project Site is located in Khizi District which has not been completely studied from a historical-archaeological perspective. Settlements and burial grounds of different periods have been found in the district by researchers. Dozens of historical and archaeological monuments have been registered and researched in the district during archaeological surveys and excavations carried out since 2007. The most famous of these are Sitalchay mounds (approximately 10-12 km from the Project Site), Dizavar, Ambizlar, Garabulag, Angilan, Altıgaj necropolises, Findigdan Antiquity necropolis, Alishirin necropolis, Agabdanyelpizi necropolis, Baylar necropolis, Khalfa Suleyman necropolis near Agdara village, Shaharchi settlement, Seyfan Takhtasi settlement, Orta Gut settlement, Eyvazli settlement, Pitar medieval settlement, Khalas settlement, etc.

The cultural and economic influences of the medieval town of Shabran, located 65 km from the site, have spread to this region, with many medieval rural settlements in the area.

INTANGIBLE CULTURAL HERITAGE

According to EBRD PR 8, tangible and intangible cultural heritage should be identified and protected to avoid adverse impacts on cultural heritage items that may be recognised to be an integral part of the continuity of cultural practices locally, regionally or internationally.

Currently, Azerbaijan has three (3) cultural heritage sites 13 elements of intangible cultural heritage listed by UNESCO. These are as provided below.

Table 11-1 Registered Cultural Heritage Sites (UNESCO)

NAME	DISTANCE FROM THE PROJECT SITE (KM)
Gobustan Rock Art Cultural Landscape (2007)	70
Historic Centre of Sheki with the Khan's Palace (2019)	193
Walled City of Baku with the Shirvanshah's Palace and Maiden Tower (2000)	54

Table 11-2 Intangible Cultural Heritage in Azerbaijan (UNESCO)

ELEMENT	DESCRIPTION	REGION WHERE IT IS COMMONLY PRACTISED
Nar Bayrami, traditional pomegranate festivity and culture	Inscribed in 2020 (15.COM) on the Representative List of the Intangible Cultural Heritage of Humanity. 'Nar Bayrami is an annual festival in October/November in Azerbaijan's Goychay region that celebrates the pomegranate and its traditional uses and symbolic meaning. Pomegranate culture is a set of practices, knowledge, traditions and skills related to the cultivation of the fruit, which is used not only in a range of culinary contexts, but is also referred to in crafts, decorative arts, myths, storytelling and other creative outlets.'	Azerbaijan's Goychay region
Art of miniature	A type of two-dimensional artwork that involves the design and creation of small paintings on books, papier-mâché, rugs, textiles, walls, ceramics and other items using raw materials such as gold, silver and various organic substances.	Azerbaijan, Iran, Turkey and Uzbekistan
Yalli (Kochari, Tenzere), traditional group dances of Nakhchivan	Traditional group dance and typically performed in a circle, chain or line, and involve elements of games, pantomime (bird or other animal imitations), physical exercises and movements.	Across Azerbaijan
Heritage of Dede	This includes folk tales and music of Dede Qorqud/Korkyt Ata/Dede Korku. They are based on twelve heroic legends, stories and tales and thirteen traditional musical compositions shared and transmitted across the generations through oral expressions, performing arts, cultural codes and musical composition. The element encompasses social, cultural and moral values and contains profound knowledge about the history and culture of Turkic-speaking communities.	Azerbaijan, Kazakhstan and Turkey

ELEMENT	DESCRIPTION	REGION WHERE IT IS COMMONLY PRACTISED
Dolma making	Set of knowledge and skills relating to the preparation of the traditional meal 'dolma', which takes the form of small fillings (containing meat, onion, rice, peas and spices) wrapped in fresh or pre-cooked leaves or stuffed in fruits and vegetables.	Across Azerbaijan
Art of crafting and playing with Kamantcheh/Kamancha	Kamantcheh is a bowed string musical instrument, which existed for over 1,000 years. In Iran and Azerbaijan, it constitutes a major element of classical and folkloric music, and performances occupy a central place in a wide number of social and cultural gatherings.	Azerbaijan and Iran
Nawrouz, Novruz, Nowrouz, Nowrouz, Nawrouz, Nauryz, Nooruz, Nowruz, Navruz, Nevruz, Nowruz, Navruz	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.	Afghanistan, Azerbaijan, India, Iran (Islamic Republic of Iran), Iraq, Kazakhstan, Kyrgyzstan, Uzbekistan, Pakistan, Tajikistan, Turkmenistan and Turkey
Flatbread making and sharing culture: Lavash, Katyрма, Jupka, Yufka	This includes making and sharing flatbread which carries social functions that have enabled it to continue as a widely-practiced tradition. This involves family members (at least 3 people) and also neighbours.	Azerbaijan, Iran (Islamic Republic of Iran), Kazakhstan, Kyrgyzstan and Turkey
Copper craftsmanship of Lahij	Copper craftsmanship of Lahij is the traditional practice of making and using copperware concentrated in the Lahij community in the Caucasus. It's a tradition transmitted within families.	Azerbaijan - Lahij
Traditional art and symbolism of Kelaghayi, making and wearing women's silk headscarves	A tradition found along the Silk Road and consists of several stages: fabric weaving, dyeing and woodblock decoration. <i>'The art of Kelaghayi making is transmitted through non-formal apprenticeship only, and is primarily a family occupation. Each family has its own stylistic features and patterns of decoration. The traditional practice of making and wearing headscarves is an expression of cultural identity and religious traditions and a symbol of social cohesion, reinforcing the role of women and strengthening the cultural unity of Azerbaijani society.'</i>	Azerbaijan: - City of Sheki - Basgal settlement
Chovqan, a traditional Karabakh horse-riding game in the Republic of Azerbaijan	It is a traditional horse-riding game played on a flat, grassy field by two competing teams of players mounted on Karabakh horses.	Across Azerbaijan

ELEMENT	DESCRIPTION	REGION WHERE IT IS COMMONLY PRACTISED
Craftsmanship and performance art of the Tar, a long-necked string musical instrument	The Tar is a long-necked plucked lute, traditionally crafted and performed in communities throughout Azerbaijan. Making of the Tar and performance play a significant role in shaping the cultural identity of Azerbaijanis.	Across Azerbaijan
Traditional art of Azerbaijani carpet weaving in the Republic of Azerbaijan	Carpet making. The patterns are characteristic of Azerbaijan's many carpet-making regions	Across Azerbaijan
Art of Azerbaijani Ashiq	It combines poetry, storytelling, dance and vocal and instrumental music into a traditional performance art that stands as a symbol of Azerbaijani culture.	Across Azerbaijan
Azerbaijani Mugham	It is a traditional musical form, characterized by a large degree of improvisation. The Mugham, though a classical and academic art, draws upon popular bard melodies, rhythms and performance techniques and is performed in many venues throughout the country.	Across Azerbaijan

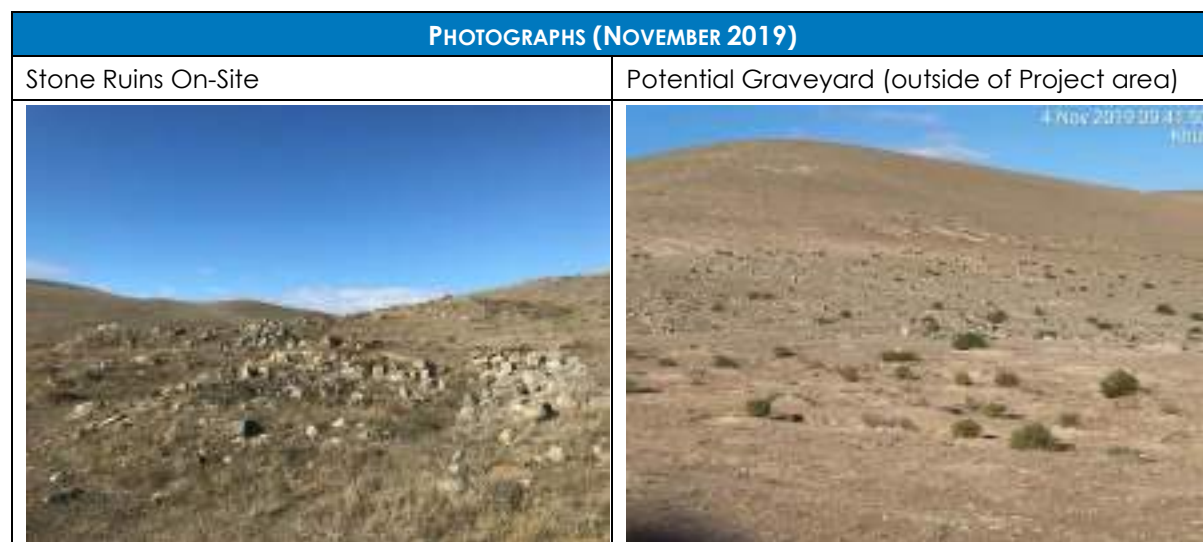
None of the intangible cultural heritage are within the Project area of influence. However, elements of intangible cultural heritage occurring across Azerbaijan such as Nar Bayrami, Art of Miniature and Nawrouz are practiced by local communities within the area.

11.3.2 Site Conditions

SITE VISIT OBSERVATIONS

A cluster of stone ruins were observed during the initial site visit carried out by 5 Capitals team in November 2019 in a section of the Project area.

Plate 11-1 Stone Ruins and Potential Graveyard Observed during Site Visit in November 2029



BASELINE SURVEYS

The following surveys were carried out by the Azerbaijan Academy of Sciences, Institute of Archaeology and Ethnography of ANAS (AAS IAE) for the Project during the course of the ESIA study:

- Preliminary Survey (May 2020): An archaeological survey (site walkover) was carried out over six (6) days from 18th May to 12th June 2020 covering the project and surrounding areas (based on initial proposed WTG layout, cabling route and access roads). Total of 23 potential sites have been identified during the survey, four (4) were located within project area, one (1) in its immediate vicinity and 18 in the adjacent areas.
- Intrusive Trial Investigation (November/ December 2020): In line with the local requirements of Ministry of Culture, consultations were carried out with AAS IAE on the 12th November 2020. This led to the creation of next archaeology strategy aimed at determining the nature and extent of archaeological features. Therefore, an intrusive trial investigation survey was as carried out between 29th November and 16th December 2020 at eight (8) locations to determine the nature and significance of the findings. The number of areas were examined and further information was gained about the archaeology of the of Project area.
- Additional surveys to cover new areas based on changes in WTG Layout (February/March 2021): A supplementary survey was carried out over 10 days from February to March of 2021 to cover new locations (based on WTG Layout issued 13 January 2021) by focusing on a 15 m radius from each WTG. The archaeological survey was carried out through a combination of visual observations and trial pits at potential areas of significance. A total of 15 potential archaeological sites were discovered, four (4) of which were located within the 15 m radius of the WTG locations.
- Additional Survey to cover revised road and cable routes and Laydown area (July 2021): An archeological survey was undertaken from 3 to 8 July 2021 for

the revised road and cable routes and Laydown area. In addition, the survey covered the locations of WTGs, connecting cabling routes, substation and site access routes as shown in Figure below.

Figure 11-2 Khizi 3 WF - Survey Area



Appendix F includes the Archaeological Survey Reports for the Project.

Outcome of surveys

A total of 32 days of field survey was carried out for the Khizi 3 WF project from May 2020 to July 2021 as per the four (4) stages summarised above.

The survey was designed to characterize the Project Site in terms of its significance to archaeological and cultural heritage. While identifying sites of local and regional significance within and around the proposed Project Site, particular emphasis was placed on sites of national importance and sensitivity. No cultural heritage site is known to have existed or been identified in the project area by previous research studies. In addition, the Project area does not fall within any national reserve or other type of protected area.

The survey team mapped the archaeological sites identified by the previous surveys with new locations of WTGs.

The surveys undertaken covered in total 65 WTG areas (based on different WTG layouts), cable routes, two (2) substations locations and laydown area.

A total of 60 sites have been identified by the surveys and trial pit assessments conducted from May 2020 to July 2021. All archaeological sites were found by the survey team to be of local significance. No sites of national or international significance were identified throughout the survey.

During the third survey, four (4) sites (potential tombs and burial mounds) were found to be within 15 m radius of WTGs (as per 13 January 2021 WTG Layout) namely K39, K39 (T), K43 (O) and K41 WTGs. This plot of site is the most sensitive from archaeological point of view (around the dry/ 'salt' lake). The finding leads to the assumption that some human settlements existed near the lake. Five potential graves with surface signs and three burial mounds were recorded in these areas. It was decided to dig trial pits to examine one of the four potential sites found in the vicinity of the turbines, situated near the so-called "dry lake". These sites fall within the 15 m radius of K39, K39 (T), K43 (O) and K41 turbines. Trial pits conducted on Site 38 (K43 - O) confirmed the expectation of the archaeology team that there are mounds of most probably bronze age in the area (shown in Pictures below). The stone formation in this area covers a radius of about 10 m. Due to its large size, the site was divided into two (2) tiers. In accordance with the archaeological excavation procedure, the site was excavated as a mound. One part of the tier, which was divided in the north-south direction, was excavated (western part). Before excavation began, pottery shards were found among the stones. The top cover was completely removed and excavation was carried out. The area excavated was found to be a mound-type tomb and covers only a third of the mound. The stone formation was found to be intact, dense and regular. The mound cover was approximately 0.5 m above contemporary ground. The type, shape and features of the stone formation and the dense arrangement of stones in the centre and the chamber-like part suggest that this is a mound believed to belong to the Bronze Age (3rd-2nd millennia BC). In addition, the potential burial mounds encountered in K42 and K42(T) are located near turbine locations. It appears that near the lake there was human settlements and they used the area near the above-mentioned WTGs as a graveyard. The survey report recommends that this area 'salt/dry lake' to be monitored by a team of archaeologists during construction and any archaeological finds will be examined on site. This will be useful both in terms of not delaying the construction work and preventing damage to the archaeological monument.

The surrounding area of the Project Site is fairly mountainous and foothill. This area is traditionally a winter pasture for semi-nomadic livestock breeders. Bulk stone formations are found in many places. However, they were collected by contemporary humans as building material and have no archaeological significance.

Mounds, tombs and pottery sites encountered during the walkovers were assessed and identified as potential archaeological sites. It is noteworthy to mention that stones in some places were not scattered randomly but were arranged in the form of a regular pattern. The discovery of pottery near the stones suggests that these were either settlements or tombs.

Monuments that do not have surface markings and may be in deeper layers of soil are more likely to appear in the Khizi-3 project site. Therefore, in accordance with the archaeological procedure, it is important that a certain number of archaeologists monitor the progress of construction in these areas. The archaeologists conducting the observation and monitoring will also regularly inform construction workers about the archaeological procedure and

conduct induction sessions. If monuments of archaeological significance are found in the project site during construction or earthworks, relevant information will be communicated to the Ministry of Culture and the Institute of Archaeology and Ethnography of ANAS.

Final Report issued in July 2021, concluded that the remaining WTGs can be installed as per the planned locations. However, if areas and monuments of archaeological significance are found in the Project Area during construction or earthworks, the Ministry of Culture and the Institute of Archaeology and Ethnography of ANAS will be informed immediately.

The revised layout has taken into consideration the outcome of the surveys and avoided archaeological sites and also excluded the identified WTGs (K39, K39(T), K40 and K43(O)) from the revised WTG layout.

Plate 11-2 Site-38 (WTG K43 (O))



Plate 11-3 Selected Photographs of Findings



Site 32 Potential mound near K43(O)



Site 29 Site of potential burials near K43(O)



Site of a potential mound near K32



Site 24. Potential burial near K32



Grave locations near K42T



Site 37. Potential mound near K39 T

11.3.3 Laydown Area

No archaeological findings were recorded in the laydown area.

11.3.4 Revised Cabling Route

An archaeological survey was undertaken in July 2021 for the revised cabling route connecting the WTGs. No significant finding was recorded with the exception for some randomly scattered pottery shards in the immediate vicinity of these points (shown in Figure below).

Figure 11-3 Location of Pottery Shards



No significant artifacts were found in the immediate vicinity of the areas with electric poles either (five areas have been identified). A small number of pottery shards typical of the Late Middle Ages were found near electrical pylons, which were found to be of low significance

11.3.5 Revised Access Road

The survey included a walkover of the access route covering a width of 50-100 meters width starting from the canal crossing spanning for 5 km (shown in Figure below).

Figure 11-4 Site Access Road Surveyed by Team



The survey identified the following sites (shown in the figures below):

1. Ruins of buildings used for keeping livestock and do not represent any archaeological value. These are semi-constructed and completely run-down buildings, fairly common in the area because this has been used as a summer-winter pasture for many years.

Figure 11-5 Ruins of Buildings



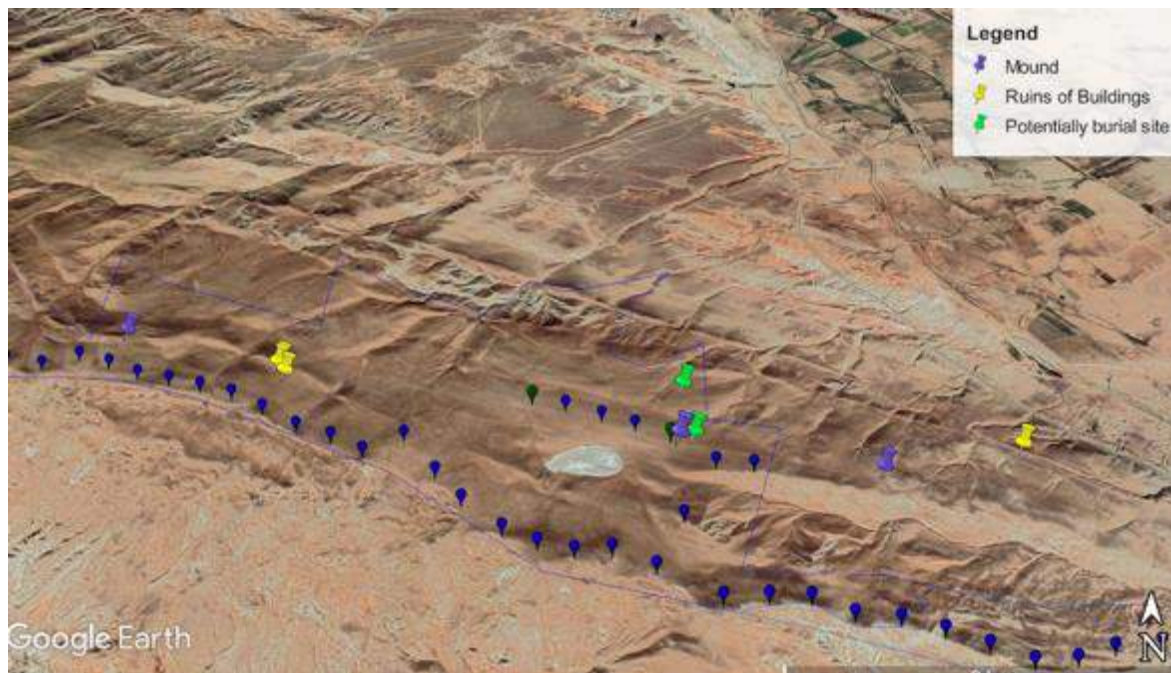
2. Mound location on a high hill, 0.5 m above contemporary surface and 16 meters in diameter. The stone cover represents a regular pattern of small and large rocks. It is located to the right of the road leading to the lake.
3. Potential burial site; fairly common in the area. The stones buried vertically are arranged in a regular pattern located 30-40 m to the right of the road leading to the lake.

4. Remains of Bilhasan village. This village was abandoned in the 1830s and there are remains of more than 50 small houses in an area of about 1.5-2 hectares.

Figure 11-6 4. Remains of Bilhasan Village



Figure 11-7 Access Roads – Archaeological Features



11.3.6 OHTL

As stated in Section 2, the reconnaissance survey undertaken for the preliminary OHTL route from Khizi 3 to Yashma substation, identified features thought to be archaeological, or possibly archaeological (small mounds and circular elements that can be visible). The route has been revised to avoid archeological features and ensure they do not exist within close proximity to revised route.

The archeological survey was undertaken by Academy of Science during the month of July 2021 to investigate and confirm natures of these findings at this location and other potential areas of concern along the route. An area of 30 to 50 m wide along the OHTL route was investigated and no significant archeological findings were identified. The stone formations found in many places are modern while late medieval pottery shards may have been left behind by local herders grazing animals or nomadic wintering families. No significant archeological finds were discovered along the OHTL.

11.3.7 Recommendations by Institute of Archeology and Ethnography of ANAS

The recommendations reported by the Institute of Archaeology and Ethnography of ANAS include:

- The officers from the Institute will carry out archaeological monitoring works in both areas (Absheron and Khizi) during earth works and construction works.
- The earthworks can commence, no archaeological monuments have been identified at revised WTG locations.
- If archaeological monuments are found in sensitive locations during earthworks, their excavation will be carried out by archaeologists immediately. During the construction, technical work should be monitored by the archaeological group and any archaeological monuments found should be examined on site. In order not to delay the project or damage the archaeological monument, the excavation of any discovered monuments on the basis of a predetermined schedule would be the most correct direction.
- The dry/ salt lake area, to be monitored by a team of archaeologists during construction and any archaeological finds will be examined on site. This will be useful both in terms of not delaying the construction work and preventing damage to the archaeological monument.
- Monuments that do not have surface markings and may be in deeper layers of soil are more likely to appear in the Khizi Project Area. Therefore, in accordance with the archaeological procedure, it is important that a certain number of archaeologists monitor the progress of construction in these areas. The archaeologists conducting the observation and monitoring will also regularly inform construction workers about the archaeological procedure and conduct induction sessions.
- If areas and monuments of archaeological significance are found in the Project Area during construction or earthworks, relevant information will be communicated to the Ministry of Culture and the Institute of Archaeology and Ethnography of ANAS.
- In certain cases, it is possible and acceptable to relocate some of the project elements (turbines, cable lines, etc.) to avoid damage to archaeological sites. It is important to excavate places of archaeological significance in cases when elements and objects cannot be moved in a sound manner. All this will benefit the history and archaeology of Azerbaijan as a whole.

11.4 Intangible Cultural Heritage

In order to verify the elements within the communities near the WF, consultations were undertaken with Head of Sitalchay Municipality on 12 May 2022 who confirmed that there are no local customs or traditions associated with using the project site.

11.5 Sensitive Receptors

11.5.1 WF

The Figure and Table below provide a summary of the findings. The sensitivity of the receptors is considered of high to medium importance on a local scale.

Table 11-3 List of all Registered Archaeological Sites

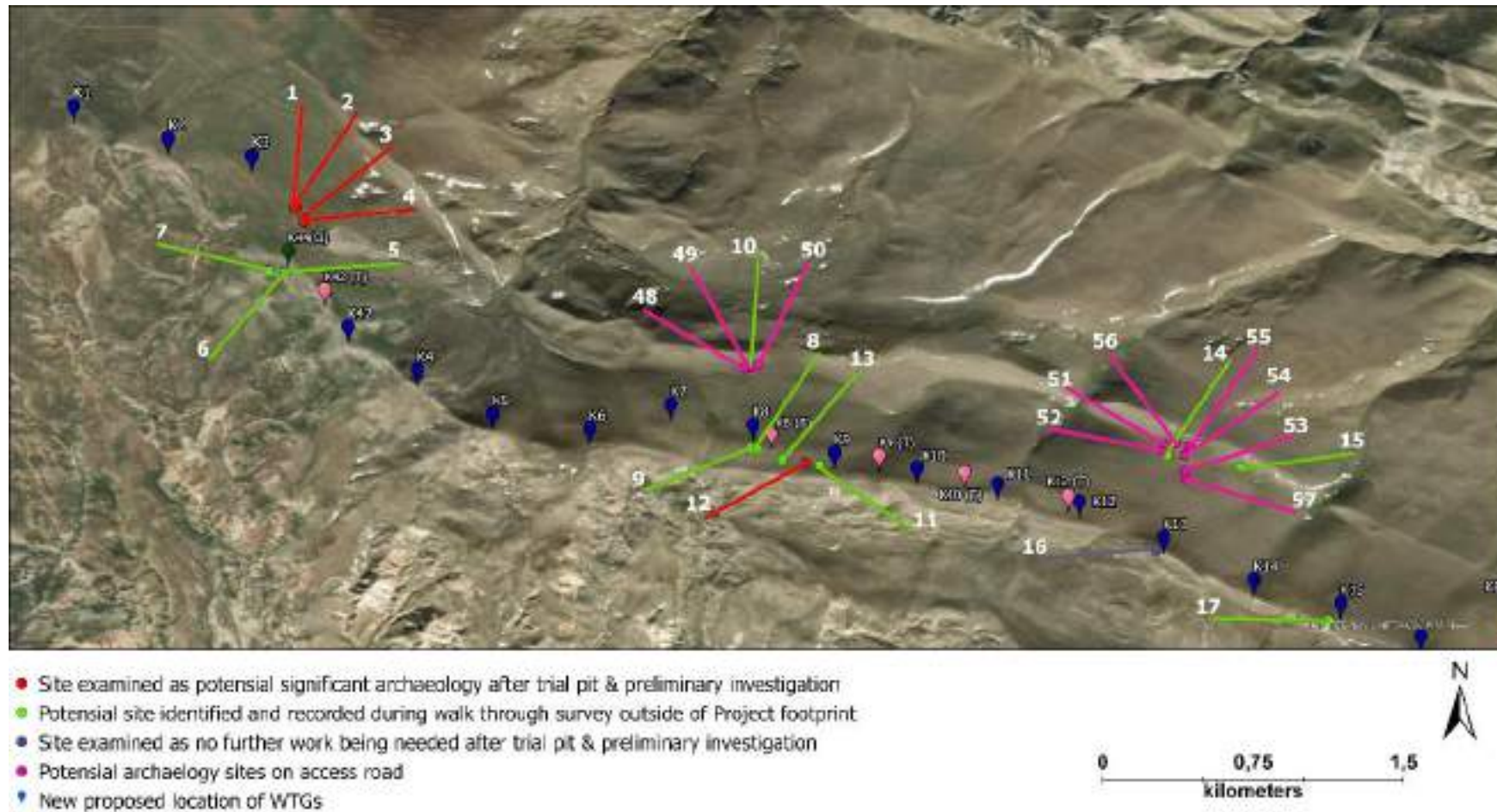
SITE ID	NEAREST REFERENCE TO PROJECT FACILITY	APPROXIMATE LOCATION (REFERENCE TO CLOSEST WTG, ACCESS ROAD OR SUB-STATION)	COORDINATES	SITE DESCRIPTION (BASED ON SURFACE OBSERVATION)
1	K3	239m - SE	355885; 4509583	There are Medieval pottery fragments on the surface. Potential Bronze burial mound. 30 m ² 0.5m height.
2	K3	243m - SE	355894; 4509584	Fragments of Medieval pottery on the surface. Potential Bronze burial mound. 50 m ² , 0.5m height.
3	K3	284m – SE	355921; 4509534	Fragment of Medieval pottery on the surface. Potential Bronze burial mound. 80 m ² , 0.5m height.
4	K3	316m - SE	355921; 4509508	Possible multiple Muslim graves (Post-Medieval modern periods, AD1700-1800s).
5	K 40 (O)	25m-S	355845; 4509262	Potential Bronze/Early Medieval single burial
6	K 40 (O)	30m-S	355842; 4509259	Potential Bronze/Early Medieval single burial
7	K 40 (O)	76m-W	355782; 4509266	Potential Bronze/Early Medieval single burial
8	K 8	36m-SE	357611; 4508351	Potential Early Bronze single burial and Medieval pottery shards.
9	K 8	34m-S	357591; 4508352	Potential Early Bronze single burial.
10	K8	370m-N	357596; 4508756	Potential Early Bronze mound.
11	K9	63m-NW	357846; 4508263	Potential Early Bronze mound.
12	K9	111m-W	357797; 4508276	There are Medieval pottery fragments on the surface. Potential Early Bronze circular mound. The mound is 10m across and from 0.5m to 1m high.
13	K8	144m-SE	357706; 4508291	Potential Early Bronze mound.
14	K12	456m-NE	359163; 4508289	Spreads of post-Medieval pottery fragments. Post-Medieval modern periods (AD1600-1900s) rural settlement
15	K13	515m-NE	359443; 4508217	Post-Medieval modern periods (AD1600-1900s) cemetery

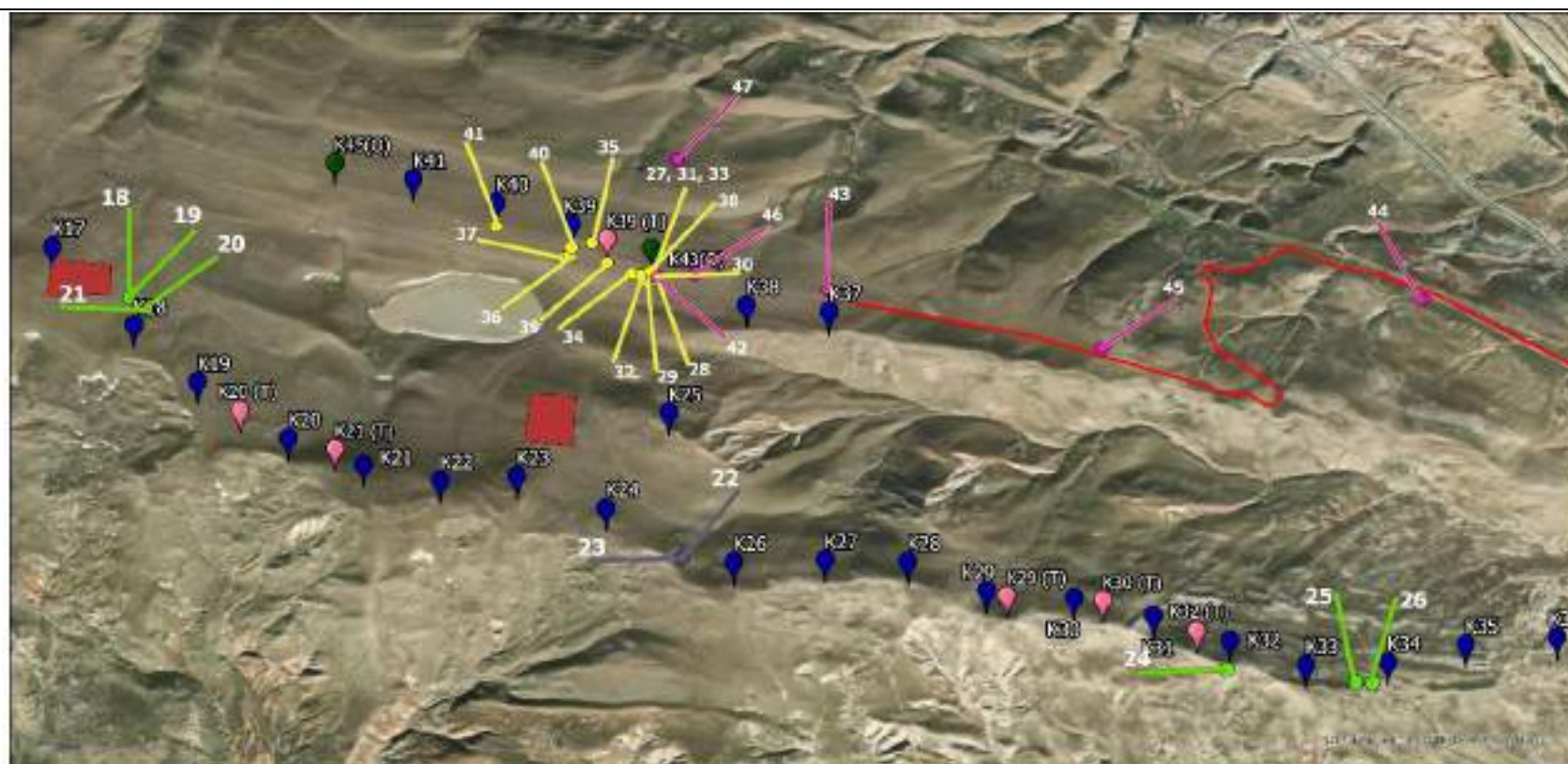
SITE ID	NEAREST REFERENCE TO PROJECT FACILITY	APPROXIMATE LOCATION (REFERENCE TO CLOSEST WTG, ACCESS ROAD OR SUB-STATION)	COORDINATES	SITE DESCRIPTION (BASED ON SURFACE OBSERVATION)
16	K13	34m-W	359113; 4507813	Disrupted potential Bronze Age circular mound. Presence of cast metal rods and dilapidated structure of remains.
17	K 15	51m-W	359759; 4507449	Potential Bronze/Early Medieval single burial
18	K17	327m-E	360740; 4507313	Fragments of Early Bronze pottery and potential Late Bronze (Late second millennium BC)/Early Iron Age (Early first millennium BC) mound. 30-40 m ² , 0.8m height.
19	K 17	332m-E	360748; 4507331	Fragment of Medieval pottery and potential Late Bronze/Early Iron Age mound. 20-25 m ² , 0.6 height.
20	K 18	201m-N	360797; 4507252	Potential Late Bronze (Late second millennium BC)/Early Iron Age (Early first millennium BC) mound. 50 m ² , 1m height.
21	K 18	204m-N	360807; 4507246	Fragments of Early Bronze and Medieval pottery and potential Late Bronze/Early Iron Age mound. 60 m ² , 0.2 height.
22	K 26	244m-NW	362867; 4505945	Remains of foundation stones of small post-Medieval (AD1600-1900s) building. Fragments of post-Medieval (AD1400-1500s) pottery.
23	K 26	251m-NW	362855; 4505940	Remains of foundation stones of small post-Medieval (AD1600-1900s) building. Fragments of post-Medieval (AD1400-1500s) pottery.
24	K 32	41m-S	364976; 4505333	Potential Bronze/Early Medieval single burial
25	K 34	125m-W	365476; 4505262	Potential Bronze/Early Medieval mound
26	K 34	62m-W	365539; 4505255	Potential Bronze/Early Medieval mound
27	K43(O)	24m-S	362776; 4507385	Potential Bronze/Early Medieval mound
28	K43(O)	51m-S	362756; 4507358	Potential Bronze/Early Medieval mound
29	K43(O)	51m-S	362789; 4507367	Potential Bronze/Early Medieval mound

SITE ID	NEAREST REFERENCE TO PROJECT FACILITY	APPROXIMATE LOCATION (REFERENCE TO CLOSEST WTG, ACCESS ROAD OR SUB-STATION)	COORDINATES	SITE DESCRIPTION (BASED ON SURFACE OBSERVATION)
30	K43(O)	42m-SE	362797; 4507386	Potential Bronze/Early Medieval mound
31	K43(O)	25m-S	362771; 4507394	Potential Bronze/Early Medieval mound
32	K43(O)	19m-S	362759; 4507393	Potential Bronze/Early Medieval mound
33	K43(O)	47m-S	362732; 4507388	Potential Bronze/Early Medieval mound
34	K43(O)	79m-SW	362695; 4507397	Potential Bronze/Early Medieval mound
35	K39	82m-NE	362546; 4507558	Potential Bronze/Early Medieval mound
36	K39	50m-S	362458; 4507494	Potential Bronze/Early Medieval mound
37	K39	62m-S	362432; 4507482	Potential Bronze/Early Medieval mound
38	K43(O)	5m-SE	362768; 4507409	Potential Bronze/Early Medieval mound
39	K39 T	7m-S	362600; 4507451	Potential Bronze/Early Medieval mound
40	K39	9m-S	362462; 4507531	Potential Bronze/Early Medieval mound
41	K40	5m-S	362173; 4507648	Potential Bronze/Early Medieval mound
42	K43(O)	5-6m-S	362799; 4507375	Potential Late Bronze & Early Iron mound
43	OHTL area	1350 m East-South from sub-station	363460; 4507299	Fragments of post-Medieval (AD1400-1500s) pottery.
44	Access road	-----	365767; 4507209	Remains of foundation stones of small post-Medieval (AD1600-1900s) building.
45	Access road	-----	364518; 4506978	Potential Bronze Age mound
46	Access road	-----	362942; 4507394	Muslim grave of post-Medieval (AD1600-1700s) period.
47	Access road	-----	362887; 4507974	Muslim grave of post-Medieval (AD1600-1700s) period.

SITE ID	NEAREST REFERENCE TO PROJECT FACILITY	APPROXIMATE LOCATION (REFERENCE TO CLOSEST WTG, ACCESS ROAD OR SUB-STATION)	COORDINATES	SITE DESCRIPTION (BASED ON SURFACE OBSERVATION)
48	Access road	-----	357596; 4508757	Potential Late Bronze & Early Iron Mound
49	Access road	-----	357574; 4508752	Potential Late Bronze & Early Iron mound
50	Access road	-----	357624; 4508762	Potential Late Bronze & Early Iron mound
51	Access road	-----	359161; 4508340	Remains of foundation stones of small post-Medieval (AD1600-1900s) building.
52	Access road	-----	359145; 4508312	Remains of foundation stones of small post-Medieval (AD1600-1900s) building.
53	Access road	-----	359230; 4508205	Remains of foundation stones of small post-Medieval (AD1600-1900s) building.
54	Access road	-----	359229; 4508286	Remains of foundation stones of small post-Medieval (AD1600-1900s) building.
55	Access road	-----	359248; 4508331	Remains of foundation stones of small post-Medieval (AD1600-1900s) building.
56	Access road	-----	359199; 4508345	Remains of foundation stones of small post-Medieval (AD1600-1900s) building.
57	Access road	-----	359231; 4508168	Remains of foundation stones of small post-Medieval (AD1600-1900s) building.
58	K18	324 m -N	360814; 4507378	Fragments of Early Bronze and Medieval pottery
59	K42(T)	8 m – SW	355984; 4509086	Grave
60	K42	7 m – SW	356068; 4508901	Mound

Figure 11-8 Archaeological Sites Locations (based on Old Layout)





- Potential site identified and recorded during walk through survey outside of Project footprint
- Site examined as no further work being needed after trial pit & preliminary investigation
- Potential Mound locations
- Potential archaeology sites on access road
- New proposed location of WTGs
- Proposed Sub-station locations
- Access road



Figure 11-9 Archaeological Sites Locations (based on current Layout)



11.6 Potential Impacts, Mitigation, Management & Residual Impact

11.6.1 WF Design

The Archaeology survey identified areas that included regular stone formations, vertical and concentric places reminiscent of burials, remains of dwellings and mound-type monuments located within close proximity (within 15 m radius) to WTG K39, K39 (T), K43 (O) and K41) (Site ID 27 to 41 as shown in Table and Map above. The identified archaeological sites can be damaged if siting of WTGs does not take into consideration the above.

As stated above, the WF layout has been revised based on the outcome of the surveys and avoided the areas determined by the Academy as potential risk. Therefore, the magnitude of impact is considered minor to moderate.

11.6.2 Construction Phase

The surveys undertaken to date identified 65 sites within the project area. Based on the survey findings, all archaeological sites were found by the survey team to be of local significance. No sites of national or international significance were identified throughout the survey.

The highest sensitive area identified is the area around the dry lake where remains of a human settlement and potential graves with surface signs and three burial mounds have been identified as discussed above.

The presence of archaeological features is high and construction activities undertaken at the Project site have the potential to damage or impact these archaeological sites. To prevent unnecessary damage during construction, these should be marked and fenced off (temporarily) by EPC Contractor, to ensure equipment and construction activities do not encroach onto the known archaeological sites.

As required by the Ministry of Culture and Tourism, a number of archaeologists will be available during construction and monitor the progress of construction in these areas. The archaeologists conducting the observation and monitoring will also regularly inform construction workers about the archaeological procedure and conduct induction sessions. The archaeologists conducting the observation and monitoring will also regularly inform construction workers about the archaeological procedure and conduct induction sessions. If monuments of archaeological significance are found in the project site during construction or earthworks, relevant information will be communicated to the Ministry of Culture and the Institute of Archaeology and Ethnography of ANAS.

An archaeological watching brief should be implemented throughout the construction phase, so that appropriate action can be taken in the event of any other archaeological sites being discovered during construction.

Land clearance, excavation and earthwork activities has the potential to impact unknown or unmarked archaeological finding. The construction of the WF project will require a small amount of land clearance and will be limited to WTG foundation, substation, road and cable route, areas. Discovery of archaeological is very likely, given the archaeological findings identified within the project area. This could lead to damage, destruction and loss of archaeological artefacts of conservation value.

Likewise, construction activities undertaken beyond the site boundary have the potential to impact archaeological or cultural items in proximity to project site.

As required by the Academy of Science and in line with national requirement, officers from the Academy to undertake monitoring during the excavation and construction work.

A "Chance Find Procedure" will however be incorporated within the project CESMP such that in the unlikely event any items of archaeological significance are discovered, these can be appropriately managed by archaeological experts and identified, recovered and preserved in coordination with the relevant government authorities.

With adequate planning and application of mitigation measures and implementation of watching brief and Chance Find Procedure by EPC Contractor, impacts on archaeological sites during construction should be avoidable and magnitude of impacts will be negligible to minor.

OHTL

The presence of archaeological features is possible and construction activities undertaken may have the potential to damage or impact any identified archaeological features along the route. To prevent unnecessary damage during construction, these should be marked and fenced off (temporarily) by EPC Contractor, to ensure equipment and construction activities do not encroach onto the known archaeological sites.

Excavation and earthwork activities can result in damage and destruction of any undiscovered archaeological artefacts.

A chance find procedure will however be incorporated within the project CESMP such that in the unlikely event any items of archaeological significance are discovered, these can be appropriately identified and preserved.

IMPACT ON INTANGIBLE CULTURAL HERITAGE

Elements of intangible cultural heritage in Azerbaijan are identified above. Intangible cultural heritage does not have a fixed location or discrete boundaries and it is embedded in

traditional residential and economic patterns and widely shared. Intangible culture can also be subject to loss under changing socio-economic conditions and if there is an influence from another culture. In consideration of this, the Project could potentially induce social change and introduce new cultural influences especially from the workforce recruited from outside of Azerbaijan. This could result into tensions between the workers and locals.

However, this impact is expected to be minor because the interaction between the workers and local communities will be very limited and a code of conduct will be implemented to guide worker interaction with the local communities.

Table 11-4 Archaeology and Cultural Heritage Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction (WF, Access Roads and Cable Routes, Laydown, etc)

IMPACTS	MAGNITUDE OF IMPACTS	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Impact to existing/ known archaeology and/cultural items	Moderate	60 archaeological sites	High	Moderate to Major	Construction: - As required by the Academy of Science and in line with national requirement, officers from the Academy to undertake monitoring during the excavation and construction work. - The dry/ salt lake area, to be monitored by a team of archaeologists during construction and any archaeological finds will be examined on site. - As required by the Institute of Archaeology and Ethnography of ANAS, a number of archaeologists will be available during construction and monitor the progress of construction in these areas. The archaeologists conducting the observation and monitoring will also regularly inform construction workers about the archaeological procedure and conduct induction sessions. The archaeologists conducting the observation and monitoring will also regularly inform construction workers about the archaeological procedure and conduct induction sessions. If monuments of archaeological significance are found in the project site during construction or earthworks, work should be stopped and Ministry of Culture and Academy of Science should be immediately informed. - A Cultural Heritage Management Plan will be developed prior to the construction and the start of the start of site earthworks, as part of / or alongside the CESMP. The plan to include the	Minor to Moderate

IMPACTS	MAGNITUDE OF IMPACTS	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					mitigation measures based on this ESIA in order to reduce and mitigate any adverse impacts on the cultural heritage, along with the implementation schedule and required budget. - To prevent unnecessary damage during construction, the archaeological sites will be marked and fenced off (temporarily) by EPC Contractor, to ensure equipment and construction activities do not encroach onto the known archaeological sites. - The Project workforce will be instructed not to interact or disturb any sites of archaeological or cultural importance. - The EPC will receive induction training on the importance of the cultural heritage and archaeology of the Project area. - EPC Contractor to ensure that trained and qualified personnel are available to oversee the implementation of mitigation measures, and that any sub-contractors working on the project have the necessary skills and expertise and are managed and monitored in accordance with national and Lender's requirements.	
Accidental destruction of unknown archaeological resources buried within the Project site	Minor Negative	Unknown Buried archaeological artefacts or remains	High	Minor to Moderate	- An archaeological 'Chance Find Procedure' will be developed prior to construction and the start of site and access road earthworks, as part of the CESMP. This will include protocols and procedures to stop work and methods preserve potential finds, as well as reporting requirements and co-ordination with Academy of Science and Ministry of Culture and Tourism. - Where artefacts or archaeological remains are encountered, the site will be clearly signed/delineated with high visibility flagging to impede access and	Minor

IMPACTS	MAGNITUDE OF IMPACTS	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					prevent any damage or loss of the artefacts which have just been found. - Relevant regional government bodies and the Academy of Science and Ministry of Culture and Tourism will be notified immediately in case of any archaeological remains find. - Raising awareness among construction workers of the actions required if they uncover any likely historical artefacts during site excavations. Also, to be informed during morning toolbox meeting about any suspected archaeological finds to avoid disturbance. - Removal of any archaeological artefacts from the site-by site workers will be strictly prohibited.	
Impact on intangible cultural heritage	Minor Negative	Communities who practise elements such as Nawrouz, making dolma, etc	High	Minor to Moderate	- The workers Code of Conduct will include measures regarding respect of beliefs, customs, rituals of local communities. - Interaction between the workers and the local communities will be kept to a minimum in order to avoid misunderstandings or conflict. - The EPC Contractor will demonstrate that all efforts have been put in place to recruit workers from local communities i.e., advertising job opportunities locally, using local registered employment agencies etc.	Minor

Table 11-5 Archaeology and Cultural Heritage Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction (OHTL)

IMPACTS	MAGNITUDE OF IMPACTS	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Impact to existing/ known archaeology	Moderate	Aboveground archaeological features along the route	High/ Medium	Moderate to Major	A Cultural Heritage Management Plan will be developed prior to the construction and the start of the start of site earthworks, as part of / or alongside the CESMP. The plan to include the mitigation measures based on this ESIA in order to reduce and	Minor

IMPACTS	MAGNITUDE OF IMPACTS	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
and/cultural items					mitigate any adverse impacts on the cultural heritage, along with the implementation schedule and required budget. - To prevent unnecessary damage during construction, the archaeological sites will be marked and fenced off (temporarily) by EPC Contractor, to ensure equipment and construction activities do not encroach onto the known archaeological sites. - The Project workforce will be instructed not to interact or disturb any sites of archaeological or cultural importance. - The EPC will receive induction training on the importance of the cultural heritage and archaeology of the Project area. - EPC Contractor to ensure that trained and qualified personnel are available to oversee the implementation of mitigation measures, and that any sub-contractors working on the project have the necessary skills and expertise and are managed and monitored in accordance with national and Lender's requirements. - As required by the Ministry of Culture and Tourism, if monuments of archaeological significance are found in the project site during construction or earthworks, work should stop and Ministry of Culture and Academy of Science should be contacted.	
Accidental destruction of unknown archaeological resources buried along the OHTL route.	Minor Negative	Unknown belowground archaeological artefacts or remains	Medium	Minor to Moderate	- As required by the Academy of Science and in line with national requirement, officers from the Academy to undertake monitoring during the excavation and construction work. - An archaeological 'Chance Find Procedure' will be developed prior to construction and the start of earthworks, as part of the CESMP. This will include protocols and procedures to stop work and methods	Negligible

IMPACTS	MAGNITUDE OF IMPACTS	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					preserve potential finds, as well as reporting requirements and co-ordination with relevant government authorities. - 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 just been found. - Contractor crew to be informed during morning toolbox meeting about any suspected archaeological finds to avoid disturbance. - Removal of any archaeological artefacts found along the OHTL route by site workers is strictly prohibited.	

11.6.3 Operation Phase

WF

The operational phase will not result in further impacts to archaeology, as the site will be static and further excavations will not be required. However, during maintenance and operation activities, main concern is to ensure archaeological sites are not damaged by O&M staff. This includes vehicle collision when commuting between WTGs and different components during in the event of off-roading and not using the service road. A cultural management plan to be developed as part of the operational ESMS to include locations and procedures to ensure protection of these archaeological sites.

OHTL

The operational phase will not result in further impacts to archaeology.

Table 11-6 Archaeology and Cultural Heritage Impact Significance, Mitigation & Management Measures and Residual Impacts - Operation

IMPACTS	MAGNITUDE OF IMPACTS	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Impact to existing archaeology and/cultural items	Minor	65 archaeological sites	High	Minor to Moderate	- A Cultural Management Plan will be developed to include locations and procedures to ensure protection of these archaeological sites. - To prevent unnecessary damage during O&M, the archaeological sites will be marked, to ensure O&M and commuting within WTGs impact or damage these sites. - The Project workforce will be instructed not to interact or disturb any sites of archaeological or cultural importance. - The O&M staff will receive induction training on the importance of the cultural heritage and archaeology of the Project area. - Strict speed controls and ban against driving outside of delineated roads - In the event of any damage, the Academy of Science and Ministry of Culture and Tourism will be informed immediately.	Minor

11.7 Monitoring

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'.

Table 11-7 Cultural Heritage - Monitoring Requirements

MONITORING	PARAMETER	FREQUENCY & DURATIONS	MONITORING LOCATION
Construction			
Archaeological Resources & Artefacts	Undiscovered archaeological remains within the Project site	Daily continued visual observations by Archaeologists and site staff involved in excavations. Academy of Science officers to monitor during excavation and construction works in accordance with Final Letter issued for the Project by Academy of Science	The Project area requiring excavations, earthworks or grading.
	Existing or known archaeological sites identified especially around dry/Salt Lake area	Daily continued visual observations by Archaeologists and site staff involved in excavations and as required by Ministry of Culture, specialized	60 archaeological sites identified by the surveys Particular focus at the dry/ Salt Lake area, to be monitored by a team of archaeologists during construction and any archaeological finds will be examined on site.
Operation			
Archaeological Resources & Artefacts	Archaeological sites within the Project area	Weekly visual observations by O&M staff while carrying out any maintenance activities	Known archaeological sites within close proximity to WF as shown in Maps above.

12 LANDSCAPE & VISUAL AMENITY

12.1 Standards and Regulatory Requirements

12.1.1 National Requirements

Specific legislation in regard to landscape and visual impacts is not known to exist in Azerbaijan, however, Azerbaijan is a signatory member of the European Landscape Convention which promotes the protection, management and planning of the landscapes and organises international co-operation on landscape issues. Azerbaijan has ratified Convention and came into force in 2011 (European Landscape Convention of the Council of Europe / Official website, 2020).

12.1.2 Lenders Requirements

EBRD has requirements relating to Landscape and Visual Impacts in their "E&S Eligibility Criteria for On-Shore Wind Power Projects", the eligibility criteria, relating to EBRD Performance Requirement 4 & 6, state that:

- Turbines should not create significant changes in the landscape fabric, character and quality as a result of development.
- Turbines and any ancillary structures should be constructed so as to minimise visual impacts.
- The Turbines should not significantly alter the appearance of the landscapes (where the turbine can be seen) and negatively affect people, or people's use of that landscape.

Shadow Flicker

Considerations to landscape and visual impacts are however included to the IFC EHS Guidelines for Wind Energy (2015), which include impacts upon landscape character, 'viewscales' of visual receptors and shadow flicker.

With specific regard to shadow flicker, the IFC EHS Guidelines for Wind Energy (2015) provide particular guidance on this matter. Paragraph 39 of the Guideline states:

'If it is not possible to locate the wind energy facility/turbines such that neighbouring receptors experience no shadow flicker effects, it is recommended that the predicted duration of shadow flicker effects experienced at a sensitive receptor not exceed 30 hours per year and 30 minutes per day on the worst affected day, based on a worst-case scenario'.

Paragraph 40 states:

'Prevention and control measures to avoid significant shadow flicker impacts include the following:

- Site wind turbines appropriately to avoid shadow flicker being experienced or to meet limits placed on the duration of shadow flicker occurrence, as set out in the paragraph above.
- Wind turbines can be programmed to shut down at times when shadow flicker limits are exceeded.'

12.1.3 Guidelines

The Landscape and Visual Impact Assessment (LVIA) methodology is based on current best practices, guidelines and guidance from the following sources:

- 'Guidelines for Landscape and Visual Impact Assessment', Landscape Institute (LI) and Institute of Environmental Management and Assessment (IEMA), Third Edition, 2013;
- 'Environmental, Health and Safety Guidelines for Wind Energy', International Finance Corporation (IFC), August 2015;
- 'An Approach to Landscape Character Assessment', Natural England, 2018;
- 'Assessing the Cumulative Impact of Onshore Wind Energy Developments', Scottish Natural Heritage, (2012);

12.2 Area of Influence, Baseline, and Sensitive Receptors

12.2.1 Desktop Study

The aim of the desktop study is to identify aspects of the landscape and visual resource that are considered in the Landscape and Visual Impact Assessment, including:

- Topography and landform, land cover, distribution and type of land use;
- Vegetation distribution and variation;
- Development / settlement patterns and scale;
- Transport routes including surfaced roads and principal unsurfaced tracks;
- Touristic / recreational destinations; and
- Landscape character typology and specific viewpoints.

The desktop study also utilised Geographic Information System (GIS) data to explore the potential visibility of the Project.

12.2.2 Fieldwork Survey

The landscape and visual field survey was conducted in June 2021. The survey consisted of:

- Ground-truthing landscape characteristics identified in the desktop study and analysing the study area for features that contribute to the landscape character. Subsequently, landscape character areas (LCAs) were determined;
- Taking panoramic photos from the verified viewpoints that were selected in the desktop study. Panoramas were taken from a variety of distances from the Project site in periods of good visibility; and
- Driving along the key transport routes in the study area to consider effects that the development of the Project would have upon landscape character and visual amenity.

12.2.3 Landscape Baseline

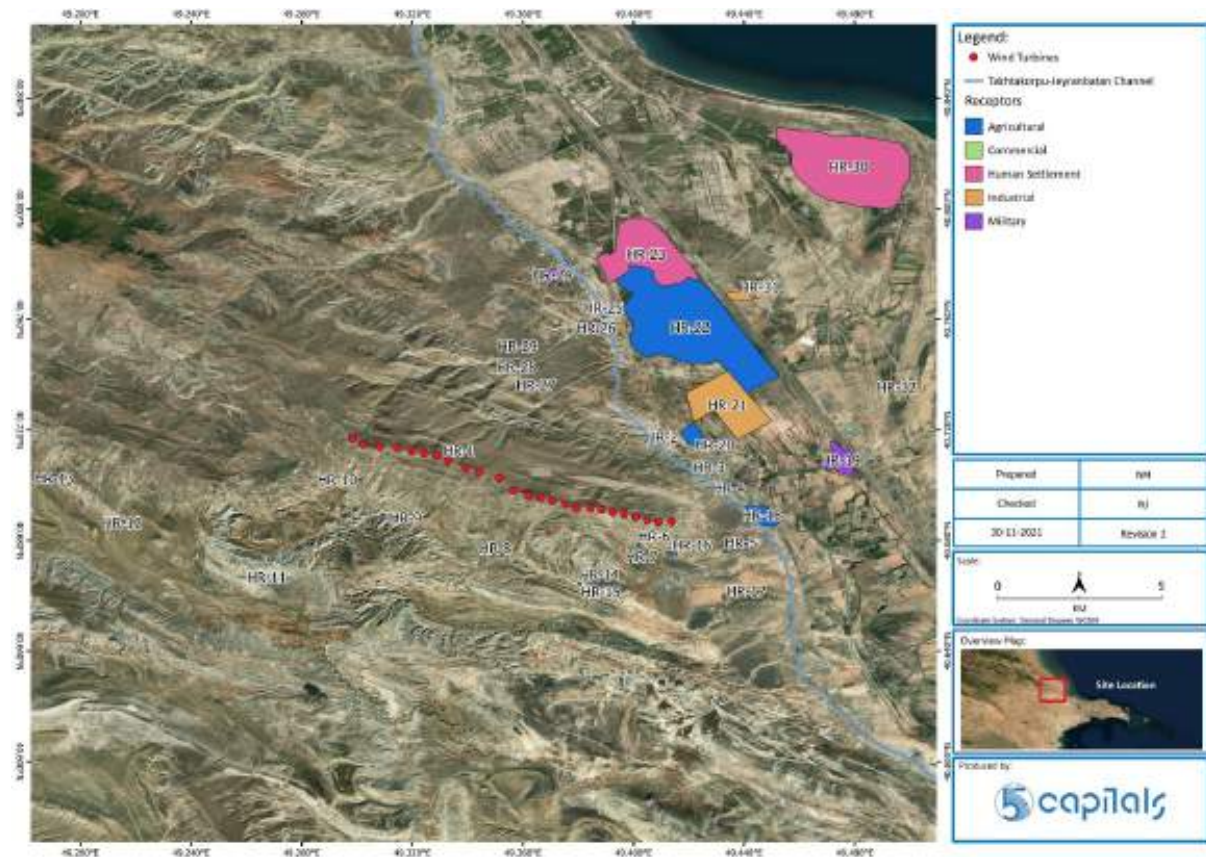
The landscape baseline forms the basis for the identification and description of the changes that may occur to the character of the landscape as a result of the construction and operation of the Project.

The following subsections highlight different elements and attributes which determine the landscape baseline within the study area.

Land Use and Cover

Land use at the site and surrounding areas is typical agricultural land use. The majority of development is concentrated near / next to the M1 highway which connects the area to Baku. There are villages such as Sitalchay and Shurabaad which are covered in the next subsection. There are two existing wind farms, the Yashma Wind Farm and a smaller, two turbine pilot project wind farm, these are located on either side of the M1. There are also areas designated for the military in the surrounding areas.

Figure 12-1 Site and Surrounding Areas Land Use



Settlements

Settlements are congregated along the M1 highway that connects the area to Baku. These settlements include Sitalachy, Gilazi and Shuraabad. These settlements are typically focused on agriculture and buildings are limited to one story.

Landform and Topography

The topography in the study area is varied as it ranges from the flatter coastal plain to the undulating hills and mountains of the Khizi region. The elevation ranges from around 1 m to over 700 m.

Vegetation

The dominant vegetation within the study area is grassland. There are not interesting variations in vegetation cover. There are planted trees along the M1 highway.

Access

The main access road in the study area is the M1 highway connecting the region to Baku. There are poorly constructed and maintained roads within the settlements. There is a dirt track to the south-west of the site that passes through the undulating hills.

Hydrology

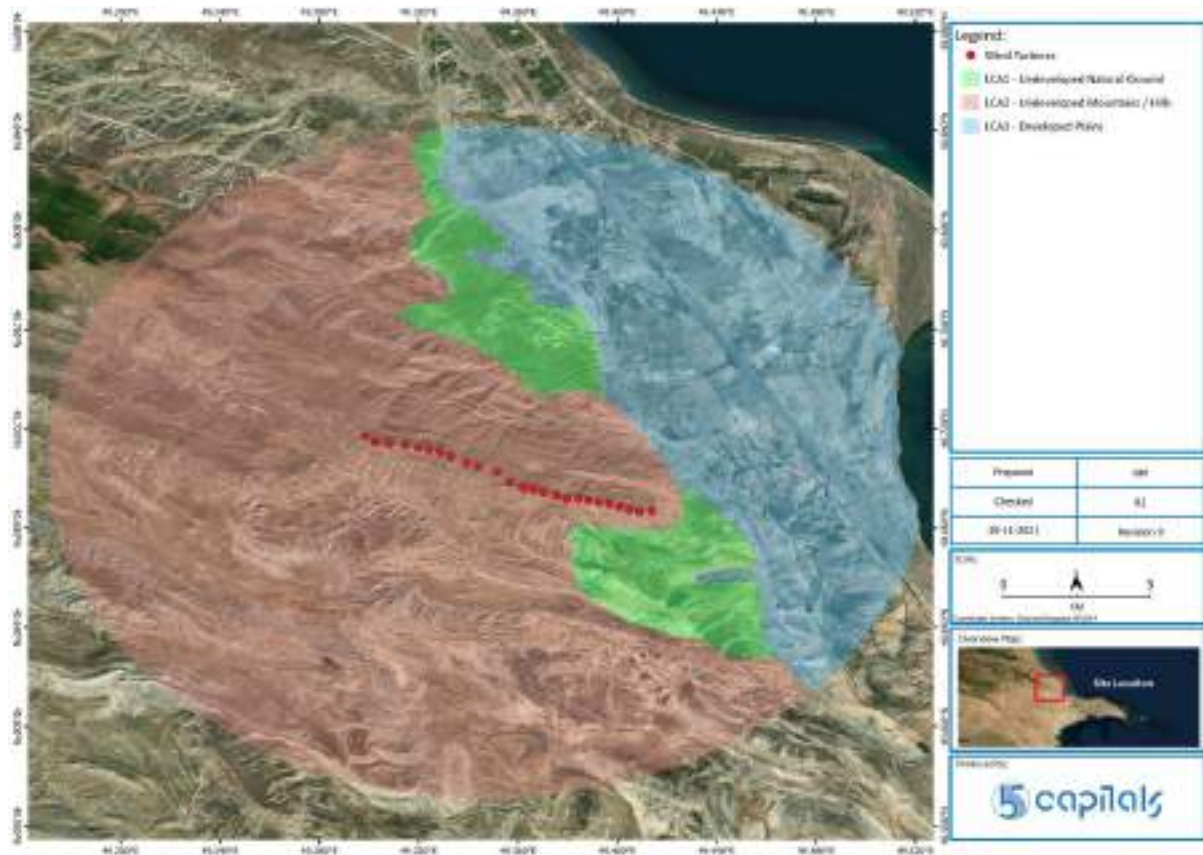
The study area is flanked to the north and east by the Caspian Sea. Hydrology closer to the site is limited to the man-made water channel.

A landscape receptor is a defined aspect of the landscape that has the potential to be affected by a development. Through a combination of desktop study and fieldwork survey the landscape is classified into units of distinct and broadly homogenous characteristics referred to as Landscape Character Areas (LCAs). Within the study area there are three distinct LCAs. The three LCAs are shown in the following table and figure.

Table 12-1 Landscape Character Areas

ID	Name	Description	Value	Sensitivity
LCA 1	Undeveloped Natural Ground	Generally undeveloped and undisturbed, however, flat ground which does not have the distinct character of the neighbouring hills and mountains.	The area lacks any recognised features of local or national value and has few distinctive characteristics. The landscape is often untouched but without interesting features, it is of low value.	Low
LCA 2	Undeveloped Hills / Mountain	The undulating hills and mountainous areas of the study area are typically undeveloped and untouched.	There are no valued features in this LCA except for the landform itself. It is entirely undeveloped and the rugged wilderness is in good condition. It is a landscape of medium value.	Medium
LCA 3	Developed Plains	The flatter, lower elevation plains that extend towards the coastline and Baku are developed with a variety of land use relating to settlements, agriculture, industry and military.	The area lacks any recognised features of local or national value and has few distinctive characteristics. Existing industrial uses and busy roads are notable detracting features. It is considered to be of low value.	Low

Figure 12-2 Landscape Character Areas



12.2.4 Visual Amenity Baseline

The visual baseline establishes the area in which the Project may be visible, the nature of the views and amenity value attributed to the views. Viewpoint locations were established through desktop research of the existing environment including the Site and surrounding landscape. The desktop selection of viewpoints is then verified through fieldwork, to confirm or discount visibility towards the Project. Some viewpoints have still been included even though they do not have a view of the Project due to obstructions that were not present in GIS database, they have been included for reference and to give an understanding to the Project's surrounding areas.

The visual assessment is based on views from external spaces within the public domain and not from inside buildings or private spaces. The viewpoints are shown in the following figure.

Figure 12-3 Viewpoint Locations



Table 12-2 Viewpoint Locations

Viewpoint ID	Coordinates	Description
KLV1	40.65752 49.52336	View of site as driving north from Baku. Industrial feel with railway and transmission lines.
KLV3	40.74630 49.45061	On the roadside with a view of the existing wind farm, the road is extremely busy. Agricultural receptors are on the other side of the road.
KLV4	40.77127 49.39154	Sitalchay village - human settlement, industry, agriculture, abandoned infra, cattle farm, photos of area
KLV6	40.66098 49.43235	Poultry farm, flat plains with mountains in background
KLV7	40.65517 49.36050	Track through the mountains, surrounded by undulating hills
KLV8	40.66962 49.22406	Track through flat plains with low shrubs on either side.
KLV9	40.63757 49.31152	Track through undulating hills.
KLV10	40.64566 49.32830	As driving along the dirt track the view opens up with a view of plains and mountains

A photographic record of each of the viewpoints is presented to illustrate the baseline views. All baseline photographs comprise high resolution images taken with a digital single-lens reflex (SLR) full frame sensor camera with a 50 mm lens. The camera location and details of each viewpoint were recorded.

The following table outlines the composition of views from each of the viewpoints and the likely receptors at the viewpoint locations.

There are no receptors that are considered to be 'critical visual receptors'; there are no receptors with a key interest or expectation of enjoying the view. There are no local national historic sites where the visitors could be considered critical receptors nor are there any touristic sites or recreational destinations nearby where the views of the project area are valued either locally, nationally or internationally.

Table 12-3 KLV1

Viewpoint ID	Visual Receptors and Sensitivity	Description of View														
KLV1	Motorists travelling north on the M1. Sensitivity: Low	The view is largely obstructed by fencing, vegetation, industrial infrastructure including a railway line and overhead transmission line. On days of good visibility, some of the turbines would likely be partially visible in the background.														
<table><tr><td>Distance from the wind turbines</td><td>Approximately 8-10 km</td></tr><tr><td>Survey Date</td><td>12th June 2021</td></tr><tr><td>Coordinates and UTM</td><td>49N 0m to 50N 10m, 500000m to 500100m</td></tr><tr><td>Characteristics</td><td>200 Degrees East/West</td></tr><tr><td>Frequency</td><td>RM</td></tr><tr><td>Checked by</td><td>AC</td></tr><tr><td>10-05-2021</td><td>Revision 0</td></tr></table>  capitals			Distance from the wind turbines	Approximately 8-10 km	Survey Date	12th June 2021	Coordinates and UTM	49N 0m to 50N 10m, 500000m to 500100m	Characteristics	200 Degrees East/West	Frequency	RM	Checked by	AC	10-05-2021	Revision 0
Distance from the wind turbines	Approximately 8-10 km															
Survey Date	12th June 2021															
Coordinates and UTM	49N 0m to 50N 10m, 500000m to 500100m															
Characteristics	200 Degrees East/West															
Frequency	RM															
Checked by	AC															
10-05-2021	Revision 0															

Table 12-4 KLV3

Viewpoint ID	Visual Receptors and Sensitivity	Description of View
KLV3	Motorists travelling on the M1. Agricultural receptors on the other side of the road Sensitivity: Low	The view of the Project will largely be obstructed by the existing wind farm, in addition to fencing, industrial infrastructure and vegetation. On days of good visibility, the turbines would likely be visible in the background.



Distance from Nearest Turbine	Approximately 7 km
Survey Date	11F July 2023
Camera and Lens	NIKON D750 with 50mm lens
Orientation	230 Degrees Southwest
Prepared	NA
Checked	AC
15-07-2023	Benjamin D



Table 12-5 KLV4

Viewpoint ID	Visual Receptors and Sensitivity	Description of View														
KLV4	Residents of Sitalchay village. Sensitivity: Medium	The view would feature the existing wind farm in addition to the Project. There is interesting variation in topography ranging from flat coastal plains to mountains.														
																
<table><tr><td>Distance from Nearest Turbine</td><td>Approximately 7.2 km</td></tr><tr><td>Survey Date</td><td>1st July 2021</td></tr><tr><td>Camera and Lens</td><td>NIKON D750 with 50mm lens</td></tr><tr><td>Orientation</td><td>200 Degrees South</td></tr><tr><td>Prepared</td><td>NM</td></tr><tr><td>Checked</td><td>IC</td></tr><tr><td>12-07-2021</td><td>Revision 0</td></tr></table>		Distance from Nearest Turbine	Approximately 7.2 km	Survey Date	1st July 2021	Camera and Lens	NIKON D750 with 50mm lens	Orientation	200 Degrees South	Prepared	NM	Checked	IC	12-07-2021	Revision 0	
Distance from Nearest Turbine	Approximately 7.2 km															
Survey Date	1st July 2021															
Camera and Lens	NIKON D750 with 50mm lens															
Orientation	200 Degrees South															
Prepared	NM															
Checked	IC															
12-07-2021	Revision 0															
																

Table 12-6 KLV6

Viewpoint ID	Visual Receptors and Sensitivity	Description of View
KLV6	Workers at the poultry farm Sensitivity: Low	This viewpoint will have an unobstructed view of the Project with the flat plains extending before the mountains in the background.

	
Distance from nearest Turbine	Approximately 3.2 km
Survey Date	1st July 2021
Camera and Lens	Mitakon D750 with 50mm lens
Orientation	310 Degrees Northwest
Prepared	NM
Checked	B.C.
13-07-2021	Revision 0

Table 12-7 KLV7

Viewpoint ID	Visual Receptors and Sensitivity	Description of View														
KLV7	Motorists using dirt track through mountains – unlikely to be used if not for Project purposes. Sensitivity: n/a	This viewpoint will have a view of flat grassland plains with low shrub cover. The mountains are visible in the background and the Project will be visible on days of good visibility. Although the viewpoint is taking from a dirt track. There are no visual receptors in this area.														
<table><tr><td>Distance from Nearest Turbine</td><td>Approximately 4.3 km</td></tr><tr><td>Survey Date</td><td>1st July 2021</td></tr><tr><td>Camera and Lens</td><td>Nikon D750 with 50mm lens</td></tr><tr><td>Orientation</td><td>330 Degrees North</td></tr><tr><td>Prepared</td><td>HM</td></tr><tr><td>Checked</td><td>EC</td></tr><tr><td>12-07-2021</td><td>Revision 0</td></tr></table> 			Distance from Nearest Turbine	Approximately 4.3 km	Survey Date	1st July 2021	Camera and Lens	Nikon D750 with 50mm lens	Orientation	330 Degrees North	Prepared	HM	Checked	EC	12-07-2021	Revision 0
Distance from Nearest Turbine	Approximately 4.3 km															
Survey Date	1st July 2021															
Camera and Lens	Nikon D750 with 50mm lens															
Orientation	330 Degrees North															
Prepared	HM															
Checked	EC															
12-07-2021	Revision 0															

Table 12-8 KLV8

Viewpoint ID	Visual Receptors and Sensitivity	Description of View														
KLV8	Motorists using dirt track through mountains – unlikely to be used if not for Project purposes. Sensitivity: n/a	This viewpoint will have a view of flat grassland plains with low shrub cover. The undulating hills and mountainous area is visible in the background and the Project will be visible on days of good visibility. Although the viewpoint is taking from a dirt track, there are no visual receptors in this area.														
<table><tr><td>Distance from Nearest Subline</td><td>Approximately 8.5 km</td></tr><tr><td>Survey Date</td><td>1st July 2021</td></tr><tr><td>Camera and Lens</td><td>NACON D750 with 500mm lens</td></tr><tr><td>Orientation</td><td>80 Degrees Northward</td></tr><tr><td>Prepared</td><td>NM</td></tr><tr><td>Checked</td><td>BC</td></tr><tr><td>12-07-2021</td><td>Revision 0</td></tr></table> 			Distance from Nearest Subline	Approximately 8.5 km	Survey Date	1st July 2021	Camera and Lens	NACON D750 with 500mm lens	Orientation	80 Degrees Northward	Prepared	NM	Checked	BC	12-07-2021	Revision 0
Distance from Nearest Subline	Approximately 8.5 km															
Survey Date	1st July 2021															
Camera and Lens	NACON D750 with 500mm lens															
Orientation	80 Degrees Northward															
Prepared	NM															
Checked	BC															
12-07-2021	Revision 0															

Table 12-9 KLV9

Viewpoint ID	Visual Receptors and Sensitivity	Description of View
KLV9	Motorists using dirt track through mountains – unlikely to be used if not for Project purposes. Sensitivity: n/a	This viewpoint is located in an area of undulating hills on the dirt track. The difference in topography evident in the view make the area interesting and the area is undisturbed apart from the dirt track.



Distance from Madinet Turbine	Approximately 7.5 km
Survey Date	1st July 2021
Camera and Lens	NIKON D750 with 50mm lens
Orientation	10 Degrees Northeast
Prepared	NA
Checked	BC
12-07-2021	Revision 0





Table 12-10 KLV10

Viewpoint ID	Visual Receptors and Sensitivity	Description of View
KLV10	Motorists using dirt track through mountains – unlikely to be used if not for Project purposes. Sensitivity: n/a	When travelling along the dirt track, after ascending a small hill the viewpoint opens up to an impressive view of the flat plains with the mountains in the background. The Project will clearly be visible in contrast to the undeveloped nature of the view.



Distance from Nearest Turbine	Approximately 6.3 km
Survey Date	11/1/2021
Camera and Lens	NIKON D750 with 50mm lens
Orientation	10 Degrees northeast
Prepared	N/A
Checked	HC
15-07-2021	Revision 0



12.2.5 Lighting

A baseline lighting survey was conducted in July 2021 in order to understand local sky brightness and existing light sources at the Project site and surrounding areas.

A Nikon D750 Camera was set up on a tripod to a mid-lens height of 1.5 m. The camera settings for the images are shown in the below table.

Table 12-11 Lighting Survey Camera Settings

CAMERA SETTINGS
Exposure: 3 Seconds
F16
Iso 5000

The night sky brightness or sky glow was measured using the Dark Sky iPhone application (app), a Sky Quality Meter (SQM) App recommended by the International Dark-Sky Association. The SQM app measures how much light strikes the camera sensor. The app then converts that amount of light into units of magnitudes per square arc-second. The larger the number reads on the meter display, the darker the sky. Using the Bortle scale, the SQM reading can be used to classify the night-sky brightness in one (1) of nine (9) classes as shown in the table and figure below.

Table 12-12 Bortle Scale Classes

CLASS	TITLE	APPROX SQM
1	Excellent dark-sky site	21.99 – 22.00
2	Typical truly dark site	21.89 – 21.99
3	Rural sky	21.69 – 21.89
4	Rural/suburban transition	20.49 – 21.69
5	Suburban sky	19.50 – 20.49
6	Bright suburban sky	18.94 – 19.50
7	Suburban/urban transition	18.38 – 18.94
8	City sky	<18.38
9	Inner-city sky	<18.38

Figure 12-4 Bortle Scale



Generally, the site is intrinsically dark. A lack of light sources was noted across the site and surrounding areas, with the only sources of light being security lighting and internal residential illumination.

The poultry farm was only illuminated with security lighting which typically was directed to the fence line perimeter. From the poultry farm, the lights from the highway and Baku are evident, with a lack of other sources, as per the below image.

Figure 12-5 Towards Baku from Poultry Farm



Within Sitalchay village, lighting was limited to internal lights at residences and there is no streetlight illumination.

Figure 12-6 Sitalchay Village



The red safety lights at the existing wind turbines and the light from vehicles on the M1 highway were also visible from Sitalchay. There are no street lights on this portion of the M1 highway.

Figure 12-7 M1 Highway and Existing Wind Farm



From Sitalchay village, the lights from the existing wind farm can be seen in contrast to the dark nature of the site, as shown in the below figure.

Figure 12-8 Existing Wind Farm to the Left and Darkness of Site to the Right



The SQM results are shown in the following table, both the poultry farm and Sitalchay villages had sky darkness attributed to Suburban / Rural transition, with the proximity of the site to Baku considered the reason for this rating.

Table 12-13 Lighting Survey SQM and Bortle Scale Results

Location	SQM	Bortle Scale
Poultry Farm	20.92	Suburban to Rural
Sitalchay Village	21.17	Suburban to Rural

12.3 Potential Impacts, Mitigation, Management & Residual Impact

12.3.1 Construction Phase

During the construction phase, the Project will result in a number of changes to the landscape character and visual amenity, arising from site preparation and construction activities. The changes are typically temporary and as such not expected to result in significant impact on the identified receptors. However, any earthmoving, recontouring or building work can give way to permanent changes to the landscape. The construction activities in themselves could also be a source of significant 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 compound(s), utilities and protective hoardings;
- Groundworks and construction of substructure (e.g. excavations, foundations and perimeter walls);
- Construction, assembly and erection of the turbines;
- Lighting during nightworks and for security;
- Construction of roads, car parking and pedestrian routes; and
- Increase in movement and disturbance associated with construction works and the operation of the construction plant.

Table 12-14 Landscape and Visual Amenity Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACT
Impacts to Landscape Character (including lighting impacts)	Moderate Negative	LCA 1 – Undeveloped Natural Ground	Low	Minor	- Land clearance to be limited within the boundaries of the Project site. - Construction works to be limited within the boundaries of the Project site. - Project footprint to be limited within the boundaries of the Project site. - Cluster temporary compounds and storage areas together to minimise the spread of influence in landscape - Lighting provision shall not be excessive or unnecessary and not result in glare effect. - Light fittings shall be directional as deemed appropriate for their use and intended areas of illumination. - Lighting column and lighting head design should be chosen to limit back spill and any unwanted light spill to other site areas or, those areas off the site.	Negligible
	Moderate Negative	LCA 2 – Undeveloped Hills / Mountain	Medium	Moderate		Minor
	Moderate Negative	LCA 3 – Developed Plains	Low	Minor		Negligible
Visual Amenity Impacts (including lighting impacts)	Moderate Negative	KLV1, KLV3, KLV6	Low	Minor		Minor
	Moderate Negative	KLV4	Medium	Moderate		Minor

12.3.2 Operation Phase

LANDSCAPE AND VISUAL

The main aspects of the Project which are likely to have permanent effects on the landscape character and visual amenity of the site and its surroundings are:

- Erection of new turbines;
- Walls or fences to turbine perimeters;
- New site contours to accommodate turbines;
- Lighting for security and safety purposes;
- Roads, car parking and pedestrian routes for maintenance access; and
- The removal of open landscape and the introduction of turbines en masse.

The Project would remain fundamentally unchanged throughout the duration of its operational life from the point at which it is completed and therefore impacts over the course of operation are not expected to vary.

It is important to highlight that the area already has existing wind farms, including the Yashma Wind Farm, which is situated approximately 4 km from the Project and closer to the M1 highway and the settlements of Sitalchay and Shuraabad. Therefore, the installation of turbines is not entirely out of keeping for the region. The Yashma Wind Farm, taken from close to the proposed site (looking east) is shown in the figure below.

Figure 12-9 Existing Wind Farm



The landscape character which will primarily be affected by the Project is the 'Undeveloped Hills / Mountain LCA'. Although it is of 'Medium' sensitivity, the 'LCA is not considered to be scarce, and in fact there are many areas of similar landscape character to the north and west

of the proposed wind farm, and it is considered that the LCA has the capacity to manage the change resulting from the development.

Lighting

The wind turbines will require safety lighting as seen at the Yashma Wind Farm; these will be evident in contrast to the intrinsically dark current baseline conditions.

SHADOW FLICKER

This 'Shadow Flicker' assessment has been undertaken in accordance with the World Bank Group/International Finance Corporation's guidelines for Wind Energy.

The 162.5MW wind farm will comprise of 25 Envision (6.5MW) and ancillary equipment. The assessment also considers the cumulative effects of the existing Yeni Yashma Wind Farm. The Yeni Yasma Farm comprises of 20 Fuhrlander FL 2500 WTGs with total capacity of 50MW. The general site location and the receptors are presented in Figure and Table below.

Wind turbines can cause 'Shadow Flicker' when the sun passes behind a moving blade and casts a shadow on the window of nearby premises. Shadow flicker for the purposes of assessment is described as:

the flickering effect caused when rotating wind turbine blades periodically cast a shadow over neighbouring properties as they turn, through constrained openings such as windows. The magnitude of the shadow flicker effect varies both spatially and temporally and depends on a number of environmental conditions coinciding at any particular point in time, including, the position and height of the sun, wind speed and direction, cloudiness, and proximity of the turbine to a sensitive receptor. Shadow flicker will depend on the following variables:

- The turbine hub height and rotor diameter;
- The distance from the turbines;
- The direction of the residence relative to the turbines;
- The time of year and wind direction;
- The proportion of daylight hours in which the turbines operate; and
- The frequency of bright sunshine and cloudless skies (particularly at low elevations above the horizon).

This assessment considers the shadow flicker of all turbines at a specific receptor(s) at any given time and therefore considers the potential increase of the shadow flicker intensity or frequency.

Figure 12-10 Sensitive Receptors (Operations) –

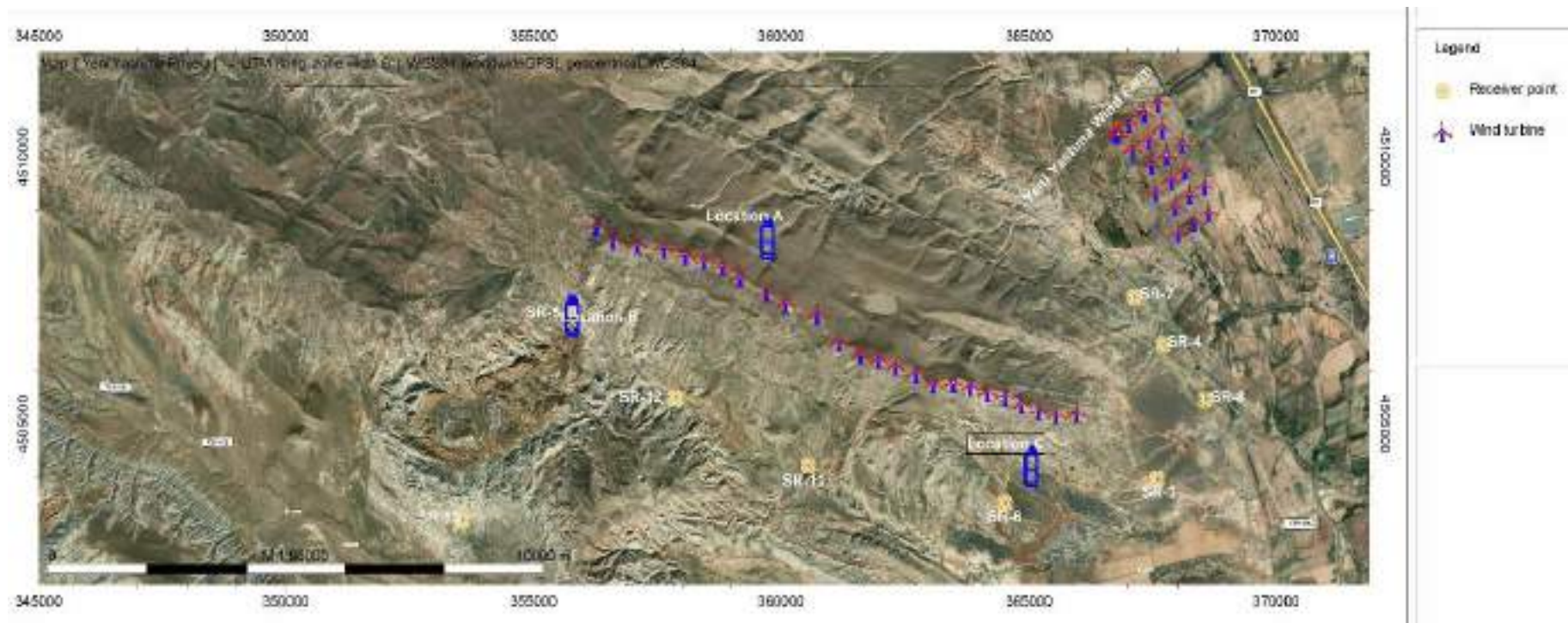


Table 12-15 Sensitive Receptors (Operation Phase)

RECEPTOR	SR AS REFERRED TO IN LAND USE MAP IN SECTION 2	LOCATION WGS84 (ZONE 39N) UTM	NEAREST WTG	DISTANCE TO NEAREST WTG, M	ABSOLUTE HEIGHT AT RECEPTOR, M	DESCRIPTION
SR-3	HR-5	367593,4503969	K27	2052	100	A sheep farm with residential facilities
SR-4	HR-4	367717,4506483	K27	2154	29	A sheep farm with residential facilities
SR-8	HR-10	368579,4505462	K27	2619	40	Farm with residential facilities
SR-5	HR-7	355790,4507056	K5	1641	369	Cattle and sheep farms with residential facilities
SR-6	HR-3	364519,4503524	K25	1889	172	Cattle farm with residential facilities
SR-7	HR-18	367145,4507373	K27	2452	24	Livestock farm (sheep and cattle) with residential facilities
SR-11	HR-8	360543,4504223	K16	2361	194	Sheep farm with residential facilities
SR-12	HR-9	357857,4505488	K11	2643	252	Cattle and sheep farms with residential facilities
SR-13	HR-11	353566,4503210	K5	6091	437	A sheep farm with residential facilities

Shadow Flicker Assessment Criteria

The Environmental, Health and Safety' Guidelines for Wind Energy (2015) sets the following screening criteria for wind farms:

If it is not possible to locate the wind energy facility/turbines such that neighbouring receptors experience no shadow flicker effects, it is recommended that the predicted duration of shadow flicker effects experienced at a sensitive receptor not exceed 30 hours per year and 30 minutes per day on the worst affected day, based on a worst-case scenario.

In order to assess compliance with the recommended limits, shadow flicker should be modelled and predicted based on an astronomical worst-case scenario, which is defined as follows:

- There is continual sunshine and permanently cloudless skies from sunrise to sunset;
- There is sufficient wind for continually rotating turbine blades;
- Rotor is perpendicular to the incident direction of the sunlight;
- Sun angles less than 3 degrees above the horizon level are disregarded (due to likelihood for vegetation and building screening);
- Distances between the rotor plane and the tower axis are negligible; and
- Light refraction in the atmosphere is not considered.

In addition to the above recommended scenario, an assessment has also been made to consider actual site conditions based upon long-term sunshine statistics at the nearest metrological station (Tbilisi) which also considers cloud/wind data.

Shadow flicker Modelling

Turbine shadow flicker was modelled using 'WindPRO' (v3.4), an industry-leading software package for the design and planning of wind energy projects. The model software considers the sun's path with respect to every turbine location during every minute over a complete year. Any shadow flicker caused by each turbine is then aggregated for each receptor for the entire year. The input parameters for the model include:

- the turbine locations and dimensions;
- the receptors location;
- the size of windows on each receptor and the direction that the windows face; and
- the topography model obtained from the (Space) 'Shuttle Radar Topography Mission', (SRTM), at 30m resolution.

Turbine data is presented in Table the Table below.

Table 12-16 Turbine Details

TURBINE MODEL	ROTOR DIAMETER, M	HUB HEIGHT, M	ROTOR TIP HEIGHT, M	ROTOR SWEEP AREA, M ²	ROTOR SPEED RANGE, RPM
EN171 (6.5MW) (Khizi Project)	171	100	-	22964	7.1 – 9.94
Fuhrlander FL 2500-90 (Yeni Yashma Project)	90	85	-	-	7.1 – 15.9

The following scenarios are considered:

- As per IFC's worst-case; and
- A realistic scenario based upon site data (e.g., long term average sunshine hours rather than the worst-case IFC scenario of constant sunshine).

For the IFC worst-case scenario, the following is considered:

- There is a clear sky 365 days per year;
- The turbine blades were assumed to be rotating for 365 days per year;
- The effect of shadow flicker was not calculated where the sun lies less than 3 degrees above the horizon;
- The receptor is occupied at all times;
- No screening (from either trees or man-made obstacles) is taken into account; and
- All receptors have a 2 m x 2 m window facing directly towards the turbine. The WindPro model utilises the concept of 'Green House' mode which allows for shadow flicker effects to be evaluated for each receptor in every direction for the nearest group of WTGs.

These assumptions result in a robust but conservative estimation, due to:

- Unlikely to have clear skies all year around;
- Screening (structures, trees or any other obstacle that may obstruct sight lines between the turbines and the receptor) can mask shadows from the turbines;
- All the turbines may not be operational all year (calm conditions/maintenance etc);
- Turbine blades will not face the shadow receptor all year (as blades will face the direction of wind to be fully efficient);
- Receptors may not be occupied during a shadow flicker event; and
- The intensity of any shadow flicker event will be diminished by the intervening distance.

For a more realistic consideration, long term weather conditions were obtained from the Tbilisi meteorological dataset (382km distant) and the sunshine probability used for the model is set out in Table below. Other meteorological sites in the immediate vicinity do not have a complete set of the required data.

Table 12-17 Sunshine Hours for Realistic Scenario

JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC
3.44 Hrs	3.27 Hrs	4.38 Hrs	5.96 Hrs	6.98 Hrs	8.33 Hrs	8.56 Hrs	7.84 Hrs	6.99 Hrs	5.15 Hrs	3.29 Hrs	3.09 Hrs

However, as the geographical extent of the study is large, screening (trees or man-made obstacles) has not been considered for the realistic scenario.

Shadow Flicker Results

The following shadow flicker effects will result for the receptors under consideration (a graphical representation of the results is presented in Figures below).

Table 12-18 Shadow Flicker Occurrence at Each Receptor (Khizi & the existing Yeni Yashma)

RECEPTOR	LOCATION	IFC WORST-CASE SHADOW HOURS PER YEAR	REALISTIC SHADOW HOURS PER YEAR	IFC MAX SHADOW HOURS PER DAY
		(H/YEAR)	(H/YEAR)	(H/DAY)
SR-3	367593,4503969	00:00	00:00	00:00
SR-4	367717,4506483	10:13	03:30	00:19
SR-8	368579,4505462	00:00	00:00	00:00
SR-5	355790,4507056	00:00	00:00	00:00
SR-6	364519,4503524	00:00	00:00	00:00
SR-7	367145,4507373	00:00	00:00	00:00
SR-11	360543,4504223	00:00	00:00	00:00
SR-12	357857,4505488	00:00	00:00	00:00
SR-13	353566,4503210	00:00	00:00	00:00

As can be seen from Table above, none of the receptors exceed the IFC criteria (30 hours per year or less than 30 mins per day, worst-case and therefore, mitigation measures are not necessary.

Figure 12-11 WBG/IFC Worst Case Maximum Minutes per Shadow Day

Project:
Khizi

Issued for:
Entran Ltd
2nd & 3rd Floors, Northgate House Upper Borough Walls
GB-BATH BA1 1RG

Sunil / sunil.patel@entrantltd.co.uk
Created:
02/12/2011 11:54/3.5.552

SHADOW - Map

Calculation: Khizi

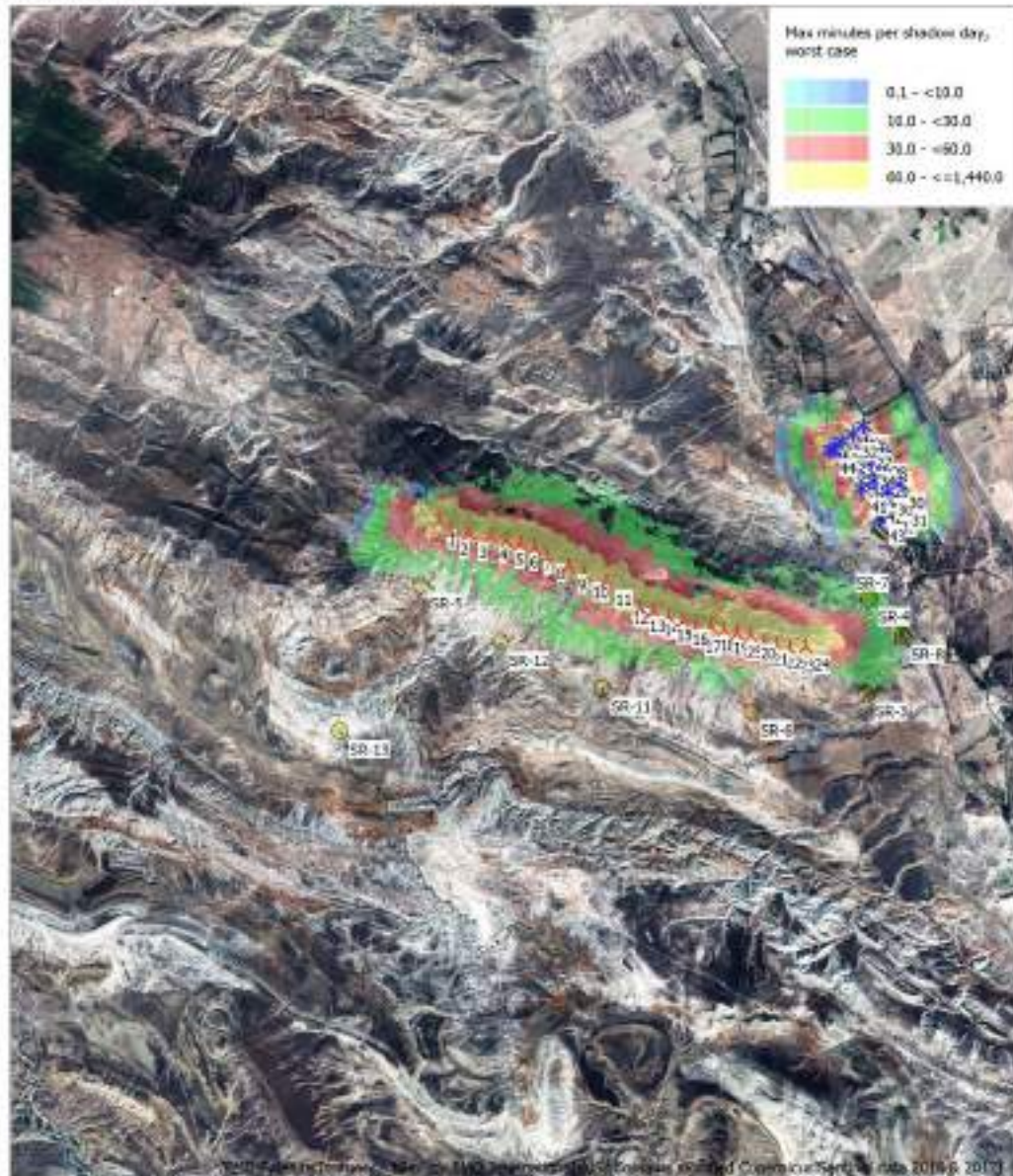


Figure 12-12 WBG/IFC Worst Case Maximum Minutes per Shadow Day

Project:
Khizi

Client:
Entran Ltd
2nd & 3rd Floors, Northgate House Upper Borough Walls
GB-BATH BA1 1RG

Email / mail: nurilpatel@entrantd.co.uk
Date:
02/12/2021 11:54/3.5.552

SHADOW - Map

Calculation: Khizi

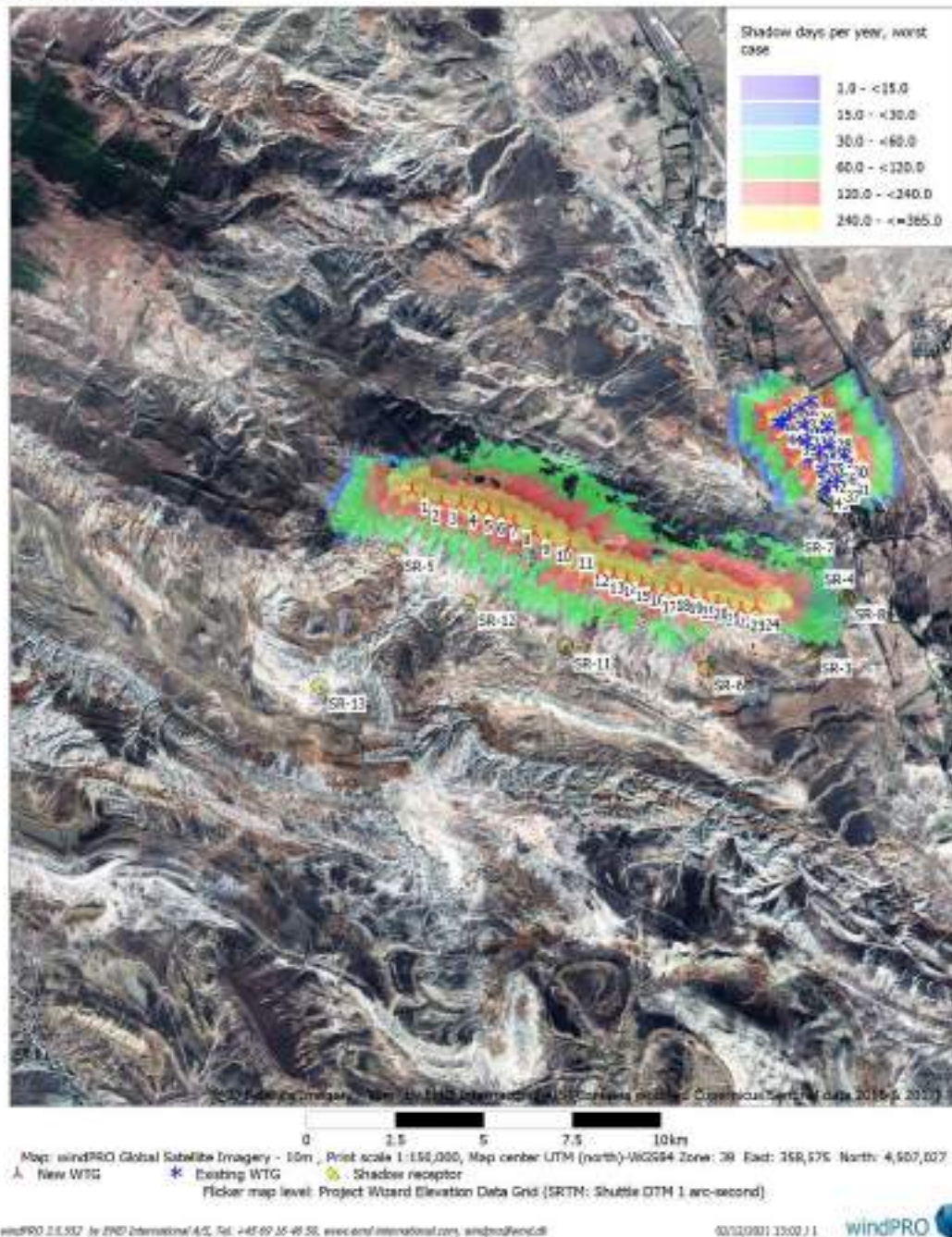


Table 12-19 Landscape and Visual Amenity Impact Significance, Mitigation & Management Measures and Residual Impacts – Operation

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACT
Impacts to Landscape Character	Major Negative	LCA 1 – Undeveloped Natural Ground	Low	Minor to Moderate	- Incorporate native planting where appropriate and allow vegetation to regrow around turbines. - Use natural materials on exterior finish of structures (site office etc.) to minimise prominence in the landscape. - Lighting provision will not be excessive or unnecessary and should be limited to security lighting. - Light fittings will be directional as deemed appropriate for their use and intended areas of illumination. - Lighting column and lighting head design will be chosen to limit back spill and any unwanted light spill to other site areas or, those areas off the site. - Control litter and maintain good housekeeping across the site	Minor
	Major Negative	LCA 1 – Undeveloped Hills / Mountain	Medium	Moderate to Major		Moderate
	Major Negative	LCA 2 – Developed Plains	Low	Minor to Moderate		Minor
Visual Amenity Impacts	Major Negative	KLV1, KLV3, KLV6	Low	Minor to Moderate		Minor
	Major Negative	KLV4	Medium	Moderate to Major		Moderate
Shadow Flicker	Negligible	All receptors	Low	Negligible to Minor	Third parties/ herders will have access to a grievance mechanism in order to make any complaints regarding shadow flicker during the operation phase.	Neutral

12.4 Monitoring Requirements

Monitoring is not proposed for landscape, visual and shadow flicker impacts, however, any third-party complaints on this topic will be gathered via the Project's construction and operational grievance mechanisms.

13 TRAFFIC AND TRANSPORTATION

13.1 Standards and Regulatory Requirements

13.1.1 National Requirements

The Regulations on the Ministry of Transport was approved by Decree No. 880 in 2003. The Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan was then established in 2017. It is the main executive body implementing state policy and regulation for transport including maritime transport and civil aviation.

ROAD TRANSPORT

The Regulations on the State Road Transport Service of the Ministry of Transport was approved by Decree No.472 in 2011 and was then included in the structure of the Ministry of Transport, Communications and High Technologies in 2018.

The State Road Transport Service is the authority responsible for road transport regulation, meeting the needs of population and economy for transportation services in Azerbaijan, while ensuring compliance with rules and requirements for international and domestic passenger and cargo transportation, as well as international treaties supported by Azerbaijan.

MARITIME TRANSPORT

Regulating maritime transport was under the Azerbaijan State Caspian Shipping Company in accordance with Order No. 697 of 2001, to be then transferred to the Ministry of Transport following its establishment in 2003. Later, the State Maritime Administration was established by Order No.1271 in 2006 on the basis of which the State Maritime Agency under the Ministry of Transport, Communications and High Technologies was established by Decree No. 1785 of in 2018 to become the current authority responsible for maritime transport.

The Navigation Safety Center is established and operates under the State Maritime Agency. The functions of the Center include organizing the navigation safety system, vessel traffic control, carrying out vessel inspection, providing pilotage service, remote vessel tracking, and other functions related to navigation safety in territorial waters and Port areas. The Center also aims at implementing the requirements of the international conventions that Azerbaijan is a signatory to.

13.1.2 Lenders Requirements

EBRD

The EBRD PR 4 on Health and Safety establishes management requirements with regards to traffic and road safety risks to workers and potentially affected communities. Relevant EU road and traffic safety management standards must therefore be taken into consideration.

"For Projects that operate moving equipment on public roads and other forms of infrastructure, the client will seek to prevent the occurrence of incidents and injuries to members of the public associated with operation of such equipment."

EPFI's AND ADB

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.

13.2 Area of Influence

The area of influence of Traffic and Transport includes all cities, towns, and settlements where the Project related vehicles will cross for transporting the components of the Project, employees and workers, materials as well as waste. Those include Sychlijar, Qobustan, Sangachal, Ümid qəsəbəsi, Gizildash, Shongar, Mushvugabad, Sumgayit as well as local communities including Sitalchay and locations of labourers accommodation.

13.3 Observation and Baseline Condition

13.3.1 Existing Local Road Network

The review of satellite imagery and site visits conducted to date, indicate that there is no permanent transport infrastructure or paved roads within the project site or the surrounding areas. Access to Khizi 3 Project from Highway M1 is mostly limited to dirt routes that were evident during the road survey conducted by Blue Water Shipping in June 2021. The proposed route is shown in the figure below.

Figure 13-1 Dirt Roads in the Project Area (Adapted from Blue Water Shipping, 2021)



The closest highway to the site is E119 (M1) located to the east at a distance of approximately 5.5 km to the closest turbine and 12.8 km from the furthest turbine. This highway runs along the

coast and connects the border of Russia to Baku. Transport to and from the Project site is anticipated to be via the dirt track that links the project area with the highway M1.

13.3.2 Project Logistics

WIND FARM TRANSPORT LOGISTICS

Wind turbines are manufactured abroad and transported to the country then transferred to the Project site for assembly and installation. The transport method will potentially be carried out using a combination of road and sea transport. To assess the suitability and capacity of the transport infrastructure and identify any restrictions or limitations along the routes, initial sea access way, port and road surveys were conducted by Blue Water Shipping in 2020 and 2021. The outcomes of those surveys are summarized in the sections below.

Sea Transport

As stated in Chapter 2, a combination of Sea transport into one of the Black Sea ports and River transportation following the Russian river system into the Caspian Sea, will be undertaken using sea barges and marine vessels and will take approximately 16 weeks to reach Alat Port. This includes transit and temporary port stops along the route. The proposed vessels for sea transport include the following:

- Barges:
 - o Stand pontoon (barge): DWCC 3200 ts (full weight intake);
 - o Tween hold type barge :Dead Wait Cargo Capacity (DWCC) approx. 7,900 tons (this refers to barges that have two (2) sometimes three (3) decks);
- Marine vessels: 30,000T heavy lift vessels with 350t-crane. Total 4.5 vessels will be required to deliver the WTGs.

The transit time for barge transport is approximately 20 days for one (1) trip and 45 days for round trip. Generally, two (2) vessels carry three (3) WTGs, therefore 17 barges will be used for Khizi 3 Project.

Figure 13-2 Shipping Requirements (Adapted from Blue Water Shipping, 2020)

COMPONENT	NUMBER OF SHIPMENTS	TYPE OF VESSEL	EXAMPLES OF REQUIRED TYPES OF VESSELS
25 Sets of Blades	7 Shipments (considering 4 blades per shipment)	Module Carrying Vessel (MCV)	

COMPONENT	NUMBER OF SHIPMENTS	TYPE OF VESSEL	EXAMPLES OF REQUIRED TYPES OF VESSELS
25 Sets of Towers	9 Shipments (considering 3 towers per shipment)	8916 Stand Pontoon (Barge)	
25 Sets of Nacelles, Hubs, and Drive Trains	3 Shipments (considering 10 nacelles, hubs, and drive trains per shipment)	RSD49	

Wind Turbines components will be manufactured abroad and shipped to Alat Seaport located approximately 100 km from Khizi 3 Project area. The barge transport will pass through the southern Russian Inland Waterway System (RIWS) using the following routes:

- Sea of Azov;
- Don River;
- Volga river; and
- Caspian Sea.

According to the Port survey, the Alat Port is a relatively new facility with suitable infrastructure and capacity to receive the Wind Turbines components and the Alat port authorities are interested in accommodating the Projects (Blue Water Shipping, 2020). However, close coordination will be required with the port authorities to ensure the required equipment, manoeuvring and storage space, and manpower are available months in advance of components arrival. Shipments and their arrival should also be arranged according to the Russian inland water opening and closure schedules.

The area designated for unloading and storage of wind turbine components within the Port include:

- The Over Weight Over Height (OWOH) area; and
- The quay which has a length of approximately 300 m and hinterland depth of 130 m, which is an area of approximately 39.000 m², asphalt/SF-stone paved.

The equipment required to unload the wind turbine components include:

- 1x350T+1x200T crawler cranes for discharging from barge;
- 2x150T tandem crane for nacelle, tower and blade; and

At least 20,000 m² area will be required to store the wind turbine components in port.

Land Transport

Appropriate roads are needed for site access and the hauling of equipment and turbines during construction and operation. For transporting the components of the Project, vehicles will use existing legal roads, from the Alat Port using the Baku-Alat-Gazakh-Georgia highway (M2), crossing by Sychlijar, Qobustan, Sangachal, and Ümid qəsəbəsi, and exiting at R6 route. On R6 the trailers will pass by multiple areas including Gizildash, Shongar, Mushvugabad, till they reach Sumgayit where they will then take the Sugmayit bypass highway. On this road, the trailers will use a junction to enter the highway M1 (E119) till they reach the smaller internal roads that will be used from that point till Khizi 3 Project site.

The Project's wind turbine blades are usually transported in one piece. Drive train and hub components have a height of more than 5 m. Nacelles are also usually transported in one piece and can have a weight of 98 tonnes whereas the drive train and hub weight can reach 127 tonnes (Blue Water Shipping, 2021).

The components shipped and stored temporarily at Alat Port will be transported via trailer trucks to the Project site. Wind turbine components are heavy and have large dimensions, therefore, their transport is a challenge and will result in pressure on the existing roads and transport infrastructure. A preliminary route survey was undertaken for the Project to assess the suitability of the road infrastructure and identify any restrictions and obstructions along the route from Alat Port in Baku to Khizi 3.

The outcomes of the survey indicate that there are no width or length obstacles enroute, however, identifying height clearance as well as weight and axle loadings are key factors for selecting trailers and accessing bridges safely. The study considers the main roads and highways as well as a potential route to enter the Khizi 3 WF, which mostly follows existing dirt roads (red line shown in the Figure below).

The preliminary survey findings and locations where road improvements are required, overhead structures removal is recommended, and bridges capacity identification or bypasses use are necessary are summarized in the figures and tables below.

Figure 13-3 Map Showing the Numbers and Location of Road Limitations (Blue Water Shipping, 2021)





Point 1: Insufficient height clearance in certain parts of the Port gate that has a height between 5.5 and 7 m.

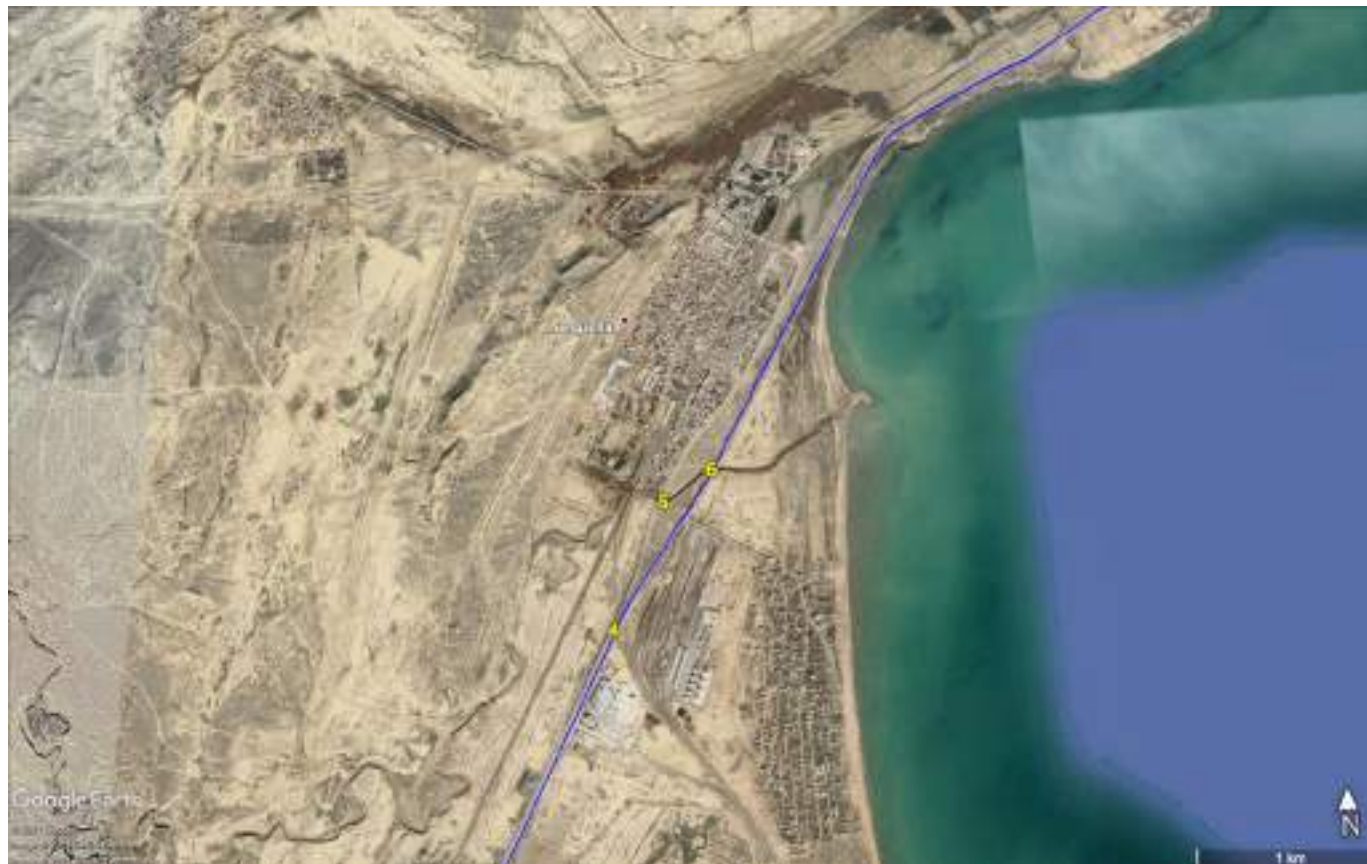


Point 2: Insufficient height clearance due to 5.1m height of overhead bridge which requires using the bypass.



Point 3: Insufficient height clearance due to 6.2 m height of pedestrian bridge.





Point 4: Insufficient height clearance due to 5.5 overhead gantry.



Point 5: Old weak bridge with unknown capacity not suitable for use by the trailers.



Point 6: Weak bridge with unknown capacity; critical point for heavy transportation that might not be approved by authorities.





Points 7 and 9: Taking opposite road direction to avoid speed camera arch.



Point 8: New pedestrian Bridge under construction. This needs to be removed or develop a bypass.



Point 10: Road signs and safety island to be modified for blade trailer passage.





Point 11: Bridge without signs to identify capacity.

Point 12: 6.5 m high MV cables that need to be lifted for enough height clearance.



Point 13: Bridge without signs to identify capacity.



Point 14: 6.5 m high LV cables that need to be lifted for enough height clearance.





Point 15: Insufficient hight clearance and safety risk due to gas pipe.



Point 16: New bridge with accepted capacity of 300 tons; limitation is subject to weight of trailer and components.

Point 17: Bridge without signs to identify capacity. If it is lower than required, need to drive around through **point 18** shown on the map.





Point 19: Insufficient hight clearance due to multiple HV cables starting 6 m height.



Point 20: Potential need to take opposite direction for heavy trailers.



Point 21: Bridge without signs to identify capacity, using the bypass shown in green might be required.

Point 22: Bridge without signs to identify capacity and confirm suitability.





Point 25: Insufficient height clearance under bridge; need to bypass through **point 26**.

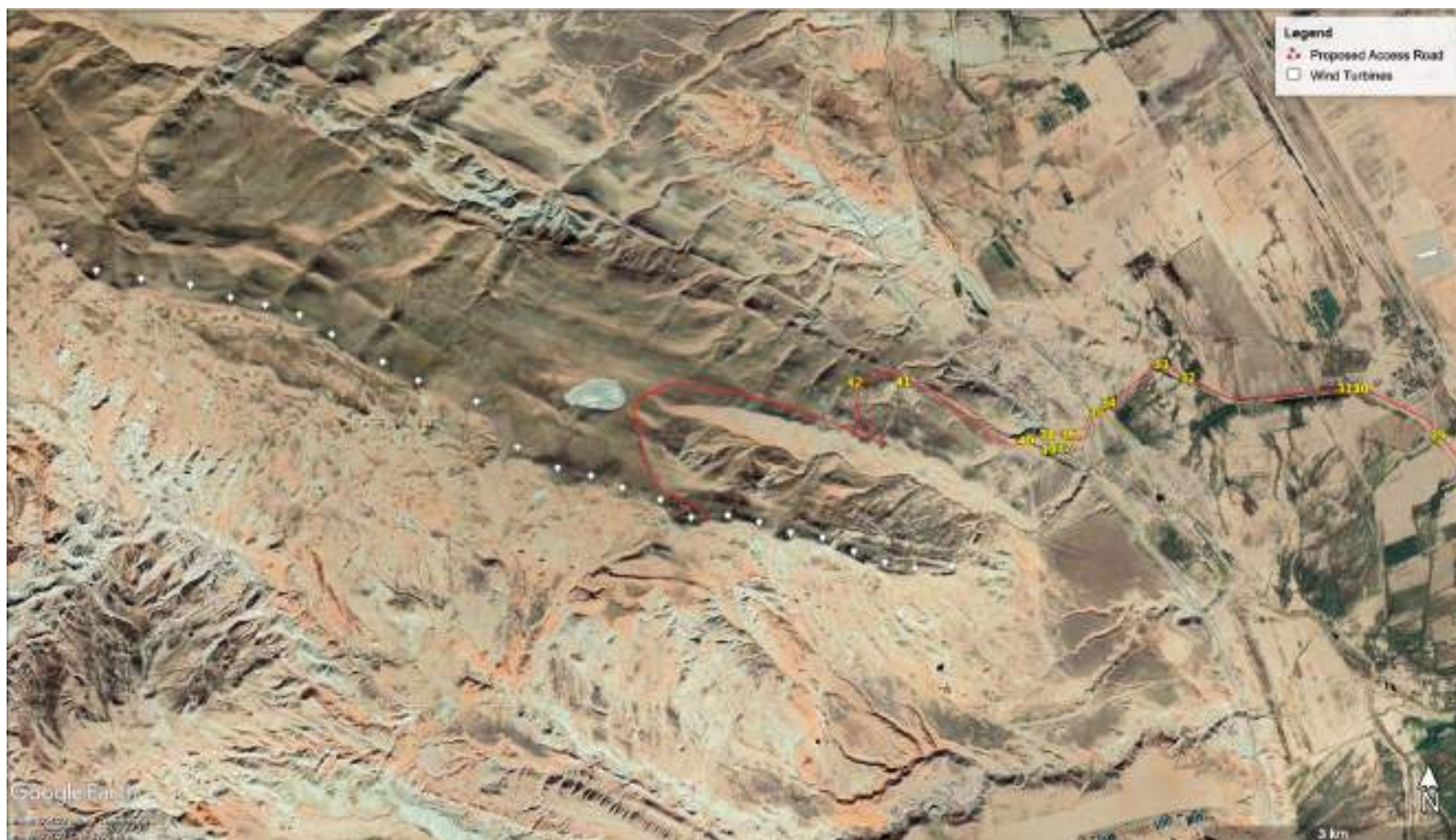


Point 27: Railway crossing with 6m high cables.



Point 28: Bridge without signs to identify capacity, using the bypass shown in green might be required.





Limitations of Proposed Access Route 1 (Red route shown on the map above)		
Point 29: Military base-controlled access gate 	Point 30: Insufficient height clearance due to 4.41 m and 5.3 m overhead cables. 	Point 31: Obstructions by trees 
Point 32: Exposed concrete water pipe under road (similarly for points 33 and 34) 	Point 35: Bridge over old water canal will require strengthening 	Point 36: 15.2° level rise (similarly point 37) 
Point 38: Bridge capacity to be confirmed 	Point 39: 15.6° level rise and sharp turn (similarly for point 40) 	Point 41: Steep rise and turn (similarly point 42) 

Indicative Vehicle Trips

In general, each WTG will require around 12 trips to transport its entire components with one vehicle (or otherwise 1 trip if 12 vehicles). This would however, include a combination of Heavy Goods Vehicle (HGV), telescopic trailers for long and/or heavy components and normal trailers for other normal size or weight components. The estimated breakdown of trips per vehicle for each turbine is as follows:

- One (1) trip per vehicle for each blade (3 trips for one set of 3 blades) and considering the long length of blades, they will be transported through telescopic trailers;
- One (1) trip per vehicle for each tower section (4 trips for one tower comprised of 4 sections) and will be transported through telescopic trailer;
- One (1) trip per vehicle for the nacelle, which is the heaviest component of the wind turbine and will be transported through a normal or telescopic trailer; and
- Around four (4) trips per vehicle for the internal equipment inside the nacelle (gear box, transformer, etc.), transported through a normal or an HGV.

Given the number of turbines expected for the Project, this will entail a total of 300 trips from the port to Project site, in case of using the Envision WTG.

Vehicle trips for balance of plant equipment, construction material, potable and construction water, waste disposal and manpower transportation shall be evaluated in the detailed Traffic Management Plan with the information provided by EPC contractor.

ACCESS ROADS

The road to access the Project area mostly follows an existing dirt track/road, however, new roads will be required between the WTGs. The layout for the roads and cables is shown in the Figure below.

Figure 13-4 BOP Design Layout (Roads, Construction & Storage Yard and Substation)



OHTL TRANSPORT LOGISTICS

Similar to the Project's access routes, the OHTL route will follow existing roads where available and is limited to existing dirt routes in other areas that will potentially require enhancement or construction. The OHTL assessed as part of the Khizi 3 WF ESIA includes:

- 220 kv Khizi 3 - Yashma OHTL connecting the Khizi 3 WF substation (SS) to the existing Yashma SS and is approximately 20 km long (Purple line in Figure below);
- 220 kv Khizi – Pirakashkul OHTL connecting Khizi 3 and Area 1 WFs SS and is approximately 30 km long (Blue line in Figure below);

Figure 13-5 OHTL Location Map



CONSULTATIONS WITH THE MINISTRY OF TRANSPORTATION

A consultation letter was sent to the Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan on 29th June 2021 informing them of the Project and enquiring on whether the Ministry had any specific requirement relating to the transportation of wind farm Project components as well as requirements relating to the following:

- The need for on-going engagement with the Ministry of Transportation;
- The need to obtain future approvals linked to traffic movements, and the need to submit any traffic management plans etc.;
- The transportation of project equipment i.e., wind turbines components such as blades, transformers etc.;
- The transportation of some hazardous material and removal of waste;
- The transportation of workers to the construction site; and
- Requirements and process relating to upgrading existing roads and construction of new access roads.

The response from the State Automobile Transportation Service under the Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan was received on 22nd July 2021 and is provided in Appendix I. As per the response, the transportation of large and heavy cargo on the designated roads is allowed through obtaining a permit from the relevant executive authority and shall be regulated by the Law of Automotive Transportation, Article 48 and the Law of the Republic of Azerbaijan on "Road Traffic" Article 62. The response letter also indicates that a permit must be obtained from the Ministry of Emergency Situations for transportation of hazardous waste.

13.4 Sensitive Receptors

Table 13-1 Traffic & Transportation – Receptor Sensitivity

Receptor	Sensitivity	Justification
Wind Farm		
Alat Port	Low	The transport of the Wind Turbines components will take up large laydown and receiving areas of the Port and will require the utilization of the equipment and manpower which can increase pressure on its operation.
Wind Farm, BOP and OHTL		
Highways and Local road	High	The preliminary road survey identified multiple areas that will require road and infrastructure improvements, overhead structures removal, or bypasses which will present a challenge in terms of obtaining permits and will increase pressure on road infrastructure when conducting those road enhancements and construction activities.
Residents of nearby communities	Medium	The transportation of the wind turbines components will cross multiple areas and cities, adding pressure on the road infrastructure and potentially increasing traffic and accidents.
Farmers and nearby settlements	High	Given that nearby settlements and farmers together with livestock will cross the access roads when moving back and forth, they are particularly vulnerable to an increase in vehicular flow.

13.5 Potential Impacts, Mitigation, Management & Residual Impact

13.5.1 Construction Phase

PRESSURE ON ALAT PORT

The Project will require an estimated number of 19 shipments for transporting the components and will require an area of at least 20,000 m² for the storage of turbines at once in the Port. The transport of the turbine's components will take up large receiving, laydown, and storage areas of the Port and will require the utilization of the equipment and manpower which can increase

pressure on its infrastructure and interfere in other operations and shipments in the absence of proper scheduling and close coordination with the Port authorities.

Transporting the turbines components from the Port can potentially require modifying the Port gate to ensure the availability of enough height clearance.

PRESSURE ON ROAD INFRASTRUCTURE

The major components for the construction of the plant are equipment that cannot be assembled in-situ. Therefore, it must be transported from the Port to the site in its built form by specialised vehicles and large trailers. Given the large dimensions and heavy weight of the wind turbines components, proper transportation and logistical solutions are necessary for managing the heavy-load long-haul requirements. The preliminary road survey identified that the current road infrastructure has several limitations which will hinder servicing Khizi 3. If improperly planned and managed, the trailers hauling the heavy Project components can potentially damage the existing highways, bridges, overpasses, roads, utilities (e.g., electricity cables, stormwater pipes), and other structures (e.g., road signs, speed cameras). In addition, the route from the main highway (M1) to the Khizi 3 Project site is a dirt road that will require upgrade, modification, and construction in several areas to accommodate the vehicles.

The EPC Contractor will be required to apply for the relevant permits from maritime and road transport authorities to transport project equipment and machinery.

INCREASED VEHICULAR FLOW

Construction activities will likely result in an increase of the numbers of movements HGVs and other vehicles for the delivery of heavy plant, equipment, materials, and transportation of Project staff. However, the volume of traffic will vary over the course of construction, in accordance with the phases of construction and the demand for materials. The main factors that will affect the number of vehicles on the roads will be related to material usage, manpower needs and waste generation. Increased traffic will potentially impact residents of nearby communities, settlements and farmers.

SAFETY OF RESIDENTS AND FARMERS

The highways that will be used for the Project are used by residents of cities and towns extending from Alat Port in Baku to Khizi. The local access road (described in section 13.3.2) from the highway M2 to the Project site is mainly used by farmers and settlements surrounding the Project area. The vehicle flow on those roads is not constant and local communities are not accustomed to a lot of traffic along the local roads, therefore, it might take them time to adjust to the new increased vehicular flow.

Therefore, an increased number of vehicles along the main and access road as a result of the Project's development has the potential to result in road traffic accidents affecting humans and livestock.

Table 13-2 Traffic & Transportation Impact Significance, Mitigation & Management Measures and Residual Impacts – Construction (WF & OHTL)

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Pressure on Alat Port	Minor Negative	Alat Port	Low	Negligible to Minor	• Close coordination with the Port Authority to obtain the required permits, schedule shipments and ensure timely removal of components from the Port. • A Shipment Plan will be conducted before shipping the Project related components. The plan must consider the number, types and schedule of shipments to ensure they are spread over the course work days which also take into account peak and non-peak operating hours of the Port. • A resources assessment will be conducted to validate the expertise, number of manpower and type and number of equipment required for unloading and loading the turbines components which also consider safety measures. • Close coordination with the Port authority to obtain the required approvals and permits for external equipment and vehicles services to access the Port. • Coordinate with Port authority to modify the entrance/exit gate as required and ensure enough height clearance. • Shipments and their arrival to be coordinated according to the Russian inland water opening and closure schedules to ensure the shipping and storage periods for the wind turbines components do not hinder other shipments.	Negligible to Minor

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Impact on Road Infrastructure	Moderate Negative	Highways and local access road	High	Moderate To Major	- EPC Contractor to obtain permits from the Ministry of Emergency Situations for transportation of hazardous waste and from the relevant executive authority. - The transport method shall be regulated by the Law of Automotive Transportation, Article 48 and the Law of the Republic of Azerbaijan on "Road Traffic" Article 62. - A Traffic & Transportation study will be conducted before the transportation of Project related equipment and machinery. The study will assess the requirements for upgrades to be made to highway & local road infrastructure to enable safe transportation of oversized and/or heavy specialised transportation vehicle. The plan will include the following (but not limited to): - Transport routes during the construction phase and scope of roads upgrade as identified in Logistic Survey. Drivers will be prohibited from taking any deviations from the designated routes. - Vehicle movement plans will be prepared by the EPC based on the logistic and route survey carried out for the project. This will include appropriate traffic management and control devices including warning and advisory signage. - Access to pedestrians will be maintained at all times during road enhancement and transport	Minor to Moderate

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					activities. Pedestrians and other users will be provided with advance warning traffic control signs. Also, for areas used by herders if any, designated passage ways will be provided to facilitate access and movement. - o Drivers will be made aware of the potential to encounter livestock and adherence to safe driving practises at all times. - o Traffic management plan will include emergency management procedures. - o During road upgrades, access for vehicles and other transport uses will be maintained. Prior to the commencement of works affecting commercial and residential users will be informed on the transport and construction activities and timing. - o Drivers will adhere to speed limits and safe driving practises in line with the national regulations. Drivers will be trained on EPC Code of Conduct and will include a requirement for drivers to	

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					reduce their speed when encountering animal warning sign. - o Training and toolbox talk on road safety will be provided. - o Inform local communities on traffic route, duration and timings. - o Construction schedule showing duration of transport activities. - o Consultations with relevant authorities to obtain necessary permits Ministry of Transport and Ministry of Emergency Situations for transportation of hazardous waste. - o A grievance mechanism will be established to allow local communities to make complaints relating to transport activities. - o Compensation of any livestock injured by Project vehicles will be conducted in coordination with community leaders and local officials. - o Project drivers will not be permitted to transport any unauthorised personnel or goods.	

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					- o A post-construction road survey to be undertaken to determine any damage caused by the Project transport and construction activities and to be repaired immediately. • Conduct all required road infrastructure upgrades before transporting turbines and other Project components. • Necessary permits to be secured from the relevant authority for the transportation of oversized and heavy goods. • Inform the affected communities along the route of the period and duration of transport activities. • Any damages to roads will be repaired by the EPC immediately after completion of transportation and construction activities .	

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Increased Vehicular Flow	Moderate Negative	Highways and local dirt roads	High	Moderate To Major	- A Traffic & Transportation Management Plan will be developed by the EPC Contractor. The plan will be prepared in accordance with IFC General EHS Guideline, outline how turbine components will be delivered to the site and outline how construction traffic will be managed to limit impacts upon local communities, personnel, and other road users (same as above). - The plan will include information on the designated access routes, site entrance points, speed limits, waiting, parking areas and map out accident and traffic hotspots for project access vehicles etc. - The local police and other relevant authorities will be consulted during the development of the Traffic & Transportation Management Plan;	Minor to Moderate
Safety of Residents of Nearby Communities Along the Main Highways	Minor Negative	Residents of Communities Along the Main Highways	Medium	Minor	- Construction access road into the site will be clearly signposted. - Buses will be used to transport workers and carpooling among staff encouraged (social distancing due to COVID-19 should be considered). - Route directions and speeds limit will be placed along the access road into the project site. - 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	Negligible to Minor

POTENTIAL IMPACTS	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	POTENTIAL IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Safety of Residents of Nearby Settlements & Farmers/ Herders	Minor Negative	Residents of Nearby Settlements & Farmers/ Herders	High	Minor to Moderate	project site and adhere to the stipulated conditions (i.e. delivery routes and timings). - 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. - Provide land owners whose lands are located along the routes on transportation schedule. - Oversize & heavy load vehicle's drivers will be competent and legally authorised to operate such vehicles in Azerbaijan 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 communities to make complaints relating to Project drivers. - 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.	Minor

13.5.2 Operational Phase

INCREASED VEHICLE FLOWS

Transportation impacts during operations are not expected to be significant, as the operation phase will not require continuous delivery of materials, or other equipment in order to operate. Chemical delivery and occasional maintenance equipment and waste removals are not expected to result in noticeable increases in vehicle traffic on existing road infrastructure. Staff movements will also contribute to a minimal additional vehicle flows on the local roads and internal site roads.

Table 13-3 Traffic and Transportation Impact Significance, Mitigation & Management Measures and Residual Impacts (WF & OHTL)

Potential Impacts	Magnitude of Impact	Receptor	Sensitivity	Potential Impact Significance	Mitigation and Management Measures	Residual Impacts
Increase d Vehicle Flows	Negligible Negative	Local roads	Medium	Negligible to Minor	- A Traffic Management Plan will be prepared identifying preferred access routes. - Operational phase workers will be encouraged to carpool wherever possible to limit the number of vehicles along the local roads.	Negligible

13.6 Monitoring

The final monitoring methodology with specific monitoring details (i.e. locations etc.) will be developed in the specific 'Environmental and Social Monitoring Plan'.

Table 13-4 Traffic and Transportation Monitoring Requirements (Construction) (WF & OHTL)

Monitoring	Parameter	Frequency & Durations	Monitoring Location
Safety of drivers, residents, and local herders in the Project area	Records of accidents or incidents	Daily	Roads used by the Project vehicles
Grievances received	Records of grievances, acknowledgement, close out	Daily	Roads used by the Project vehicles
Road infrastructure	Reports of damage due to project related transportation vehicles	Daily	Roads used by the Project vehicles
Permits and licenses	Validity and renewal of permits and licenses	Regularly	Document control office – EPC Contractor

14 INFRASTRUCTURE AND UTILITIES

14.1 Site Conditions

There is no physical infrastructure at the Khizi 3 project site such as public roads, electrical connections, OHTL's or other utilities such as water or gas pipelines. (see Chapter 2).

In terms of airport facilities, there are two (2) civil aviation airports in Baku which include Baku International Airport and Zabrat Airport (helicopter service) located 45 and 37km south east of project area, respectively. There is also a military airport at Baku Kala Air Base located approximately 15 km to the north east of the project area.

14.2 Consultations

Consultations were undertaken with the relevant authorities during 2021 to confirm the infrastructure and utilities within project area (e.g. underground pipes, cables, etc) and if there any additional requirements to be considered by the project. The table below provides a summary of the authorities consulted, method of consultation, purpose and issue and response dates.

The Letters issued and responses received are provided in Appendix I of Volume 4 of the ESIA.

Table 14-1 Utilities and Infrastructure Consultation Summary Table

No.	NAME OF AUTHORITY/ ORGANISATION	PURPOSE FOR CONSULTATION	METHOD (EMAIL, LETTER, ETC)	ISSUE DATE	RESPONSE DATE
OHTL					
1	Azerishiq Open Joint Stock Company	Request feedback that may be relevant to the project and to raise awareness of any issues that should be addressed in the planning and development or in the ESIA such as setback requirements for Wind Turbines from OHTL and other electrical infrastructure within project areas.	Email & Letter	E-mail sent 21/09/2021 Sent by post on22/09/2021	Meeting held on 11/11/2021
2	Azerenerji Joint Stock Company			E-mail sent 21/09/2021 Sent by post 21/09/2021	01/11/2021
			Meeting	-	11/11/2021
Telecommunication Towers					
3	The Ministry of Transportation, Communications and High Technologies of the Republic of Azerbaijan, Aztelekom LLC	Request feedback that may be relevant to the project and to raise awareness of any issues that should be addressed in the planning and development or in the ESIA. Also, to check if any telecommunication towers and infrastructure located within project area.	Email & Letter	E-mail 21/09/2021 Sent by post 22/09/2021	02/11/2021
4	National Television and Radio Council			Sent by e-mail 21/09/2021 Sent by post 22/09/2021	07/10/2021
Military					
5	Mine Action Agency and Ministry of Energy	Request feedback that may be relevant to the project and to raise awareness of any issues that should be addressed in the planning and development or in the ESIA, including requirements relating to the following:	Letter	Sent 10/11/2021	Mine Action Agency: 22/10/2021, 17/12/2021

NO.	NAME OF AUTHORITY/ ORGANISATION	PURPOSE FOR CONSULTATION	METHOD (EMAIL, LETTER, ETC)	ISSUE DATE	RESPONSE DATE
		- Safety zones to be maintained during construction and operation of the Projects; - Have the proposed project areas been used for live munitions training such as mortar or light artillery with possible presence of UXOs.			Ministry of Energy: 14/02/2022
Aviation					
11	The Ministry of Transportation, Communications and High Technologies of the Republic of Azerbaijan, State Civil Aviation Agency	Request feedback that may be relevant to the project and to raise awareness of any issues that should be addressed in the planning and development or in the ESIA, including requirements relating to the following:	Email & Letter	Sent by e-mail and post on 21/09/2021	20/10/2021
12	Deputy Minister of Defence-Commander of the Air Force	- Are there any setback requirements for Wind Turbines from aviation infrastructure within project areas such as radars, helipads, etc.; - Are there any safety zones to be maintained during construction and operation of the Projects; - Have the proposed project areas been used for live munitions training such as mortar or light artillery with possible presence of UXOs;	Email & Letter	Sent by e-mail and post on 21/09/2021	04/10/2021

The outcome of consultations for the above authorities are summarised in the Table below.

Table 14-2 Outcome of Consultations

AUTHORITY	RESPONSE	OUTCOME
Azerenerji Joint Stock Company	Response received from the authority states that Azerbaijan Scientific – Research and Project – Research Power Engineering Institute, a structural unit of Azerenergi OJSC, has performed the design of Gobu – Pirakushkul, Pirakushkul- Khizy and Khizy – Yashma OHTL 220 kW (associated facility for this Project) in connection with the points stated in the letter and that proper expertise opinions were obtained from relevant government authorities. Azerenergi requested consultation to be undertaken with relevant staff listed in their response letter.	Additional meeting has been scheduled by Local consultant with the listed staff in letter. The OHTL has will consider considered the buffer zone 25-30 m (according to the Cabinet of Ministers of the Azerbaijan Republic, decision No. 103, June 10, 2005),
Additional Meeting held on 11 November 2021 with Azerenerji Joint Stock Company	Azerenergi did not specify any requirements for the project such as buffer zones for WTGs from OHTL.	The Project Company & EPC Contractor will ensure that any construction work near or under OHTL is agreed with Azerenerji and NOC are obtained
The Ministry of Transportation, Communications and High Technologies of the Republic of Azerbaijan, Aztelekom LLC	Letter stated that Center of Aztelekom LLC has inspected the locations and confirmed they do not have cables at Khizi 3 and Area 1 WF project areas.	Project area cleared by authority.
National Television and Radio Council	The National Television and Radio Council ensures implementation of the state policy in television and radio broadcasting field and regulates this activity. The authority provides oversight of enforcement of the requirements of legislative acts in television and radio broadcasting field. It is not an entity organizing broadcasting via any technical means or usage of telecommunication towers. Therefore, the Council cannot provide any feedback or response to the Consultation Letter.	None

AUTHORITY	RESPONSE	OUTCOME
Mine Action Agency of the Republic of Azerbaijan (ANAMA)	The Agency referred to an explosion that took place in a military unit located in the Khizi, which after the Agency cleared the area. As a result, 10,136 hectares of land were cleared and 25,846 pieces of unexploded ordnance (UXO) were found and neutralized. According to the Agency, the project area is unlikely to be contaminated with ammunition. A letter issued by the Ministry of Energy on 12/02/2022 also clears the projects sites and states project areas are unlikely to be contaminated by with UXO.	Site is unlikely to be contaminated by UXO and ammunition.
The Ministry of Transportation, Communications and High Technologies of the Republic of Azerbaijan, State Civil Aviation Agency	Response was provided in consultation with Azerbaijan Airways CJSC Azeraerionavigasiya Air Traffic Department. As per Flight Security Rules, Sub-clause 3.3.8 as approved by Decree 756 dated June 27 2019 of the President of the Republic of Azerbaijan, the inspection team of the State Civil Aviation Agency shall conduct onsite inspection of the construction works before it commences to ensure flights security as the height of the building specified in the presented design is above 100 m. The response also refers to Chapter 10 of the Azerbaijan Aviation Rules – Aerodrome standards document (visual devices to indicate obstructions) for lighting requirements for WF. Also, Civil Aviation Authority requested to contact Head of the Aerodrome Operators Control Officer (Mr. Fikrat Akhundov (phone: + 994-55-211-11-77, e- mail: f.akhundov@caa.gov.az) to follow up on the site inspection of the lighting features and location after construction is complete.	Additional consultation to be undertaken with Authority before construction and after construction in line with the requirements stated in the Letter. Also, lighting features for WF should meet the national standards as outlines in Letter.
Deputy Minister of Defence-Commander of the Air Force	Response from Air Force cleared Khizi 3 WF project area and stated that there are no obstructions from flying high – speed and low – speed for aircrafts belonging to Air Force at any of the coordinates provided in Letter.	Area cleared based on coordinates provided

14.3 Potential Impacts, Mitigation, Management and Residual Impacts

14.3.1 Construction Phase

DAMAGE OF EXISTING INFRASTRUCTURE AND DISRUPTION OF SERVICES

The construction of the Project may potentially lead to the damage to any existing infrastructure within project area or in close proximity.

Based on consultations undertaken, the project area was cleared from cables belonging to the Ministry of Transportation, Communications and High Technologies of the Republic of Azerbaijan, Aztelekom LLC. Also, there are no OHTLs identified at the project area.

However, EPC contractor to undertake a Risk Assessment before the start of any construction work and obtain the necessary coordination with relevant authorities before movement of machinery/equipment especially within close proximity to any existing structures.

UXO

The response by Mine Action Agency and Ministry of Energy stated the project area is unlikely to be contaminated with ammunition and UXO.

The Azerbaijan National Agency for Mine Action ANAMA, established in 1999, with the support of UNDP, have cleared over 806,000 mines and other explosive weapons in Azerbaijan over the last 20 years helping to ensure a safe return home for over 160,500 displaced people. ANAMA has its own National Mine Action Standards (NMAS) which is in accordance with International Mine Action Standards (IMAS) and best practice. IMAS is the current framework for guiding mine action operations around the world.

The workforce during construction and operational phase and surrounding communities might be affected by UXO if found within site may cause casualties and fatalities if exploded. This will also impact the WF infrastructure if explosion occurs during operation. However, the project area has been cleared by the Ministry of Energy in a Letter dated 12 February 2022.

Table 14-3 Existing Infrastructure Mitigation & Management Measures – Construction

Impacts	Mitigation and Management Measures
Damage to existing infrastructure and disruption of services	- The EPC Contractor will obtain all relevant NOCs before any work affecting existing infrastructure is conducted. - Construction workers will be forbidden from accessing any facilities belonging to Asia Trans Gas and no construction works will be undertaken within the buffer zone. - The EPC Contractor will prepare an Emergency Preparedness and Response Plan in consultations with relevant stakeholders. - The EPC will notify the Project Company and other relevant authorities immediately in case of any incidents involving any existing infrastructure and

Impacts	Mitigation and Management Measures
	corrective action taken in consultation and coordination with relevant stakeholders. - The Project specific Traffic Management Plan will be developed and prepared in consultations with relevant stakeholders. Gas in case access roads will go over any of existing facilities. - The EPC Contractor will ensure that any construction work near or under OHTL is agreed with Azerenerji and NOC are obtained.

14.3.2 Operational Phase

The Project site facilities will be static during the operational phase of the Project. As such, no further excavations are expected to be undertaken and the movement of vehicles will be minimal. However, the movement of maintenance and security vehicles could potentially damage the existing infrastructure but the risk is considered minimal.

AVIATION AND RADAR

The installation of the WTGs could have a potential impact on aviation. Such impacts include the WTGs presenting an obstacle on flight routes and hence affecting the safety of flights. However, this would only occur in instances where the aircraft are flying close to the ground during take-off and landing or where flights are flying low as with military activities.

However, based on consultation undertaken with the Air Force, Khizi 3 WF project area has been cleared and letter states that there are no obstructions from flying high – speed and low – speed for aircrafts belonging to Air Force at any of the coordinates provided in Letter.

In terms of radar, whenever in use, there is a potential for the operation of the wind turbines particularly the rotating blades to interfere with aircraft radar (if any) which is assumed to track incoming and outgoing aircraft. The rotation of the rotor blades makes it possible for wind turbines to reflect signals with a Doppler signature (depending of the wind direction and relative alignment of the wind turbine versus the radar) thereby creating interference on the radar display/screen such as erroneous signals, echoes and other clutters and these could further create flight safety issues.

In the event that the wind turbine near the military area is in line of sight or in visible horizon to the radar, the turbines can appear as helicopter obstacles masking real aircraft responses thereby creating the interference mentioned above. However, the area has been cleared by the Ministry of Defence, therefore, risk is considered negligible.

The presence of wind turbine in proximity to a radar site can also result in blockage of the radar beam and this could lead to loss of meteorological data resulting in extreme weather conditions to go undetected. In addition, the WTGs may also cause radar and navigational aid interference where the blades appear as “clutter” on radar screens and can be mistaken as aircraft.

TELECOMMUNICATION SYSTEMS

There are no communication systems (microwave, television, and radio) sources known or identified within close proximity to the project site.

Consultations were undertaken with the Ministry of Transportation, Communications and High Technologies of the Republic of Azerbaijan, Aztelekom LLC and the authority inspected the project area and confirmed they do not have telecommunication cables at Khizi 3 WF project areas. Therefore, there are no likely risks on any telecommunication cables/network since area has been cleared. Nevertheless, Table below includes mitigation measures to address any impact on telecommunications systems,

Table 14-4 Existing Infrastructure Mitigation & Management Measures– Operational Phase

Potential Impacts	Mitigation and Management Measures
Damage to existing infrastructure and disruption of services	- The O&M Company will ensure ongoing consultations with Military where any maintenance work impacts the existing OHTL and military area. - O&M workers are forbidden from accessing any facilities belonging to Military. - The O&M will prepare an Emergency Preparedness and Response Plan in consultations with relevant stakeholders. - The Project specific Traffic Management Plan will be developed and prepared in consultations with relevant stakeholders including Azerenergi, Military s in case any activities will impact the existing structures.
Aviation and Radar	- O&M to apply for NOC from Civil and Military Aviation authorities before the start of operations. - Lighting requirements to comply with national and Civil Aviation Authority requirements (Chapter 10 of the Azerbaijan Aviation Rules – Aerodrome standards document (visual devices to indicate obstructions). - Consultations with Civil and Military Aviation Authorities will continue in order to establish any additional requirements applicable to the Project.
Telecommunication systems	- Prevention and controls as recommended by IFC EHS Guideline for Wind Energy (IFC, 2015): - Siting of WTGs to avoid direct physical interference of point-to-point communication systems; - Consultation with relevant operators to establish the location of telecommunication links and relevant buffers to be applied in order to minimize impacts. - Install a directional antenna. - Modify the existing aerial. - Install an amplifier to boost the signal

15 COMMUNITY HEALTH, SAFETY & SECURITY

This chapter assesses the impacts relating to the health, safety and security of the local community who live and work in the surrounding area and may be subject to project related impacts.

The majority of secondary impacts relating to the local community in terms of air quality, noise, wastewater, waste etc., have been addressed in specific chapters elsewhere in this ESIA. This chapter therefore concentrates more specifically on the potential emergency impacts that could relate to the project, and the security of the project to avoid instances of trespass, malicious intrusions and other misdemeanours.

The primary purpose of this chapter is therefore to identify specific management measures in regard to community, health, safety and security.

15.1 Standards and Regulatory Requirements

15.1.1 National Requirements

Law of the Azerbaijan Republic on Protection of Public Health No. 360-IQ sets the regulations for public health protection and the health care system. The law stipulates the liability and compensation requirements in the event of damage to health that results from a polluted environment.

OHTL

Laws on safety zones for OHTL include the following:

- Resolution of the Cabinet of Ministers of the Republic of Azerbaijan on the approval of the "Rules for the protection of electrical networks with voltage up to 1000 volts" and "Rules for the protection of electrical networks with voltages over 1000 volts", Approved by the Decision No. 103 of Cabinet of Ministers dated 10 June 2005.
- The protective zones identified for lines over 1000 V are presented in the Table below.

Table 15-1 Protective Zones set by National Requirements

LINE VOLTAGE (kV)	>1≤20	35	110	150	220	330-500
DISTANCE (m)	10	15	20	25	25	30

15.1.2 Lenders Requirements

EBRD

The application of EBRD's Performance Requirements to the ESIA will ensure that social and economic impacts are fully assessed with suitable provision for the management of identified potential impacts. The notable PR's that will apply to this project include:

- Performance Requirement 4: Health and Safety; and
- Performance Requirement 10: Information Disclosure and Stakeholder Engagement.

EBRD also requires the application of PR 5 on Land Acquisition, Restrictions on Land Use and Involuntary Resettlement to be consistent with the universal respect for, and observance of human rights and freedoms specifically the right to private property, adequate housing and to the continuous improvement of living conditions.

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. Preparation are also required to be made to plan for such events.

EPFI's

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; and
- 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.

IFC Guidance on Gender Based Violence and Harassment (GBVH)

According to the guidance, addressing GBVH can build relationships and provide a Project with a social license to operate in communities. This can result from regular dialogue to understand and track project GBVH risks as well as the effective use of measures to prevent and respond to GBVH. In addition, it broadens the pool of potential workers that companies can draw upon, including women workers from nearby communities because of lower perceived risk of GBVH.

World Bank Good Practice Note on Addressing Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) in Investment Project Financing Involving Major Civil Works

The World Bank GPN is structured around three key steps that cover project preparation and implementation. These steps include:

- Identifying and assessing the risks of SEA/SH, including social and capacity assessments.
 - Undertaking social risk assessment of community-level risks.
 - Assess capacity and availability, safe and ethical services of survivors.
 - Review ability of the client to respond to SEA/SH risks.
 - Rate project for overall risk using several Bank tools including the SEA/SH Risk Assessment Tool.
 - Establish procedures to review and update risk assessment during the project implementation.
- Establishment of mitigation, reporting and monitoring measures.
 - Based on risks identified, identify the corresponding mitigation measures and implement actions suggested to mitigate project related risks of GBV in the project area.
 - Monitor effectiveness of the mitigation measures and adapt as appropriate.
- Project response actions for GBVH cases.
 - Provide essential services for survivors.
 - Report case through the GM as appropriate keeping survivor information confidential and anonymous.
 - Document and close cases brought through the GM.

United Nations Guiding Principles on Business and Human Rights

In addition to adhering to human rights requirements under the Azerbaijan laws and lenders requirements, the project construction and operational phases will be required to adhere to the United Nations Guiding Principles on Business and Human Rights. The Guiding Principles are grounded in recognition of the role of business enterprise as specialised organs of society required to comply with all applicable laws and to respect human rights.

Equator Principles Guidance on Implementation of the Equator Principles During the Covid-19 Pandemic

The guidance recommends that the borrower should:

- Review potential risks on local communities, including direct and indirect impacts of COVID-19 and other impacts relating to worker interfaces and how any Project changes during this period might affect the community.
- Assess its mitigation approach to Project related impacts.
- Identify opportunities to support communities mitigate wider COVID-19 risks/impacts either through new initiatives or building on existing programmes i.e. provision of food for vulnerable people in isolation, test kits medical facilities and equipment etc.

15.2 Area of Influence

CONSTRUCTION PHASE

Project construction and operational activities is likely to impact seasonal herders/farms who are present during grazing season particularly those within 2km from the WTGs.

OPERATION PHASE

With regards to blade throw, the Aol is defined based on the minimum set back recommended by IFC EHS for Wind Energy, which is $1.5 \times$ turbine height (tower + rotor radius). The total height for GW165 5.6 is approximately 185 m. The Aol therefore is set to 273 m.

For ice throw, the maximum falling distance of ice for the Envision EN 171/6.5 is roughly 406.5 m. This is based on the International Energy Agency on Wind Energy Projects in Cold Climates and referenced in the IFC EHS Guideline on Wind Energy $1.5 \times$ (rotor diameter + hub height).

There are no local community/village within close proximity to the WTG. Sitalchay villages is located approximately 10 km from project area, therefore will not be likely impacted by failure of wind turbine.

15.3 Baseline

15.3.1 WF

LOCAL COMMUNITIES

The nearest human settlement and active community is Sitalchay village which is located 9.9 km north east of the WF. There are no permanent settlements or structures within the identified distance above of any WTG. A small area located 480m east of WTG K11 with a small tent and shelter which is rarely used and does not include any permanent structures. Shelter is rarely used; therefore, this temporary receptor has not been considered in this assessment.

LAND USERS (INFORMAL GRAZING)

Five (5) seasonal agricultural farm; HR-5, HR-6, HR-7, HR10, and HR-16 are located approximately, 1.9 km, 950 m, 1.8 km and 1.5 km from WTG K27, WTG K27, WTG K24, WTG K5 and WTG K27 respectively.

Given the proximity (within 2 km) of these receptors to the Project WTGs, project activities may pose health, safety and security risks to these seasonal receptors. Impacts relating to the local community in terms of noise, air quality, waste, wastewater, etc., have been addressed in specific chapters in this ESIA.

15.3.2 OHTL

Two receptors were identified that the OHTL will cross which is the Military Base and Almond Orchard Farm. The following receptors by which construction and operation of the OHTL may pose health, safety and security risks to users:

220 KV KHIZI - YASHMA OHTL (OHTL CONNECTING KHIZI 3 WF TO YASHMA SUBSTATION)

- Farm 1: A farm which includes a building and a yard for livestock (350 sheep, 5 Cattle and 1000 geese), located approximately 30 m east of proposed OHTL. The area is only used for grazing. (please refer to Chapter 2 for locations - SC7 in Map); and
- Farm 2: A farm located approximately 100 m south of proposed OHTL and includes 200 sheep and 50 cattle. (please refer to Chapter 2 for locations - SC9 in map);

220 KV KHIZI – PIRAKASHKUL OHTL

- Farm 3: A farm which includes a house and yard for the livestock located approximately 100 m north east of OHTL. (please refer to Chapter 2 for locations - SC6);
- Farm 4: A farm located approximately 110 m east of OHTL and includes 300 sheep. The farm is leased from the state land committee of Khizi District and LLA will expire in 2034. The land is used for grazing only throughout the year (please refer to Chapter 2 for locations - SC10); and

Military training centre (please refer to Chapter 2 for locations -SC8) located approximately 800 east of OHTL).

220 KV PIRAKASHKUL – GOBU OHTL

- Four (4) farms were observed along the route located between 500 to 700 m northwest of proposed OHTL (please refer to Chapter 2 for locations -SC1, SC2, SC3 and SC4);
- A farms with greenhouses located approximately 125 m east of OHTL. The land is leased from the state land committee of Absheron District. The LLA will expire in 2034 (please refer to Chapter 2 for locations - SC11);
- A Dog shelter located approximately 150 m east of OHTL (please refer to Chapter 2 for locations - SC12);

- An almond orchard 'Almond Agro Company' (proposed OHTL route crosses this field) (please refer to Chapter 2 for locations - SC5); and
- Azerbaijan National Guard Training Facility located approximately 400 m south of OHTL (please refer to Chapter 2 for locations - SC13).

220 KV KHIZI - YASHMA OHTL (OHTL CONNECTING KHIZI 3 WF TO YASHMA SUBSTATION)

- Farm 1: A farm which includes a building and a yard for livestock (350 sheep, 5 Cattle and 1000 geese), located approximately 30 m east of proposed OHTL. The area is only used for grazing. (please refer to Chapter 2 for locations - SC7 in Map); and
- Farm 2: A farm located approximately 100 m south of proposed OHTL and includes 200 sheep and 50 cattle. (please refer to Chapter 2 for locations - SC9 in map).

220 KV KHIZI – PIRAKASHKUL OHTL

- Farm 3: A farm which includes a house and yard for the livestock located approximately 100 m north east of OHTL. (please refer to Chapter 2 for locations - SC6);
- Farm 4: A farm located approximately 110 m east of OHTL and includes 300 sheep. The farm is leased from the state land committee of Khizi District and LLA will expire in 2034. The land is used for grazing only throughout the year (please refer to Chapter 2 for locations - SC10); and
- Military training centre (please refer to Chapter 2 for locations -SC8) located approximately 800 east of OHTL).

220 KV PIRAKASHKUL – GOBU OHTL

- Four (4) farms were observed along the route located between 500 to 700 m northwest of proposed OHTL (please refer to Chapter 2 for locations -SC1, SC2, SC3 and SC4);
- A farms with greenhouses located approximately 125 m east of OHTL. The land is leased from the state land committee of Absheron District. The LLA will expire in 2034 (please refer to Chapter 2 for locations - SC11);
- A Dog shelter located approximately 150 m east of OHTL (please refer to Chapter 2 for locations - SC12);
- An almond orchard 'Almond Agro Compny' (proposed OHTL route crosses this field) (please refer to Chapter 2 for locations - SC5); and
- Azerbaijan National Guard Training Facility located approximately 400 m south of OHTL (please refer to Chapter 2 for locations - SC13).

15.3.3 Consultations and Safety/Buffer Zones

There are no national requirements regarding buffer zones and health and safety requirements for WFs. Therefore, consultation letters were issued to the following authorities to introduce

project and establish any specific requirements to be considered by the Project (e.g., safety zones, setbacks, etc.):

The Ministry of Emergency Situations of Azerbaijan Republic, State Agency for Construction Safety Control, Letter issued on 21st September 2021, however no response received yet;

The Ministry of Healthcare of Azerbaijan Republic, Letter issued on 21st September 2021, however no response received yet; and

Ministry of Labour and Social Protection of Population of the Republic of Azerbaijan, Letter issued on 21st September 2021. Response letter received on 11th October 2021 and requested the following to be considered in ESIA :

- Development of the project in line with the requirements of both national and international labour regulations and standards;
- Formulation of requirements for holding regular Environmental and Social Audits within the project execution period;
- Definition of environmental and social goals to achieve full environmental and social efficiency;
- Consideration of measures to minimize negative socio – economic impacts and benefits for local population from the project;
- Consideration of measures to eliminate environmental and social risks, including negative impacts on vulnerable population groups and enhance efficiency;
- Awareness among population regarding the potential risks that may be encountered in the project execution period through alternative awareness tools;
- Presentation of the developed draft ESIA document to concerned parties for their opinions and proposals.

The above requirements are considered in the ESIA report and will be implemented during the development of the Project. Also, the ESIA will includes the outcome of the public disclosure undertaken with the local communities and other relevant stakeholders.

15.4 Potential Impacts, Mitigation, Management & Residual Impact

15.4.1 Construction Phase

INFLUX, COMMUNITY HEALTH & CRIME

The construction phase of the Project will require a dedicated workforce of permanent staff, contractors, as well as the use of specialist sub-contractors and key supply chains. This will therefore lead to an increase in the population on-site and surrounding community (i.e., Sitalchay Village) during construction.

Accommodation

The construction phase of the project will require an amount of workforce as well as suitable accommodation areas for this workforce. Emergency accommodation areas will be made available at the site for limited stay such as during adverse weather conditions (rain, extreme hot and cold weather conditions, etc.) however the exact location of the permanent worker accommodation for either the EPC contractor and subcontractor have not been determined yet.). It is expected that the project workers will be provided with suitable accommodation in nearby cities such as Sumgayit and Baku which has the infrastructure and facilities to accommodate the workforce. Recruitment for the Project will be advertised locally and preference will be given to nationals matching levels of skills requirements.

In addition, it is expected that some of the Project workers will come from outside of the Project area and the Khizi region and there will also be international experts. The influx of such workers from other regions of Azerbaijan and outside Azerbaijan could potentially lead to cultural or religious conflicts with the local communities. This is because the workers may have alternative ideals, behaviour and cultural practices than the local population. Such interactions could lead to potential conflicts or result into crime.

Diseases and Illness

The interaction of workers from different areas (and parts of the world), as well as the close-knit mixing of workers on-sites and in labour accommodation may well result in the transfer of certain communicable disease and/or illness. This may also impact upon communities where interactions take place. Such diseases include Sexually Transmitted Illnesses (STIs) and skin infections. There will also be a potential risk of transmitting COVID-19 between the workers and the communities near the project site and off-site accommodation areas.

There is also potential for construction excavation activities on the site to create breeding grounds for bacteria and parasites which will not only affect the workers but the local communities too. Any potential contamination from the site such as spillage of raw sewage or hazardous materials could potentially result into water related and water borne diseases through contamination of surface and groundwater.

HIV/AIDS

The influx construction workers, some of whom may be from other regions in Azerbaijan and some international workers away from their families, poses a health risk to both workers and the local communities. The EPC Contractor will therefore be required to run a sexual health and HIV awareness campaign with the production of information leaflets to be distributed in the local communities in coordination with local health officials and awareness training among the Project workers.

PUBLIC/COMMUNITY SAFETY**WF**

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 amongst others, including fire and pollution releases.

The construction phase may present a risk if one or more individuals from the local communities ignore signage to try and access the site. Under such circumstances there is potential for untrained personnel not wearing adequate personal protective equipment to risk harm to themselves and so this will be monitored by the EPC/Project Company to ensure that any unauthorised access is immediately reported and individuals are requested to leave the site.

Public risks during construction have the potential to result in isolated incidents, which could be of a devastating magnitude to a person or group of people in the wrong place at the wrong time. . In addition, the absence of proper management, receptors along the access road and motorists are subject to impacts from traffic accidents.

Risks associated with hazardous material or chemical storage will be suitably managed in the construction phase through the implementation of a robust CESMP and an Emergency Preparedness and Response Plan. The Emergency Preparedness and Response Plan will cover works on the project site and along the access road.

OHTL

Based on the Resolution of the Cabinet of Ministers of the Republic of Azerbaijan on the approval of the "Rules for the protection of electrical networks with voltage up to 1000 volts" and "Rules for the protection of electrical networks with voltages over 1000 volts", Approved by the Decision No. 103 of Cabinet of Ministers dated 10 June 2005, the protection zone for the OHTLs will be minimum of 25 m.

PUBLIC/ COMMUNITY SECURITY

The construction phase of the project will require site-based security at the gates and on patrol around the site and access road during construction in order to prevent the public from trespassing to the construction areas. This is so as to minimize the potential for construction site incidents or damage of construction machinery.

There is also a risk that the security personnel who are mandated with providing protection to the workers can abuse their position of power and status and become perpetrators of GBVH either to the members of the workforce or the community.

Following suitable security risk assessment by the EPC Contractor, the security arrangements will require to be guided by UN Code of Conducts for law enforcement officials, the IFC's Good Practice Handbook on the Use of Security Forces: Assessing and Managing Risks and Impacts

IFC's and the UN Basic Principles on the use of Force and Firearms by law enforcement officials in case security at the site will be armed.

In addition to this, security personnel will receive internal training in regard to receiving grievances, reporting such grievances through the Project Information Centre and conduct dialogue with any members of the local community.

A Project Information Centre (PIC) has been established for the Project at Sitalchay Village. This PIC will allow the public to express concerns or make complaints about the Project. Please refer to the Public Consultation Section in this report and the Stakeholder Engagement Plan for additional details on the Project Information Centre.

The workers on the project site will additionally receive cultural awareness training with regard to local customs as such guidance can provide a ready resource on the do's and don'ts of culture centred behaviour.

ABNORMAL LOAD TRANSPORTATION

The transportation of oversized WTG components to project areas is identified as a main challenge for WFs in general. The highways that will be used for the Project are used by residents of cities and towns extending from Alat Port in Baku to project area. The roads within project area are mainly used by framers and settlements surrounding the Project area. The vehicle flow on those roads is not constant and local communities are not accustomed to a lot of traffic along the local roads, therefore, it might take them time to adjust to the new increased vehicular flow. Therefore, an increased number of vehicles along the main and access road as a result of the Project's development has the potential to impact local communities and users of roads. This impacts relating to this has been discuss and assessed in the Transport and Transportation Section of this ESIA Report.

Risks to public safety will be appropriately addressed and prepared for in the construction phase 'Emergency Preparedness and Response Plan' and via appropriate training of staff.

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 potential impacts to communities relating to health, safety and security, although there is no land acquisition or expropriation of land. It is noted that a Project Information Centre and Grievance Mechanism has been established within the standalone Stakeholder Engagement Plan (SEP) for the Project, which 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 to a clean and safe environment is safeguarded through the implementation of mitigation and management measures detailed in this ESIA including adherence to all 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. Increase in crime poses safety risks to the local communities thereby interfering with right to security of the local communities. This will be prevented through mandatory protocols for behaviour and monitoring of all workers on site and interaction with local communities will be minimised.

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 Public/Community Security section above and all security staff will receive training on behavioural standards and interactions with local community members and the receiving of grievances.

Economic Right (Economic Displacement of Herders)

During construction the project will also cause temporary restriction on use of land and access by herders who only graze livestock at the project site thereby impacting herders right to access resources that support their livelihoods.

From a human rights perspective, temporary restrictions to accessing the site must not result in a detriment to Project-affected people's human rights nor should it create obstructions to the right to continuous improvement of living conditions (Van der Ploeg & Vanclay, 2017).

The Project will be required to implement the LRP and comply with IFC PS 5 and EBRD PR 5 in order to ensure that the impacts of the Project to PAPs are minimised and managed.

HUMAN RIGHT RISKS TO VULNERABLE GROUPS

GENDER BASED VIOLENCE & HARASSMENT (GBVH), SEXUAL EXPLOITATION AND ABUSE (SEA) AND SEXUAL HARASSMENT (SH)

The proposed project may lead to an influx of workers during the construction phase majority of whom will be young men who will be away from their families. This may increase the demand for sex workers and put women from other regions in Azerbaijan at the risk of being trafficked to the Project area for the purposes of sex work.

Influx of workers could pose a risk to young adolescent girls who may be at risk of being forced into early marriages to project workers who are perceived to have better wages. It could also increase the risk of violence and sexual abuse against the children in the community who have no ability to give consent, are not empowered to refuse any sexual advances made towards them or anticipate the implications of any actions against them. Exposure to GBVH/SEA/SH has the potential to have profound, long-term impacts on the health and mental well-being of the victims.

In addition, the presence of young men in the project area could also lead to shift in the community's power dynamics and within households. This may be manifested through male jealousy if the workers are believed to be interacting with the women in the community triggering violence towards the women.

The EPC Contractor will be required to conduct a GBVH/SEA/SH risk assessment and conduct training among all Project workers regarding these risks. In addition, a GBVH Policy will be put in place detailing the list of unacceptable behaviour among workers, provisions for reporting, sanctions for perpetrators and available resources and support systems for the victims.

15.4.2 Operational Phase

WF

The health and safety risks applicable to the WF include the following:

- Blade and Ice throw;
- Public Access;
- Traffic; and
- Public safety.

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 nearby receptors and users (including seasonal herders and road users) where some turbines are located. No receptors were identified with the setback distance of 277m for blade throw and the maximum falling distance of ice of 406.5m.

The nearest populated human settlement is located approximately 9.9 km from the project site. The seasonal farms surrounding the WTGs are all located outside project boundary and Aol, therefore, all receptors are considered of Low significance. Given the distance of the WTGs to the nearest local community and the fact that the wind turbines will be subject to continuous monitoring and regular maintenance, the likelihood/risk of blade throw is anticipated to be negligible.

Public Access

Safety risks may happen from any unauthorised access to WTGs and substations. This includes unauthorised climbing of turbines. As stated above there are no permanent receptors or human settlements within close proximity to WF. The seasonal herders during grazing season are the only potential users of project area. Therefore, access to the turbines, substations and other restricted areas will not be allowed. With adequate controls, the magnitude of this impact is likely to be negligible to minor. It should be noted the individual turbines will be fenced to restrict any unauthorised access.

Public/Community Security

The project constitutes a facility of high importance due to the generation of electricity. The project will also include site-based security at the project main entrance and on patrol around the site.

As is consistent with the construction phase, the O&M Contractor will undertake a security risk assessment to determine the appropriate level of security required at the facility. Security arrangements should 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 if security personnel will be armed.

In addition to this, security personnel will receive internal training in regard to grievances, reporting such grievances through the PIC and dialogue with any members of the local community.

OHTL

The risks associated with the operation of the OHTL on the community health and safety includes risk of electrocution through direct contact with the high voltage line or in the event of falling lines or tower failure due to high winds or other natural causes. Other risks include :

- Fires in the event of tower failure or falling line to agricultural fields or crop (i.e. orchard field). However, such incidents are highly unlikely and likelihood is considered very low.
- Electric magnetic field emitted from the OHTL. Magnetic fields decrease with distance. According to the IFC guidance for electrical power transmission and distribution, 'there is no empirical data demonstrating adverse health effects from exposure to typical EMF levels from power transmissions lines and equipment (IFC, 2007)', however limited concern is linked to EMF exposure. The OHTL will pass through a military and orchard field, where exposure is likely to occur. However, given these are not residential receptors, the exposure period will be limited to the working hours. The lines will be installed at an elevated height and not at ground level, therefore reducing EMF exposure to the military and almond orchard workers. Information on EMF will be provided to military and farm workers who will work on land under the OHTL along with recommendations to reduce potential exposure as well as safe working practices. Safety signals and warning signs will be posted along the OHTL.

Emergency response plan will be prepared by the off-taker to address emergency events and other risks.

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 including standards and protocols of behaviours for all staff will need to be put in place just as in the construction phase.

In addition, the O&M Company will be required to implement the grievance mechanism, conduct consultations and provide information to local communities in line with the SEP.

GENDER BASED VIOLENCE & HARASSMENT (GBVH), Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)

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.

15.5 Mitigation and Management Measures

Table 15-2 Community Health, Safety and Security Mitigation & Management Measures – Construction Phase

Potential Impact	Mitigation and Management Measures
Influx	- 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. - The EPC Contractor will develop an Accommodation 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 workers accommodation areas including Codes of Conduct for all workers. - 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 organizations 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

Potential Impact	Mitigation and Management Measures
	be cleared for work with a medical fitness certificate from an authorized medical center issued. - Any reportable disease will be diagnosed by the authorized occupation health center 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 within the site, access road and wells excavated in the area 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 given advice 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. - The Project shall prepare a site Community Response Action Plan which shall define the site action to support community stakeholders in planning, responding and recovering from the COVID-19 outbreak especially when outbreaks are directly linked to the Project workers. - Due to the health risk posed by COVID-19, workers will be screened in accordance with the Azerbaijan guidelines and WHO. They will also be provided with PPE and training on how to safely use them during induction and as part of the toolbox talks. - If any cases of COVID-19 are reported on site, the EPC Contractor will notify the relevant health officials and isolation of concern individuals performed immediately. - The workers will ensure minimal interaction with community members as long as COVID-19 continues to be a health risk. In addition, community members working on the site will be trained on how to ensure proper hygiene when working on the site and when they go home. - Community members will have access to a grievance mechanism in order to make any complaints regarding public health and safety in line with project SEP.
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.

Potential Impact	Mitigation and Management Measures
	• 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. • Community members will have access to a grievance mechanism in order to make any complaints regarding public health and safety in line with project SEP.
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 EPC will prepare a Security Plan consistent with its Security Risk Assessment. The security risk assessment to be conducted as part of the security plan will confirm whether the use of firearms will be necessary for Project security management. If required, appropriate training on usage and code of conduct will be carried out. • Security arrangements shall 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, human rights and receipt of grievances. • Any use of firearms will be in accordance with the Azerbaijan 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 unauthorized 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 unauthorised 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. • The security personnel will be regularly trained on GBVH code of conduct including how to handle grievances related to GBVH/SEA/SH from the community.

Potential Impact	Mitigation and Management Measures
	Community members will have access to a grievance mechanism in order to make any complaints regarding security in line with project SEP.
Abnormal Load Transportation	Mitigation measures are listed in Traffic and Transportation Section of this EISA Report.
Human Right Risks to Local Communities – Right to Security	- Substance abuse prevention and management programs will be provided to workers; - There will be a zero tolerance standard of drug and alcohol abuse. - The Project will provide training to local law enforcement staff on management of illicit behaviour; - Workers code of conduct will be developed and implemented to guide workers 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 – Economic Right (Economic Displacement of Herders)	- A Livelihood Restoration Plan (LRP) will be developed to assess potential impacts to herders - Compensation will be provided to all herders that will be economically displaced as a result of the project's development - The Project will also ensure that the following rights of the herders are adhered to: - Right to information; - Right for the impacted PAPs to participate in decision making consistent with the principle of equality and non-discrimination; - Right to freedom of expression and opinion without fear of retribution; - Right to remedy through an operational grievance mechanism that is also accessible to vulnerable groups; and - Right to an adequate standard of living and continuous improvement in living conditions by ensuring a full and fair compensation in accordance with Azerbaijan and lender's requirements
Human Right Risks to Vulnerable Groups – GBV, SEA & SH	- The Project Company and the EPC Contractor will conduct a 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 Azerbaijan requirements including ACWA Power's

Potential Impact	Mitigation and Management Measures
	Environmental & Social Management System Implementation Manual. • Awareness training will be mandatory for all Project workers regarding the 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 SEA/SH and information provided on how to report any cases of SEA/SH and the services that will be made available to offer support to any of the survivors. • Approach towards 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 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 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 SEA/SH shall be documented and closed. • The EPC Contractor will prepare and implement a 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.
Grievance Mechanism	• The project will implement an appropriate system to allow external parties to raise grievances in regard to the Project through the Project Information Center. • 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 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;

Potential Impact	Mitigation and Management Measures
	Be reflected in the other policies and procedures to embed it throughout their construction phase activities.

Table 15-3 Community Health, Safety and Security Mitigation & Management Measures – Operational Phase

Potential Impact	Mitigation and Management Measures
Public/Community Safety	- 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. - Grievance Redressal Mechanism shall be made accessible to the community to ensure that community members raise grievances to the Project leadership. - This grievance mechanism shall be within the scope of the Project Information Centre. - 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. - 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. - Community members will have access to a grievance mechanism in order to make any complaints regarding public health and safety in line with project SEP.
Blade/Ice Throw	- As recommended by IFC EHS for Wind Energy, selecting wind turbines that have been subject to independent design verification/certification (e.g., IEC 61400-1), and surveillance of manufacturing quality. - In accordance with IFC EHS Guideline on Wind Energy, the final selected WTG specification will ensure a minimum setback distance of 1.5 X turbine height (tower + rotor radius) between the turbines and local population. - 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 - In accordance with IFC EHS Guideline on Wind Energy, wind turbines should be equipped with ice detectors that shut down the turbine to an idling state when ice is present. - Where wind turbines are required to operate in icing conditions, warning signs will be posted at least one rotor diameter from each wind turbine in all directions. - Training to be provided on procedures for shutting down wind turbines before O&M personnel access the site during icing conditions

Potential Impact	Mitigation and Management Measures
	• Wind turbines should be equipped with ice detectors to control blade-heating systems, which are designed to release ice from the blade surface, thereby maintaining the efficiency of the turbine; the blade surface finish may also affect the efficiency of heating systems. • 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. • Ensure that lightning protection systems are properly installed and maintained.
Public Access	Prevention and controls as recommended by IFC EHS Guideline for Wind Energy (IFC, 2015): • Consideration to use gates on access roads. • Provide fencing of an appropriate standard around the substation with anti-climb paint and warning signs. • Access to turbine tower ladders will be prevented • Information boards about public safety hazards and emergency contact information will be posted.
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 O&M will prepare a Security Plan consistent with its Security Risk Assessment. The security risk assessment to be conducted as part of the security plan will confirm whether the use of firearms will be necessary for Project security management. If required, appropriate training on usage and code of conduct will be carried out. • Security arrangements shall 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, human rights and receipt of grievances. • 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. • Community members will have access to a grievance mechanism in order to make any complaints regarding security in line with project SEP.

Potential Impact	Mitigation and Management Measures
Gender Based Violence & Harassment, Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH)	• The Project Company and the O&M Company will conduct a 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 SE/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 SEA/SH and information provided on how to report any cases of SEA/SH and the services that will be made available to offer support to any of the survivors. • Approach towards 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 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 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 SEA/SH shall be documented and closed. • The O&M Company will prepare and implement a 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.
Grievance Mechanism	• The project will implement an appropriate system to allow external parties to raise grievances in regard to the Project through the Project Information Centre. • 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;

Potential Impact	Mitigation and Management Measures
	- 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.
Risks from OHTL	- Off-taker to develop an Emergency and Preparedness Plan to address safety risks that may occur during operation of the OHTL including fires, falling and failure of towers and lines, etc. - Exposure to EMF: - Information on EMF will be provided to almond orchard workers and military personnel who will work on land under the OHTL along with recommendations to reduce potential exposure as well as safe working practices. - Safety signals and warning signs will be posted along the OHTL.

15.6 Monitoring

Monitoring of Community Health and Safety 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 monthly during construction and quarterly during operations.

Table 15-4 Key monitoring indicators (Construction & Operations)

Indicator	Source of information	Frequency Construction /Operation
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 operations
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.	On-going
Record of average period taken to handle SEA/SH grievances in accordance with lenders requirements and referral to legal entities	Complaints received and the period of time it takes to close them.	On-going
Discharging of fire arms by security personnel on site	Security personnel/local police	On-going in the event the security personnel are armed

Indicator	Source of information	Frequency Construction /Operation
Record of human rights violation/complaints from the local communities	Complaints filed by community members in relation to the Project	Ongoing
Record of incidents/accidents and near misses (involving external parties)	Records from daily monitoring procedures on site	On-going
Record of any communicable diseases on site that could pose a risk to the local communities	Project site clinic or HSE personnel	On-going
Any suspected cases of COVID-19 on site	Records from daily monitoring procedures on site	On-going
Number of grievances closed out	Grievance Management System	Quarterly / bi-yearly
Average time for grievance processing and close out and trends	Grievance Management System	Quarterly / bi-yearly
Number of grievances still opened, method to submit the grievance and trends	Grievance Management System	Quarterly / bi-yearly
Topics raised in grievances and trends	Grievance Management System	Quarterly / bi-yearly

16 SOCIOECONOMICS

16.1 Standards and Regulatory Requirements

16.1.1 National Requirements

Key legislative and regulations addressing land acquisition and resettlement in the Republic of Azerbaijan include (Asian Development Bank, 2014):

- The Constitution of the Republic of Azerbaijan (Adopted on 12 November 1995, revisions made on 18 March 2009);
- The Land Code (Adopted on 25 June 1999, last revisions made on 20 April 2012);
- The Civil Code (Adopted on 28 December 1999, last revisions made on 20 April 2012);
- The Flat Code (Adopted on 15 November 2011, last revisions made on 20 April 2012);
- The Land Acquisition Law (April 2010);
- Law on valuation activity (25 June 1998, last revisions made on 20 April 2012);
- Law on "Land Lease" (11 December 1998, № 587-IQ);
- Decree of the President on additional activities regarding to implementation of the Law on "Acquisition of Lands for State Needs" (15 February 2011);
- Decree of the President on ensuring the execution of the law No. 506-3 QD dated 7 December 2007 on —Amendments and Additions to the Civil Code of the Azerbaijan RepublicII (26 December 2007);
- Resolution of the Cabinet of Ministers on approving of guidelines for preparation of Resettlement Plan and Resettlement Guideline No. 45 dated 24 February 2012;
- Resolution of the Cabinet of Ministers on approving the guidelines for selection of a person or entity to prepare Resettlement Plan or Resettlement Guideline No. 55 (21 April 2011);
- Resolution of the Cabinet of Ministers No. 110 (28 June 1999);
- Resolution of the Cabinet of Ministers No. 42 On Some Normative and Legal Acts Relating to the Land Code (15 March 2000);
- Law of Azerbaijan Republic on Municipality Area and Lands (07 December 1999, No: 771-IQ); and
- Law on Management of Municipality Lands (29 June 2001, No: 160-IIQ).

Laws on Land Acquisition and Resettlement

- The Land Code; and
- The Land Acquisition Law.

Key National Laws on Gender Equality

- The Law “On Guarantees of Gender Equality” (2006) covers gender-based discrimination;
- Article 12 of the Constitution of the Republic of Azerbaijan, all international agreements and Conventions that the Republic of Azerbaijan has ratified, are considered to be a part of its domestic legislation;
- The Law on the Prevention of Domestic Violence (2010) contains provisions pertaining to sexual violence in the family;
- The Law of the Republic of Azerbaijan “On Amendments to the Family Code” was adopted in November 2011 to raising the age of consent to marriage to 18 for both men and women; and
- The Criminal Code (Law No. 256-IVQD) was accordingly amended in November 2011, to prohibit early and forced marriages and to increase sanctions for such offences.

Azerbaijan ratified the following international treaties:

- Azerbaijan ratified CEDAW in 1995 and the optional protocol in 2001; and
- In May 2011, the Republic of Azerbaijan ratified ILO Convention No. 156 concerning Equal Opportunities and Equal Treatment for Men and Women Workers: Workers with Family Responsibilities and Convention No. 183 concerning the revision of the Maternity Protection Convention (Revised), 1952.

16.1.2 Lenders Requirements

EBRD

Performance Requirement 1 outlines the needs to assessing social impacts as part of ESIA. This is interpreted to include socio-economic effects to individuals/groups/populations that may be impacted by a project.

Performance Requirement 5 on land acquisition, involuntary resettlement and economic displacement refers to Involuntary resettlement as both physical displacement (relocation or loss of shelter) and economic displacement (loss of assets or resources, and/or loss of access to assets or resources that leads to loss of income sources or means of livelihood) as a result of project-related land acquisition and/or restrictions on land use.

Where resettlement is government is led, PS5 requires, *‘the client (to) collaborate with the responsible government agency, to the extent permitted by the agency, to achieve outcomes that are consistent with the objectives of this PR’*.

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 involuntary resettlement safeguard 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.

EPFI's

International financial institutions are likely to require adherence to IFC Performance Standard 1 on Assessment and Management of Environmental and Social Risks and Impacts Performance Standard 2 on Labour and Working Conditions and IFC performance Standard 4 on Community Health, Safety and Security.

IFC PS 1 standard establishes requirements for the assessment of Social risk and impacts associated with the project while IFC PS 2 & 4 establish requirements for the safeguard of the workforce and local community from potential risks associated with the project including impacts associated with introduction of communicable disease, loss of ecosystem function, site access and operation, material use etc.

IFC 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.

16.2 Area of Influence

The direct area of influence includes the surrounding seasonal farms/ herders as well as Sitalchay village as the nearest human settlement to project area, located approximately 9.9 km north east of project area. The indirect area of influence is Azerbaijan in general through the sustainable supply of energy.

16.3 Baseline

16.3.1 National and Regional Baseline Conditions

This chapter provides an overview of the social and socio-economic baseline conditions relevant to the Project. Where relevant, information is presented at the following levels:

- National - relevant to Azerbaijan; and
- Region - relevant to Absheron Economic Region in general and Khizi Region specifically.

ADMINISTRATIVE AND GEOGRAPHIC CONTEXT

Azerbaijan is divided into 63 administrative regions, 14 urban districts, and nine (9) economic zones in addition to Baku city and Nakhchivan Autonomous Republic (STAT, 2021). The Project falls within Khizi which is located in the north east of Azerbaijan approximately 55km north west of Baku. Khizi Region falls within Absheron Economic Region and has an area of 1,670 Km² that includes one town, three settlements, and 25 villages.

The breakdown of territorial units within Azerbaijan, Absheron Economic Region and Khizi Region are shown below.

Table 16-1 Territorial Units by Regions in Azerbaijan in 2020 (State Statistical Committee, 2020)

AREA	REGIONS	URBAN DISTRICTS	TOWNS	URBAN ADMINISTRATIVE SETTLEMENTS	SETTLEMENTS ADMINISTRATIVE	RURAL SETTLEMENTS	RURAL ADMINISTRATIVE	REGIONAL ADMINISTRATIVE TERRITORIAL	
Azerbaijan	63	14	79	68	262	190	4,246	1,724	40
Absheron Economic Region	2	-	3	2	13	13	32	14	4
Khizi Region	1	-	1	1	3	3	25	8	-

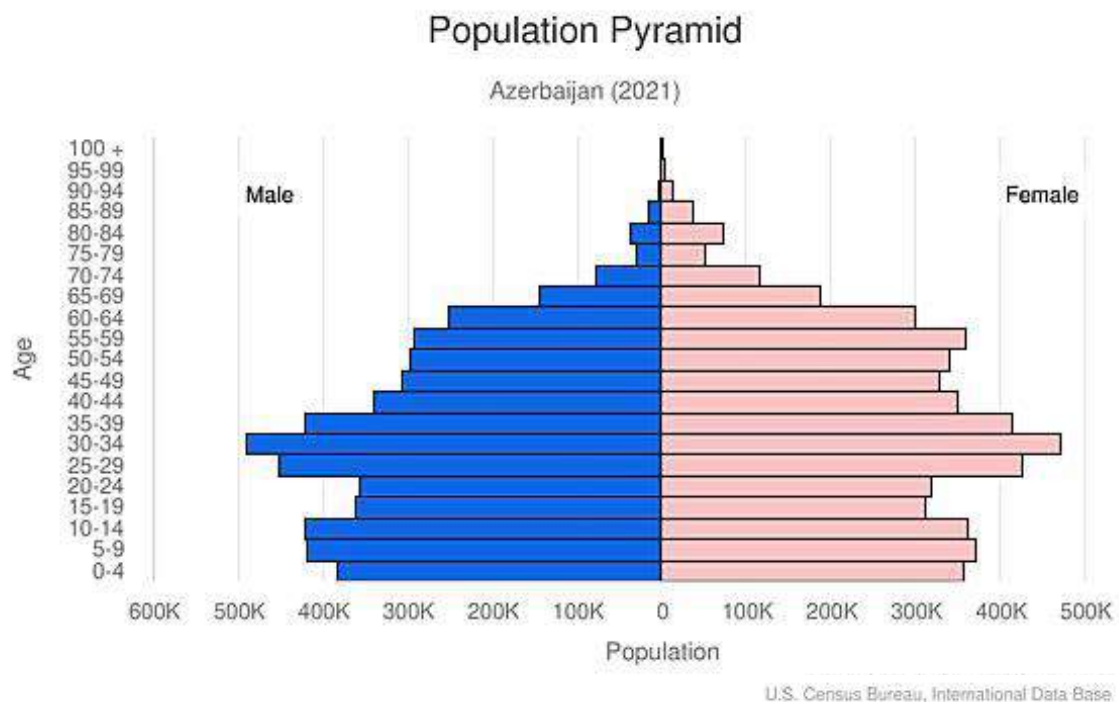
POPULATION AND DEMOGRAPHICS

The population in Azerbaijan by mid 2021 was estimated at 10,282,283 individuals distributed between urban (53%) and rural areas (47%), with a growth rate of 0.71% (CIA, 2021). The population is diverse and rich with several ethnic groups where 92.5% of the population are

Azerbaijani, 2% are Lezghin, 1.3% are Russian, 1.3% are Armenian, 1.3% are Talysh, while the remaining 2.4% comprise other groups (CIA, 2021).

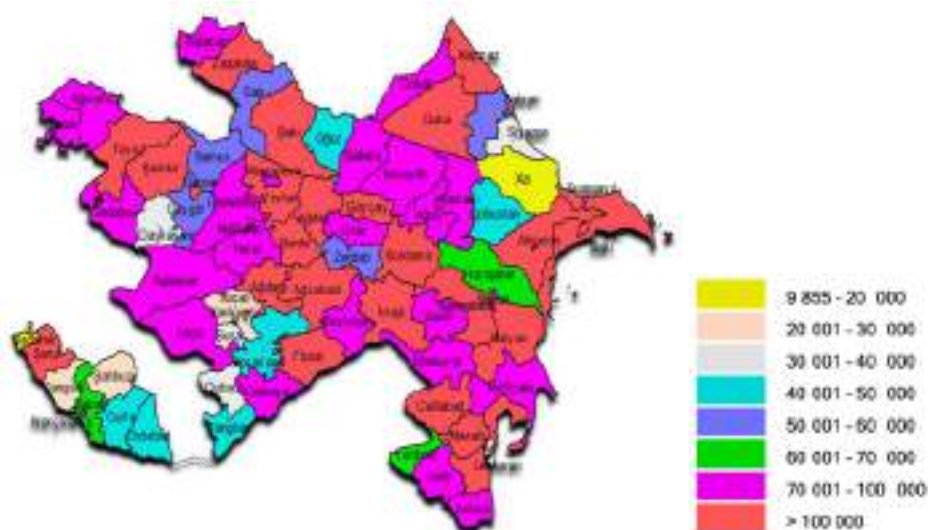
The percentage of males and females are similar at 49.9% and 50.1% respectively (State Statistical Committee, 2020). The majority of the population is between the ages of 15 and 64 years (70.4%), while the remaining 22.8% and 7.29% are below 15 years or above 64 respectively (CIA, 2021). The Population pyramid is shown in the figure below.

Figure 16-1 Azerbaijan Population Pyramid (CIA, 2021)



According to the Population of Azerbaijan report published by State Statistical Committee of the Republic of Azerbaijan, at the beginning of 2020 Absheron Economic Region had a population of 576,500 individuals, out of which Khizi Region, referred to as Xizi and highlighted yellow in the Figure below, has a total population of 17,200 persons and is considered to be one of the least populated regions in Azerbaijan (STAT, 2021). Males make up 49.7% of the population in both Absheron Economic Region and Khizi Region while females make up 50.3% of the population. The national average household size is 4.14 members per household.

Figure 16-2 Distribution of Population by Region Beginning of 2021 (Population of Azerbaijan, 2021)



ETHNICITY

There are more than 15 ethnic groups in Azerbaijan and most live in settlements and constitute 8.4 % of the population. Azerbaijanis constitute over 90% of the population as shown in the Table below. Ethnic minorities include Armenian, Lezgins, Russian, Armenians and others. Over the past decade the share of all major ethnic minorities of Azerbaijan except Talysh and Tats has been shrinking, but the census recorded a dramatic fall in numbers of Russians and Armenians in the republic. Most Armenians outside Nagorno-Karabakh left Azerbaijan as a result of the Nagorno-Karabakh conflict, and many Russians also opted to leave for socio-economic reasons. Lezgins became Azerbaijan's largest minority as a result of these changes. Azerbaijani is the state language, spoken by the majority of the population. Russian is also widely used, particularly in urban areas. Table below presents the ethnic groups and native language in Azerbaijan, based on most recent statistics published by The State Statistical Committee of the Republic of Azerbaijan.

Table 16-2 Population by Ethnic group and Native Language

ETHNIC GROUPS	1926	1939	1959	1970	1979	1989	1999	2009
<i>thsd. person</i>								
Number of population - total	2314.6	3205.2	3697.7	5117.1	6026.5	7021.2	7953.4	8922.4
<i>including:</i>								
Azerbaijanians	1438.0	1870.5	2494.4	3776.8	4708.8	5805.0	7205.5	8172.8
Lezgins	37.3	111.7	98.2	137.3	158.1	171.4	178.0	180.3
Armenians	282.0	388.0	442.1	483.5	475.5	390.5	120.7	120.3
Russians	220.5	528.3	501.3	510.1	475.3	392.3	141.7	119.3

ETHNIC GROUPS	1926	1939	1959	1970	1979	1989	1999	2009
Talyshs	77.3	87.5	0.1	...	...	21.2	76.8	112.0
Avars	19.1	15.7	17.3	30.7	36.0	44.1	50.9	49.8
turkisks	...	...	0.2	8.5	7.9	17.7	43.4	38.0
tatarians	9.9	27.6	29.6	31.8	31.4	28.6	30.0	25.9
Tats	...	...	5.9	7.8	8.9	10.2	10.9	25.2
ukrainians	18.2	23.6	25.8	29.2	26.4	32.3	29.0	21.5
sakhurs	15.6	...	2.9	6.2	8.5	13.3	15.9	12.3
georgians	9.5	10.2	9.5	13.6	11.4	14.2	14.9	9.9
Jews	30.9	41.2	40.2	41.3	35.5	30.8	8.9	9.1
Kurds	41.2	6.0	1.5	5.5	5.7	12.2	13.1	6.1
Kryzs	...	...	...	...	...	...	...	4.4
Udins	2.4	...	3.2	5.5	5.8	6.1	4.1	3.8
khynalygs	...	...	...	...	...	...	...	2.2
other nationalities	112.7	94.9	25.5	29.3	31.3	31.3	9.6	9.5
<i>as % to total</i>								
Population, total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<i>including:</i>								
azerbaijanians	62.1	58.4	67.4	73.8	78.1	82.7	90.6	91.6
lezgis	1.6	3.5	2.6	2.7	2.6	2.4	2.2	2.0
armenians	12.2	12.1	11.9	9.4	7.9	5.6	1.5	1.3
russians	9.5	16.5	13.6	10.0	7.9	5.6	1.8	1.3
talyshs	3.3	2.7	0.0	...	...	0.3	1.0	1.3
avars	0.8	0.5	0.5	0.6	0.6	0.6	0.6	0.6
turkisks	...	...	0.0	0.2	0.1	0.2	0.5	0.4
tatarians	0.4	0.9	0.8	0.6	0.5	0.4	0.4	0.3
tats	...	...	0.2	0.15	0.14	0.14	0.13	0.3
ukrainians	0.8	0.7	0.7	0.6	0.4	0.5	0.4	0.3
sakhurs	0.7	...	0.1	0.1	0.1	0.2	0.2	0.1
georgians	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.1
jews	1.3	1.3	1.1	0.8	0.6	0.4	0.1	0.1
kurds	1.8	0.2	0.0	0.1	0.1	0.2	0.2	0.1
kryzs	...	...	...	...	...	...	...	0.04
udins	0.1	...	0.1	0.1	0.1	0.1	0.05	0.04
khynalygs	...	...	...	...	...	...	...	0.02
other nationalities	5.0	2.9	0.7	0.55	0.66	0.46	0.12	0.10

Source: The State Statistical Committee of the Republic of Azerbaijan, 2021

Table below presents the ethnic composition for Khizi Region, which shows the majority of the population are of Azerbaijani ethnicity (99%), followed by Turks (0.5%), Russians (0.18%), Lezgins and other groups (0.11%) and Tats (0.03%).

Table 16-3 Population by Ethnic group for Khizi region

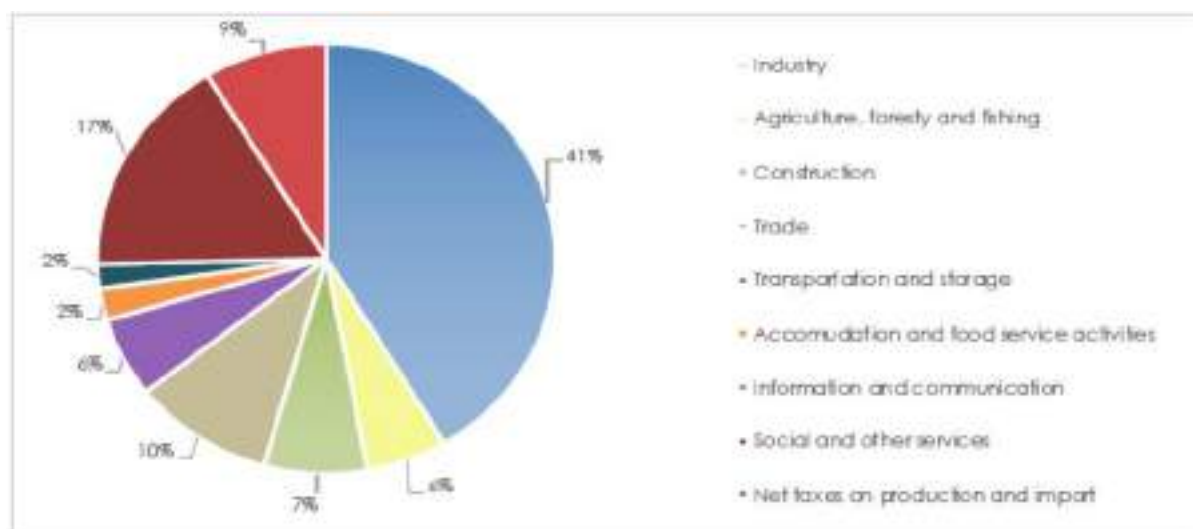
ETHNIC GROUPS	TOTAL	AZERBAIJANIS	LEZGINS	RUSSIANS	TURKS	TATARS	TATS	OTHER
Khizi (thsd. Person)	14731	14596	16	27	68	3	5	16

Source: The State Statistical Committee of the Republic of Azerbaijan, 2021

ECONOMY AND EMPLOYMENT

Azerbaijan has been a fast-developing economy with a Gross Domestic Product (GDP) per capita that has risen from 663 USD in 2000 to an estimated 4,272 USD in 2020 (STAT, 2020). As per the National Accounts of Azerbaijan report, the industrial sector generated 41% of Azerbaijan's GDP in 2019 this includes the oil and gas sector which is considered the main economic sector in Azerbaijan even though it employs less than 1% of the total labour force (STAT, 2020). The contribution of the different economic sectors in the GDP is shown in the figure below.

Figure 16-3 Structure of the GDP in 2019 (STAT, 2020)



A total of 141,057 business entities were operating in Azerbaijan beginning of 2021, out of which 7% are located in Absheron Economic Region, dominated mostly by micro and small businesses. More than 58,000 entrepreneurs are located in Absheron Economic Region, out of which around 80% are males.

The national unemployment rate in Azerbaijan was estimated at 6.27% in 2020 (World Bank, 2021). Employment has been increasing over the past 10 years in Azerbaijan as shown in the table below.

Table 16-4 Number of Employment within Azerbaijan, Absheron Economic Region, and Khizi Region (STAT, 2020)

AREA	2010	2015	2016	2017	2018	2019
Azerbaijan	4,329,100	4,671,600	4,759,900	4,822,100	4,879,300	4,938,500
Absheron Economic Region	256,500	272,400	277,400	279,700	281,800	283,600
Khizi Region	7,200	9,000	9,200	9,300	9,400	9,900

Self-employment is one of the main sources of income in Azerbaijan especially in rural areas where 44.3% of the population is self-employed. The table below presents the breakdown of income sources by gender.

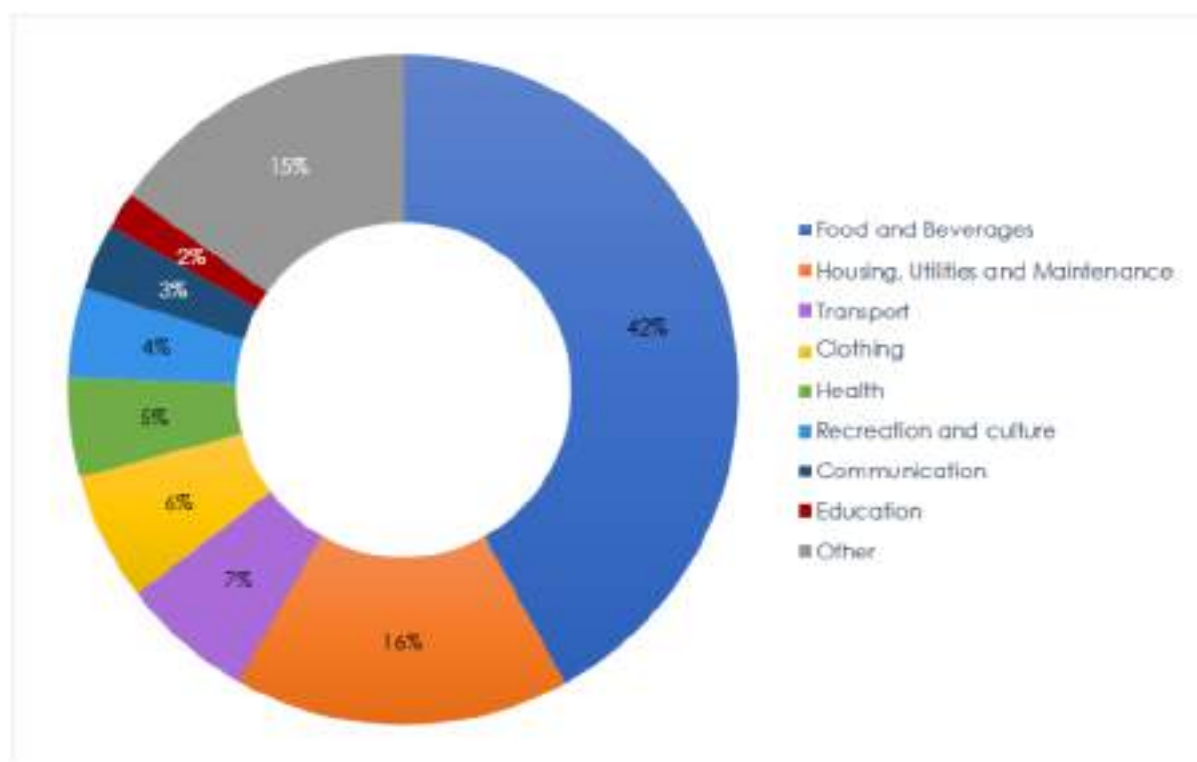
Table 16-5 Population's Sources of Income in 2019 (STAT, 2020)

SOURCE	PERCENTAGE OF POPULATION IN AZERBAIJAN		PERCENTAGE OF POPULATION IN ABSHERON ECONOMIC REGION	
	MALES	FEMALES	MALES	FEMALES
Working in the Public Sector	9.5%	9%	11.4%	11%
Working in the Private Sector	4.8%	1.9%	6.5%	1.9%
Self employed	20.1%	11.8%	13.3%	4.4%
Pensions	6.1%	10.5%	5.9%	11%
Study Grants	0.3%	0.2%	0.5%	0.3%
Social Grants	0.3%	0.5%	0.1%	0.1%
Dependent	6.7%	17.8%	9.8%	23.2%
Income from Outside the Country	0.1%	0.3%	0.2%	0.4%
Other	-	0.1%	-	0.1%
Total Percentage of Population by Gender	47.9%	52.1%	47.6%	52.4%

In Azerbaijan, 6.3% of the population lived below the national poverty line in 2020 (ADB, 2021). The national minimum wage in Azerbaijan is 147 USD (250 AZN) and the national monthly average income was around 374 USD (635 AZN) per capita in 2019 (STAT, 2020). Monthly average incomes in Absheron Economic Region and Khizi Region are lower than the national average, at 296 USD (503 AZN) and 212 USD (361 AZN) respectively.

The breakdown of expenditure by type of activity in Azerbaijan is shown in the figure below where the main expenses are related to food and beverages, followed by housing and utilities.

Figure 16-4 Distribution of Expenditure in Azerbaijan (STAT, 2020)



The agriculture, forestry and fishing industry is also an important economic sector in Azerbaijan considering it provides employment for approximately 36% of the population although it made up only 6% of the GDP in Azerbaijan in 2019. In 2019, irrigated lands formed a total of 1,450,200 ha and cropped agricultural lands formed a total of 1,717,054 ha in Azerbaijan. Absheron economic region had a total of 8,152 ha of cropped agricultural lands out of which more than 73% are located in Khizi Region (STAT, 2020).

The main agricultural crops in Azerbaijan in general and the Khizi Region in particular are cereals and dried pulses, winter and spring wheat and barley, as well as orchards and berry plantations.

Table 16-6 Main Crops in Azerbaijan, Absheron Economic Region, and Khizi Region (STAT, 2020)

TYPE OF CROPS	CROPPED AREA IN AZERBAIJAN (HA)	CROPPED AREA IN ABSHERON ECONOMIC REGION (HA)	CROPPED AREA IN KHIZI REGION (HA)
Cereals and dried pulses	1,072,344	6,664	5,439
Winter and spring wheat	670,020	3,795	3,488
Winter and spring barley	342,214	2,865	1,949
Orchards and berry	210,350	5,118	962
Fodder crops	366,922	432	297
Watermelons and melons	21,358	223	113
Vegetables	69,354	762	107
Potatoes	56,921	35	24

TYPE OF CROPS	CROPPED AREA IN AZERBAIJAN (HA)	CROPPED AREA IN ABSHERON ECONOMIC REGION (HA)	CROPPED AREA IN KHIZI REGION (HA)
Industrial crops	130,155	36	-

The agriculture sector also relies on raising livestock and poultry and selling their products. A total of 32,230,200 birds were recorder in the poultry sector in 2019 while the Azerbaijani farms and herders raised a total of 12,208,500 heads of livestock with the majority being sheep and goats. The animal products recorded during 2019 are shown in the table below.

Table 16-7 Animal Products in Azerbaijan, Absheron Economic Region, and Khizi Region (STAT, 2020)

PRODUCE	AZERBAIJAN	ABSHERON ECONOMIC REGION	KHIZI REGION
Meat (tons)	335,719	7,093	4,186
Milk (tons)	2,150,817	58,225	6,845
Eggs (units)	1,827,072,000	436,811,000	318,725,000
Wool (greasy weight in tons)	16,095	351	110

EDUCATION

The education system in Azerbaijan has expanded significantly over the past years, providing increased access to learning and making education compulsory for children above the age of 6 years. The majority of the population can read and write with a literacy rate of 99.8% similar among males and females. As provided in the table below, Khizi region has a total of 8 pre-schools, 15 general schools and one vocational school, however it lacks any specialized secondary schools and higher education institutions.

Table 16-8 Distribution of Schools and Students in Azerbaijan, Absheron Economic Region, and Khizi Region for the School Year 2019/2020 (STAT, 2020)

TYPE OF SCHOOL	AZERBAIJAN		ABSHERON ECONOMIC REGION		KHIZI REGION	
	NUMBER OF SCHOOLS	NUMBER OF STUDENTS	NUMBER OF SCHOOLS	NUMBER OF STUDENTS	NUMBER OF SCHOOLS	NUMBER OF STUDENTS
Public Pre-schools	1,684	122,398	96	11,562	8	275
Private Pre-schools	156	6,428	8	329	-	-
General Public Schools	4,400	1,600,790	106	124,640	15	2,531
General Private Schools	33	15,315	4	1,353	-	-
Vocational Schools	110	23,193	5	1,185	1	36
Public Specialized Secondary Schools	55	50,570	4	3127	-	-
Private Specialized Secondary Schools	4	5,430	-	-	-	-

TYPE OF SCHOOL	AZERBAIJAN		ABSHERON ECONOMIC REGION		KHIZI REGION	
	NUMBER OF SCHOOLS	NUMBER OF STUDENTS	NUMBER OF SCHOOLS	NUMBER OF STUDENTS	NUMBER OF SCHOOLS	NUMBER OF STUDENTS
Public Higher Education Institutions	40	169,015	2	11,497	-	-
Private Higher Education Institutions	12	18,639	-	-	-	-

HEALTHCARE

The health system in Azerbaijan is centralized and hierarchical, and even though the Ministry of Health manages the health system at the national level, it has limited influence over health care providers at the local level as they are financed by the local district health or village authorities (European Observatory, 2010). The Healthcare facilities and medical staff are presented in the table below. Khizi Region has one hospital equipped with 37 beds and 7 outpatient clinics with a total capacity of 261 patients (STAT, 2020).

Table 16-9 Healthcare Facilities in 2019 (STAT, 2020)

AREA	HOSPITALS	NUMBER OF BEDS	PHYSICIANS/ DOCTORS	PARAMEDICAL STAFF/ NURSES	NUMBER OF AMBULANCE POLYCLINICS	CAPACITY OF AMBULANCE POLYCLINICS
Azerbaijan	563	44,000	32,500	54,000	1,741	104,921
Absheron Economic Region	25	1,966	1,763	3,072	56	3,820
Khizi Region	1	37	28	70	7	261

Expenditure on health in Azerbaijan has significantly increased since the 2000; it is considered to have one of the highest out-of-pocket (OOP) expenditure on health in the region with low public expenditure on health. Most of this OOP expenditure is on pharmaceutical products (World Bank, 2018).

According to the World Factbook, life expectancy at birth is 73.88 years in Azerbaijan with 70.79 years for males and 77.15 years for females (CIA, 2021). Mortality rates for Azerbaijan reported by the State Statistical Committee of the Republic of Azerbaijan in 2019 include:

- Infant mortality was 11 deaths per 1,000 live births, a 15.52% decline from 2010. Majority of the deaths were recorded in urban areas (73.47%). Main causes of infant mortality were attributed to complication and health conditions during perinatal period, diseases of the respiratory system, congenital malformations, deformations and chromosomal abnormalities, and diseases of the nervous system;

- Children mortality under 5 years was 13 deaths per 1,000 live births, a 20.45% decline from 2010. The total deaths were higher for males than females with 60.65% and 39.34% deaths respectively;
- Maternal mortality was 14.9 deaths per 100,000 live births, a 19.23% decline from 2010; and
- The rate of death at working age was 2.7 deaths per 1,000 population, a 23.62% increase from 2010. The total deaths were higher for males than females with 70.6% and 29.4% deaths respectively.

A total of 55,916 deaths were recorded in Azerbaijan in 2019. The main causes of deaths are shown in the table below, the predominant causes of death are diseases affecting the circulatory system (STAT, 2020).

Table 16-10 Main Causes of Death in Azerbaijan in 2019 (STAT, 2020)

CAUSE OF DEATH	PERCENTAGE OF TOTAL DEATHS
Circulatory System Diseases	58.1%
Neoplasms	15.8%
Injuries, Poisoning and Other External Reasons	5%
Digestive System Diseases	4.8%
Respiratory System Diseases	3.3%
Endocrine System Diseases, Malnutrition, Metabolism	2.7%
Urogenital System Diseases	2.3%
Conditions Originating in Perinatal Period	1.8%
Nervous System Diseases	1.5%
Others	4.8%

GENDER ROLES

According to the Country Gender Assessment prepared by ADB in 2019, girls achieving a university education and women having paid work is considered necessary in Azerbaijan. Women in Azerbaijan spend triple the amount of time on unpaid household work than men spend. This is attributed to the patriarchal societies and imbedded social norms that bound women by the traditional concepts of motherhood, responsibility of household work, and taking care of the family.

Azerbaijan has adopted the Platform for Action of the Fourth World Conference on Women in Beijing 1995. Therefore, gender statistics is annually published by the State Statistical Committee (SSC) of the Republic of Azerbaijan. The main gender indicators that characterize the country's labour market such as employment, unemployment rate, labour conditions, occupational injuries are summarised below (State Statistical Committee of the Republic of Azerbaijan, 2021):

- The number of men economically active and employed in Azerbaijan was more than that of women (51.1% men and 48.9% women);
- Unemployment rate were higher for women than men for the year 2020, with women accounting for 8.4% while 6.0% for men; and
- Women are mainly engaged in human health and social work, education and art, entertainment and recreation and are higher than those of men by 55.2%, 46.6% and 24.0% respectively in these sectors.

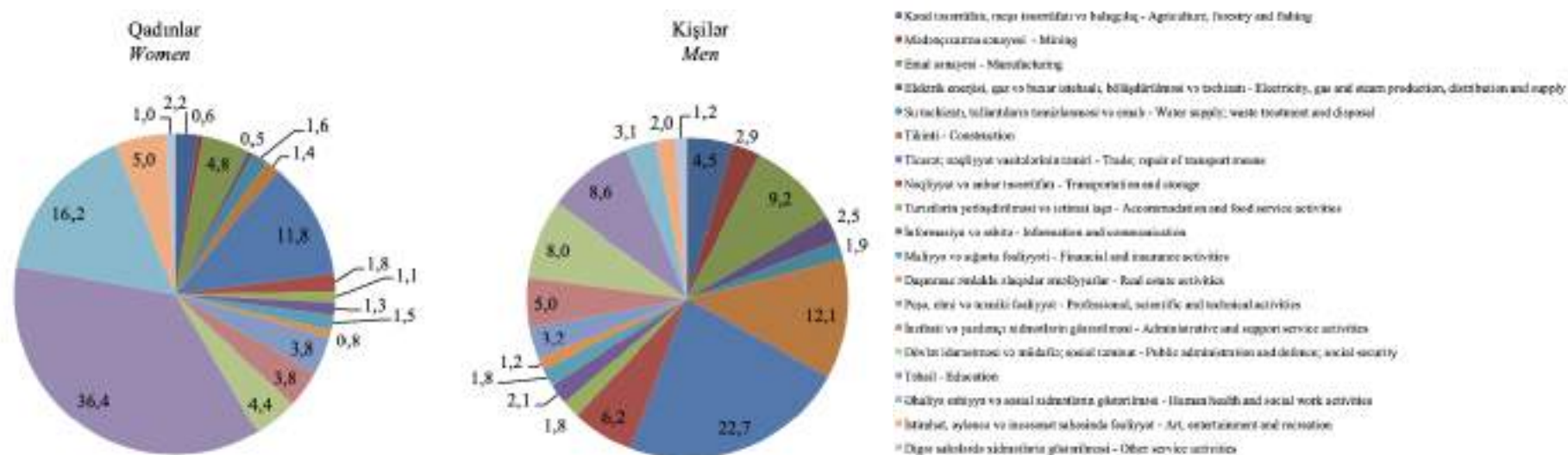
Access to Employment and Wage Gaps

Having a 68.6% women labour force participation rate compared to 73.9% for men placed Azerbaijan in the top three countries for women's economic participation and opportunity in the Global Gender Gap Index (GGGI) in 2018. But despite being economically active in the labour market, the gap in labour force participation has not changed since 2012 and women still experience gender discrimination in types of occupation, face higher unemployment and earn less than men (ADB, 2019).

According to ADB, 2019, the labour market in Azerbaijan is characterised by a visible gender segregation by industry where women are well represented in the healthcare, education, and arts, entertainment, and recreation sectors compared to men who dominate technical fields such as mining, construction, and electricity and gas production that tend to pay more (ADB, 2019). According to EBRD gender profile on Azerbaijan women devote on average 6.1 hours per day to unpaid care and domestic work, compared to 2.1 hours for men (UNECE, 2012). This is higher than the regional average¹ (5.6 hours and 2 hours, respectively) (UNECE, 2012).

Even though gender discrimination in hiring in Azerbaijan is illegal, the Labour Code of Azerbaijan restricts employing women in labour intensive jobs or hazardous workplaces including mining, construction, fuel extraction, powerplants, metal processing, cement and chemical production, as well as manufacturing of aircrafts, ships, glass, and furniture (ADB, 2019).

Figure 16-5 Economic Activity by Gender, 2020 (State Statistical Committee of the Republic of Azerbaijan, 2021)



In terms of wages, women earn only 48% of what men earn, even though Azerbaijani legislation ensures equal pay for the same labor, position and profession for both women and men but can for the same job based on the work experience and academic degree. The wage gap has increased since 2012 when women earned 52% of what men earned and the country ranked 88 out of 135. In similar occupations, women earn 73% of what men earn.⁶² This figure has changed little since 2012 when women in similar occupations earned 71% of what men earned.

Gender Norms and Discrimination

Based on ADB Gender Profile Report on Azerbaijan, women tend to face gender-based restrictions and discriminations, which is deeply rooted in the traditional social norms and by strict gender roles and stereotypes in Azerbaijan (ADB, 2019). *Occupational stereotyping, cultural norms, the perception and family views of women entering male-dominated professions as well as the need to balance the job with domestic responsibilities, influence women's decisions concerning employment, limit their choices and form a constraint to them entering nontraditional occupations. (ADB, 2019).*

Gender Based Violence and Harassment (GBVH)

Gender-based discrimination against women is more evident and higher in rural areas and among vulnerable communities (ADB, 2019).

The Special Rapporteur on Violence against Women notes that women did not report sexual harassment as a concern in Azerbaijan, probably because it is hidden or not recognised as a form of violence (Human Rights Council, 2014). Additionally, reports show that women are unaware of their rights and that there is a prevalent social tolerance to sexual harassment in the workplace (Advocates for Human Rights, 2014).

According to ADB, 2019 only few shelters for women victims are available in Azerbaijan and those are run by civil society groups, however, "An estimated 14% of Azerbaijani women between 15 and 49 years of age experience intimate partner violence (physical and/or sexual) at least once in their lifetime. Data in 2017 show 1,031 cases of domestic violence reported with 807 (78%) by women and 224 by men (22%). A total of 110 women were murdered in 2016 of which 48 were by their husbands and 35 by a close male relative such as father, brother, son, or another close relative."

A law was passed to prevent violence against women. Workshops were organized and recommendations were given to improve the quality of work of local monitoring authorities in the field of gender-based violence and child abuse. Since October 2018, online information on domestic violence has been operational. According to the State Committee for Family, Women and Children Affairs, there are 11 regional children and families support centers and eight women's resource centers.

Climate Related Risks on Women

Climate change related impacts such as earthquakes, floods, landslides, water shortage, rising temperatures have negative impacts on the population. Such impacts including resettlement of families may create a heavy burden on women in specific. Also, since women in Azerbaijan have higher responsibility in for domestic work, they will be negatively impacted by increased water scarcity and shortages.

Government Commitments in Gender Equality

In 1995, the Republic of Azerbaijan ratified "Convention on Elimination of all Forms of Discrimination Against Women", and also other principal international documents on protection human rights (State Statistical Committee of the Republic of Azerbaijan, 2021).

According to the State Committee for Family, Women and Children's Affairs of the Republic of Azerbaijan of 2019, the country has made improvements and achievements in the economic empowerment of women where the share of women entrepreneurs in small and medium business reached 30 % in 2018 compared to earlier years where it was only 4%.

In addition to business development trainings, special awareness raising and sensitization campaigns are carried out to reduce gender occupational stereotyping as well as gender-based distribution of family duties. The government also holds meetings with the private sector and banks to raise awareness on gender specific needs and initiate dialogue between the businesses and civil society activists to promote women's rights (State Committee for Family, Women and Children's Affairs of the Republic of Azerbaijan, 2019). The government has also adopted a number of legislative acts to provide young girls with opportunity to get higher education such as giving grants to the best students.

SOCIAL PROTECTION AND SOCIAL SERVICES

According to the Country Gender Assessment prepared by ADB in 2019, the social assistance programs in Azerbaijan support households of low-income, pension systems, internally displaced persons (IDPs) and refugees, and provide maternal benefits including child allowance, childcare benefits, and birth and adoption grants. However, the social assistance scheme is not sufficient to provide adequate living standards for the poor especially with informal employment (ADB, 2019).

Pension benefits in Azerbaijan have increased over the past years, however, the structure of the pension system rates creates some inequalities for women considering:

- Women age of retirement is 60 compared to the age of 65 for men, therefore, women have fewer years of employment and years to save for retirement;
- Lower average earnings of working women result in a lower monthly pension; and
- With higher life expectancy and lower retirement age means women will depend on pension income that alone cannot guarantee a decent living, resulting in a tough financial situation.

16.3.2 Outcome of Socio-economic Survey

Sitalchay is the closest village to Khizi 3, located approximately 9.9 km north east the Project area. The socio-economic surveys carried out between 17 July and 5 August 2020 in Sitalchay Village targeted 65 households to collect quantitative data on 330 household members, including vulnerable groups.

POPULATION AND DEMOGRAPHICS

Sitalchay Village has an area of 53.12 km² and a total population of 1,360 in addition, and includes 66 Internally Displaced Persons (IDPs) households that moved to the village from Gubadli. The population of Sitalchay is composed of 47.9% are males and 52.1% are females.

According to the responses of the members of the 65 surveyed households, 91% have been living in Sitalchay for over 20 years, 8% between 11 and 20 years, while only 1% moved there between 1 and 5 years ago. The size of the surveyed households shown in the chart below indicates that the majority of the households have more than 5 members which is above the national average. Around 32% of the surveyed household members are children and teenagers up to the age of 18.

Figure 16-6 Size of Households (Socio-economic survey, 2021)

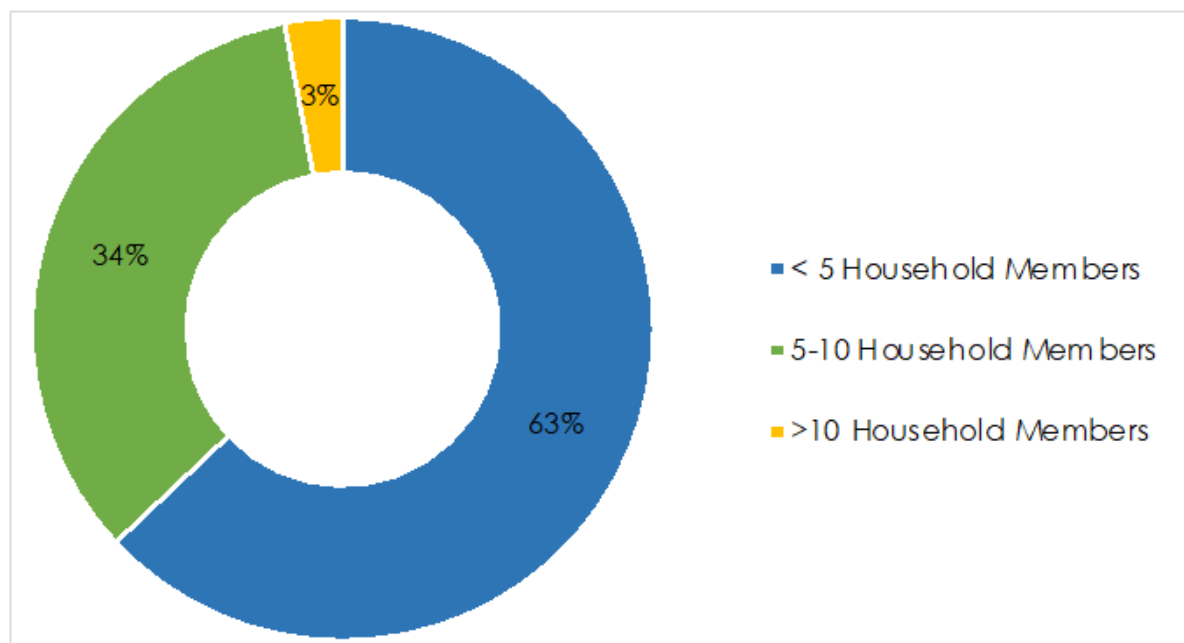


Table below presents the disadvantaged or vulnerable individuals who took part in the socio-economic survey. This was based on an initial identification of what typically is considered as vulnerable groups based on EBRC definition “*vulnerable groups include people who, by virtue of gender identity, religion, ethnicity, indigenous status, age, disability, economic disadvantage or social status may be more adversely affected by the project impacts than others who may be limited in their ability to claim or take advantage of the project benefits*”.

During the socioeconomic survey, the vulnerable groups have been based on the perception and limitation of these groups to have benefits from the project such as employment. As stated above, the Labour Law restricts employing women in labour intensive jobs or hazardous workplaces such as construction, which are one of the benefits of this project will provide to the local community. In addition, the elderly is another group that most likely will not benefit from any employment opportunities.

Table 16-11 Vulnerable Individuals Who Took part in Survey

VULNERABLE / DISADVANTAGED	NUMBER OF PEOPLE WHO TOOK PART
Women	5
Disabled people	4
IDPs	4
Elderly	9

A vulnerability assessment has been undertaken for the identified PAPs as part of the LRP and summarised in Section 16.3.4 below.

REFUGEES

Following the war between Armenia and Azerbaijan from February 1988 to May 1994, 30 families, 89 IDPs and refugees settled in Sitalchay village. They mostly came from Gubadly (during the occupation of Gubadly on August 31, 1993), Fuzuli (during the occupation of Fizuli region in 1993), Jabrayil (during the occupation of Jabrayil on August 23, 1993), and Zangilan Districts (after the occupation of Zangilan on October 29, 1993). The state provides assistance to IDPs and refugees. IDPs living in densely populated temporary settlements are paid a monthly allowance of 33 AZN (\$19.4), and IDPs living in other settlements are paid a monthly allowance of 60 AZN (\$35.3). At the same time, the government pays for utilities (electricity, natural gas, water and household waste transportation) consumed by IDPs who are temporarily settled in densely populated areas. IDPs are provided with free medical examination and treatment and are exempt from the fee for issuing ID cards, the fee for filing a lawsuit, the notary fee for the purchase or sale of an apartment or house, as well as income tax of up to 55 times the conventional financial unit. Consultations were undertaken with two (2) IDPs from the village on 24 January 2022. The participants stated that they do not face any form of discrimination or harassment because of their IDP status. The socioeconomic profile of the IDPs that took part in the survey are summarised below:

- IDPs reported they have been living in the village for more than 21 years and have been displaced by war from Gubadly District. All households are led by men. Only two participants reported to own their house. All IDPs reported that they perceive their living conditions as either satisfactory or good.
- Main source of drinking water is from groundwater. The water supply was reported to be sometimes or always insufficient;
- The survey respondents reported to be satisfied with the existing energy supply and reported it to be continuous;

- Main sources of income for the IDPs include employment with the government (2 participants), pensioner (1 participant) and labour activities (1 participant). All with the exception of one (1) participant reported they receive state subsidiary for IDPs as a secondary source of income. The monthly income reported ranged from 200 to 300 AZN. According to the survey results, majority of income is spent on food (60 to 80%) followed by utilities (10 to 20%), healthcare (30% for one respondent) and clothing (5% for one respondent);
- The key problems related to their living conditions included water supply, lack of heating, lack of space and poor house conditions and lack of sewerage system;
- Two (2) of the respondents consider themselves to be in good health conditions and two (2) reported to be in poor conditions;
- None of the respondents reported any conflict or concerns from the community that impacts their livelihood or security. Also, none of the surveyed households reported gender violence or intra-family violence towards women. All participants reported housework was mainly the responsibility of women. One respondent reported key challenge are household work for women; and
- Similar to all participants who took part in the survey, when asked about their opinion on the Project, no issues or concerns were raised regarding the development of the Project. In general, the majority of the respondents considered that the Project will have positive impacts especially on the employment and infrastructure.

ETHNICITY AND RELIGION

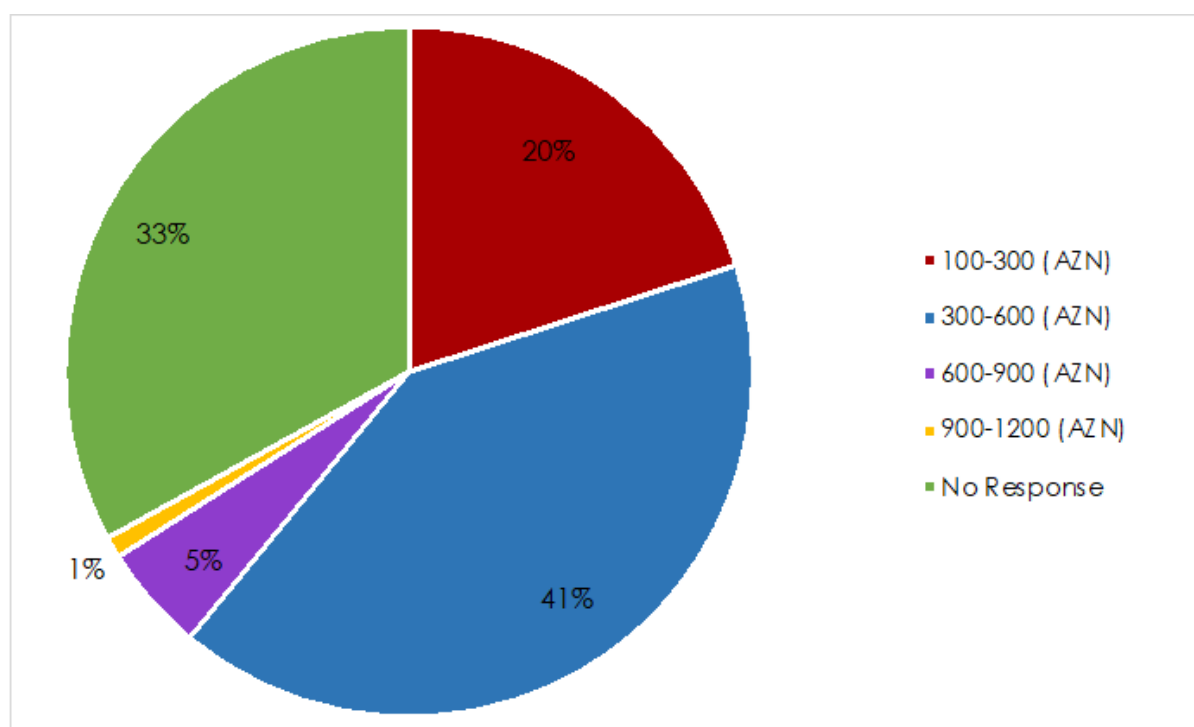
The population of Sitalchay are considered Azerbaijani ethnicity. The question of religion and ethnicity was not included in the socio-economic survey due to its sensitivity in the Project area. However, based on the municipality, the entire population of the village are Muslims.

Note: The PR7 on Indigenous Peoples have not been triggered for this project.

ECONOMY AND EMPLOYMENT

The outcome of the socio-economic survey indicates that villagers of Sitalchay are mainly employed in the construction, agriculture, livestock, and horticulture sectors. There are 96 pensioners and 59 unemployed in the village; the employment rate among interviewed households is low with only 37% of the respondents being employed while 31% are pensioners and 32% are housewives or unemployed residents among which is an increased number of unemployed widows seeking a job. The majority of the surveyed village residents are employed in the village (83%), while 9% work in Sumgait, and the rest are employed in other areas.

The monthly income as reported by the surveyed villagers is shown in the figure below. Around 47% of the respondents have a monthly income above 300 AZN and higher than the monthly average income in Khizi Region.

Figure 16-7 Monthly Income of Survey Respondents

According to the survey respondents, 40% for their income is spent on food, 20% is spent on utilities, 15% on loan payment, 10% on clothing, and 15% on healthcare.

Agriculture is a main economic activity in Sitalchay with an area of 744,5 hectares out of which 6.7 % is privately owned. Wheat, corn, and clover are the dominant crops within the village.

Sitalchay has one private poultry company within employs about 120 people from the village. Around 68% of the surveyed households practice animal husbandry where 29 respondents raise cows, 8 raise sheep, one raise horse, one raise rabbits and 35 raise poultry. As per the survey, 35% of the respondents own the land property used for agricultural, 2% have rented the agricultural lands they use whereas 63% do not use their lands for agriculture.

Five farms shown in the figure below with around 4,000 sheep and 1,000 cattle were identified among the surveyed households to be using pastures around the Project site for grazing during winter season.

Figure 16-8 Farms of Sitalchay Villagers using the Project's Surrounding Area for Seasonal Grazing



Note: The Figure above include the previous layout for Khizi 3 WF.

EDUCATION

The survey findings indicated that people are happy with the quality of educational services within Sitalchay and the neighbouring villages considering the quality of teaching has improved and the schools' infrastructure have been upgraded. 20 surveyed households have children with preschool age, out of which only 50% have enrolled them preschools. The village has one secondary school and a total of 33 surveyed households have children, out of which 97% have enrolled their children in the village school. Based on the survey findings, higher education is equally important for both boys and girls.

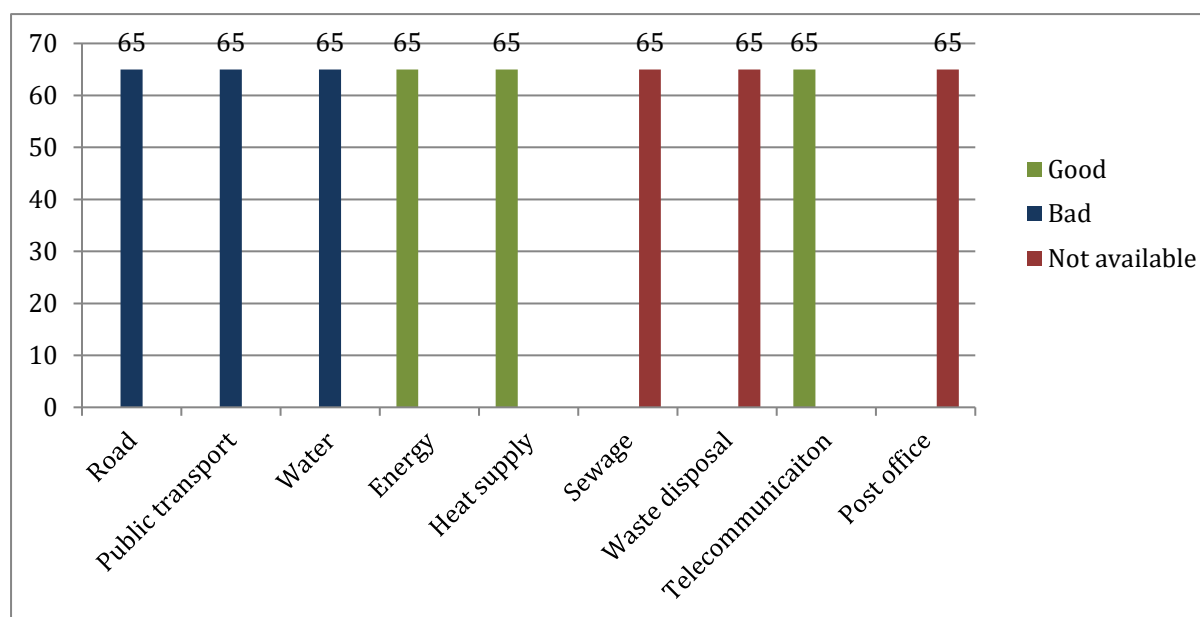
HEALTHCARE

According to the findings of the survey conducted in Sitalchay Village, 15% of the income is spent on healthcare which is triple the national average for expenditure on health. The majority of the respondents consider themselves to be in good health conditions with 17% reporting to have poor health conditions and four households reporting to have family members with disability.

INFRASTRUCTURE

Electricity and gas in the village of Sitalchay are supplied through the existing national grid and gas network respectively and survey respondents reported to be satisfied with the existing energy supply as well as the telecommunication network in Sitalchay. The survey findings on infrastructure indicate that the residents are not satisfied with the absence of a post office, sewage network and waste management as shown below.

Figure 16-9 Conditions of Infrastructure in Sitalchay



Road infrastructure and the public transport services in the village were reported by the survey respondents to be in bad conditions. An example of the road infrastructure is shown in the Figure below.

Figure 16-10 Example of Sitalchay Road Infrastructure



The village does not have any water wells, and the main source of water in the village is supplied through the municipal water network to which the majority of households are

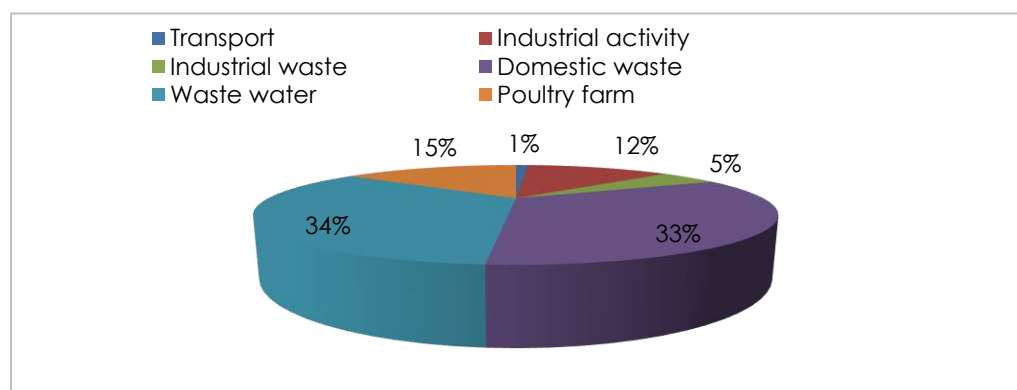
connected and supplied by water for both drinking and domestic use. The water infrastructure was reported to be in bad conditions and water shortage is experienced during summer months and dry seasons. Some villagers also rely on water supplied by Samur-Absheron water channel.

Waste management services including waste collection, transportation and disposal are nonexistent. Villagers of Sitalchay and the villages in the Project area manage waste through burying it in the lands around their homes, burning it, or dumping it outside the village. The closest waste management facility is located in Sumgayit as discussed in the Waste and Wastewater Section of this ESIA.

Wastewater management services are nonexistent, and it is not clear whether there are any plans to develop a sewage network and a treatment facility for the area in the future. Sitalchay does not have a wastewater network and therefore, sewage is either discharged into excavated pits where wastewater slowly seeps into the ground, or it is discharged into enclosed drainage ditches that convey the sewage from some houses of the village to a nearby Poultry Farm. At the farm, the received domestic wastewater mixes with sewage generated from the farm's operational activities and is then discharged into the sea without any treatment. The closest wastewater treatment facility is located in Sumgayit as discussed in the Waste and Wastewater Section of this ESIA.

Both waste and wastewater were reported to be the main sources of environmental deterioration in the village followed by poultry farms and industrial activities as shown below.

Figure 16-11 Sources Contributing to Environmental Deterioration

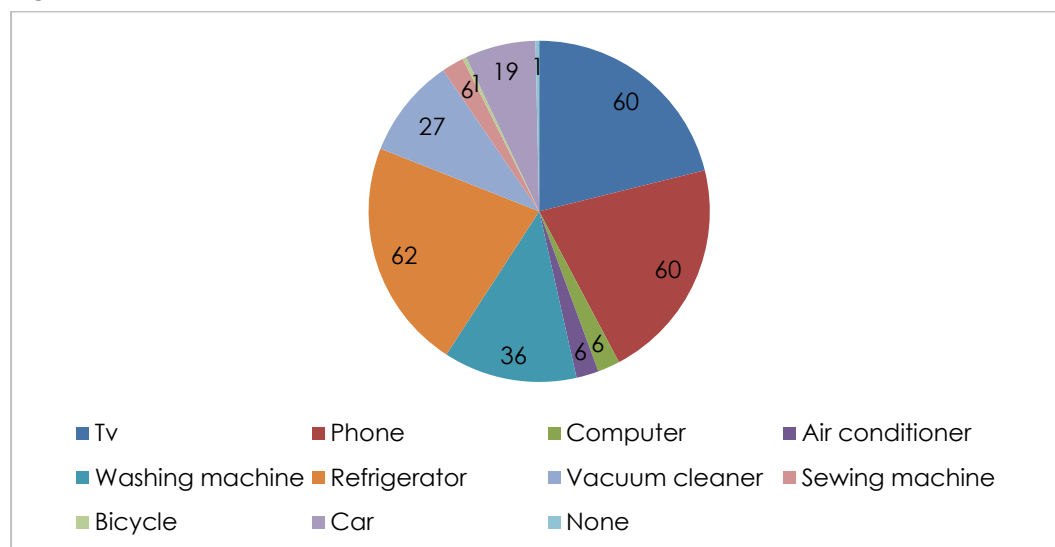


HOUSEHOLDS AND COMMODITIES

The areas of the houses in the village of Sitalchay as per the survey respondents range between 20 to 150 m² area houses, most of which lack major renovations. It was reported that 50% live in 20-60 m² houses, while 41% live in 60-100 m² houses, while only 9% live in houses bigger than 100 m².

Only one third of Sitalchay residents have access to the internet. The types of utilities owned by the surveyed households are provided in the figure below.

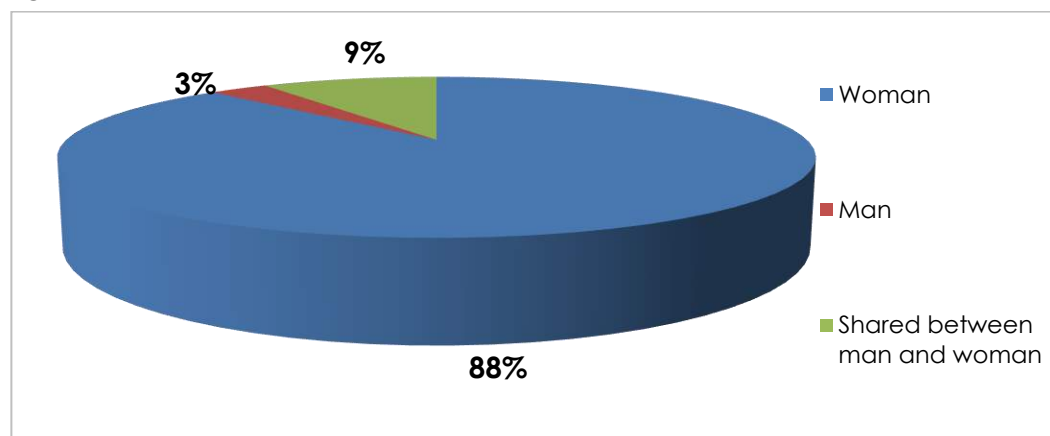
Figure 16-12 Types of Utilities and Commodities



GENDER EQUALITY

None of the surveyed households reported gender violence or intra-family violence towards women. Around 41% of the surveyed households indicated the key challenges are household work where housework was mainly the responsibility of women as reported by 88% of the survey respondents as shown in the Figure below.

Figure 16-13 Daily Housework and Lines of Responsibility



VILLAGERS PERCEPTION OF THE PROJECT

When asked about their opinion on the Project, no issues or concerns were raised regarding the development of the Project. In general, the majority of the respondents considered that the Project will have positive impacts especially on the employment, infrastructure and socio-cultural life of the village and they expect the project to create opportunities for jobs and social investments as shown in the charts below.

Figure 16-14 Survey Respondents Anticipated Impacts of the Wind Farm Project

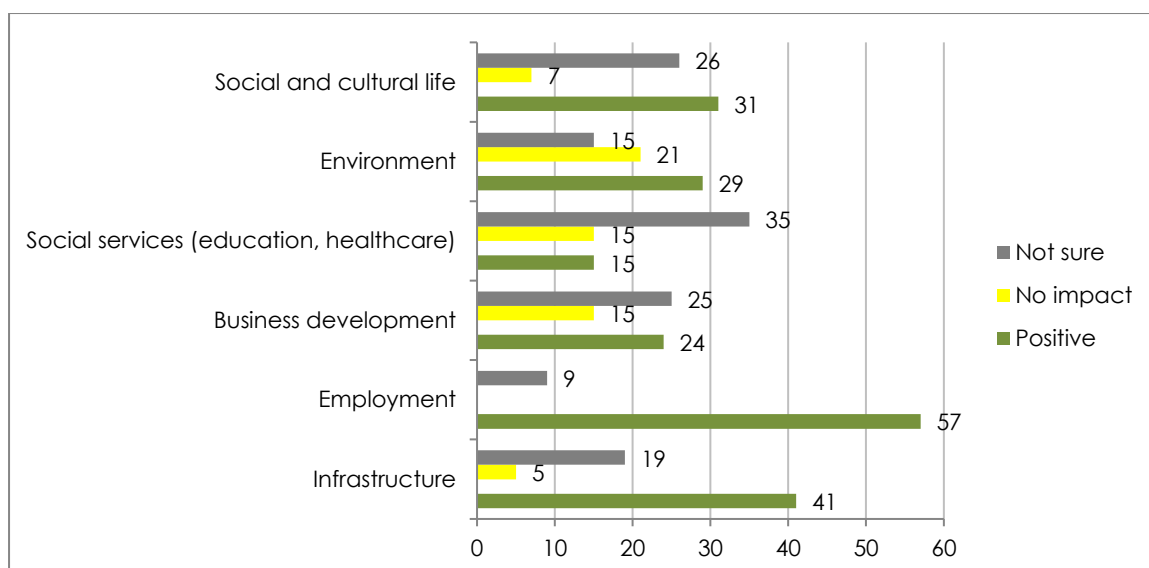
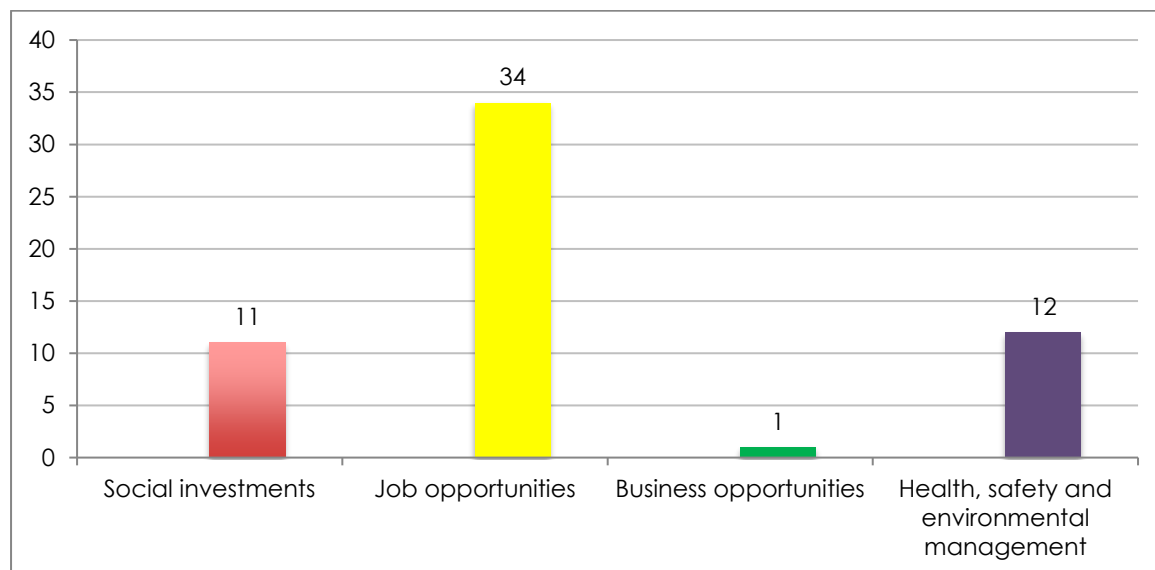


Figure 16-15 Survey Respondents Expectations from the Project



16.3.3 Use of Project Site

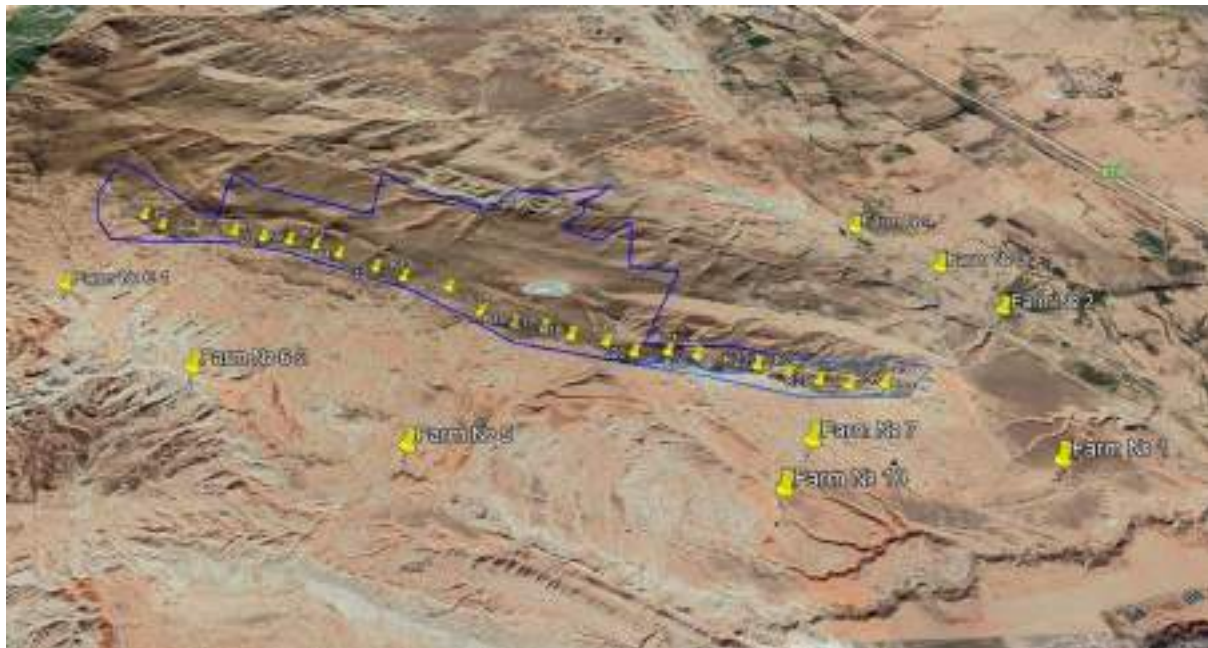
GRAZING ACTIVITIES AT PROJECT SITE

A herders' survey was carried out in November 2021 to determine the following:

- Identify the number of herders who using project areas (formally and informally);
- Periods of Use (whole year, seasonal, etc) with exact dates;
- Identify specific seasons when there is influx of Nomadic herders using project areas; and
- Establish whether the project areas are used for any other purpose other than grazing i.e., hunting, herbal plants, etc.

Nine (9) farms were identified surrounding the project area as shown in Figure below. The survey was undertaken for eight (8) farms (Farm 1,2, 3,4, 5, 6, 7 and 10). Farm 2 did not take part in this survey.

Figure 16-16 Seasonal Farms surrounding Project Site

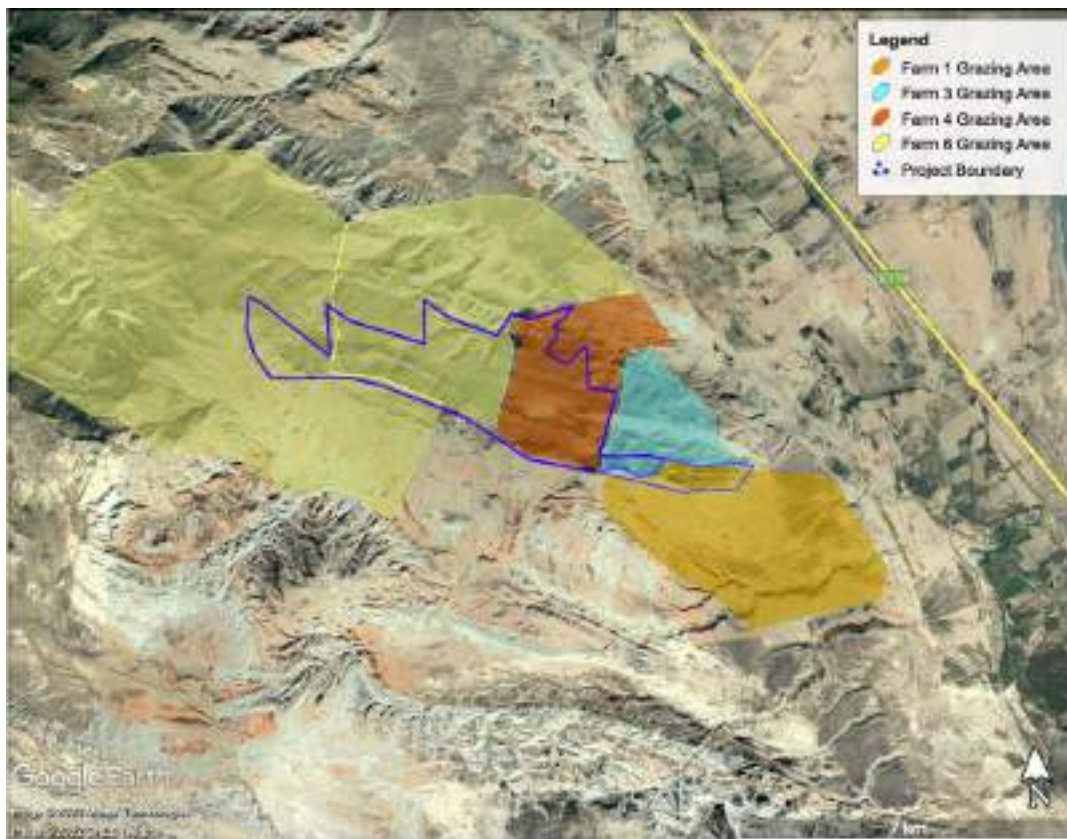


Based on the survey and further consultations undertaken as part of the LRP, the following were identified as users of the Project site:

- Four (4) Seasonal Farmers without valid lease agreement – Surrounding farmers have expired land lease agreement with the municipality but are allowed to graze within the project boundary; and
- Other informal land users such as hunters (undertaken by one of the farmers identified above) and herb collectors who use the project site for hunting and herb collection respectively. Herbs are collected from March to October while hunting is undertaken during grazing season by one of the farmer. All five (5) herb collectors do not have permits, license or any form of agreement with Municipality to collect herbs from the site as this is not required because municipality lands is generally available for local community needs.

The Figure below shows the location of the grazing area of these seasonal farmers within the Project site. During the herders survey in November 2021, one seasonal farmer (Farm 4) indicated that in addition to grazing livestock, he also hunts for rabbits and ducks within the Project site for personal use.

Figure 16-17 Seasonal Farmers Grazing Area within the Project Site



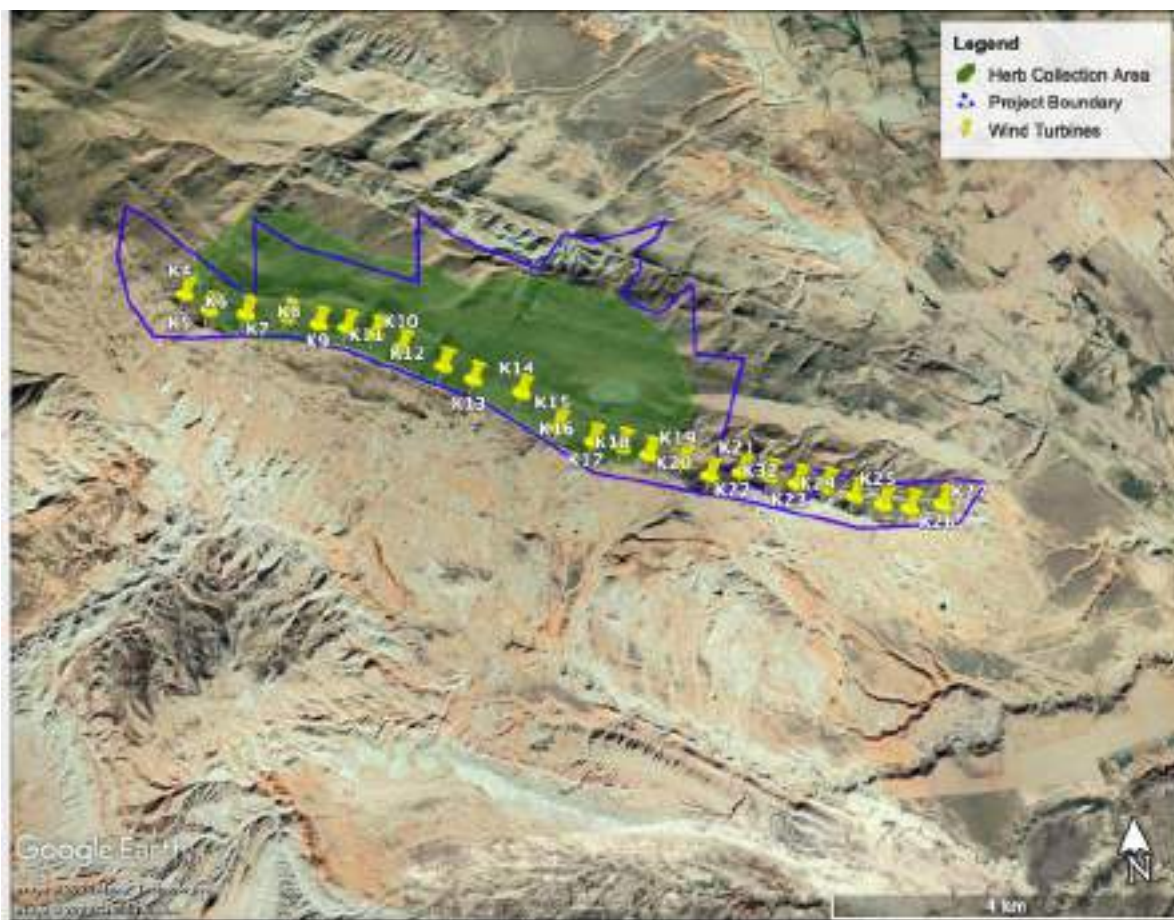
During the preparation of the ESIA, two (2) nomadic herders were identified outside the project boundary in November 2021. These herders move from the highlands to lowlands in winter and from lowlands to highlands during summer. The herders indicated that they use designated route provided by the government as shown in the map below.

Figure 16-18 Designated Route Nomadic Herders Use Between Highlands and Lowlands



Further consultations were undertaken with the nomadic herders in December 2021 by the local consultant to verify if they use the project site and it was confirmed that these herders do not use the Project site for livestock grazing neither do they pass through the project site when moving to and from the highlands. The Figure below shows the herb collecting area within the Project site.

Figure 16-19 Herb Collection Area within the Project Site



Summary of consultations are provided in the Draft Livelihood Restoration Plan Report. The project land needs calculations are further discussed in the LRF Report.

16.3.4 Socioeconomic Profile of PAPs

A socio-economic survey was undertaken as part of the LRP between 12 March to 12 April 2022 and included 13 participants; five (5) herb collectors, four (4) farmers and four (4) herders that work with the seasonal farmers.

AFFECTED HOUSEHOLDS

The table below provides an overview of the affected households in Khizi 3 Project site due to the development of the Project.

Table 16-12 Affected Households

PAPs	NUMBER OF HOUSEHOLDS THAT EXPERIENCE PERMANENT IMPACT	NUMBER OF HOUSEHOLDS THAT EXPERIENCE TEMPORARY IMPACT	TOTAL
Herb collectors	0	5	5
Farmers	0	4	4
Herders (workers employed by the seasonal farmers)	0	4	4

The total number of household members for each PAP are as follows:

- 18 members – five (5) herb collectors' households;
- 21 members - four (4) farmers; and
- 30 members – four (4) herders' households (workers employed or work with the farmers to assist with grazing).

GENDER AND ETHNICITY

According to the socio-economic survey, 12 out of 13 households are male headed households (HH) and one (1) household is led by female. All households are of Azerbaijani ethnicity.

None of surveyed households are refugees or IDPs. No ethnic minority groups were identified among the surveyed PAPs households.

AGE AND MARITAL STATUS

The age structure and marital status are provided in the Tables below. Majority of the surveyed farmer and herb collector households were aged between 40 to 49 years and 50 to 59 for herders. According to the survey, all herders, farmers and herb collectors are married with the exception of one (1) herb collectors who recorded to be single.

Table 16-13 Age Structure of the Households

PAPs	20-29	30-39	40-49	50-59	60-69
Herb collectors	1	1	2	1	-
Farmers	0	0	2	1	1
Herders	0	1	1	2	0

Table 16-14 Marital Status of Affected Households

PAPs	MARRIED	SINGLE	DIVORCED	WIDOW/WIDOWER	TOTAL
Herb collectors	4	1	0	0	5
Farmers	4	-	-	-	4
Herders	4	-	-	-	4

EDUCATION

The table below shows a high literacy level among the households. The overall majority of PAPs have high school level education, two (2) farmers have University degree (higher education) and one (1) herb collector has secondary specialised education. None of the PAPs households were recorded as being illiterate.

Table 16-15 Education Level of Surveyed Households

EDUCATION STATUS	HERB COLLECTORS	FARMERS	HERDERS
	Number	Number	Number
Illiterate	0	0	0
Primary School	0	0	0
High School	4	2	4
Special school Education/ Technical/College Education	1	0	0
University	0	2	0
Total	5	4	4

EMPLOYMENT AND INCOME SOURCES

Employment and income data were collected for herb collectors, farmers and herders' households including their family members.

All herders surveyed stated that their income mainly depends on grazing activities only. None of the herders have employment agreement with the farmers. Two (2) out of the four (4) herders are sons of the farmers, thus they assist their fathers to graze livestock and all income received from grazing are used for the household. The remaining two (2) farmers do not receive any salary for grazing farmer's livestock. Instead, they are allowed to graze own livestock within the farmer's land.

Three (3) out of the four (4) farmers stated that farming is their only source of income. Only one (1) of farmers has a permanent job (in custom service) and receives a monthly salary. This farmer manages his farm over weekends only. Only one of the farmers occasionally collects herbs for his own consumption.

Only two (2) of the five (5) herb collectors indicated that selling herbs is the only source of. The other three (3) herb collectors have permanent jobs and receive monthly salaries. However, their monthly salaries are not sufficient for household supplies.

Table 16-16 Employment Status of Households and their Families

TYPE OF EMPLOYMENT	HERB COLLECTORS		FARMERS		HERDERS	
	HHs	FAMILY MEMBERS	HHs	FAMILY MEMBERS	HHs	FAMILY MEMBERS
Working as Herders	0	0	0	2	2	2
Self-employed	0	0	0	0	0	0
Civil servant			1	2	0	0
Pensioner	0	1	1	2	0	0
Private sector	0	1	0	0	0	0
Seasonal worker	0	0	0	0	0	0
Housewife	0	6	1	6	0	5
Unemployed	2	2	0	1	0	0

The source of income for each PAP group is provided in the Table below.

Table 16-17 Source of Income

SOURCE	HERB COLLECTORS		FARMERS		HERDERS	
	MONTHLY INCOME IN AZN	USD	MONTHLY INCOME IN AZN	USD	MONTHLY INCOME IN AZN	USD
Salary from employment (job)	221	130	0	0	0	0
Selling herbs	272	160	0	0	0	0
Selling livestock	0	0	4167	245	625	368
Pensions	16	9	506	298	0	0
Disability pensions	82	48	0	0	0	0
Social assistance	72	42	0	0	0	0
Other (seasonal worker, alimant, taxi driver etc.)	0	0	0	0	0	0

Three (3) out of 13 of the respondents stated that their income is enough for purchasing all needs. One (1) respondent stated that his income is enough for basic needs, while the remaining six (6) PAPs stated that their income is enough only for food.

The majority of the PAPs stated that their profits decreased during the COVID-19 quarantine period. Two (2) herb collectors responded that “it didn’t affect”. Decreases in income were associated with limitations of movement, transportation, attending bazaars for a limited time.

EXPENDITURE

The main source of expenditure in the surveyed households for herb collectors and farmers is food, while it was on livestock for herders. The average household expenditure is provided in the table below.

Table 16-18 Average Household Expenditure

EXPENSES	HERB COLLECTORS		FARMERS		HERDERS	
	MONTHLY EXPENSES IN AZN	USD	MONTHLY/ANNUAL EXPENSES IN AZN	USD	MONTHLY EXPENSES IN AZN	USD
Utilities	90	53	150	88	180	106
Food	400	253	1000	588	212	124
Education	50	30	2650*	1558	52	31
Medical	136	80	566*	332	62	36
Special medical treatment for members with disabilities	N/A	N/A	66	38	100	59
Loan repayment	180	106	0	0	0	0
Livestock	N/A	N/A	5800*	3411	322	189
Herb collection	20	12	0	0	0	0
Transport	55	32	2307*	1357	50	29
Other	150	88	83 ⁴	48	N/A	N/A

*Annual expenses

ACCOMMODATION AND LIVING CONDITIONS

The results of socioeconomic survey demonstrated that none of the 13 PAPs have structures at the Project site. All surveyed households own private houses in their village where they reside all year round with their families. Only one (1) herb collector lives in a house provided by his relative and lives free of charge.

ACCESS TO UTILITIES & SERVICES

All 13 surveyed households have stable supply of electricity and potable water. All surveyed PAPs reported that they are satisfied with the quality of water and do not face shortage.

Almost all surveyed households reported that they have stable heating system, and all of them use gas for heating house and cooking. Only two (2) households among the herders stated that they do not have stable gas supply. To cook and heat house they use manure or liquid gas.

⁴ Payment for Land taxes

Almost all surveyed households stated that they do not have stable wastewater management (centralized/or decentralized system) in the village. Sewage is discharged into artificial wells or ditches. All households burn waste in a place far away from the house.

Only two (2) farmers who live in Guba and Sumgayit have proper waste management. As a result, these two (2) farmers do not face challenges in accessing food and clothes supply. The remaining households travel to neighbouring cities to buy food and clothes, i.e. to Sumgayit (30 km) and Baku (60km).

Table 16-19 Frequency of the Visits to the Hospital/Medical Centre

FREQUENCY	HERB COLLECTORS	FARMERS	HERDERS
1 in month	1	0	2
1 in 2 months	1	0	0
1 in three months	0	0	0
1 in six months	0	1	0
1 in a year	4	3	2
Do not know	0	0	0

All herb collectors as well as two (2) farmers and two (2) herders who live in Khizi district, visit hospitals in Sumgayit (30 km) or Baku cities (60km). The remaining two (2) farmers and two (2) herders visit hospital in Guba district which is approximately a 30 minutes' drive from their living place.

All surveyed households reported that they have no challenges with access to loan. Sumgayit, Baku and Guba cities have commercial banks where PAPs can use loan service. Among the 13 PAPs, only two (2) have taken a loan from bank, both for repairing works of house.

It is necessary to note that all villages in Azerbaijan have schools and kindergartens. Therefore, all PAPs have access for secondary education in their villages. However, there are no colleges, or higher education institutions/training centres. Nearest ones are located in Sumgayit (30km), Baku (60 km) and in Guba district.

All PAPs indicated that there are no challenges associated with access to public transportation, although some of them do not use it. The table below shows the use of public transport by PAPs.

Table 16-20 Use of Public Transport by PAPs

TYPE OF TRANSPORT	HERB COLLECTORS		FARMERS		HERDERS	
	BUS	TAXI	BUS	TAXI	BUS	TAXI
Every 2 days	1	0	0	0	0	0
2-3 times in a week	1	0	1	0	1	1
2-3 times in a month	2	0	0	0	1	1
More than 5 times in a month	1	0	0	0	0	0
As required	0	5	0	0	0	0
Do not use public transport			3	0	0	0

LAND USE

Grazing Activities

The table below provides a summary of the grazing activities undertaken by the farmers and herders. Herders hired by the farmers are allowed to graze their own livestock without paying for land use. Only two (2) farmers pay for the hired herder's a monthly salary, which is 300-350 AZN. Farmers who use their relatives as herders do not pay them a monthly salary.

Both herders and farmers use livestock for meat and milk. They all reported that meat and milk from livestock is sufficient to supply the household.

The number of livestock owned by each herder and their employment agreement status are provided in the Table below.

Farmers use state veterinary services in Khizi district and Baku city from two (2) to four (4) times a year. As it was stated by farmers, veterinarians come to their farm as per request and examine livestock. They spend 4000 AZN annually for veterinary services.

Table 16-21 Grazing Activities

FARMER	NUMBER OF OWNED LIVESTOCK			HIRED HERDERS	GRAZING PERIOD	LLA	WATERING LIVESTOCK	TRANSPORTATION OF LIVESTOCK	EXPENSES FOR LIVESTOCK IN AZN
	COWS	SHEEP	GOAT						
Farmer 1 (Avaz)	30	450	0	5 herders (2 out of 5 are his sons)	May-September	Was expired in 2019	Buys a water and delivers to farm	Has an oversize car (KAMAZ)	6000 annually
Farmer 2 (Zaur)	55	600	50	2 herders	All around the year	Was expired in 2019	Use water from canal	Has medium sized car (GAZEL)	600-700 monthly
Farmer 3 (Mubariz)	140	2000	200	8 herders	All around the year	Was expired in 2019	Use water from canal	Pays for transporting - hires a car	3500 annually
Farmer 4 (Ilham)	0	750	0	3 herders (his relatives)	May-September	Was expired in 2019	Use water from canal	Pays for transporting - hires a car	Refused to share

Table 16-22 Number of Livestock Owned and Employment Status

FARMER	NUMBER OF OWNED LIVESTOCK			EMPLOYMENT AGREEMENT	WORKING PERIOD	SALARY
	COWS	SHEEP	GOAT			
Herder 1	Number of livestock the same as for farmer 1 (they do not separate livestock, as he lives together with father)			No	Daily basis (every day)	Not paid
Herder 2	The number of livestock is the same as for farmer 1 (they do not separate livestock, as he lives together with father).			No	Daily basis (every day)	Not paid

FARMER	NUMBER OF OWNED LIVESTOCK			EMPLOYMENT AGREEMENT	WORKING PERIOD	SALARY
	COWS	SHEEP	GOAT			
Herder 3	5	120	0	No	Daily basis (every day)	Not paid
Herder 4	5	280	0	No	Daily basis (every day)	Not paid

Herb Collection

The project site is used for collecting herbs such as thyme, spinacia and adonis by five (5) households from Sitalchay village. These households collect herbs for selling purposes. Table below provides information for each PAP. Thyme is usually collected from July to August, Spinacia March to April and Adonis from September to October.

Table 16-23 Herb Collection Activities

HOUSEHOLD (HH) NUMBER	TYPE OF COLLECTED HERBS AND SEASONS	HIRED WORKERS	PURPOSE OF HERB COLLECTION
HH1	March-April – spinacia July-August – thyme September – October -adonis	N/A	Selling
HH2	March-April – spinacia July-August – thyme September – October -adonis	N/A	Selling
HH3	March-April – spinacia July-August – thyme September – October -adonis	N/A	Selling
HH4	May – August – thyme and spinacia	N/A	Selling
HH5	May – August – thyme and spinacia	N/A	Selling

Collected herbs are sold in Sumgayit, which is 30 km away from village and Baku around 60 km away in the bazaars. All herb collectors use knife and scissors while collecting herbs. Considering that the majority of them have permanent jobs (3 out of 5) they collect and sell herbs during weekends and public holidays.

Although salary is a main source for the three (3) employed herb collectors, income from herb collection makes a significant value from their overall household income. Income from selling herbs per month varies between 100 AZN and 450, as well as 500 AZN and 2400 per season (From March till October). During the surveys all interviewed herders reported that they do not collect herbs at all. Only one (1) farmer collects thyme (very rare to occur) and uses for his own consumption when he stays in the farm for a long time.

VULNERABLE HOUSEHOLDS

The household survey identified the following vulnerable groups as provided in the table below.

Table 16-24 Number of Vulnerable People Impacted by the Project

PAPs	CHRONIC ILLNESSES	ELDERLY (OVER 60 YEARS)	REFUGEES/INTERNALLY DISPLACED PEOPLE (IDPs)	HERDING/LIVESTOCK ACTIVITIES IS THE MAIN/ONLY SOURCE OF INCOME
Herders	- One (1) herder's daughter has low eye vision and has a I grade disability. - One (1) herder's spouse has hepatitis	0	N/A	N/A
Farmers	- One (1) farmer had a heart attack	1	N/A	2/4
Herb collectors	- One (1) herb collector suffer from nervous breakdown - One (1) herb collector's step mother suffer from chest cancer and his father has II grade disability (due to the injuries)	0	N/A	N/A

Vulnerability Analysis

- PAPs with disabilities:
 - One farmer had heart attack and had to visit hospital twice in a year to monitor his overall health condition. However, farmer doesn't need any special treatment. He has no challenges associated with his health due to the heart attack at the moment;
 - One herb collector has two vulnerable people in his household, i.e., his father who got many injuries due to his military service and currently has II grade of disability, and his step mother who suffers from chest cancer;
 - One herder's daughter has low eye vision and needs constant treatment. Due to the low eye vision she has a first grade of disability status.
- Elderly:
 - One farmer is 68 years old. He can be considered as vulnerable due to his age.
- Chronic illness:
 - One herder's spouse has hepatitis and has to make monthly visits to hospital to check the status of her health.
- Low-income families:
 - One herb collector receives social assistance in a form of financial assistance as 360 AZN monthly.

- Loans:
 - One herb collector has taken a loan for repairing his house. He has to pay 180 AZN monthly. His loan should be repaid by the end of January, 2023; and
 - One farmer took a loan for repairing work in his house. Farmer refused to provide more information on his loan.

Potential impacts to the above identified PAPs and vulnerable groups will be assessed in the LRP and mitigated through the implementation of the LRP.

CONCERNS RAISED BY PAPs

The following concerns were raised by the PAPs during the survey:

- Lack of alternative pasture;
- Availability of herbs at alternative land;
- Decrease of grazing area availability;
- Long distance to travel to reach alternative area;

Table 16-25 Concerns Raised by PAPs

IMPACT	HERB COLLECTORS	FARMERS	HERDERS
Lack of alternative pasture	0	0	0
Availability of herbs at alternative land	5	0	0
Decrease of grazing area	0	4	4
Long distance to alternative area	0	4	4
No impact	0	0	0
Do not know	0	0	0

PAPs EXPECTATIONS ON LIVELIHOOD RESTORATION MEASURES AND/OR SUPPORT

All farmers expressed their worries about land lease agreement. Since their LLA was expired in 2019, they expect the municipalities to extend it for another 15 years. Farmers expectations from the Project include:

- Support in receiving solar PV or another source of renewable energy for their farms;
- Construction of an OHTL to get electricity supply to farms;
- Provision of alternative grazing land with the same conditions and quality as it is in project site; and
- Provision of some compensation if no alternative land is provided.

Herders were worried about the increase of expenses for feeding livestock in case of decreasing size of land for grazing due to the construction of the Project.

Herders' expectations from Project include:

- Feeding of livestock; and
- Provision of alternative land.

Herb collectors were worried about distance and quality of alternative land. Thyme is the main herb and has a high demand in the market and its quantity may not be the same at surrounding areas. Herb collectors' expectation is that municipality will be able to provide a suitable alternative land where the quantity of thyme is abundant.

16.3.5 Outcome of Socio-economic Survey along the OHTL Route

BACKGROUND

Based on site visits undertaken along the OHTL routes in May and November 2021 and review of satellite imagery, various land users were identified within 1km of the OHTL route. Land users include farms, local businesses (including a greenhouse farm, almond orchard and state dog shelter), military base and private land plots.

A socio-economic survey was undertaken from 28th to 30th November 2021 and included representatives of the local farms, greenhouse farms, almond orchard and dog shelter. A total of eight (8) representatives were interviewed during the socio-economic survey.

The table below provides a summary of the land users identified along the route and the number of land users surveyed.

Table 16-26 Land Users Surveyed along the OHTL Route

LAND USER		OVERALL NO. OF LAND USERS ALONG THE ROUTE	NUMBER OF SURVEYED LAND USERS
Farms		6	5
Local Business	Almond Orchard	1	1
	Dog Shelter	1	1
	Greenhouse Farm	1	1
	Abandoned workshop	1	0
Military Base		2	0

Note: representatives of the military base and one of the farms were approached for the survey but they expressed no interest to participate in the interview

During the survey, information on the economic status, infrastructure and services, traffic and transportation, income and the presence/absence of vulnerable groups were obtained from the land users. The figure below shows the location of land users along the OHTL route.

Figure 16-20 Land Users Along OHTL Route

A- Locations of Farm F01, Military base M01 and Almond orchard B01



B - Locations of Dog shelter D01, Greenhouse Farm B02 and Farm F02



C- Locations of Farms F03, D02, F04, F05, F06 and M02



Table 16-27 Land Users within 1km of the OHTL

ID	LAND USE TYPE	APPROXIMATE DISTANCE TO THE OHTL
F01	Farm	110m from the Pereleshkul -Gobu OHTL route
M01	Military Base	180m from the Pereleshkul -Gobu OHTL route
B01	Almond orchard	The Pereleshkul -Gobu OHTL route crosses this almond orchard for about 0.5km and runs at a distance of approximately 50m from closest boundary of the orchard with productive almond trees.
D01	Dog shelter (State owned)	80m from the Pereleshkul -Gobu OHTL route
B02	Greenhouse farm	80m from the Pereleshkul -Gobu OHTL route
F02	Farmstead	110m from the Khizi – Pereleshkul OHTL
B03	Abandoned workshop	70m from the Khizi – Pereleshkul OHTL
F03	Farmstead	50m from the Khizi – Pereleshkul I OHTL
D02	Baku-Mozdok Gas Pipeline	The Khizi – Pereleshkul OHTL crosses operational gas pipeline owned by State Oil Company of Republic of Azerbaijan (SOCAR)
F04	Farm	110m from the Khizi – Pereleshkul OHTL
M02	Military Base	The Khizi – Yashma OHTL route crosses the eastern plot of the military base
F05	Farm	15-20m from the Khizi – Yashma OHTL
F06	Farm	80m from the Khizi – Yashma OHTL

Plate 16-1 Compilation of Photographs during OHTL Socio-economic Survey



POPULATION

According to the socio-economic survey undertaken, a total of 50 people are living in the five (5) farms surveyed and 16 workers are working for the three (3) local businesses surveyed (almond orchard, dog shelter and greenhouse farm). None of the residents of the farms are refugees, IDPs, or chronically sick/disabled. There is however one elderly family member residing in one of the farms (F06) and this person is a pensioner.

Of the 16 workers working for the local businesses, four (4) work at the almond orchard, six (6) work at the dog shelter and another six (6) work at the greenhouse farm. Two (2) of the almond orchard workers are Internally Displaced Persons (IDPs) that got displaced as a result of conflict with Armenia in Karabakh region of the Republic of Azerbaijan. All the six (6) workers at the greenhouse farm are refugees who fled Armenia after 1988 and now residing in Perekeshkul village.

The tables below show the distribution of persons living in the farms and number of individuals working for the local businesses.

Table 16-28 Family Size in the Farms

ID	NUMBER OF INDIVIDUALS IN FAMILY	ADULTS		CHILDREN	
		MALE	FEMALE	MALE	FEMALE
F02	5 families comprising 10 adults and 5 children	4	6	2	3
F03	1 family comprising 4 adults and 2 children	2	2	2	-
F04	2 families comprising 11 adults and 2 school children	6	5	1	1
F05	2 family comprising 7 adults and 3 children	4	3	2	1
F06	1 family comprising 1 elderly, 3 adults and 2 children	2	2	-	2

Table 16-29 Number of Individuals Working for Local Businesses

ID	DESCRIPTION OF STAKEHOLDER	NUMBER OF WORKERS
B01	Almond orchard	4
D01	State dog shelter	6
B02	Greenhouse farm	6

ECONOMIC STATUS

According to the survey, all the representatives of the farm reported that livestock farming or selling of livestock and dairy products is their primary income with only one farmstead representative (F04) indicating that he has a secondary source of income which is from raising livestock owned by other individuals. The monthly income of the representatives of the farm ranged from 300AZN to 2500AZN.

The table below provides a summary of the economic activities of the farms.

Table 16-30 Economic Activities and Monthly Income of the Farms

ID	SCALE OF ACTIVITIES	SOURCE OF INCOME	INCOME (MONTHLY IN AZN)
F02	Livestock farming: approximately 100 cows and 2000 sheep	Primary income from raising livestock owned by other individual.	300
F03	Livestock farming: approximately 20 cows, 400 sheep and 100 goats.	Primary income from selling livestock owned by family and dairy products. Secondary source of income from raising livestock owned by other individual.	1000
F04	Livestock farming: approximately 50 cows and 800 sheep; Municipal land for cultivation rented: 200ha	Primary income from selling of livestock and dairy products, and cultivation. No secondary income.	2500
F05	Livestock farming: approximately 22 cows, 500 sheep and 120 goats; Municipal pasture land sized for 700 livestock is rented	Primary income from selling of livestock and dairy products. No secondary income.	300
F06	Livestock farming: approximately 20 cows and 124 sheep; Municipal pasture land rented: 120ha in Surabad located approximately 5km east of Sitalchay	Primary income from selling of livestock and dairy products No secondary income.	1000

A worker at the almond orchard indicated that his monthly income is between 500AZN and 600AZN, the manager of the greenhouse reported that his monthly income is between 700AZN and 800AZN while a worker of the dog shelter indicated that his monthly income is 400AZN.

ACCESS TO HEALTHCARE/ HEALTH SERVICES

Based on responses received during the survey, there are no health care centres or medical facilities in the OHTL area. Representatives of the farm indicated they go to Mushfigabad (farms F02 and F03) or Sumgayit city (farms F04, F05 and F06) if they require medical assistance.

PUBLIC SERVICES

All interviewed persons from the farm and local businesses indicated that they have access to electricity which is supplied through the existing national grid.

For the farm, water is purchased and supplied by tankers to the farms F02, F04, F05 and F06 while farm F03 is supplied with water from the Semur-Absheron irrigation channels.

The local businesses (dog shelter, almond orchard and greenhouse) are supplied with water from the water distribution network.

There is no municipal sewage system. Sewage waste from toilets, shower and washing is collected in a sump and/or directly discharged into open drainage ditches. There is also no solid waste management system near or at the farm and local businesses as open burning of waste is undertaken to reduce the quantity of dumped waste and odour emanating from the waste.

TRAFFIC AND TRANSPORTATION

The OHTL route crosses the Baku-Shamakhi highway that passes to the south of Perekeshkul village. This section of road is one of main highways in Azerbaijan. It is part of the main transportation route northwest from Baku to Shamakhi and to Balakan at the Georgian border and west-northwest from Baku to Boyuk Kesik at the Georgian border

16.4 Sensitive Receptors

Based on review of satellite imagery, site observations, the socio-economic surveys as well as the consultations conducted, there are no permanent structures or settlements within the proposed project site.

A temporary/seasonal shelter seldomly used by seasonal herders is located 500 m from closest WTG.

Along the OHTL route, the Perekeshkul-Gobu OHTL crosses an almond orchard, and the Khizi – Yashma OHTL crosses a military base. The potential socio-economic receptors and their respective sensitivity are provided in the table below.

Table 16-31 Potential Socio-Economic Receptors

RECEPTOR	SENSITIVITY	JUSTIFICATION
Seasonal Herders	High	Seasonal herders who may use the Project site for grazing will not be able to use the land temporarily during construction.
Other informal users such as collection of herbs / Hunting activities, etc.	Medium	Informal users who may collect certain herbs in the project area and hunting activities which has been reported during the interviews with seasonal herders/farmers surrounding project area will not be able to use the land temporarily during construction.
Almond Orchard (B01) - OHTL	Medium	As the Perekeshkul -Gobu OHTL crosses a portion of the almond orchard, there may be access restrictions in this area as such farmers and other users of the orchard will be vulnerable to such access restrictions. However, this will only occur if OHTL towers will be installed in this orchard.
Military Base (M02) - OHTL	Low	Although the Khizi – Yashma OHTL crosses the eastern extent of the military base, it is not anticipated that OHTL towers will be installed in this military base as such the military base will not be impacted as a result of OHTL development.
Welfare of Local Population	Medium	Any change to infrastructure, population or regional inputs is likely to have impact the welfare of the local population closest to the Project site in Sitalchay.
Local / Regional Economy	Medium	The proposed project is likely to influence regional businesses including local contractors and those directly involved in the construction, local commercial operations such as accommodation, food retailers etc.
Employment Market	Medium	The development of the Project will create employment opportunities and offer an opportunity for greater dissemination of skills.
Female Populations	Medium	Local women who are seeking job opportunities and keen to have increased involvement in employment.
Project Construction Workers	High	The construction workers employed will be vulnerable to job losses as a result of the completion of the construction phase of the Project.
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.

16.5 Potential Impacts, Mitigation, Management & Residual Impact

16.5.1 Construction Phase

EMPLOYMENT AND ECONOMICS

The primary economic impact during construction is likely to result from limited project timeline centric employment creation during this phase. This Project is expected to create employment opportunities during the construction phase for unskilled and applicably skilled workers.

ACWA Power project's typical process for employment considers the availability of local talent in the first instance as well as the use of relevant contracting companies (for applicable sub-contractor works). Therefore, local workers will be hired in order to reduce risk of socio-cultural conflict due to influx of people to the Project area. A PIC has been established on 15th June 2021 by ACWA Power at Sitalchay Village to provide information on the Project to the members of the community, receive grievances and facilitate local recruitment where possible for the Project. As of 8 July 2021, 34 job applications were submitted. EPC to provide training and upskilling for local community and provide employment opportunities.

In addition, the direct monetary uplift to the families of those employed, money paid to workers will also stimulate the local economy via the multiplier effect, whereby money earned on the project expended locally will re-circulate within the local economy.

Job Opportunities for Females

It is evident based on the socio-economic survey outcomes that local women and widows are seeking jobs and the Project has potential opportunities to offer female employment in specific roles. Therefore, EPC to provide training and upskilling for women and provide employment opportunities.

TRAINING AND DISSEMINATION OF SKILLS

In addition to the direct monetary impact of employment created during construction, there also exists the potential for the Project to promote the dissemination of construction and construction support skills from expatriate workers into the local labour force. This will open job opportunities to the unemployed in Sitalchay and increase their probability of securing similar jobs after completion of the Project construction phase.

UNEMPLOYMENT WHEN COMPLETING PROJECT CONSTRUCTION

At the completion of the construction phase of the Project, it is expected that the majority of worker's contracts (particularly for temporary/contracted staff) will come to an end. This will have an impact on these workers' incomes and their livelihoods due to unemployment. It is therefore important that the employment contracts provide clear information on the duration of each workers contracts and that the workers are given full and prior notice in line with contract terms (preferably 3 months) before their contracts comes to an end, in order to have additional time to find alternative employment.

LOCAL ECONOMY (PURCHASE OF CONSTRUCTION MATERIALS AND FOOD PRODUCTS LOCALLY)

A secondary impact on the local economy is likely to arise from spending on local and foreign goods, services and accommodation during the construction process. The nature of the development, and specialized nature of required materials, suggests that these will be sourced internationally, apart from construction materials (e.g. concrete, aggregate, etc.) which will be sourced locally. There is also the potential for purchase of food products locally to boost

the local economy where local people are able to sell vegetables and daily products to the workers.

PUBLIC WELFARE, SOCIAL SERVICES AND RECREATION

The Project will not specifically result in direct uplift of such social provisions (particularly where responsibility for such services falls under government), however, given the increased activity from the project and elements for some influx of workers to the area, it is possible that some opportunities for improvements to this may be realised.

There may be opportunities for the Project to offer some services through corporate social responsibility type activities.

LAND USE CHANGE

Seasonal herders and any other informal users will no longer be able to use the land for grazing during the construction phase. A temporary disruption will be experienced; however, the project area will be accessible once construction activities are complete. In addition, disruption will be limited to a short period during the Project construction as the Project area will not be fenced and will be accessible for grazing during operation.

Therefore, this impact is reversible, short term, and considered to be minimal as herders/ users will have access to the wider area during construction. The economic displacement and impacts of the Project on the herders will be assessed in the Project specific Livelihood Restoration Framework (LRF) and Livelihood Restoration Plan (LRP).

Similarly, if OHTL towers will be installed at the almond orchard, farmers and other users of the orchard will also be restricted from accessing some areas of the orchard. Any access restriction within the orchard will be for a short duration and in specific areas as other areas will be accessible during construction and the whole almond orchard will be accessible once construction works are completed.

In addition, farms and agricultural lands located along the OHTL alignment will also lose access to part of their lands temporarily during construction; however, those lands will remain with their owners who can continue using them for their regular activities after construction is complete.

To facilitate community and farmers/herders' involvement in the Project and ensure their concerns are considered, a PIC has been established on 15th June 2021 by ACWA Power at Sitalchay Village. The PIC provides information on the Project to the members of the community and receives grievances. The PIC will register the grievances, send them to the Project management, track progress and ensure close-out. As of 4 November 2021, no official grievances were received.

Land Acquisition and Resettlement

Wind Farm

Considering the Project area is State and Municipality owned and there are no valid land lease agreements and does not include any private plots or permanent structures, the Project development will not result in direct negative impacts that require land acquisition or physical displacement or resettlement of people. This will cause economic displacement rather than physical; therefore, this will not include any land acquisition or resettlement. The economic displacement and economic impacts of the Project on the herders will be assessed in the Project LRP and provided below.

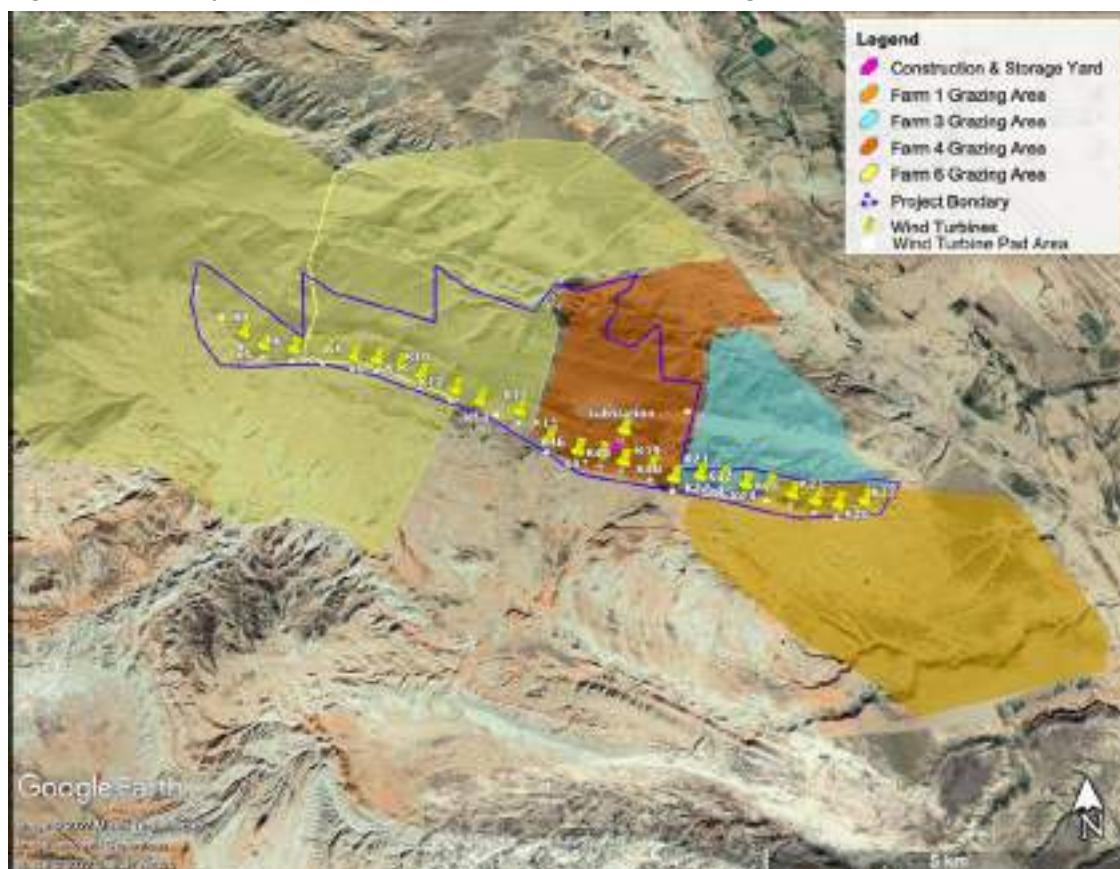
Economic Displacement of PAPs

Impacts on Farmers

During the construction phase of the project, grazing of livestock by seasonal farmers will be restricted as the grazing area of these farms encroach into the Project site as shown in Figure below.

However, such restriction will be limited to the active construction areas i.e. the turbine pad area, substation, and laydown areas. The figure below shows the project facilities in relation to the areas used by farmers for grazing.

Figure 16-21 Project Components in relation to the Grazing Areas



Only a small section of the Project site particularly the southern section will be active during construction. Based on this, it is expected that the area of land that will be restricted to livestock grazing will be less than 20% of the present grazing area within the Project site used by farmer of Farm 1 and Farm 3 and less than 5% of the present grazing area within the Project site used by farmer of Farm 4 and Farm 6. The anticipated loss of grazing land for each PAP are presented in the Table below.

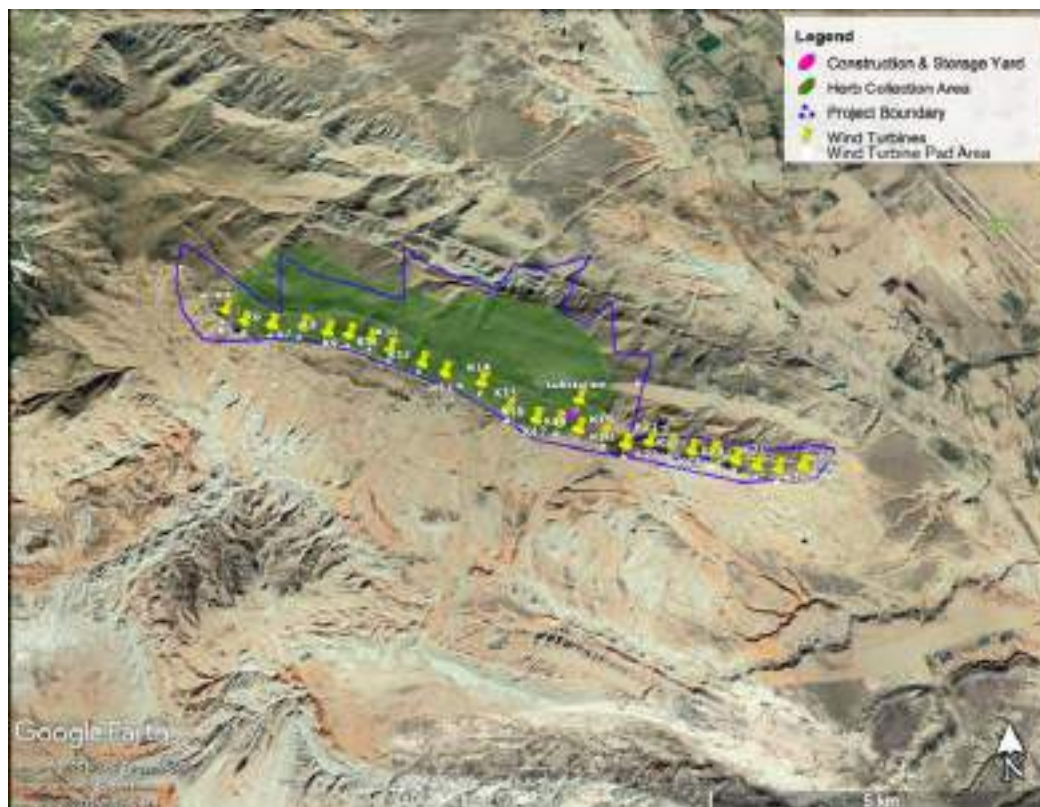
Table 16-32 Anticipated Loss of Grazing Land within the Project Site

FARMS	TOTAL GRAZING AREA WITHIN PROJECT SITE (HA)	TOTAL GRAZING AREA IN ACTIVE CONSTRUCTION AREAS + BUFFER (HA)	GRAZING AREA AFFECTED (%)
Farm 1	109.7	10.9	9.9%
Farm 3	54.8	9.7	17.7%
Farm 4	567.4	21.7	3.8%
Farm 6	658.4	6.2	0.9%

Impacts on Herb Collectors

The herb collectors use the area near the salt lake going up to 1000m above the sea towards the north west extent of the Project site to collect herbs from March to September. It is anticipated that their activities at the site will be impacted during the construction phase of the Project. The Figure below shows the project facilities in relation to the areas used by herb collectors.

Figure 16-22 Project Components in relation to the Herb Collection



Only a small section of the Project site particularly the southern section will be active during construction. Based on this, it is expected that the area of land that will be restricted to herb collection will be less than 5% of the present herb collection area as shown in the Table below.

Table 16-33 Anticipated Loss of Herb Collection Area within the Project Site

TOTAL HERB COLLECTION AREA WITHIN PROJECT SITE (HA)	TOTAL HERB COLLECTION AREA IN ACTIVE CONSTRUCTION AREAS + BUFFER (HA)	HERB COLLECTION AREA AFFECTED (%)
1025.74	32.3	3.1%

Impacts on a Single Hunter

There is only one farmer that hunts at the project site. Based on consultation with this farmer, hunting at the project site is only undertaken occasionally and solely for household consumption. Although the hunting activities of this farmer does not contribute to his household income the project site provides provisioning ecosystem service to this farmer and his household. Based on the above it is anticipated that impacts will occur during the construction phase of the Project as there would be restriction on hunting of rabbits and ducks at the project site during this period.

Given that the farmer also hunts outside the project site any impact on his hunting activities will be negligible and limited to project site as these animals will be present in areas outside the site and as such his hunting activities can still be undertaken. During the operational phase, it is expected that wildlife (including rabbits and ducks) will return to the Project site and as such his hunting activities can commence at the Project site.

Loss of Wages

Workers employed by farmers may be impacted by the construction of the wind farm. As part of the LRP, consultations will be undertaken with all farmers to find out details of the workers they employ. Further consultations will also be undertaken with the workers in order to assess the impacts of the Project on their livelihoods.

Potential impacts for all of the above will be assessed in the LRP and mitigated through the implementation of the LRP.

OHTL

Based on the data collected during the socioeconomic survey, the land along the OHTL is mainly state and municipality owned. None of the land is privately owned. Azerenergi will follow the national requirements during the development of the OHTL. Based on "Rules for the protection of electrical networks with a voltage of more than 1000 volts" approved by the Resolution of the Cabinet of Ministers of the Republic of Azerbaijan dated 10.06.2005, No 103, "Land plots included in the protection zones of electricity networks remain in the use of the land owner or user and can be used by them for agricultural and other purposes in

compliance with the requirements of these Rules". Therefore, the development of the OHTL will not involve any land expropriation in line with local regulations.

Farming, herding and military activities were identified along the route and may experience short term disruption during tower/pylon installation at the impacted receptors.

At this stage, the exact location of the pylons is not known as the design of the OHTL has not been finalised. If pylons are located within the Almond, Military and any grazing areas, it is anticipated that any disruption in their activities will be temporary and will be for a short period.

It should be noted that the design and route provided for the OHTL has not been finalised, therefore, the outcome of the ESIA and socio-economic survey will influence the final layout and route of OHTL by Azerenergi to minimise temporary restrictions on land use and livelihood impacts.

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;
- Human rights risks associated with COVID-19 restrictions such as movement restrictions etc; and
- Impact on the environment relating to pollution of water supplies, soil and air..

In order to assess these risks to the Project, ACWA Power requested Envision (WTG Supplier) to undertake a supplier's risk assessment for their tier 1 & 2 suppliers. This is in order to ensure that the Project complies with PR1 and PR2 requirements on supply chain. In turn, Envision commissioned SGS to undertake the assessment.

SGS has mapped 18 suppliers for the Project which include Envision (Tier 1) and the rest as Tier 2 & 3. The scope of the on-going assessment includes the following:

- Desktop screening of labour, HSE risks through review of the suppliers' policies/procedures and public concerns/court case results etc (on-going).
- Site based audits to suppliers whose desktop screening raised any red flags by showing non-compliance (to be determined).

It is noted that ACWA Power will contractually engage with one (1) EPC Contractor. The EPC will be contractually obligated to follow ACWA Power's Chartered Institute of Procurement & Supply (CIPS) procurement system which entails that all contractors and suppliers under EPC are vetted and in line with ACWA Power's procurement policies as well as national and lenders requirements.

The EPC is responsible for undertaking due diligence and audits to ensure that its contractors and suppliers are in compliance with the applicable national and lenders requirements. In addition the ongoing vetting of suppliers by the EPC will be monitored during the quarterly independent E&S Audits with specific questions relating to the supply chain.

Table 16-34 Socio-Economics Impact Significance, Mitigation & Management Measures and Residual Impacts-Construction

POTENTIAL IMPACT	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Employment Opportunities	Minor Positive	Employment Market	Medium	Minor Positive	- Local employment/recruitment management plan will be prepared and implemented. This plan will include clear targets for employment under EPC and sub-contractors and to include jobs and skills mapping to develop skill development initiatives for the local community. - The Project Company will need to develop A HR Policy that outlines key employment processes for the Project. This should include a requirement for contractors to prioritize the employment of local workers including women (populations from Sitalchay Village and nearby settlement) where possible and where skills are available locally. - The EPC and Sub-Contractors HR Procedures will be prepared to ensure alignment with the Project Company policy	Minor Positive

POTENTIAL IMPACT	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					and consistent 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 to provide training and upskilling for local community and provide employment opportunities, where possible.	
		Female Populations	Medium	Minor Positive	- Considerations for employment of local females– including considerations of methods to reduce barriers to working (e.g. transportation to site, provision of female facilities etc.). - EPC to provide training and upskilling for women and provide employment opportunities.	Minor Positive
Unemployment due to the completion of the	Minor Negative	Construction Workers	High	Minor to Moderate	The workers employment contracts shall clearly state the years of employment in order to	Minor

POTENTIAL IMPACT	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
construction phase					set the expectations for the workers on how long they will be employed. - The workers will be provided with notification prior to the end of their contracts to allow them to look for another job e.g. 3 months' notice. - All project employees will be paid their salaries in full before the end of their contracts. - The Project will work to retain some of the workers from the construction phase into the operational phase, but this will be based on the skills required and it is expected the operational phase workforce will be greatly reduced. - The Project will be able to provide references to the workers (based on their performance) which will support in their application of other jobs. - The Project contractors can potentially offer the workers (based on their performance) similar	

POTENTIAL IMPACT	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					future job opportunities in the area.	
Training and dissemination of construction skills	Minor Positive	Employment Market	Medium	Minor Positive	- 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 awareness. - 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 Azerbaijan.	Minor Positive
Purchase of construction materials and food resources locally	Minor Positive	Local / Regional Economy	Medium	Minor Positive	- Contractor to purchase goods and materials from the local/regional economy where possible. - The EPC Contractor will purchase some of the food products such as meat from the local suppliers. - Establish market network between the Project	Minor Positive

POTENTIAL IMPACT	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					workers and the local people where possible in consultation with the community leaders.	
Increase in retail and commodity prices	Minor Negative	Local / Regional Economy	Medium	Minor	- Establish market network between the Project workers and the local people where possible in consultation with the community leaders. - 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 and accommodation or giving them transportation to larger towns.	Negligible To Minor
CSR Opportunities	Minor Positive	Public Welfare & Social Services	High	Minor to Moderate Positive	Project CSR activities can look to add value to public services (examples could include health care screenings, recreation, training centers etc.).	Minor to Moderate Positive
Land Use Change	Moderate Negative	PAPs/ Farmers, Herders, Herb Collectors	Medium	Moderate	- The LRP for the Project will be implemented in accordance with national regulations and lenders requirements. - The EPC Contractor will clearly mark out	Minor
	Minor Negative	Almond Orchard (B01)	Medium	Minor		Negligible to Minor

POTENTIAL IMPACT	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					construction areas which will be inaccessible to herders during the construction phase of the Project. - 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 - 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. - The impacted herders will have access to a grievance mechanism in accordance with the Project SEP and LRP. - Project Company to coordinate with local authorities and facilitate	

POTENTIAL IMPACT	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					access to alternative areas for grazing in the vicinity of the Project site in parallel with construction activities in accordance with LRP. The impacted farmers/herders and other users will have access to a grievance mechanism through the PIC and in accordance with LRP. The grievances should be acknowledged, registered and addressed in a timely manner.	
				Minor	OHTL - Azerenergi to review OHTL alignment and avoid identified receptors based on the outcome of the ESIA and socioeconomic survey where possible to minimise temporary restrictions on land use and livelihood impacts. - Where this cannot be avoided, Azerenergi to provide compensation based on national laws and requirements with appropriate consultation	Negligible to Minor

POTENTIAL IMPACT	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					- ACWA Power to encourage Azerenergi to adopt EBRD requirements on Land Acquisition, Involuntary Resettlement and Economic Displacement. - Prior to construction, Azerenergi shall engage with identified user to inform them of the start of construction and the specific locations - Azerenergi to avoid where possible almond orchard, military base and other identified land users. Where possible, the OHTL developer will seek to install OHTL towers outside the almond orchard and avoid identified receptors. - Where OHTL towers are installed at the almond orchard, the OHTL developer will ensure that construction areas are clearly demarcated and signs put in place so farmers and other orchard users/workers do not trespass into active construction areas.	

POTENTIAL IMPACT	MAGNITUDE OF IMPACT	RECEPTOR			SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
							Where OHTL towers are installed at the almond orchard, farmers and other users/workers at the almond farm will have access to a grievance mechanism.	
Social risks related to Supply Chain	To Be Determined (TBD)	Workers working within the supply chain	High	TBD	- ACWA Power & the Project Company will develop a Supply chain Management Plan (based on outcome of risk assessment) 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 & Project Company will establish a responsible sourcing policy to ensure traceability from	TBD		

POTENTIAL IMPACT	MAGNITUDE OF IMPACT	RECEPTOR			SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
					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. - 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. A dis-engagement clause will be added to the loan agreement in case of material non-compliance with the measures listed above.			

16.5.2 Operational Phase

At a strategic level the operation of the Wind Farm is a proactive measure towards a low carbon transition for Azerbaijan's economy harnessing the wind resources in the country. This project will reduce Azerbaijan's dependency on fossil fuel generated power and will reduce atmospheric pollution; in comparison to other power generation technologies in the current energy mix of Azerbaijan. It will also support the continued growth of the national economy through the provision of sufficient power supplies.

As with the construction phase, an economic impact during operation will result from any local employment created by the Project. The operational phase will however require significantly less staff than during construction. Besides management and technical operator positions, the majority of staff will be security teams and other office-based support staff. Such non-technical staff will likely be sourced locally based on ACWA Power's typical processes and observed track record of other projects.

Whilst the size of the required workforce is significantly smaller, the type of work and the increased timescales involved offer an opportunity for greater dissemination of skills. A targeted system of local recruitment and investment in the human capital of the local workforce will enhance this process and consequently increase the benefit to the local economy.

Table 16-35 Socio-Economics Impact Significance, Mitigation & Management Measures and Residual Impacts-Operation

POTENTIAL IMPACT	MAGNITUDE OF IMPACT	RECEPTOR	SENSITIVITY	IMPACT SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	RESIDUAL IMPACTS
Employment Opportunities, facilitating development and dissemination of skills	Minor Positive	Employment Market	Medium	Negligible to Minor Positive	- The Projects 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 corporate policy 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.	Negligible to Minor Positive
Sustainable supply of energy	Moderate Positive	National Electric Grid of Azerbaijan	Medium	Moderate Positive	Ensure the appropriate operation and maintenance of the Khizi 3 Wind Farm to enable a secure supply of renewable energy	Moderate Positive

16.6 Monitoring

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'.

Table 16-36 Socio-Economic Monitoring Requirements (Construction and Operations)

MONITORING	PARAMETER	FREQUENCY & DURATIONS	RESPONSIBILITY
Employment	Number of persons employed from the local population	On-going	HR Dept.
CSR	Records of CSR plans and activities	On-going	CSR responsible party
Supply Chain	Suppliers and contractors code of conduct and human right practises in line with ESIA and Lenders requirements	On-going	EPC Contractor
Third Party Grievances	Issues concerning socio-economic factors or land access and land use	On-going	Project Company

17 STAKEHOLDER ENGAGEMENT AND CONSULTATION

17.1 Standards and Regulatory Requirements

17.1.1 National Requirements

Based on the revised Law on EIA (2018), public consultations in the form of hearings should be carried out during the development of EIA study in line with Law of the Republic of Azerbaijan "On Public Participation". The participants should include 'individuals living in the area of intended activity and legal entities operating in that area, as well as with the real estate owner'. The final document of public hearings conducted pursuant to article 4.10 of this Law shall be reviewed in accordance with the Law of the Republic of Azerbaijan On Citizens' Appeals'.

According to Azerbaijan's Law on Public Participation, forms of public participation can be carried out as follows:

- Public council;
- Public discussion;
- Public hearing;
- Studying public opinion;
- Public discussion of draft legal acts;
- Written consultation.

Other forms of public participation are also allowed under this Law.

17.1.2 Lenders Requirements

EBRD

Effective stakeholder engagement and consultation are a key part of EBRD's Environmental and Social Policy and PRs. The EBRD PR10 on Information Disclosure and Stakeholder Engagement requires that 'Clients conduct stakeholder engagement on the basis of providing local communities that are directly affected by the project and other relevant stakeholders with access to timely, relevant, understandable and accessible information, in a culturally appropriate manner, and free of manipulation, interference, coercion and intimidation'. Stakeholder Engagement must involve the following elements:

- Stakeholder identification and analysis;
- Stakeholder Engagement Plan;

-
- Disclosure of information, meaningful consultation and participation;
 - Grievance mechanism; and
 - On-going reporting to relevant stakeholders.

Stakeholder Engagement for the Project should be proportionate to the nature and scale of its potential adverse impacts on the affected communities and the sensitivity of the environment.

EBRD PR10 Briefing Note (COVID-19)

The guidance note provides considerations for continuing effective information disclosure and stakeholder engagement during the COVID-19 pandemic. The note provides possible alternative approaches through email campaigns, Project leaflets, text-based messaging, traditional media, signage etc.

The following processes, systems and tools are recommended:

- Stakeholder database: Ensuring its updated and key contact information is provided. The development of the database must respect people's privacy and be consistent with regulations such as General Data Protection Regulations;
- Messaging: When using different engagement platforms, the information provided should be clear, concise and consistent and provided in relevant local languages;
- Documentation: Keep track of interactions through documentation of engagement activities, commitments and complaints; and
- Resources: Ensure appropriate resources are in place to track and respond to queries, concerns and disputes or grievances that may be raised.

Note: EBRD notes that the briefing note is not a compliance document and should be taken as a source of information and analysis

ADB

The ADB have established an Operational Manual and Policy Statement that includes the need for an amount of consultation, participation and stakeholder engagement. Both documents set out the applicable requirements the banks investment projects should fulfil in the potential receipt of finance.

Stakeholder Engagement

ADB Operational Manual on "*Project Design and Preparation: Item C- Consultation and Participation*" requires meaningful consultation to be carried out with affected people and the consultation processes to be appropriately documented in the EIA, IEE, resettlement plan and/or IPP as applicable to the project.

The Operational Manual requires that vulnerable groups have sufficient opportunities to participate in consultations.

ADB Safeguard Requirement 1 on Environment: Consultation and Participation states that the client will undertake *"meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. Meaningful consultation is a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle;1 (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues"*.

ADB Safeguard Requirement 2 on Involuntary Resettlement: Consultation and Participation also requires meaningful consultation to be undertaken by the client as stated above for ADB Safeguard Requirement 1 but includes consultation with host communities and the need for the client to pay particular attention to the need of disadvantaged or vulnerable groups, especially those below the poverty line, the landless, the elderly, female headed households, women and children, Indigenous Peoples, and those without legal title to land.

ADB Safeguard Requirement 3 on Indigenous Peoples: Consultation and Participation requires *"the borrower/client will undertake meaningful consultation with affected Indigenous Peoples to ensure their informed participation in (i) designing, implementing, and monitoring measures to avoid adverse impacts on them or, when avoidance is not possible, to minimize, mitigate, and compensate for such effects; and (ii) tailoring project benefits that accrue to them in a culturally appropriate manner"*.

According to the 2009 ADB Safeguard Policy Statement, ADB requires *"borrowers/clients to engage with communities, groups, or people affected by proposed projects, and with civil society through information disclosure, consultation, and informed participation in a manner commensurate with the risks to and impacts on affected communities"*

Grievance Redress Mechanism

According to the ADB Safeguard Policy Statement (2009), the bank *"requires that the borrower/client establish and maintain a grievance redress mechanism to receive and facilitate resolution of affected peoples' concerns and grievances about the borrower's/client's social and environmental performance at project level. The grievance redress mechanism should be scaled to the risks and impacts of the project. It should address affected people's concerns and complaints promptly, using an understandable and*

transparent process that is gender responsive, culturally appropriate, and readily accessible to all segments of the affected people".

ADB Safeguard Requirement 2 and Requirement 3 specifically requires the grievance mechanism to receive and facilitate the resolution of:

- Affected persons' concerns and grievances about physical and economic displacement and other project impacts, paying particular attention to the impacts on vulnerable groups (ADB Safeguard Requirement 2 on Involuntary Resettlement); and
- Resolution of the affected Indigenous Peoples communities' concerns, complaints, and grievances (ADB Safeguard Requirement 3 on Indigenous Peoples).

EQUATOR PRINCIPLES IV

The Equator Principles IV establish key requirements for stakeholder engagement through the following principles:

- Principle 5: Stakeholder Engagement
 - For all Category A and Category B Projects the EPFI will require the client to demonstrate effective Stakeholder Engagement, as an ongoing process in a structured and culturally appropriate manner, with Affected Communities, Workers and, where relevant, Other Stakeholders.
 - For Projects with potentially significant adverse impacts on Affected Communities, the client will conduct an Informed Consultation and Participation process. The client will tailor its consultation process to: the risks and impacts of the Project; the Project's phase of development; the language preferences of the Affected Communities; their decision-making processes; and the needs of disadvantaged and vulnerable groups. This process should be free from external manipulation, interference, coercion and intimidation.
 - There are also other requirements for facilitating engagement and engagement with indigenous peoples.
- Principle 6: Grievance Mechanism
 - For all Category A and, as appropriate, Category B Projects, the EPFI will require the client, as part of the ESMS, to establish effective grievance mechanisms which are designed for use by Affected Communities and Workers, as appropriate, to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance.
 - Grievance mechanisms are required to be scaled to the risks and impacts of the Project, and will seek to resolve concerns promptly, using an understandable and transparent consultative process that is culturally appropriate, readily accessible, at no cost, and without retribution to the party that originated the issue or concern. Grievance mechanisms should not impede access to judicial or administrative remedies. The client will inform Affected Communities and Workers about the grievance mechanisms in the course of the Stakeholder Engagement process.

Equator Principles Guidance on Implementation of the Equator Principles during the COVID-19 Pandemic

The guidance recommends that the borrower should communicate information to local communities on the Project's response to Covid-19 including control of work-force community interactions, any necessary changes to procedures, the Project approach to controlling COVID-19 risks in the workforce and any aspects of support being offered by the Project to the local community. This should include the review of appropriate stakeholders and include a focus on any identified vulnerable groups. The guidance recommends the following alternative engagement processes:

- Consideration of opportunities for engagement through local actors such as women, youth, leaders, local authorities, traditional leaders etc.; and
- Implementation of additional training for Community Liaison Officers to ensure they can effectively deliver key messages, particularly to the most the most vulnerable and where Project impacts will be significant.

The engagement should be mindful of managing social stigma of COVID-19 and consider alternative methods that ensure anonymity.

EPFIs - IFC PERFORMANCE STANDARDS

All of the IFC Performance Standards include requirements for an amount of stakeholder consultation/engagement (either in the EIA, or as part of the future ESMS) and therefore the project will require a level of engagement. In particular, IFC Performance Standard 1 on "Social and Environmental Assessment and Management Systems" describes the stakeholder engagement requirements in more depth. It states the following:

"Stakeholder engagement is the basis for building strong, constructive, and responsive relationships that are essential for the successful management of a project's environmental and social impacts. Stakeholder engagement is an on-going process that may involve, in varying degrees, the following elements:

- *Stakeholder analysis and planning;*
- *Disclosure and dissemination of information;*
- *Consultation and participation;*
- *Grievance mechanism; and*
- *On-going reporting to Affected Communities.*

The nature, frequency, and level of effort of stakeholder engagement may vary considerably and will be commensurate with the project's risks and adverse impacts, and the project's phase of development."

The IFC Performance Standards indicate that when Affected Communities are subject to identified risks and adverse impacts from a project, the developer/client will undertake a

process of consultation in a manner that provides the Affected Communities with opportunities to express their views on project risks, impacts and mitigation measures, and allows the client to consider and respond to them. Effective consultation is a two-way process that will:

- Begin early in the process of identification of environmental and social risks and impacts and continue on an on-going basis as risks and impacts arise;
- Be based on the prior disclosure and dissemination of relevant, transparent, objective, meaningful and easily accessible information which is in a culturally appropriate local language(s) and format and is understandable to Affected Communities;
- Focus inclusive engagement on those directly affected as opposed to those not directly affected;
- Be free of external manipulation, interference, coercion, or intimidation;
- Enable meaningful participation, where applicable; and
- Be documented.

17.2 Public Consultation Timeline

Stakeholder identification for the Project commenced during the scoping stage of the Project. Stakeholder and public consultations were conducted during the scoping stage as a part of the national EIA and as part of the ESIA. The methods used for the on-going stakeholder engagement process include letter correspondence with national, regional, local authorities, face-to-face meetings, virtual meetings, emails and telephone calls. Public consultations and meetings were also held with local communities between 15th April and 24th June 2021 as shown below:

- Sitalchay Village:
 - o Public consultation meeting held on 25 June 2020 with members of the community of Sitalchay village; a total of 10 participants attended (maximum number of people allowed due to COVID restrictions); and
 - o Letters introducing the Project including contact details of the local consultant to receive any feedback and questions from the local community were distributed in May 2020 among Sitalchay Village (houses and supermarkets) and the announcement office of the Municipality as part of the Consultation during the Scoping phase.
- Consultation with herders using project area for seasonal grazing:
 - o Surrounding farms/ herders: Interviews/ consultations were held in February and March 2021 with the nearby farmers/herders who occasionally use the project area for grazing;

- o Informal interviews held with nomadic herders during site survey work in October 2020 and November 2021; and
 - o Herder Survey undertaken in November 2021 during the grazing season and return of seasonal herders.
- Consultations with Potentially Affected Persons (PAPs). Consultations with the farmers and PAPs were undertaken in the context of Livelihood Restoration Plan (LRP):
 - o Consultations and socio-economic surveys were undertaken on 12 and 16 March 2022 consultation was with Municipality and PAPs.

17.3 Objectives of Public Consultation

The major objectives of the stakeholders' consultations were to:

- Introduce the objective and process of the project to stakeholders;
- Solicit the views of local community members regarding the proposed project;
- Assess potential social impact of the project, including socio-economic benefits and possible mitigation measures for potential adverse impacts; and
- Establish baseline for long-term harmonious relationships with the local people and other key stakeholders.

Consultations with stakeholders were conducted as per the principles provided in IFC Performance Standards and EBRD's Environmental and Social Policy and Performance Requirements and Equator Principles Guidance.

17.4 Public Information Centre (PIC)

A PIC has been established on 15th June 2021 by ACWA Power at Sitalchay Village to provide information on the Project to the members of the community, receive grievances and facilitate local recruitment for the Project. The main functions of the PIC can be summarised as follows:

- Inform local community of the project status and any new developments;
- Disseminate project related announcements by placing posters within the community;
- Receive and process public grievances;
 - Register grievances and send it to project management
 - Track the grievances until it is closed
 - Keep the log of grievances
- Facilitate the local recruitment for the project;
 - Place Job Announcements;

- Organise job interviews by engaging project company/contractors' representatives
- Document and keep record of interview results;
- Organise public meetings by engaging local authorities and project management;
- Generate project proposals from communities for financing by the Project Developer; and
- Document and keep the records of all communication with community.

No grievances were received by the PIC as of 2 November 2021. No recruitment notice was placed by the project; however, 34 job applications were submitted as of 2 July 2021. Recruitment for the Project will be advertised locally and preference will be given to nationals with matching levels of skills required.

Plate 17-1 Public Information Centre at Sitalchay Village



17.5 Public Consultation Process During ESIA Preparation

The key stakeholders identified for the project include:

Table 17-1 Stakeholder Engagement during the ESIA Preparation

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST-BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS	CONSULTATION DATE
Directly Affected Communities (wind turbines, substations, access roads, etc.)	Local residential community of Sitalchay Village including vulnerable groups: women, the elderly, youth, people living with disabilities, poor households, illiterate members of the community	A: The closest community to the turbines and project footprint.	Issues regarding the environmental and social impact from Project and any issues/concerns local residents might have with project - One-page letter distributed to the local community. - PIC which provides information on the Project to the members of the community and receive grievances - Meeting with maximum of 10 people was held in line with COVID restrictions and national requirements during the time of consultation.	Letter sent out in May 2020 Public meeting (group of 10) held on 25 June 2020. In addition, project information was provided during the socio-economic herder's surveys. Socio-economic survey undertaken between 17th July and 5th August 2020 in Sitalchay Village targeting 65 households. Focus Group Discussions (FGD) undertaken with women and elderly from Sitalchay Village on 24 September 2021 and with refugees on 24 January 2022.
Land users	Seasonal Herders (Surrounding Farms and Nomadic herders)	A: Adverse effects from construction activity	Issues regarding the seasonal grazing (formal informal) and other land use	Informal interview was carried out in October 2020 with a herder observed on site (nomadic).

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST- BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS	CONSULTATION DATE
				Phone interviews were held by the PIC representative with 4 surrounding farmers on 23 November 2021. Formal meetings/interviews held in February/ March 2021 Herders Survey undertaken in November 2021 when herders are back to seasonal farms. Consultation undertaken on 12 and 16 March 2022 with PAPs as part of the LRP consultations.
	Farmer/ Herder with LLA			Formal meetings/interviews held in February/ March 2021 and additional meeting undertaken on 17 August 2021. Additional consultation (face to face meeting) undertaken on 16 March 2022.
	Hunters and herb collectors			Informal consultation with the Municipality Additional consultations (face to face meeting)

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST- BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS	CONSULTATION DATE
				undertaken on 14 March 2022.
Local governmental authorities	Sitalchay Municipality	D: Project area lies within the jurisdiction of the municipality	Consultations regarding land use and overall process of the development of the Project	Meetings held 12 May 2020 and 4 February 2021. A face-to-face meeting held on 12 March 2022 as part of the LRP consultations to discuss: - Clarifications regarding proposed alternative land, i.e., status of these land, availability of water sources etc; - Current status of land lease agreements of potentially affected farmers; - Clarification regarding the access to alternative land by local people
Governmental Bodies	Local representative of The Executive power of Khizi region	D: Part of the Regulatory body overseeing land ownership and land use	Consultations regarding land use	Letter sent 29 June 2021
	Ministry of Energy	D: Responsible for development of the project	Issues regarding overall process of Project development	Virtual meeting held on 29 th July 2020
	Ministry of Culture and Tourism	D: Regulatory body overseeing cultural and	Issues regarding cultural and archaeological sites/features within project area and	Email sent 4 th May 2021

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST-BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS	CONSULTATION DATE
		archaeological sites/features issues.	specific requirements for buffer zones/distances around these areas during the construction of the Projects.	
	Azerbaijan Academy of Sciences, Institute of Archaeology and Ethnography (AAS IAE)	D: According to national requirements, Ministry of Culture requires Academy approval/advice before granting permits for the excavation of archaeological and heritage sites	Issues regarding cultural and archaeological sites/features within project area and setting buffer zones	Academy carried out the archaeological surveys as mandated by Law of the Republic of Azerbaijan on Historical and Cultural Monuments. Therefore, consultations and discussions were a continuous process throughout the ESIA process. Official meeting held on 12 th November 2020 Additional consultation: Official Letter also sent on 1 st July 2021
	Ministry of Ecology and Natural Resources	D: Regulatory body overseeing protected areas, ecologically sensitive and environmental issues.	Issues regarding overall process of the development and approval of the Project	Virtual Meeting held on 8 September 2020
	Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan	D: Regulatory body overseeing transport in Azerbaijan	Issues regarding the delivery of equipment and machinery (if necessary)	Letter sent 29 June 2021
Industrial facilities	Poultry Farm	I: the closest industrial facility to the Project site	Issues regarding impacts from the Project and regarding observations made that vultures and eagles travel to the poultry farm near most	Informal meeting on 21 August 2021

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST- BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS	CONSULTATION DATE
			likely searching for poultry waste Note: Poultry farm manager refused to set any official meeting for consultation and discussion	
	Yeni Yeshma Wind Farm (Azerishiq – Operator)	I: Existing wind Farm	Operator of Yeni Yashma Wind Farm	5 Capitals Request for Data Letter sent 29 May 2021 and emailed 31 May 2021
State Organisations	Azerenerji Joint Stock Company	D: Off-taker and responsible for development of OHTL required for the Project	OHTL design information required for the ESIA and Project and requesting for data relating to Yeni Yashma Wind Farm	E-mail sent 21 September 2021 Sent by post on 22 September 2021
			Request feedback that may be relevant to the project and to raise awareness of any issues that should be addressed in the planning and development or in the ESIA such as setback requirements for Wind Turbines from existing OHTL and other electrical infrastructure within project area.	E-mail and letter sent 21 September 2021

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST- BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS	CONSULTATION DATE
	The Ministry of Transportation, Communications and High Technologies of the Republic of Azerbaijan, Aztelekom LLC	D: Request feedback	Request feedback that may be relevant to the project and to raise awareness of any issues that should be addressed in the planning and development or in the ESIA. Also, to check if any telecommunication towers and infrastructure located within project area.	E-mail 21 September 2021 Sent by post 22 September 2021
	National Television and Radio Council	D: Request information on telecommunications systems within project area and request feedback on any specific requirements		Sent by e-mail 21 September 2021 Sent by post 22 September 2021
	Mine Action Agency	D: Safety zones to be maintains and clearance of project area from UXO	Request feedback that may be relevant to the project and to raise awareness of any issues that should be addressed in the planning and development or in the ESIA, including requirements relating to the following: - Are there any setback requirements for Wind Turbines from aviation infrastructure within project areas such as radars, helipads, etc.; - Are there any safety zones to be maintained during construction and operation of the Projects; - Have the proposed project areas been used for live munitions training such as	Letter sent 10 November 2021
	The Ministry of Transportation, Communications and High Technologies of the Republic of Azerbaijan, State Civil Aviation Agency	D: Request feedback and clearance for project areas.		Letter sent 20 October 2021

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST- BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS	CONSULTATION DATE
			mortar or light artillery with possible presence of UXOs;	
	Deputy Minister of Defense- Commander of the Air Force	D: Request feedback and clearance for project areas. There's a military area with helipads within close proximity to project areas.		Letter sent 4 October 2021
	Azerbaijan Amelioration and Water Farm Open Joint Stock Company	D: Water Authority in Absheron Region	Request feedback relevant to the project including requirements relating to the following: - Water sources managed by (insert name of Authority) in Absheron and Khizi Regions.	Email sent on 25 October 2021
	AZERSU" Open Joint Stock Company	D: Water and Wastewater Distribution Authority	- Sources of water that can be used by the Projects during construction, commissioning and operational phases (Absheron and Khizi area). Can water be used from water channel?	Letter and email issued 21 September 2021
	Khizi Water Canal Office	D: Water Canal Authority in Khizi Region	- Any other requirements to be considered during all phases of the project.	

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST- BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS	CONSULTATION DATE
	Khizi District Executive Power	D: Waste Authority in Khizi Region	Request feedback that may be relevant to the project and data that will be relevant to the Project, including the following: - Licensed hazardous and non-hazardous waste processing and disposal facilities in Khizi and Absheron. If not, nearest available facilities that can be used by the project. - List of approved waste transporters (hazardous and non-hazardous) and management companies including waste processing and recycling companies. - Any other requirements	Letter and email issued 21 September 2021. Response received 5 October 2021.
	Azersu Open Joint Stock Company	D: Wastewater Authority	Request feedback that may be relevant to the project and data that will be relevant to the Project, including the following: - Licensed wastewater treatment facilities in Khizi and Absheron. If not, nearest available facilities that can be used by the project. - List of approved transporter companies (hazardous and	Letter issued by email and post on 25 October 2021 and response received on 15 March 2022.

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST-BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS	CONSULTATION DATE
			sanitary/domestic wastewater) - Any other requirements to be considered during all phases of the project	
Media	List Regional and local mass media	D: Will potentially be involved in disseminating information about the Project.	Issues regarding the media cover of planned Project (if necessary, at the scoping stage)	No specific consultation required. Public Disclosure meeting announced in Media on 30 December 2022. Public Disclosure Meeting Announced in Respublika Newspaper. Please see Media Coverage of the Project for local & international news coverage of the Project as provided in this Chapter.
Financial institutions	EBRD (And possibly others)	D: Providing finance for the Project	On-going dialogue to ensure scope of ESIA is in line with Lender's requirements	Meeting held as follows: - Meeting with EBRD held on 10th December 2020 to discuss Birds and Bats Surveys - Meeting with AIIB held on 5th March 2021 to discuss Scoping Report - Meeting with ADB on 8 July 2021 to discuss OHTL and WF Scope of Work

STAKEHOLDER GROUP	STAKEHOLDER BODIES	RELEVANCE TO PROJECT: IMPACT-BASED (A), INTEREST- BASED (I), OR DECISION MAKER (D)	AGENDA FOR CONSULTATIONS AND METHODS	CONSULTATION DATE
				Meeting held with EBRD on 11 November 2021 to discuss status of EISA.
NGOs	NGOs Public Council at MENR	I: Will be interested in the execution of the Project and its environmental impacts and mitigation measures.	No specific consultation, but may have an interest in publicly disclosed documents	Meeting held on 16 May 2020.
Researchers and Experts	Rob Sheldon: Ornithologist	I: Experts have knowledge of the project site region and have been involved in past bird surveys and research.	Request for available bird data for the project area/region.	Emails sent 3 and 7 June 2021

17.6 Summary of Public Consultations and Minutes of Meetings

17.6.1 Engagement during Scoping Stage

Engagement during scoping was carried out with the following:

- Local community of Sitalchay Village;
- Ministry of Environment and Natural Resources (Environmental Regulator in Azerbaijan);
- Ministry of Energy (MOE);
- Members of public council of NGOs established under MENR; and
- Municipality of Sitalchay.

A summary of the engagement/ consultations undertaken for the above stakeholders are provided below.

LOCAL COMMUNITY OF SITALCHAY VILLAGE

Due to COVID 19 pandemic and movement restrictions imposed in Azerbaijan during scoping, public meeting could not be held, therefore letters introducing the Project were distributed on 19th May 2020 and during June 2021 among Sitalchay Village (houses and supermarkets) and the announcement office of the Municipality. The Letter included contact details of the local consultant to receive any feedback and questions from the local community.

The English copy of Letter is shown below and the Azeri Letter is provided in Appendix I of Volume 4 of the ESIA.

Figure 17-1 Letter Distributed in Sitalchay Village – Scoping Stage



According to an executive agreement signed between the Ministry of Energy of the Republic of Azerbaijan and international Power and Water Developer ACWA Power on January 9, 2020, a 240 MW wind power project will be developed and built in the mountainous part of Perekishkul and Sitalchay villages of Absheron region. Part of this capacity, total of 23 turbines, will be installed on a 17 km long mountain range near the village of Sitalchay. The location of the project is shown in the map below:



The wind farm will be part of Azerbaijan's energy system and will contribute to the further diversification of the economy, giving a new impetus to the sustainable development of the country.

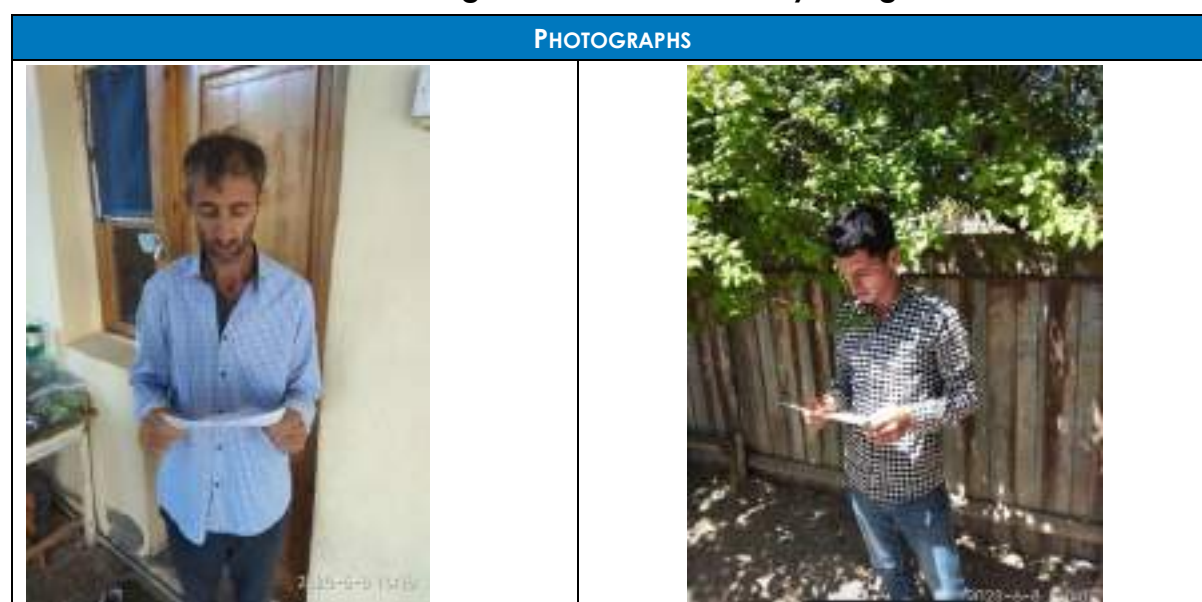
ACWA Power is seeking project financing from International Financial Institutions (IFIs) who require projects to comply with the World Bank/IFC standards and assess environmental and social issues to ensure that the project minimises any environmental/social impacts and identifies suitable mitigation measures. 5 Capitals Environmental and Management Consultancy and the local consultants Ecoenergy Ltd. (Ecoenergy), have been appointed by ACWA Power to carry out the Environmental & Social Impact Assessment (ESIA) study for the Project to gain regulatory approval and project financing. Therefore, as part of the ESIA process and in line with international lender requirements, ACWA Power is consulting with relevant stakeholders to inform them of the planned Project and to receive any feedback or comments in regard to this Project (such as construction or operational impacts on the natural environment and local communities – including land use, soil and water quality, noise, ecology, archaeology, to be assessed in the ESIA study). We would therefore welcome any comments or feedback you may have in regard to the proposed Project through the following:

Email: info@ecoenergy.az

Phone number - +994 (50) 367-32-00

Website: www.ecoenergy.az

Plate 17-2 Picture of Letters being distributed in Sitalchay Village



After, a consultation meeting was held on 25th June 2020 at Sitalchay Village with community members where a total of 10 participants attended (maximum number of people allowed due to COVID restrictions). During the meeting local consultant and representative from ACWA Power introduced the Project and the ESIA study. The following was presented during the meeting:

- General Overview of the Project (Purpose, nature and location of Project and associated facilities, project characteristics and features);
- General overview of the ESIA study;
- Reason/Objective of ESIA: Participants were informed that the ESIA will be submitted to MENR to achieve local approval and also study will be submitted to international Lenders as project is seeking finance;
- Outline of scoping report; and
- Public Disclosure of ESIA carried out on 8 and 10 of January 2022 at Sitalchay village.

Local consultant shared the below contact details (as stated in Letter distributed in community) - for Grievance Redress Mechanism.

Email: info@ecoenergy.az	Phone number - +994 (50) 367-32-00	Website: www.ecoenergy.az

During the meetings the following issues were raised:

- Employment opportunities for the local community;
- Location of WTGs;
- Employment opportunities for women;
- Whether archaeological artefacts found in the project area;

- ESIA study considered water springs in the area; and
- Location of new roads required during construction phase.

Minutes of Meetings (MoM) are also provided in Appendix I of Volume 4.

Plate 17-3 Consultation Meeting - Community Members of Sitalchay Village



MUNICIPALITY OF SITALCHAY

A consultation meeting was carried out with on 12th May 2020 with the Chairman of the municipal council of Sitalchay village and local consultant. Purpose of the meeting was to brief the chairman of municipality about the project and the ESIA baseline surveys for wind farm project, scoping stage and activities to be undertaken by consultant during the course of the ESIA study. It was noted that the project is developed following the agreement signed between the Ministry of Energy and ACWA POWER of the Kingdom of Saudi Arabia. The map was introduced to show the primary locations of WGTs. It was brought to the attention of the chairman that "Ecoenergy" LLC was involved in the study of the Environmental and Social impact Assessment of the project as a local consultant.

The chairman provided the socio-economic data of the village including the village population, employment, as well as land ownership by categories.

It was concluded that for raising the awareness about the project amongst the local population the project posters shall be posted at the municipality board, shops and schools. Posters will provide basic information about the project.

MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES (MENR)

MENR, the environmental regulator in Azerbaijan, does not require a Scoping Report and scoping can be carried out in a form of a meeting instead. Therefore, a virtual meeting was held with the State Environmental Expertise Department of the MENR on 8th September 2021 to introduce the project and ESIA study scope. The meeting was attended by 5 capitals and Local Consultant team. The following was raised by the MENR:

- Presence of Orchidaceous flower in Khizi area, a red book listed species and measures to be taken to protect this species;
- Asked whether Project area will be restricted to local farmers during operation phase (it should be during operation; the sites will not be fenced and herders/farmers can access the areas);
- Did you obtain the climate related meteorological data from the Ministry? The regulator will check for the evidence that project uses official data.
- Land acquisition process;
- Impact of WTG in terms of noise, radiation, vibration on humans;
- Will local roads be used and if damaged will they be restored;
- Monitoring activities during operation phase;
- Plans for local recruitment and opportunities for the local community from the development of this project.

The below responses were sent to MENR to questions raised by MENR that weren't answered during the consultation meeting.

Table 17-2 Responses to MENR Questions

COMMENTS RAISED BY MENR	ACWA POWER & 5 CAPITALS RESPONSES
There is a red book listed species of Orchidaceae flower in Khizi area. What kind of measures will be engaged to protect this rare species?	As part of the Environmental and Social Impact Assessment (ESIA), a botanical survey has been carried out for the Khizi 3 Wind Farm project area. The survey has identified some Vulnerable and Endangered species listed under the IUCN Red List and Azerbaijan Red Book including <i>Orchis caspia</i>. Therefore, the assessment team is aware of this. The assessment of impacts is being undertaken in accordance with IFC PS6 which includes Biodiversity Conservation. As part of this assessment process, habitats will be classified according to certain criteria. Where there are endangered species as per the IUCN classification (or species of local importance/protection), the habitat type supporting such species will be considered as a 'critical habitat'. The ESIA will define these areas and consider whether the layout of the project (and its associated facilities) will have an overlying impact on these areas. Where areas of the Project works potentially overlap with critical habitats, these will be raised with ACWA Power to determine what mitigation can be implemented to avoid or reduce such impacts. If impacts cannot be avoided, IFC PS6 requires the project to implement other appropriate mitigation measures based on hierarchy of control, which for 'critical' habitats requires processes to achieve a 'net gain' with respect to the habitat type.
Shall the area be closed for farmers use during operation?	Access to the project areas will be temporarily restricted during construction for safety reasons. However, during operation the sites will not be fenced and herders/farmers can access the areas.

COMMENTS RAISED BY MENR	ACWA POWER & 5 CAPITALS RESPONSES
Did you obtain the climate related meteorological data from the Ministry? The regulator will check for the evidence that project uses official data.	The ESIA studies will include an assessment of Climate Impacts in accordance to the new requirements under Equator Principles IV. As part of the assessment, a review of historical climate data will be included from publicly available sources. The main purpose of this climate change assessment is however to look at future projections of climate (for the project area) and to predict the physical risks that may occur to the project (and of the project to the local area), as well as any risks may be posed by the transition to a lower carbon economy. 5 Capitals will consider purchasing any meteorological data if further data is required and deemed necessary by the assessment team. However, please be advised that the need for extensive historic meteorological data to support or inform the ESIA process is considered to be of limited value, besides providing an element of background information.
How was the land acquisition conducted? Has the land been allocated?	The ESIA studies will include an assessment of the land acquisition process in line with IFC Performance Standard 5 on Land Acquisition and Involuntary Resettlement. Also, a Land Lease Agreement (LLA) will be finalised between ACWA Power and Ministry of Energy.
Did you explore the impact of WTGs on people such as radiation, noise, electric waves, vibration?	The ESIA studies will assess the Environmental and Social (E&S) impacts associated with the construction, commissioning and operational phases of the Projects and will include assessment of the physical environment (noise, visual, etc.), biodiversity (impact on birds, bats, flora, habitat, etc.) and social conditions (health, safety and socio-economic). Therefore, these impacts will be assessed in the ESIA's. With specific reference to the points raised: For Radiation - the project will not have any radioactive components and as such this is not an impact. For Noise - yes, where there are residences/sensitive receptors within a defined proximity of the wind turbines (as outlined in the IFC EHS Guidelines for Wind Energy) the ESIA will include noise modelling study to predict potential impacts upon those receptors from the project. For Electric waves - EMF impacts are typically relatively limited by distance, and where sensitive receptors are in proximity to transmission lines these will be considered. Vibration - It's critical that the wind turbines do not cause vibration to ensure their structural integrity. As such, vibration impacts are not expected from the project.
Shall you carry out the monitoring and how often during the operation?	The ESIA studies will include monitoring requirements for the construction, commissioning and operational phases of the Projects. Also, more specific monitoring details will be provided in the specific 'Environmental and Social Monitoring Plan' that will be developed as part of the construction and operational phases ESMS by the EPC and O&M Companies.
Will you use local roads and if damaged will they be restored?	Plant Access roads will be constructed for the Project, as well as internal roads. It will be the responsibility of the EPC Contractor to ensure returning all local roads to their original state after transporting the Wind Turbines. A high level assessment of the Associated Facilities including access roads will be included in the ESIA studies in line with Lenders requirements.

COMMENTS RAISED BY MENR	ACWA POWER & 5 CAPITALS RESPONSES
Is there a plan for local recruitment? What are the opportunities for local villagers to work?	It is part of ACWA Power's internal KPI to ensure and promote local employment. Corporate Social Responsibility (CSR) is currently being evaluated and will be developed for the region. This is currently ongoing and will be finalised in due course.
Timeline	5 Capitals is aiming to submit ESIA Report to MENR review by April 2021.

MINISTRY OF ENVIRONMENT AND NATURAL RESOURCES (MENR)

A virtual meeting was held on 29 July 2021 with representatives from ACWA Power, 5 Capitals and Ecoenergy to discuss the ESIA study. In total nine (9) participants attended the meeting. A power point presentation was used to present the project, location, purpose, requirements and explain the activities undertaken as part of the ESIA. The meeting was held in Azeri language.

During the presentation, participants noted the importance of consulting with stakeholders. During the presentation, Chingiz Orujov gave detailed information on the surveys on-going and planned for the project.

The questions and answers raised during the session are presented in Table below.

Table 17-3 Response to Questions

QUESTIONS	RESPONSES BY LOCAL CONSULTANT
Is there a major environmental problem for Wind Energy Turbines to be built based on your research?	Environmental assessment still continues in the area where the turbines will be installed. There are some points where birds fly intensively in the areas where the turbines will be constructed. Data collection continues and more accurate information will be formed after its results. It is too early to say general information. 5 Capitals stated that it is not possible to give an exact information about project impacts at this stage as the environmental assessments continues and more information shall be available upon completion of all environmental surveys. MoE noted that the information provided was comprehensive for the current progress of the project.

MEMBERS OF PUBLIC COUNCIL OF NGOS

A meeting was held on 16th May 2020 with the members of the Public Council of NGOs established under the MENR to introduce project and ESIA Study. The meeting was attended by the Chairman of the Public Council, the head of the Azerbaijan Scouts Association, the head of the National Environmental Forecasting, a member of Ireli Public Union and members of the Public Council. The project and scope of the ESIA study were presented to the participants. The following was raised during the meeting:

- Location of human settlements within project areas;
- If ice accretion can occur on blades and possibility of ice throw;
- Consultation with other NGOs during the course of the EISA study;
- Has research been conducted on the change of wind direction against the background of climate change; and
- Land ownership of WF project areas.

The questions and answers raised during the session are presented in Table below.

Table 17-4 Response to Questions

QUESTIONS	RESPONSES
What settlements surround the project?	There are seasonal farming activities nearby the Khizi project site most of which are from Sitalchay village located about 8 km to NE from the project site. Whereas in Area 1 project site there are two settlements: Perekishkul and Gobustan. There are also several farms and a military unit near the project area.
Can icing occur on wind blades in winter? Is there a chance that these ice will scatter when the wind blades are rotating at high speed?	This issue will be addressed by the project engineers and detailed information including the mitigation measures shall be provided.
Will there be consultations with other NGOs?	Yes, project management shall conduct environmental consultations with NGOs upon public disclosure of the draft ESIA.
Has research been conducted on the change of wind direction against the background of climate change?	Information about the wind is being obtained through meteorological masts installed in the fields. Estimations are based on actual wind data.
Who owns the territory?	The project area is located near Sitalchay village in Khizi district and Perekeskul village of Absheron district. The area is owned by the Municipality and the State Property Committee (Government).

Plate 17-4 Consultation Meeting - Members of Public Council of NGOs



17.6.2 Engagement during ESIA Study

Meeting and interviews with potentially affected users, as well as with some institutional stakeholders. This included meetings with the following:

- Informal meeting with herder passing by the project area (nomadic herder);
- Focus Discussion Group (FDG) Meetings from members of Sitalchay village (women and elderly);
- Seasonal farmers/ herders;
- Poultry Farm;
- Government and Institutional Stakeholders:
 - Municipality of Sitalchay;
 - Ministry of Culture and Tourism;
 - Institute of Archaeology and Ethnography (AAS IAE) - Azerbaijan National Academy of Sciences;
 - MENR;
 - Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan; and
 - Local representative of The Executive power of Khizi region/ Representative of Executive Power of Absheron District;
 - Other state agencies listed in Table above.

The method and outcome of consultations are provided below.

17.6.3 Informal Meeting with Nomadic Herder

An informal interview was carried out in October 2020 with a herder observed on site during site survey. The herder explained that this shelter is not used every year and only used during dry years. Nomadic herders may use this area as temporary shelter (HR-1).



17.6.4 Meeting Held Refugees and IDPs from Sitalchay Village

A meeting was held on 24 January 2022 by representative of PIC office and refugees/ IDPs from the village. The PIC representative explained the nature of the project, location, components of the WF, explained the national permitting process and the key risk and opportunities from the Project.

The participants stated that they do not face any discrimination by the community and do not foresee any negative impacts from the Project. They find the Project a great opportunity for the youth in the village. The concerns raised during the meeting include:

- Water shortage they face in the Village especially during summertime;
- Lack of hospital in Village; and
- Poor condition of the Village school.

17.6.5 Meeting Held with Women

A meeting was held on 24 September at the Representative Office of Khizi District Executive Power. The meeting was attended by Ecoenergy team (the local consultant), Chairman of Municipality, Chairman of Sitalchay village Representative Office of Khizi district Executive Power and five (5) members of Siltachay community, with one participant is a refugee.

The local consultant explained the nature of the project introduced ACWA Power, location, components of the WF, explained the national permitting process and the key risk and opportunities from the Project. The questions and answers raised during the session are presented in Table below.

Table 17-5 Response to Questions

QUESTIONS	RESPONSES BY LOCAL CONSULTANT
Could there be job opportunities also for women during the project implementation?	There will be a need for a number of labour forces at project construction and operation phases and it may also include women. There may be vacancies such as cooks and cleaners. The interested persons are requested to complete and present applications to our representatives.
We experience water shortage problem in the village, could you take any measures in this regard?	This concern was also raised in the previous session and we will convey water shortage problem to the company management.
You may have paid attention to the road problem on your way to the village. Unfortunately, bad shape of the road extremely complicates our work. Given that most of the necessary labour force would travel to their workplace using this road, could you take any measures in this regard?	ACWA Power company is for implementing social measures within the project frame. You may be assured that this problem will be conveyed to the company management.

17.6.6 Meeting Held with Elderly

A meeting was held on 24 September 2021 at the Representative Office of Khizi District Executive Power. The meeting was attended by Ecoenergy team (the local consultant), Chairman of Municipality, Chairman of Sitalchay village Representative Office of Khizi district Executive Power and 13 members of Siltachay community.

The local consultant explained the nature of the project introduced ACWA Power, location, components of the WF, explained the national permitting process and the key risk and opportunities from the Project. The questions and answers raised during the session are presented in Table below.

Table 17-6 Response to Questions

QUESTIONS	RESPONSES BY LOCAL CONSULTANT
High wind speed in the project area may cause construction concerns. Is the company informed about it?	There is an instrument installed to regularly measure the wind speed in the project area within a year period. All risks likely to arise during the construction have been examined and the measures regarding the company and employees have been taken in advance.
Do you have plans for solar energy?	Only turbines for wind energy will be installed in the project area. There are no plans for solar energy in Sitalchay village yet.
It was noted that social measures would be implemented for the village. Repair of roads for Sitalchay village would positively impact the living standards of the village inhabitants. Will there be any measures in this regard?	ACWA Power company implements multiple projects in many countries of the world and it is the company's internal policy to implement social measures in each of its projects. However, the course of action to be taken would be defined based on feedback from the village inhabitants.
Information has been disseminated regarding the job opportunity in the village recently. The number of job applicants is high. However the village inhabitants are not informed about the commencement date of the job. Could you please inform us regarding commencement of construction, employee salaries and the information relating to it?	The project works are scheduled to commence until end of the year. Employee selection will be made by the Project information Centre in a transparent manner. They will be hired in line with the Labour Code of the Republic of Azerbaijan. Employee salaries will be higher than minimum salary threshold. The company will advise of the salary calculations.
The village experiences a very serious water shortage problem. Could you envision measures also relating to it?	Choice of social projects will be made following consultations with the village inhabitants. Water, road, and other projects will be defined based on general agreement.
Construction of a sports hall may help to prevent spread of drug addiction in the village. We kindly request you to implement measures regarding it.	We are taking note of all proposals and will convey them to the company management.

17.6.7 Meeting with Seasonal Farmers/ Herders (surrounding project area)

Interviews were held with the nearby farmers/ herders from February to March 2021 who occasionally use the project area for grazing. The following data was collected:

- Farmers Name;
- Farm location and number of livestock;
- Area of grazing;
- Type of lease agreement (if any);
- Farmers were asked if project area is used by them for grazing;
- Whether alternative grazing pastures/areas were provided by Municipality; and
- Period of grazing and how frequent

The outcome of interviews revealed that farmers occasionally use project area for seasonal grazing informally. However, one of the farmers has a land lease agreement for grazing within project area. More data is provided below.

17.6.8 Meeting Held with Farmer with LLA at WF and Farmer along OHTL

A meeting was held with Mr. Zaur Suleymanov on 17 August 2021 and was attended by the Ministry of Energy and ACWA Power representatives and local consultant's Community Liaison Officer. The purpose of the meeting was to clarify and confirm land use status of Mr. Zaur. The meeting was held in the PIC in Sitalchay Village.

Outcome of meeting:

- Mr. Zaur stated he has been farming in the project area for over 15 years and WTG K31 and K32 WTGs (based on old layout) falls inside the boundaries of LLA from Municipality. A copy of the LLA was provided during the meeting;
- ACWA Power ensured Mr. Zaur the project area will not be fenced off during operation, as this was one of the concerns raised by the farmer. Javid Abdullayev reaffirmed Mr. Alifly adding only the areas where the turbines are to be deployed will not fall under the limits of the common pasture;
- Head of Municipality stated that the lease agreement signed between the Municipality and Mr. Suleymanov was not validated by the state land department of Khizi district;
- Mr. Zaur Suleymanov noted that the validation of agreement is pending and will be finalised once project LLA is finalised;
- Mr. Zaur Suleymanov requested ACWA Power to install a small-scale renewable power for his farm. He mentioned that there is no power at the farm and struggles to supply the

generators with diesel. This was noted by ACWA Power's representative and stated this will be evaluated and a response will be provided; and

- Another farmer, Mr Nasrullah Abdullayev asked about the OHTL that will run adjacent to his farm area and asked if there would be any hazards relating to it; and
- Representative of MOE said Azerenerji OJSC company will be informed about his concern and they would provide detailed information to Mr. Nasrullah Abdullayev regarding the safety measures to follow around the OHTL.

17.6.9 Poultry Farm

Informal meeting was held on 21 August 2021 and was attended by the Director of the Poultry Farm (Gilezi) and Chingiz Orujov from Ecoenergy (Local Consultant). The Gilezi poultry is one of the largest eggs and poultry meat producer in the country. It has two factories in Khizi district.

The purpose of the meeting was to explore the factors attracting vultures to the factory that was observed by the ornithology team.

Director acknowledged the fact that vultures are visiting the factory in large groups for many years since 2013 when factory started operations. He believes that vultures feel the smell of poultry and it attracts them to the factory site. Asked if the factory dumps any carcasses of chicken, he said there is special incineration unit for damaged or dead chicken. He showed the video of the incineration unit in his phone. However, he admitted that few chickens that are damaged by mechanical equipment in the factory may be dumped mixed with manure. Otherwise, he believes that factory follows all standards and requirements of the regulations related with waste management.

Mr. Mirzayev refused to sign the MoM and refused to have any additional meetings with local consultant.

17.6.10 Institutional stakeholders Consultations

Official consultation letters/emails were issued to the following institutional stakeholders as follows (MoM and copies of Letters are provided in Appendix I of Volume 4):

- Ministry of Culture and Tourism: An email was sent by the local consultant on 4 May 2021 to confirm if there are specific requirements for buffer zones/distances around artefacts and archaeological sites within project areas during the construction of the Projects. Copy of the Archaeological Survey Report for Khizi 3 Wind Farm were also provided to the Ministry;
- Outcome: Ministry of Culture requested to refer to the Institute of Archaeology and Ethnography (AAS IAE) - Azerbaijan National Academy of Sciences and project should comply with Article 13 and 14 of the Law On Protection of Historic and Cultural Monuments of the Republic of Azerbaijan.

- Institute of Archaeology and Ethnography (AAS IAE) - Azerbaijan National Academy of Sciences: First consultation: A meeting was held on 12th November 2020 regarding the further archaeological site investigation program required for Khizi 3 WF based on the findings of the initial archaeological findings undertaken by the Academy. Mr Shamil Najafov from the Academy of Science updated the participants of the results of these walkovers (first survey) within project area. Mr Najafov indicated that features of potential archaeological interest have been identified at four locations on the Project Site, one in the immediate vicinity and eighteen in the adjacent areas, respectively, were identified through this exercise. Potential areas of concern the four locations on and one in the immediate vicinity of the Project Site were highlighted by Mr Najafov. Mr. Najafov stated that the potential areas of archaeological interest have been identified by the observation of Bronze Age/Medieval ceramic artefacts on the surface of the ground and surface features, the potential mounds left by Bronze Age/Medieval period. Following, the following points were discussed:
 - Archaeological strategy for the Project at this stage of Environmental and Social Impact Assessment (ESIA) process and during construction;
 - Outcome: Permits or authorisation is required from the Academy before trial trenching activities. Archaeologist from the Academy should be present to record any discoveries.
 - Additional consultation: A letter was issued on 1st July 2021 to confirm if there are any specific requirements for buffer (safety) zones/distances around the potential archaeological sites that should be applied and maintained during the construction and operation of the Projects. . No response was received on buffer zones requirements for archaeological sites.
- Azerishiq (As the operator of Yani Yeshma Wind Farm): A letter was sent on 29th May 2021 and emailed 31st May to request data relating to the existing Yeni Yashma Wind Farm required for the Noise and Shadow Flicker modelling which will consider the cumulative effects of Khizi 3 Wind Project as well as Yeni Yashma Wind Farm.
 - o Outcome: Data on Yashma WF was provided on 13 July 2021.
- Azerenerji Joint Stock Company: A letter and email sent on 21 and 22 September 2021, respectively. Purpose of consultation is to request the OHTL design information required for the ESIA. Also, to request feedback that may be relevant to the project and to raise awareness of any issues that should be addressed in the planning and development or in the ESIA such as setback requirements for Wind Turbines from existing OHTL and other electrical infrastructure within project area.
 - o Outcome: Response received from the authority states that Azerbaijan Scientific – Research and Project – Research Power Engineering Institute, a structural unit of Azerenergi OJSC, has performed the design of Gobu – Pirakushkul, Pirakushkul- Khizy and Khizy – Yashma OHTL 220 kW (associated facility for this Project) in connection with the points stated in the letter and that proper expertise opinions were obtained from relevant government authorities. Azerenergi requested consultation to be undertaken with relevant staff listed in their response letter.

- o Outcome of additional consultation undertaken on 11 November 2021: Azerenergi did not specify any requirements for the project such as buffer zones for WTGs from OHTL. However, this question was raised by Azerenergi during meeting and local consultant stated that this will be discussed with ACWA Power and a response will be provided back.
- National Television and Radio Council: A letter and email sent on 21 and 22 September 2021, respectively. Purpose of consultation is to request feedback that may be relevant to the project and to raise awareness of any issues that should be addressed in the planning and development or in the ESIA. Also, to check if any telecommunication towers and infrastructure located within project area.
 - o Outcome: The National Television and Radio Council ensures implementation of the state policy in television and radio broadcasting field and regulates this activity. The authority provides oversight of enforcement of the requirements of legislative acts in television and radio broadcasting field. It is not an entity organizing broadcasting via any technical means or usage of telecommunication towers. Therefore, the Council cannot provide any feedback or response to the Consultation Letter.
- Mine Action Agency: A letter and email sent on 21 and 22 September 2021, respectively to request feedback that may be relevant to the project and to raise awareness of any issues that should be addressed in the planning and development or in the ESIA, including requirements relating to the following:
 - o Are there any setback requirements for Wind Turbines from aviation infrastructure within project areas such as radars, helipads, etc.;
 - o Are there any safety zones to be maintained during construction and operation of the Projects; and
 - o Have the proposed project areas been used for live munitions training such as mortar or light artillery with possible presence of UXOs.
 - Outcome: The Agency referred to an explosion that took place in a military unit located in the Khizi, which after the Agency cleared the area. As a result, 10,136 hectares of land were cleared and 25,846 pieces of unexploded ordnance (UXO) were found and neutralized. The Agency has cleared the project area and stated site is unlikely to 'be contaminated with ammunition and UXO. The project area was also cleared from UXO by the Ministry of Energy in a Letter issued on 15 March 2022.
- The Ministry of Transportation, Communications and High Technologies of the Republic of Azerbaijan, State Civil Aviation Agency: A letter was sent on 20 October 2021 to request feedback that may be relevant to the project and to raise awareness of any issues that should be addressed in the planning and development or in the ESIA, including requirements relating to the following:
 - o Are there any setback requirements for Wind Turbines from aviation infrastructure within project areas such as radars, helipads, etc.;

-
- o Are there any safety zones to be maintained during construction and operation of the Projects;
 - o Have the proposed project areas been used for live munitions training such as mortar or light artillery with possible presence of UXOs;
 - Outcome: Response was provided in consultation with Azerbaijan Airways CJSC Azeraerionavigasiya Air Traffic Department. As per Flight Security Rules, Sub-clause 3.3.8 as approved by Decree 756 dated June 27 2019 of the President of the Republic of Azerbaijan, the inspection team of the State Civil Aviation Agency shall conduct onsite inspection of the construction works before it commences to ensure flights security as the height of the building specified in the presented design is above 100 m. The response also refers to Chapter 10 of the Azerbaijan Aviation Rules – Aerodrome standards document (visual devices to indicate obstructions) for lighting requirements for WF. Also, Civil Aviation Authority requested to contact Head of the Aerodrome Operators Control Officer (Mr. Fikrat Akhundov (phone: + 994-55-211-11-77, e- mail: f.akhundov@caa.gov.az) to follow up on the site inspection of the lighting features and location after construction is complete.
 - Deputy Minister of Defence-Commander of the Air Force: A letter was sent on 4 October 2021 to request feedback and clearance for the project (same as above).
 - o Outcome: Response from Air Force cleared Khizi 3 WF project area and stated that there are no obstructions from flying high – speed and low – speed for aircrafts belonging to Air Force at any of the coordinates provided in Letter (coordinates provided In letter are for project boundary).
 - Azerbaijan Amelioration and Water Farm Open Joint Stock Company: An email sent on 25. October 2021 to request feedback relevant to the project including requirements relating to the following:
 - o Water sources managed) in Absheron and Khizi Regions.
 - o Sources of water that can be used by the Projects during construction, commissioning and operational phases (Absheron and Khizi area).
 - o Any other requirements to be considered during all phases of the project.
 - Response: No response.
 - AZERSU" Open Joint Stock Company: Letter sent on 21 September 2021 to request feedback on wastewater disposal and treatment facilities for project including the following:
 - o Licensed wastewater treatment facilities in Khizi and Absheron. If not, nearest available facilities that can be used by the project.

-
- o List of approved transporter companies (hazardous and sanitary/domestic wastewater)
 - o Any other requirements to be considered during all phases of the project
 - Response: Response received 15 March 2022. The letter stated the project areas do not include wastewater sewage systems. The state agency is currently constructing a wastewater treatment plant near Khizi and Altiaghaj settlement. The Agency confirmed the wastewater treatment plant in Sumgayit is operational and can be used for the Project. AZERSU stated that the wastewater generated during the construction and operational phases to be collected using septic tanks and transported by a licensed contractor to Sumgayit Wastewater Treatment Plant.
 - The Ministry of Emergency Situations of Azerbaijan Republic, State Agency for Construction Safety Control, Letter issued on 21st September 2021, however no response received yet.
 - Khizi District Executive Power: A letter sent 21 September 2021 to request feedback that may be relevant to the project and data that will be relevant to the Project, including the following:
 - o Licensed hazardous and non-hazardous waste processing and disposal facilities in Khizi and Absheron. If not, nearest available facilities that can be used by the project.
 - o List of approved waste transporters (hazardous and non-hazardous) and management companies including waste processing and recycling companies.
 - o Any other requirements
 - Outcome: Response received 5 October 2021. The Agency stated that there are no functional hazardous and non – hazardous wastes processing facilities in Khizi district. The closest facility that may be used by the project is located near Sumgayit city, Haji Zeynalabdin settlement. There are no waste processing and recycling companies, waste transporters (hazardous and non – hazardous) and management companies in Khizi district.
 - Ministry of Labour and Social Protection of the Population of Azerbaijan Republic: Letter sent on 21 September 2021 to request feedback on that may be relevant to the project and specific requirements for the project.
 - o Outcome: Response letter received on 11th October 2021 and requested the following to be considered in ESIA:
 - Development of the project in line with the requirements of both national and international labour regulations and standards;

-
- Formulation of requirements for holding regular Environmental and Social Audits within the project execution period;
 - Definition of environmental and social goals to achieve full environmental and social efficiency;
 - Consideration of measures to minimize negative socio - economic impacts and benefits for local population from the project;
 - Consideration of measures to eliminate environmental and social risks, including negative impacts on vulnerable population groups and enhance efficiency;
 - Awareness among population regarding the potential risks that may be encountered in the project execution period through alternative awareness tools;
 - Presentation of the developed draft ESIA document to concerned parties for their opinions and proposals.
- The Ministry of Healthcare of Azerbaijan Republic: A letter sent on 21 September 2021, however no response received
 - Ministry of Transport, Communications and High Technologies of the Republic of Azerbaijan: A Letter was sent on 29 June 2021 to request data or comments that will be relevant to the Project, including requirements relating to the following:
 - The need for on-going engagement with the Ministry of Transportation;
 - The need to obtain future approvals linked to traffic movements, and the need to submit any traffic management plans etc.;
 - The transportation of project equipment i.e., wind turbines components such as blades, transformers etc.;
 - The transportation of some hazardous material and removal of waste;
 - The transportation of workers to the construction site; and
 - Requirements and process relating to upgrading existing roads and construction of new access roads.
 - o Outcome: Response was received on 22nd July 2021 from the State Automobile Transportation Service department under the Ministry. The Ministry stated the transport of large heavy cargo will be allowed through obtaining a permit from relevant authorities. The transportation process shall be regulated by the Law of Automotive Transportation Article 48 and the Law of the Republic of Azerbaijan on "Road Traffic" Article 62. The response letter also indicates that a permit must be obtained from the Ministry of Emergency Situations for transportation of hazardous waste. Also, the Letter stated that State Automobile Transportation Service do not have any opinion or proposal in relation to the project.
 - Local representative of The Executive power of Khizi region/ Representative of Executive Power of Absheron District: Letter sent 29th June 2021 to receive any feedback or comments in regard to the Project including land use.

- Outcome: Letter sent 29th June 2021 to receive feedback or comments in regard to the Project including land use. Response was received 27 August 2021.
- Outcome: The State agency confirmed that the Khizi 3 WF is not under any LLA. The State agency does not have any data regarding herb collection, hunting, or herding activities within the project area.

17.6.11 Consultations Undertaken for CHA

As part of the CHA, Sociable Lapwing leading researching and expert Rob Sheldon was consulted, to request any relevant data covering the Absheron Peninsula. An unpublished report, "Survey of the Critically Endangered Sociable Lapwing in Azerbaijan, September 2016" by Rob Sheldon, Ruslan Urazaliyev, and Kai Gauger was shared.

As part of the ESIA process, an email was sent on 17th March 2021 to the MENR to request data relating to the existing Yeni Yeshma Wind Farm required for the cumulative impact assessment (CIA) of this ESIA study.

Outcome: On 4 May 2021, a formal letter was received back from MENR sharing bird data collected during 2020. The Letter stated that bird monitoring is carried out for wetland bird's species mainly at Yashma district on a yearly basis. The Letter also stated that there is no information available regarding an EIA study for the Yeni Yeshma Wind Farm.

17.6.12 Consultations regarding Land Use and PAPs (as part of LRP)

Consultations with the farmers ,PAPs and municipality were undertaken in the context of Livelihood Restoration Plan (LRP) between 12 to 30 March 2022. A summary of the consultations are provided in Draft LRP.

17.7 Public Disclosure Meetings

Two (2) public disclosure meetings were undertaken on 8 and 10 January 2022 at Sitalchay village. The objectives of the meetings were to:

- Publicly disclose the results of detailed ESIA undertaken for the Khizi3 162.5MW Wind Farm Project over the past 2 years;
- Give an opportunity for national and local government to comment on the ESIA findings;
- Give an opportunity for affected Stakeholders and interested parties to comment on the ESIA findings; and
- To provide project information on:
 - Purpose, nature, and scale of the project;
 - Duration of proposed project activities (construction and operation);
 - Risks, impacts and relevant mitigation measures and benefits; and

- Public feedback forms and grievance mechanism.

Due to the COVID restrictions imposed in Azerbaijan, a maximum of 50 people were allowed to attend each meeting. Two (2) meetings were held over a weekday and weekend, to ensure maximum number of participants of attendance. The meetings were held at the village Sports Club yard.

Meeting announcement and invitations were sent out 10 days prior to meetings and announced in the press and project website (www.azerwind.az). Invitations letters were also posted in the village and sent out to NGOs and state agencies as shown below.

The issues mainly raised and was of great interest was recruitment and support expected from the Project to the village such as better infrastructure, parks, playgrounds, etc. Only one concern/ question was raised regarding compensation and impact on grazing areas.

Appendix N includes the Public Disclosure Meeting Report in Azerbaijani and English and includes the questions and answers raised during the meetings.

Table 17-7 Public Disclosure Meeting – Participants

	DETAILS
Dates	8 and 10 January 2022
Venue	Sitalchay Village - Village Sports Club yard
No. of Participants (Total)	88
Breakdown by Gender	Women: 23 Men: 65
Participants	- Members of Local community (Sitalchay and Village) - NGOs including Azerbaijan Ornithological Society, Environmental Education and Monitoring PU, Support for innovative education of women and children PU, Social and political research PU, Support for Sustainable Tourism Development PU - State Agencies such as State Agency for Renewable Energy Sources, State Employment Agency Territorial Employment No. 10, Institute of Archeology and Ethnography of ANAS, Museum of Natural History of ANAS, Representation on Administrative Territorial Districts - Youth Tourism Public Union

Plate 17-5 Announcements Placed in Sitalchay Village



Plate 17-6 Sample Letters Issued to State Agencies, NGOs and Unions

Invitation letter sent to State Agency on Alternative and Renewable Energy Sources under the Ministry of Energy of the Republic of Azerbaijan	Invitation Letter sent to Employment Department of the State Employment Agency under the Ministry of Labour and Social Protection of Population of the Republic of Azerbaijan
Invitation letter sent to "For Development and Wellbeing" Public Union of the Public Council under the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan	Invitation letter sent to "EKO-TES" Environmental Researches and Enlightenment Public Union of the Public Council under the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan

Plate 17-7 Announcements Placed in Sitalchay Village

PHOTOGRAPHS



17.8 Grievances Received

No grievances have been received as of 2 November 2021.

17.9 Media Coverage of the Project

News regarding the development of the 240 MW Wind Farm Project (Khizi 3 and Area 1 WFs) was published in the following media outlets:

LOCAL NEWS COVERAGE

- AzerNews
 - <https://www.azernews.az/business/174430.html>
- Ministry of Energy website
 - <https://minenergy.gov.az/en/xeberler-arxivi/acwa-power-sirketi-ile-qoyulus-gucu-240-mvt-olan-kulek-elektrik-stansiyasi-layihesi-uzre-muqavileler-imzalanib> (30-12-2020)
 - <https://minenergy.gov.az/en/xeberler-arxivi/240-mvt-liq-kulek-enerjisi-layihesinin-etraf-muhite-ve-sosial-tesirinin-qiyametlendirmesi-prosesi-iln-sonunda-tamamlanacaq> (30-07-2020)

REGIONAL MEDIA

- Caspian Barrel
 - <http://caspianbarrel.org/en/2020/01/acwa-power-to-open-office-in-azerbaijan-in-spring/>
- Caspian News
 - <http://caspianbarrel.org/en/2020/01/acwa-power-to-open-office-in-azerbaijan-in-spring/>

INTERNATIONAL MEDIA

- Renewables Now
 - <https://renewablesnow.com/news/acwa-power-signs-ppa-and-other-deals-for-240-mw-azeri-wind-project-726307/>
- Renewable Energy World
 - <https://www.renewableenergyworld.com/wind-power/acwa-power-signs-agreement-for-240-mw-wind-project-in-azerbaijan/#gref>

ACWA POWERS WEBSITE

- <https://acwapower.com/en/projects/azerbaijan-wind-ipp/>

PUBLIC DISCLOSURE MEETING ANNOUNCED IN RESPUBLIKA NEWSPAPER

Kıy ve Akdeniz kıyılarındaki 240 MYI-lik köpek enlempel belirlenim programı için ACWA Projesi girilmiştir. Bu, Türkiye'nin Akdeniz kıyılarında Akdeniz kıyılarında (MGTG) sınırlı bir şekilde ve belirli dönemlerdeki Akdeniz kıyılarında.

[illegible]

© 2007 Blackwell Publishing Ltd, *Journal of Internal Medicine* 261: 19–28

- Zorlu 2. Mərhələ Fərdi olaraq Təqdimatı Gözəli Nəzi Həyranova, Əlişanbəy xanım, Əlişanbəy xanımın qızı Nəzi 12. illərindəki təhsilini İsmayilova tərəfindən yerləşdirir. (səhifə Məsləhət Mərkəzi)
- Səhifə 1. Kəbir Fərdi olaraq Təqdimatı Gözəli Nəzi Həyranova, Əlişanbəy xanım, Əlişanbəy xanımın qızı Nəzi 12. illərindəki təhsilini İsmayilova tərəfindən yerləşdirir. (səhifə Məsləhət Mərkəzi)
- Bəzi qəhər, Əlişanbəy xanım, 2.15.

[illegible]

Farida Meckizade, EcoEnergy MMT, Tila Cir. High Safety-
regio 44g, 215, Sals, Astorbyan

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific information required.

Florida Marketplace, Energy News

The Off. Reg. Referec. No. 212, Baku, Azerbaijan
Tel. (094 35) 761-27-82.

18 LABOUR & WORKING CONDITIONS

This chapter identifies aspects relating to Labour & Working Conditions for the Project and how they will be managed in accordance with EBRD PR 2 /IFC PS 2 requirements.

18.1 Standards and Regulatory Requirements

18.1.1 National Requirements

LABOUR & WORKING CONDITION REQUIREMENTS

The Labour Code of the Republic of Azerbaijan (1999), as amended on 29-10-2021 is the main legislation in the Country that governs employment relationships between workers (employees) and employers. It also governs other legal relations between employees and employers and established minimum requirements in regards to labour rights of persons and the implementation of these rights.

The Labour Code authorises the following:

- *'Employment, social and economic rights of employees and employers in the sphere of labour relations on the basis of the appropriate legal norms and a minimum level of proper guarantees relating to said rights';*
- *'Employment, social and economic rights of employees and employers in the sphere of labour relations on the basis of the appropriate legal norms and a minimum level of proper guarantees relating to said rights';*
- *'Principles and procedures ensuring the right to employment, rest and work under safe and healthy conditions and to other basic human rights and freedoms as stipulated in Section Two of the Constitution of the Republic of Azerbaijan';*

The labour code also specifies

- Rights to work, rest, work in safe and healthy conditions, and other basic rights and human freedom.
- Termination of employment relationships and the protection of the rights of participants of these relations according to the international treaties signed by the Azerbaijan Republic which is the International Labour Organization Conventions and other international precepts of law

Other applicable legislation include:

- Law on Sanitary-Epidemiological Services (authorised by Presidential Decree No. 371); and
- The Constitution of the Republic of Azerbaijan (1995 as amended on 25-07-2016).

HUMAN RIGHTS REQUIREMENTS

The rights of people are guaranteed by the Constitution of Azerbaijan under Chapter III 'Basic Rights and Liberties of a Person and Citizen' which lists the main principles of these rights. The constitution states that "The state guarantees equality of rights and liberties of everyone, irrespective of race, nationality, religion, language, sex, origin, financial position, occupation, political convictions, membership in political parties, trade unions and other public organizations. Rights and liberties of a person, citizen cannot be restricted due to race, nationality, religion, language, sex, origin, conviction, political and social belonging."

Azerbaijan ratified the Convention for the Protection of Human Rights and Fundamental Freedoms (ECHR) on 15 April 2002. Human right treaties ratified by Azerbaijan include (Treaty Body Database, 2020):

- Convention against Torture and Other Cruel Inhuman or Degrading Treatment or Punishment (ratified 16 August 1996);
- Optional Protocol of the Convention against Torture (ratified 28 January 2009);
- International Covenant on Civil and Political Rights (ratified 13 August 1992);
- Second Optional Protocol to the International Covenant on Civil and Political Rights aiming to the abolition of the death penalty (ratified 22 January 1999);
- Convention for the Protection of All Persons from Enforced Disappearance (signed 6 February 2007);
- Convention on the Elimination of All Forms of Discrimination against Women (ratified 10 July 1995);
- International Convention on the Elimination of All Forms of Racial Discrimination (ratified 16 August 1996);
- International Covenant on Economic, Social and Cultural Rights (ratified 13 August 1992);
- International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (ratified 11 January 1999);
- Convention on the Rights of the Child (ratified 13 August 1992);
- Optional Protocol to the Convention on the Rights of the Child on the involvement of children in armed conflict (ratified 3 July 2002);
- Optional Protocol to the Convention on the Rights of the Child on the sale of children child prostitution and child pornography (ratified 3 July 2002); and
- Convention on the Rights of Persons with Disabilities (ratified 28 January 2009).

18.1.2 Lenders Requirements

EBRD

The notable PR's that will apply to this project include:

- Performance Requirement 2: Labour and Working Conditions; and
- Performance Requirement 10: Information Disclosure and Stakeholder Engagement.

In line with EBRD requirements 'Projects are required to comply, at a minimum, with (i) national labour, social security and occupational health and safety laws, and (ii) the fundamental principles and standards embodied in the ILO conventions (EBRD, Performance Requirement 2, 2014).

Concerning dedicated accommodation, compliance is required with:

- IFC & EBRD Workers Accommodation: Processes and Standards (2009).

EBRD's Environmental and Social Policy

- 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.
- PR 1 states "...it may be appropriate for the client to complement its environmental and social assessment with further studies focusing on specific risks and impacts such as human rights."

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.'

ADB have stated that compliance with the IFC & EBRD Worker Accommodation: Processes and Standards (2009) will also be required.

EPFI's

The applicable IFC Performance Standards that aim to identify and ensure that social and economic impacts of a project are addressed in the relevant areas is the IFC Performance Standard 2: Labour and Working Conditions.

In line with IFC Performance Standard 2 (Labour and Working Condition's), the following conventions will be complied with:

- ILO Convention 87 on Freedom of Association and Protection of the Right to Organize;

-
- ILO Convention 29 on Forced Labour;
 - ILO Convention 105 on the Abolition of Forced Labour;
 - ILO Convention 138 on Minimum Age (of Employment);
 - ILO Convention 182 on the Worst Forms of Child Labour;
 - ILO Convention 100 on Equal Remuneration;
 - ILO Convention 111 on Discrimination (Employment and Occupation);
 - UN Convention on the Rights of the Child, Article 32.1;
 - UN Convention on the Protection of the Rights of all Migrant Workers and Members of their Families;
 - ILO Convention 98 on the Right to Organize and Collective Bargaining (if applicable).

In line with EP IV requirements, the United Nations Human Rights Guiding Principle (HRGP)s 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 Foundational principles to take into consideration are (Guiding Principles on Business and Human Rights, 2011):

- Principle 11: Business enterprises should respect human rights. Business enterprises should avoid infringing on the human rights of others and should address adverse human rights impacts with which they are involved;
- Principle 12: The responsibility of business enterprises to respect human rights refers to internationally recognized human rights – understood, at a minimum, as those expressed in the International Bill of Human Rights and the principles concerning fundamental rights set out in the International Labour Organization’s Declaration on Fundamental Principles and Rights at Work;
- Principle-13: The responsibility to respect human rights requires that business enterprises avoid causing or contributing to adverse human rights impacts through their activities, and address such impacts when they occur;
- Principle-14: The responsibility of business enterprises to respect human rights applies to all enterprises regardless of their size, sector, operational context, ownership and structure. Nevertheless, the scale and complexity of the means through which enterprises meet that responsibility may vary according to these factors and with the severity of the enterprise’s adverse human rights impacts; and
- Principle-15: Business enterprises should have policies and processes appropriate to their size and circumstances in place.

The following Operational Principles should also be taken into consideration.

- Principle-16: Policy commitment;

-
- Principle-17 to 21: Human rights due diligence;
 - Principle 22: Remediation; and
 - Principle 23: Issues of Context.

18.2 Area of Influence

CONSTRUCTION PHASE

During construction, working conditions, welfare and occupational health & safety related impacts will likely impact Project workers within the Project site and at accommodation facilities.

OPERATION PHASE

During operations, working conditions and occupational health and safety related impacts are not expected to be as significant as the construction phase. However, any such impacts are likely to affect workers involved in the operation and maintenance of the Wind Farm.

18.3 Baseline

Any construction project will introduce health and safety risks associated with the use of plant, machinery and construction processes. Risks can be severe depending on the type of activities required, materials used and site condition.

The Project workforce (local & migrant workers) will be one of the Project's most valuable asset and good human resources management and a sound worker-management relationship based on respect for workers' rights, including freedom of association and right to collective bargaining must be guaranteed. In addition, due to the influx of workers in the Project area from other regions/countries consideration will need to be given in relation to accommodation facilities, worker welfare, sanitary provision, health care, hygiene, food and potable water etc.

18.4 Potential Impacts, Mitigation, Management & Residual Impact

18.4.1 Construction Phase

The nature of construction work means that construction workers (especially unskilled, semi-skilled workers) can be exposed to certain working conditions that could potentially impact their human rights. Risks that construction workers may be exposed to include:

- Occupational Health & Safety Risks;
- Forced labour;
- Child labour;

-
- Compulsory overtime and excessive working hours
 - Lack of worker representation and restrictions on trade unions;
 - Provision of inadequate accommodation facilities; and
 - Lack of access to grievance mechanism.

An assessment of these risks is as provided in the sections below.

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 all introduce significant risk to the health and safety for the associated work force (local & migrant workers). In particular, risks are more likely to be apparent for those who are not familiar with the type of works undertaken and/or the associated hazards.

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-contractor. It is therefore of the utmost importance that the EPC and affiliated 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 force will be managed through effective risk assessment, development and implementation of an Occupational Health & Safety Plan.

FORCED LABOUR

According to Article 35 of the Constitution of Azerbaijan, everyone has the right to freely choose to work on the basis of the type of activity, profession, occupation and place of employment. Article 9 of the Azerbaijan Labour Code states that workers have the right to sign employment contract freely choosing type of labour activity and place of employment according to qualification, specialty and profession. It also states that workers have the right to work in safe and healthy conditions and to request for change of conditions of the employment contract or its termination. Article 13 states that foreigner and stateless persons have all the labour rights on an equal basis with citizens of Azerbaijan.

The above Azeri requirements are mostly aligned with lenders and ILO requirements but the main challenge relates to enforcement and implementation. For instance, under the 2017 ILO declaration annual review, the Government of Azerbaijan reported that regulation and supervision of the labour recruitment & placement process and promotion of safe and regular migration are currently being implemented in the country for persons who are at risk of being victims of forced labour. Although measures are taken to prevent all forms of forced labour in

the Country, challenges still persist as only minimal advancement/progress is made (Bureau of International Labour Affairs, 2020).

In relation to the Project, there will be approximately 220 workers during the peak construction phase majority of which will consist of local workforce. The local workforce will be encouraged to apply for different jobs available depending on skills & qualifications of the local people. During recruitment, there shall be no discrimination based on a person's gender, race, religion, disability, political opinion, etc. as every person will be given an 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.

Envision implements a Code of Conduct for Suppliers which is applicable to all suppliers, their subcontractor and any third-party contractors that provide products and services to the project. Suppliers are requested to sign the Code of Conduct before any supply agreement. The Code of Conduct for Suppliers does not allow the engagement in child labour, forced, bonded (including debt bondage), involuntary or exploitative prison laborers, slavery or trafficking of people.

Environ carried out supply chain mapping for the Khizi 3 and Area 1 Wind and identified 18 Tier 1 and 2 suppliers that will be involved in the project's supply chain. To ensure the project is not involved in child and forced labour, ACWA Power requested Envision (WTG Supplier) to undertake a supplier's risk assessment for their tier 1 and 2 suppliers. The scope of the on-going assessment includes:

- Desktop screening of forced labour, child labour and HSE risks through review of the suppliers' policies/procedures and public concerns/court case results etc (on-going); and
- Site based audits to suppliers whose desktop screening raised any red flags by showing non-compliance (to be determined).

The initial outcome of the media screening showed that none of the suppliers are engaged in child and forced labour violations. A Supply Chain Management Plan will be developed (based on outcomes of risk assessment),

To ensure the wellbeing of the 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 (local and migrant workers). 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 particularly in terms of sanitation facilities on site, and having adequate checks and balances.

As a contractual obligation, ACWA Power requires the EPC contractor to undertake within thirty (30) days of the effective date to provide a tier 4 level Conduct CSR audit of suppliers (considering that the EPC Contractor is considered tier 1 level) of the supply chains of the major subcontractors including independent third party, which audit must show that the supply chains of the main subcontractors comply with the EBRD Performance Requirements and guidelines and the International CSR Standard System (ISO 26000, SA 8000).

Risks associated with 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 (15 years) as established in Article 42 and 249 of the Labour Code will not be employed at the project site. EBRD requires 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, young people below the age of 18 years should not be employed for hazardous work. This is in line with Azerbaijan (Article 250 of Labour Code) and ILO requirements.

According to data published by Bureau of international Labour Affairs in 2020, 4.5% of children in Azerbaijan are engaged in child labour and mainly occurs in the agriculture sector (91.9%). This is followed by street services such as street work, begging, washing and repairing cars, etc (7.2%). Also, children in Azerbaijan are subjected to commercial sexual exploitation domestically (Bureau of International Labour Affairs, 2020). There are no published data available relating to child labour in construction and other industries in Azerbaijan.

As stated above, the outcome of the media screening undertaken by Envision as part of the supplier risk assessment showed that none of the suppliers are engaged in child and forced labour violations. The contractual obligations set by ACWA Power stated above also ensures the EPC and its supplier are not engaged in any human rights violations and comply with the EBRD Performance Requirements and guidelines and the International CSR Standard System (ISO 26000, SA 8000).

In addition to the above, the EPC Contractor and subcontractors shall adhere to all requirements regarding employment of underage workers on and off site during recruitment.

However, where child labour is discovered in the subcontractor or supply chain workforce (for example young persons less than 18 years of age working in a hazardous environment), the Project shall undertake the necessary steps in accordance with Azerbaijan 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.

Compulsory Overtime, Excessive Working Hours & Job Security

Article 9, 89 & 90 of the Labour Code states that workers have the right to work in the working hours established by law which is no more than 8 hours a day and 40 hours per week with a working week set at five working days and two days off. In certain industries, the employer may impose a six-day working week; in such situations, the daily working time limits may not exceed 7 hours (if the weekly total is 40 hours), 6 hours (if the weekly total is 36 hours), or 4 hours (if the weekly total is 24 hours) a day.

In addition, according to Article 99 overtime work may only be allowed with the consent of the employee. The amount of salary/wages/remuneration paid cannot be below the minimum amount established by law.

EBRD requires that all workers should be treated equally in relation to working conditions which includes pay including additional payments such as overtime, bonuses, allowances. In addition, clients are expected to comply with national legislation in the countries where they operate as well as with collective agreement that may apply. PR 2 also states that clients should offer wages, benefits and work conditions that are overall comparable to those by equivalent employers in the relevant region of that country and sector.

As such it is expected that the project will comply with all established requirements for wages, working hours, rest and retrenchment as the EPC Contractor and subcontractors will be required to adhere to good practice measures regarding worker welfare in terms of timely payment of salaries, working hours, rest days, paid leave and having necessary redressal access in case of forced retrenchment.

In the event that workers (local & migrant workers) are required to work overtime, on weekends, holidays or planned leave days, the EPC Contractor will pay the workers not less than twice the amount for the period of work.

LACK OF WORKER REPRESENTATION & RESTRICTIONS ON TRADE UNIONS

Workers (both local & migrant workers) shall be allowed to be involved in labour unions, public associations, organisations or labour collective in accordance with Article 9(p) and Article 25 of the Labour Code. The EPC Contractor and associated subcontractors will not prevent workers from forming associations or joining trade unions depending on their preferences.

In addition, collective bargaining and freedom of association is allowed in Azerbaijan under Law No. 792 of 24 February 1994 on Trade Unions. Laws allows organisation of unions and their fundamental rights including the right to conclude collective agreements and the right to hold mass events.

In order to ensure that the right to form and/or join trade unions is guaranteed, the Project Company and the EPC Contractor will include a clause in their Human Resources Policies and Procedures that allow workers to form, or join a union without discrimination or risk of retaliation. It will also be permissible for workers to raise collective grievances via the Project's grievance mechanism

WORKERS FREEDOM OF MOVEMENT

Workers (both local & migrant 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.

Due to the ongoing COVID-19 pandemic, movement of workers to their families or home region/countries may be restricted which could leave some feeling isolated, fatigued and could lead to mental health issues if not properly addressed.

PROVISION OF INADEQUATE ACCOMMODATION FACILITIES

The EPC Contractor will provide accommodation facilities to workers and it is noted that there will be requirements for workers to be accommodated in alignment with the benchmarks outlined in the IFC & EBRD Workers Accommodation: Processes & Standards (2009).

Due to the remote location of the Project site, there is a risk that accommodation facilities may be inadequate vs. the aforementioned guidelines. Key risk areas are likely to be during the commencement of construction where accommodation camps may not be fully established and all amenities may not be in place at the camp(s). This has the potential to include a lack of relevant facilities, welfare provisions on-site such as clean drinking water, hygienic and ample toilet facilities, hand basins (with soaps/hand wash), temporary rest areas, food and other amenities necessary to the workers. In the event that there are female workers, there are also risks that accommodation areas may not be suitably equipped to cater for separate sex living and welfare provisions, which will need to be ensured.

In order to avoid such a scenario and to ensure the wellbeing of all staff associated with the Project, the EPC Contractor and associated sub-contractors will be required to plan for necessary provisions relative to the requirements of the workforce and the timing of the construction of camps. This includes carefully safeguarding risks through policy and internal processes (including monitoring and audit), the provision of appropriate labour accommodation plans and mechanism for inspections and corrective actions.

LACK OF ACCESS TO A GRIEVANCE MECHANISM

Workers contracted by the EPC Contractor and sub-contractors may not be able to freely express their opinions or seek remedy. This may be because they do not know that a grievance mechanism is available to them, how it works or they are afraid of retribution.

As such, the EPC Contractor will provide information about the grievance mechanism to all the workers during their site induction sessions, in employee handbooks and on posters across

the site and in accommodation areas. The implementation of the Workers Grievance Mechanism will be in accordance with the Project specific SEP.

In order for the grievance mechanism to be successfully implemented, it will be necessary to ensure that competent and trained staff are in place who can fully implement provisions, whilst ensuring compliance with the procedures and maintaining full integrity and privacy to the grievant.

POTENTIAL GENDER RISKS ASSOCIATED WITH THE PROJECT

Gender Based Violence and Harassment

Influx of 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 Azerbaijan 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 traditionally male working environment. GBVH/SEA/SH is 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. 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 track 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 a temporary camp for emergency accommodation onsite. This presents a safety risk especially for women who may be working at the Project and using the temporary camp and common areas on site such as the cafeteria.

In order to address such risks, the EPC Contractor will be required to provide safeguards such as locating temporary camp for women in an area separate from the men's temporary camp, provision of locks on doors, separate sanitation facilities, adequate lighting, separate social facilities, etc.

Wage discrimination based on Gender

In an effort to promote wage parity between men and women, the government of Azerbaijan ratified ILO's Convention No. 100 (Equal Remuneration 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 & Guarantees

Traditional norms in Azerbaijan 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 125 of the Labour Code women employees are entitled to paid maternity leave for a period of 126 days. This includes 70 days given before the expected birth of the child and 56 days after the birth. In case of abnormal or multiple births, women will be granted 70 days leave after childbirth. Depending on the industry the women work, the total number of maternity leave day and the leave days before childbirth and after childbirth varies. Although men may be eligible for partially -paid social leave as a single parent or when directly caring for a child, childcare (especially in rural areas) is still seen as a woman's job.

As such, women of child bearing 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.

18.4.2 Operational Phase

OCCUPATIONAL HEALTH AND SAFETY

The risks associated with the operational phase of the project are anticipated to be significantly less than during 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 wind farm, there is the risk of working at height to undertake 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 in order to conduct inspection, maintenance, replacement or repairs. As such, there is a risk that O&M workers will be exposed to electrical hazard (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 Grievance Redressal Mechanism (GRM) shall 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.

LABOUR RISK 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 associated 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 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 Azerbaijan national requirements. Allowance will also need to be made for site staff welfare facilities including sanitation, rest, recreational and medical facilities.

POTENTIAL GENDER RISKS

Even though 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 Azerbaijan 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.

18.5 Mitigation and Management Measures

Table 18-1 Labour & Working Conditions Mitigation & Management Measures – Construction

Potential Impact	Mitigation and Management Measures
All Impacts	The Project Company and EPC Contractor will ensure that the following plans/policies are prepared and implemented. • Occupational Health & Safety Plan • Emergency Preparedness & Response Plan • Supply Chain Management Plan (based on the outcome of the risk assessment) • Human Resource Policies & Procedures • Worker Accommodation Plan • Stakeholder Engagement Plan (including implementation of the Grievance Mechanism) • Human Rights Policy • GBVH Policy • Worker Code of Conduct
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 EPC Contractor will implement and maintain an OHS management plan 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 plan. The OHS management plan will be in-line with recognised international best practice and as a minimum, this plan will include:

Potential Impact	Mitigation and Management Measures
	- 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
Forced Labour	• 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. • The EPC will only engage recruitment agencies that are registered in their country of operations and have a good track record i.e., have no court cases. EPC contractor to undertake within thirty (30) days of the effective date to provide a tier 4 level Conduct CSR audit of suppliers (considering that the EPC Contractor is considered tier 1 level) of the supply chains of the major subcontractors including independent third party, which audit must show that the supply chains of the main subcontractors comply with the EBRD Performance Requirements and guidelines and the International CSR Standard System (ISO 26000, SA 8000).
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. • EPC contractor to undertake within thirty (30) days of the effective date to provide a tier 4 level Conduct CSR audit of suppliers (considering that the EPC Contractor is considered tier 1 level) of the supply chains of the major subcontractors including independent third party, which audit must show that the supply chains of the main subcontractors comply with the EBRD Performance Requirements and guidelines and the International CSR Standard System (ISO 26000, SA 8000). • The EPC will not employ children in a manner that is economically exploitative, or is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. • 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 Azerbaijan Labour Code.

Potential Impact	Mitigation and Management Measures
Lack of Worker Representation & Restrictions on Trade Unions	• HR Policies will include the ability of workers to form or join all types of associations. • HR Policies will include the ability of workers to join a Trade Union; as well as ensure collective bargaining rights of workers. • Trade unions will be permitted to function freely subject only to limitations that are in line with the Azerbaijan Labour Code and the International Human Right standards.
Compulsory Overtime, Excessive Hours & Job Security	• 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). • The workers will be informed and understand the nature of their contracts, duration • Wages, benefits, leave days and other conditions of work offered will, 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 (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.
Provision of Inadequate Accommodation Facilities	• Worker accommodation areas will be managed in accordance with the EBRD and IFC Workers' Accommodation: Processes and Standards. • Implementation of the Worker Accommodation Plan.
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

Potential Impact	Mitigation and Management Measures
	coordination with any GBVH organisations working in the Project area where available. • 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 minimise 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 Azerbaijan and lenders requirements. This will include provision of training to workers, subcontractors and suppliers on GBVH associated risks.
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.

Potential Impact	Mitigation and Management Measures
	The EPC Contractor shall implement a zero-tolerance process for discrimination against women.
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. - Grievance mechanism will be used to monitor worker morale, understand how workers are affected and what their concern are in relation to COVID-19 and address pressing matters promptly. - 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. - Female workers will be included in the grievance redress committee to help female workers and host community female members raise their grievances.
Human Rights	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 18-2 Labour & Working Conditions Mitigation & Management Measures – Operational Phase

Potential Impact	Mitigation and Management Measures
All Impacts	The Project Company & O&M Company will ensure that the following plans/procedures/policies are in prepared and implemented: - Emergency Preparedness & Response Plan - Worker Code of Conduct - Human Resources Policies & Procedures - Human Rights Policy - GBVH Policy - Stakeholder Engagement Plan (including the implementation of the Grievance Mechanism).

Potential Impact	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 plan specific to the operational phase taking into account specific risks associated with the project, legal requirements and duty of care. - The Project's Operator will be responsible for ensuring that all affiliated sub-contractors comply with the OHS management plan. The OHS management plan 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 measures
Forced Labour	- 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. <i>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.</i>
Child Labour	- The O&M Company will comply with all relevant national laws, lenders requirements and ILO provisions related to the employment of minors. - In any event, the client will not employ children in a manner that is economically exploitative or is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. - 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

Potential Impact	Mitigation and Management Measures
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 nondiscrimination 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. - Where workers have to be retrenched due to the economic impacts of COVID-19, this shall be carried out incrementally and consider options avoiding redundancy with retrenchment as the last option. - The workers/representatives shall be involved on any labour reduction measures including those relating to COVID-19. The O&M Company 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).
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

Potential Impact	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. - Grievance mechanism will be used to monitor worker morale, understand how workers are affected and what their concern are in relation to COVID-19 and address pressing matters promptly.
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.

18.6 Monitoring

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'.

Table 18-3 Key Monitoring Indicators

Monitoring	Parameter	Frequency & Durations	Monitoring Locations
Construction & Operations			
Worker Contracts & HR	Records of contracts, payments, receipt of benefits, leave	On-going	For all Project workers (direct staff) and oversight of sub-

Monitoring	Parameter	Frequency & Durations	Monitoring Locations
	entitlements, retrenchment etc.		contractor staff dedicated to the project
Women employed in the Project (if employed)	Number of women employed in the project including their rank and remuneration compared to men occupying the same positions.	On-going	For all female Project personnel including those employed by the sub-contractors.
Worker Welfare	Sanitation Facilities, Office Spaces, Welfare and Rest Areas	On-going	At all such facilities on-site
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.
OH&S Near Misses (involving external parties)	Any classified near miss	On-going	n/a
OH&S Emergency Situations and Incidents	Any classified emergency situation or incident	On-going	n/a
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.
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)
Records and frequency of human rights training among the workers	Human Rights training records	Quarterly / bi-yearly	All Project site workers including those under different sub-contractors, suppliers etc.

Note: The protection of human rights is an ongoing process and this should be reflected in the Projects internal management policies. As discussed, monitoring of labour and working conditions will be necessary through the applicable HR management systems established as part of the project.

It will be expected from the EPC Contractor (for construction) and the O&M Company (for operations) to be the primary parties for ensuring that measures are internally audited and processes are in place to protect subcontractors, labourers or other suppliers.

19 CLIMATE AFFAIRS

19.1 Overview

Significant amounts of scientific research have identified a link between the rising concentration of greenhouse gases (GHGs) in the atmosphere and trends in current global warming. A key factor in the increases of GHGs would result from the combustion of fossil fuels and the associated release of GHGs into the atmosphere. Potential impacts of global warming have been modelled by various agencies and organisations and are now well documented. Besides a global average rise in temperature, there is expected to be more frequent extreme weather events, as well as associated impacts to biodiversity, amongst many other primarily negative impacts.

Such impacts of current climate change are starting to be realised worldwide and will potentially include impacts in Azerbaijan.

The impacts on climate due to the proposed project activities and associated facilities are discussed in this chapter, as is a high-level vulnerability overview of potential climate impacts on the Project.

19.2 Standards and Regulations

19.2.1 National Context and Regulations

The Paris Agreement came into force on 4th November 2016. The Republic of Azerbaijan ratified the Paris Agreement on 9 January 2017 (UNTC, 2020).

The United Nations Development Programme (UNDP) in Azerbaijan and MENR signed a Project on the Fourth National Communication and the Second Biennial Reporting under the United Nations Framework Convention on Climate Change (UNFCCC). The aim of the Project is to support the Government of Azerbaijan through the MENR to continue reporting under the Convention (UNDP Azerbaijan, 2020).

Climate change is reflected in the government's strategies as follows (Climate Change Risk Profile Azerbaijan, 2017):

- Republic of Azerbaijan's Third National Communication to the UNFCCC (2015);
- Azerbaijan 2020: Look into the Future Development Concept (2014);
- Comprehensive Action Plan to improve environmental situation in the Republic of Azerbaijan in 2006 (2010);
- Action Plan on Improvement of the Ecological Situation and Efficient Use of Natural Resources in the Republic of Azerbaijan (2015–2020); and

- National Adaptation Plan (NAP).

Azerbaijan's ratified the UNFCCC on January 10, 1995 and the Kyoto Protocol on July 18, 2000.

19.2.2 Lender Requirements

EBRD

According to EBRD Environmental and Social Policy, climate change shall be considered throughout the assessment process and identify appropriate climate resilience and adaptation measures to be integrated into the project design.

EBRD is committed to 'engage, whenever appropriate, in innovative investments and technical assistance to support no/low-carbon investments and climate change mitigation and adaptation opportunities, as well as identify opportunities to avoid, minimise or reduce greenhouse gas emissions in projects. EBRD will require its clients to assess risks caused by climate change to the projects. EBRD will also support its clients in developing climate adaptation measures and climate resilient investments as well as in managing risks caused by climate change'.

EPFI's

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.

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.

19.3 Area of Influence

Climate affairs are typically considered on a country-wide basis; however, it is noted that climate impacts can be trans-boundary. The impacts of climate change upon the Project (i.e. flood risk) is considered on a more regional scale to provide Project specific risks.

19.4 Observation and Baseline Conditions

19.4.1 Historic and Existing Conditions

The figure below presents the long-term mean monthly temperature and rainfall for the Project area for the years 1991 until 2020. The temperature varies from a mean of near freezing in the winter months to over 24 °C in the summer months. Precipitation peaks in the spring and autumn, with lower precipitation recorded in the summer months of July and August.

Figure 19-1 Average Monthly Temperature and Precipitation in Azerbaijan for 1991-2020 (World Bank Climate Change Knowledge Portal, 2021)



TEMPERATURE

There has been an increase in temperatures across Azerbaijan of 1.3 °C in 2010, relative to the normal average annual temperatures observed in the period 1961 – 1990. Temperatures during the summer months of June, July and August 2010 for the Capital city Baku were 2.9 – 3.2 °C higher than the 1961 – 1990 baseline. In the summer of 2010, Baku experienced 44 days on which temperatures reached 35 °C or higher. The increase in annual average temperatures was more acute in areas of higher altitude (>1,000 m), where 2010 temperatures were 1.9 °C above their 1961 – 1990 levels.

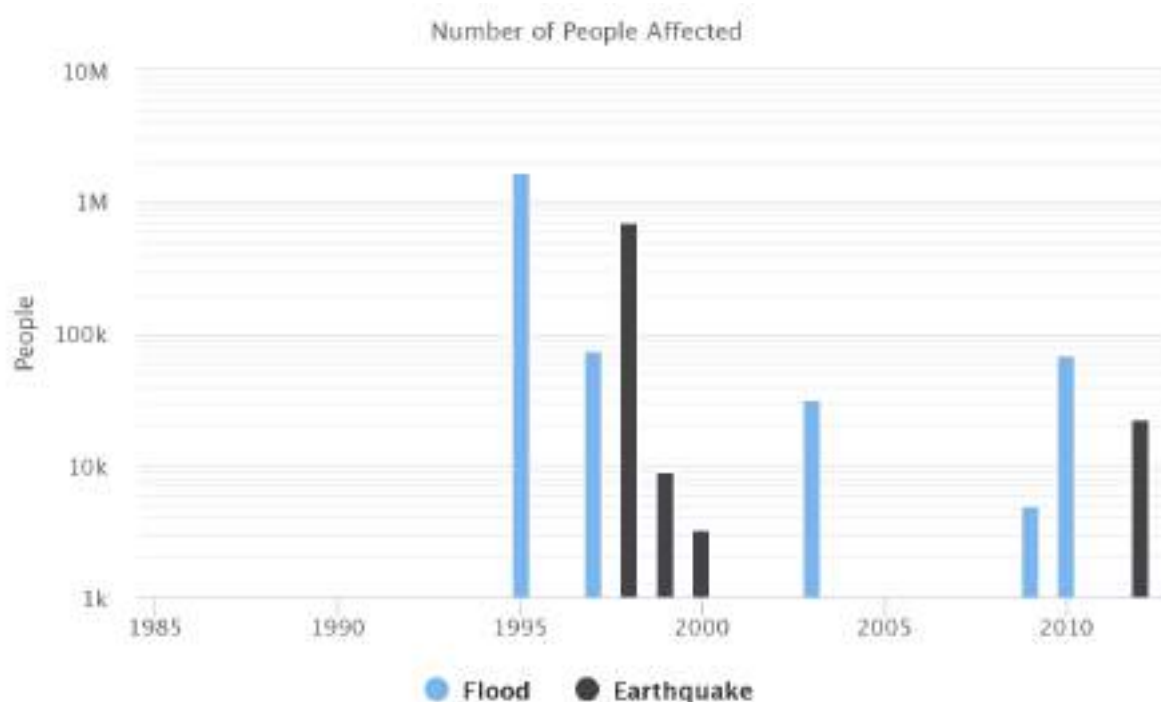
PRECIPITATION

Trends in precipitation in Azerbaijan are variable with a degree of uncertainty. The amount of precipitation, seasonal and annual is determined by the interaction of air masses with the landscape and the Caspian Sea.

EXTREME EVENTS

There has been an Increase in extreme events such as floods, droughts and heat waves. An average of 17.5 floods per year were recorded from 2002 – 2008 (compared to 3.5 per year previously) (Climate Change Risk Profile Azerbaijan, 2017). Azerbaijan experiences frequent flooding, as can be seen with flooding making up the majority of key natural hazards in Azerbaijan, alongside earthquakes. The parts of Azerbaijan at greatest risk of floods are in the central and south-eastern regions. Flooding events have considerable potential to reduce crop output, in 2010, cereal production fell by 14% relative to its 2005 – 09 average due to floods (FAO, 2011).

Figure 19-2 Key Natural Statistics in Azerbaijan for the Period of 1985-2018 (World Bank Climate Change Knowledge Portal, 2021)



SEA LEVEL

The Caspian Sea level fell by an average of 6.7 cm per year between 1996 and 2015, with recent research finding that evaporation played a dominant role in this sea-level reduction (Chen et al., 2017).

19.5 Potential Project Impacts upon Climate Change

19.5.1 Construction

STATIONARY SOURCE - FUEL COMBUSTION

The stationary combustion sources used during the construction phase of the Project will primarily relate to temporary Diesel Generators, which will be located around the site in the

Engineering, Procurement, and Construction (EPC) and sub-contractor administration & office areas.

The electricity on site will be provided by onsite generators, at the time of writing the number of generators and their estimated consumption are unknown, the following calculation has been based of an estimated 10,500 L of diesel per month. This calculation can be updated once details are confirmed.

Using the Greenhouse Gas (GHG) Protocol calculation tool for GHG Emissions from Stationary Combustion (World Resources Institute, 2015), the GHG emissions during construction were calculated and are summarised in the table below.

Table 19-1 Generators-GHG Emissions During Construction of the Project

Fuel Type	Volume of Fuel (l/ Month)	GHG Emissions (tonnes/month)			Total GHG (tonnes CO ₂ e/month) *
		CO ₂	CH ₄	N ₂ O	
Liquid Fossil (Diesel)	10,500	28.103	1.138E-03	2.276E-04	28.195
Total GHG emissions from fossil fuels (tonnes CO₂e)					28.195
*If/when the generators are operational					

MOBILE SOURCE - FUEL COMBUSTION

The construction phase of the Project will necessitate an amount of mobile equipment/plant and vehicles to facilitate works. Equipment such as excavators, rollers, cranes, pneumatic compressors, and other vehicles will be ample on the site, and are expected to be used in most construction processes. Such equipment will be fuelled by either diesel or unleaded petrol. Given the early stages of the Project's development, the expected quantity of fuel to be consumed during construction by the appointed EPC has not yet been confirmed. The expected fuel quantity will depend on the number of mobile equipment, hours of operation and efficiency of machinery. Therefore, the potential GHGs have not been calculated for the mobile equipment/plant and vehicles.

LOSS OF CARBON SINKS

The Project is located in an open area with limited vegetative ground cover besides grass and shrubs and a lack of voluminous biomass that would present stores for carbon. Stores of carbon on-site relate to seasonal grasses and low-relief shrubs. While it is noted that the construction phase will result in the removal of ground cover vegetation, this is not expected to be widespread and instead limited to turbine footprints and ancillary facility footprints. This is not expected to result in significant losses of carbon storage, due to the limited footprint loss of vegetation.

19.5.2 Operations

PRIMARY OPERATIONS – GHG EMISSIONS ABATEMENT

As a renewable energy project, there is essentially a neutral operational impact on GHGs, as the Project will not combust fossil fuels, or otherwise operationally reduce (or affect) carbon sinks. A key benefit of the Project is the resulting lowering of the carbon intensity of the grid produced electricity in Azerbaijan.

Considering it is not possible to determine specific savings of GHGs for the project against reductions in power output elsewhere (which may occur in part from a variety of other projects, or at other times). However, it is possible to make a comparison of GHGs mitigated against a grid factor for GHG emissions if conventional fossil fuel-based technology had been developed to cater for this energy capacity.

The GHG emissions avoided over the operational phase have been calculated below using the 'IFI (Interim) Dataset of Grid Factors'. Version 1.0 was originally released in July 2016 on the basis of the methodological approaches to GHG Accounting for Emissions from grid-connected renewable energy and energy efficiency projects, that were announced by the IFIs at the 21st Conference of the Parties in Paris in December 2015. The IFI Data set (Version 2.0, July 2019) is currently used by IFIs as the default basis of their GHG emissions accounting.

The table below shows estimated CO₂e that will be avoided, compared with typical grid generation emissions. This is based on the Azerbaijan default grid factor from the IFI Dataset for Intermittent renewable energy sources (i.e. solar and wind) which gives a value of 488 gCO₂/kWh.

Table 19-2 Estimated CO₂ Emissions Mitigated in Tonnes per Year

ANNUAL ENERGY (KWH)	RELATIVE NET EMISSIONS (TCO ₂ EQ/YEAR)
700,000,000	341,600

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 the night to provide electricity for lighting, security purposes (e.g. security systems, CCTV etc.) and any site office, workshop or other requirements being undertaken at night.

Given that it is only expected that security staff will be present at night, the amount of power usage is expected to be minimal, and there are 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.

EMERGENCY DIESEL GENERATOR - FUEL COMBUSTION

The Project will have emergency diesel generators that will be located on-site. These generators are not expected to be used except during grid blackout conditions, where the generators would provide an amount of power load to enable the safe operation of the plant in such circumstances. At the time of writing the number of generators, nor the estimated fuel consumption, is known and therefore a calculation of GHG emissions from the generators has not been undertaken.

MOBILE SOURCE - FUEL COMBUSTION

Mobile source GHG emissions during operations will only relate to the few vehicles being used on-site for O&M purposes and for the commuting of the small number of staff who will be required to operate the Project. The Project does not require key supply chains (i.e. regular deliveries or removals) and is not expected to require significant maintenance. An estimated 1,050 L/year is required for the operation of an estimated seven vehicles. Using the Greenhouse Gas Protocol calculation tool for GHG Emissions from Mobile Combustion (World Resources Institute, 2015), the GHG emissions from vehicles during operation were estimated at 2.385 tonnes CO₂eq/year.

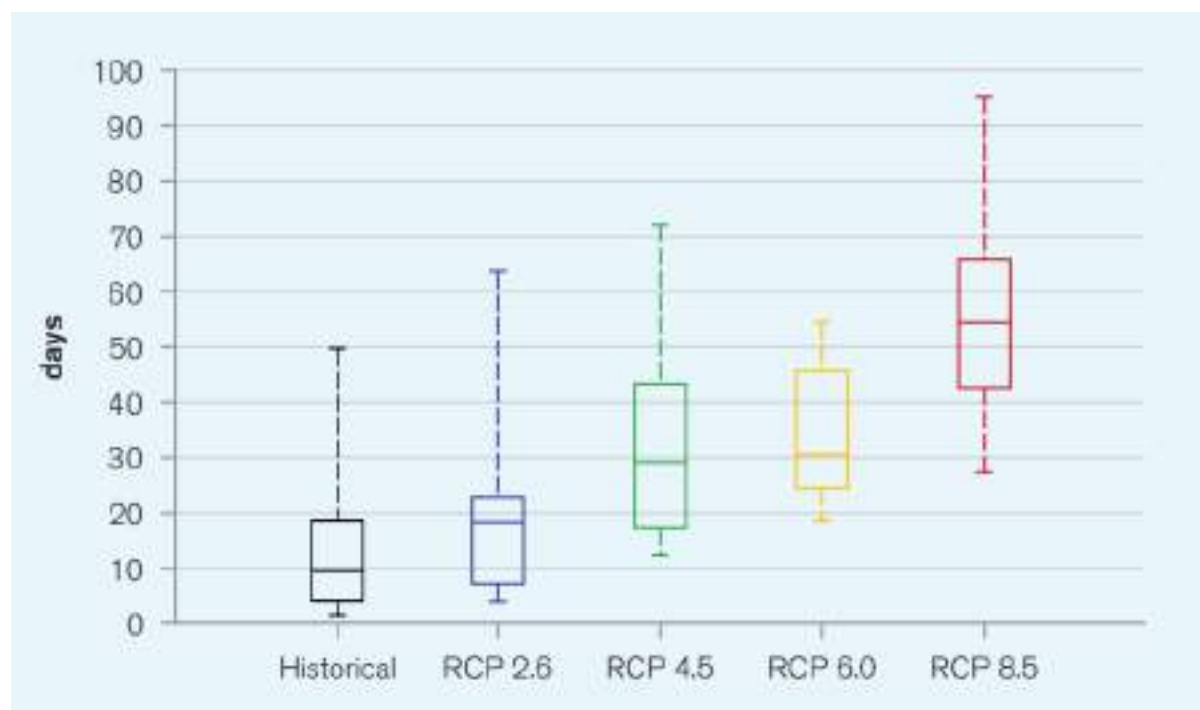
REFRIGERANTS

Trace amounts of refrigerants will be used in chiller packages were needed on-site for air conditioning, refrigerators etc. Where applicable, the requirements of the Montreal Protocol are applicable concerning applicable Ozone Depleting Substances (ODS).

19.6 Vulnerability of the Project to Climate Change

According to Azerbaijan's Climate Risk Country Profile prepared by The World Bank Group and Asian Development Bank (2021) maximum and minimum temperatures are projected to rise faster than the global average, which will amplify the impacts on human health, livelihoods, and ecosystems. The strongest warming is expected to occur during summer months, with average temperatures between July and September projected to rise by almost 6 °C by the 2090s, under the RCP8.5 pathway. Increases in temperature of this magnitude could reduce agricultural productivity, exacerbate issues of desertification and soil salinity, and increase demand for irrigation, putting further pressure on the country's water supply. The below figure shows model ensemble estimates of annual number of days over 35 °C. The increase in temperature associated with climate change will also lead to more rapid glacial melt, which would increase the risk of downstream flooding, landslides and mudslides.

Figure 19-3 Boxplots showing the model ensemble estimate of the annual number of >35 °C days in 2080 - 2099 under four emission pathways in Azerbaijan



There is a risk that the impacts of climate change will be disproportionately felt by those least able to adapt. For example, poorer communities in rural areas are more reliant on rain-fed agriculture, which is likely to be negatively impacted by more frequent droughts.

increased temperatures are likely to lead to greater evaporation of water resources and reduced river flows, putting pressure on Azerbaijan's main sources of freshwater. Water shortages are likely to coincide with an increased need for irrigation (due to higher temperatures and changes in length of growing season). This impact will be more severe in certain regions of Azerbaijan, and could reduce crop yields. Naumann et al. (2018) provide a global overview of changes in drought conditions under different warming scenarios. They project large increases in the duration and magnitude of meteorological droughts in West Asia by the end of the 21st century under global warming levels of 1.5 °C, 2.0 °C and 3.0 °C. Droughts of a magnitude that is extremely rare at present in West Asia (100-year droughts) are projected to become 5 to 10 times more common under the same warming scenarios. These estimates reflect a transition to a chronically drought-affected environment in many regions of Azerbaijan, and are likely to contribute to the expansion of arid ecosystems and desertification.

In addition to the above, the hazards of high and medium significance for Khizi area include wildfires, earthquakes, landslides and extreme heat. Other hazards such as urban floods,

landslide, water scarcity and river flood are ranked as low to very low (Think Hazard - Khizi, 2020)⁵.

19.6.1 Climate Physical Risks

TEMPERATURE RISKS

Although exact numbers are unknown it has been estimated that the Project will require an estimated 21 O&M staff, some of which will have to work outdoors during operations. Primary project staff will be security, control room operators, administration teams and some maintenance engineers, most of which will be based indoors, although sufficient air conditioning capacity will be required. The number of these staff working outdoors will be limited and as such impacts to the workforce from possible rising temperatures due to climate change are expected to be limited and can be managed by resting periods indoors.

DROUGHT AND WATER AVAILABILITY

The estimated annual amount of water required during operation (considering 21 O&M employees) is provided in the table below.

Table 19-3 Annual Water consumption Based on Type of Use

Use	Quantity (m ³ /year)
Domestic	280
Drinking Water	42
Firefighting	66

Taking into consideration the water quantity required for the Project, climate change impacts on water resources is not anticipated to pose a significant risk to the availability of water for the Project. It is, however, recognised that prolonged and severe drought events could cause unrest especially due to the presence of agriculture in the Project area.

FLOOD RISKS

Climate change is expected to result in extreme rainfall events becoming more common which in turn is expected to result in an increase in flash-flood events. The hydrology study conducted by ARPA Consulting (2021) determined that the region has unstable flow patterns with dry riverbeds in the summer and seasonal streams in spring and autumn with local flooding events.

Flood events could affect both the construction and operation phases of the Project; however, impacts are expected to be more significant during the construction phase as this

⁵ ThinkHazard is developed by GFDRR and provides a general view of the hazards, for a given location, that should be considered in project design and implementation to promote disaster and climate resilience.

could potentially result in pollution events downstream in addition to delaying planned construction works.

As stated in Section 9 of ESIA Report, the area is prone to floods according to the Hydrological study prepared for Khizi by ARPA Consulting (2021). The statistical analysis of the rainfall data for 1, 5, 10, 20, 50 and 100-year return period, the analysis of the streams flow pattern and peak discharges, and the rainfall-runoff models of designed long-term and short-term hyetographs indicated no flood threat to the WTGs locations due to the elevation differences between the turbine locations and riverbeds. However, the flood risk assessment indicated risks to the locations of the roads and access routes for the designed turbine locations K44, K6, K14, K16, K28 and K33 (based on previous WTG layout).

19.6.2 Climate Transitions Risks

Given the Project is a wind farm, there are not expected to be specific risks related to future low carbon economies (policy, regulations etc.) or future public perceptions of the Project that are considered to be risks at this stage.

19.7 Recommended Mitigation Measures

TEMPERATURE

It is envisaged that increases in temperatures will have minimal effect on workers, who will largely be able to avoid the heat (i.e. in air conditioned rooms).

Temperature risk has been assessed as part of the wind measurement campaign where the maximum and minimum temperatures were recorded. Based on this information, the design basis for selection of WTG, civil and electrical infrastructure has been decided to ensure appropriate design.

FLOODING

Flooding risk has been assessed as part of the hydrology survey undertaken for the Project. Specific mitigation will be applied like provision of drainage, culverts at designated places as per the civil and electrical design. This has been covered in the relevant hydrology section.

SCOPE 2 GHG EMISSIONS

As the Project will draw a limited amount of electricity from the grid for night time uses, it is recommended that where possible the Project endeavours to install energy efficient appliances and utilities, lights etc., throughout the plant.

WATER AVAILABILITY

To reduce the impacts on water resources, a water management plan should be implemented to include the following:

-
- Installing smart water management systems (faucets with sensors, water meters, leakage detection systems etc.);
 - Monitoring water consumption;
 - Conducting regular maintenance of faucets, plumbing, water tanks etc; and
 - Raising awareness on water conservation among workers.

20 CUMULATIVE IMPACT ASSESSMENT (CIA)

20.1 Introduction

EBRD requires the assessment process to consider the cumulative impacts of the project “in combination with impacts from other relevant past, present and reasonably foreseeable developments as well as unplanned but predictable activities enabled by the project that may occur later or at a different location” (EBRD, 2014).

IFC defines cumulative impacts as “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” (IFC, 2013). 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 CIA process are as follows:

- Identification of Valued Environmental and Social Components (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.

20.2 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, construction air quality (particulates), construction noise impacts, etc. 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 and any cumulative impacts from existing neighbouring projects or emission sources.

20.3 Identification of Other Activities and Environmental Drivers

Existing WFs within Khizi include:

- Yeni Yashma Wind Park, located approximately 3.5 km to the closest WTG on the lower land to the southeast of the project area. The WF is owned and operated by Azerishiq OJSC and started operation in October 2018; and
- A two-turbine pilot project wind farm, these are located on the other side of the M1 highway to the Project, approximately 8.6 km to the Project's closest WTG; and
- A four-turbine wind Project located approximately 8 km to the east of the Project's closest WTG, although it is understood that this is not operational.

The locations of the existing WF relative to the Project are shown in the following figure. Based on local consultant feedback, both WFs are not operational or connected to the national grid, therefore excluded from the CIA. With regards to noise and shadow flicker, both WFs are outside the AOI.

Other developments include:

- Development of OHTL required to connect Khizi 3 and Area 1 WF and connect the WFs to the grid. The construction timeline is not known at this stage.

Figure 20-1 Existing WFs in Khizi – Wider Project Area



20.4 Assessment of Cumulative Impacts on VECs Due to Development of Project Area

20.4.1 Construction Phase

Cumulative impacts are those where the effects of other project act in combination with the project. For this project, no other projects known to be planned in the AoI. This section discusses the cumulative impacts of the project together with Area 1 WF and the OHTL required for the Project (associated facility). A summary of the cumulative impacts resulting from the development of both WFs (Khizi 3 and Area 1) and OHTL are provided below.

Table 20-1 Summary of CIA – Construction Phase (Qualitative Assessment)

DEVELOPMENT	CONSTRUCTION
Air Quality	
Impacts from Khizi 3 WF	During construction, local ambient air quality may potentially be affected by increased dust and by the exhaust fumes of construction vehicles, equipment and temporary power generators.
Impacts from Area 1 WF	Expected to be similar to the impacts identified for Khizi 3 WF
Impacts from OHTL	Expected to be similar to the impacts identified for Khizi 3 WF

DEVELOPMENT	CONSTRUCTION
Cumulative Impacts	If the construction periods do coincide, cumulative impact on air quality with respect to dust generation and gaseous emissions from construction activities at the Project is anticipated. However, with the adoption of good management practises (mitigation measures) the cumulative impacts are expected to be minor. Mitigation measures that will be implemented at all three (3) projects will be suitable to reduce the cumulative effects on air quality. There are very few receptors identified within the Aol for all three (3) projects. Therefore, with the application of the mitigation measures specified in the ESIA Reports, the magnitude of the impacts from PM and gaseous emissions are considered Minor, with the receptor sensitivity considered Low to Medium, resulting in a Negligible to Minor impact.
Noise	
Impacts from Khizi 3 WF	Increases in ambient noise due to operation of construction plant, equipment and vehicles.
Impacts from Area 1 WF	Expected to be similar to the impacts identified for Khizi 3 WF
Impacts from OHTL	Expected to be similar to the impacts identified for Khizi 3 WF
Cumulative Impacts	Cumulative effect is only expected at the receptors within 1 km of the OHTL and WFs construction areas. If construction period coincides (OHTL and WFs), cumulative impact will occur at receptors within the area of influence which is defined as 1 km in this ESIA. Receptors within the area of influence may be temporarily impacted by the cumulative impact if construction period coincides. Even when considered cumulatively, the activities associated with the construction of the OHTL and WFs are not expected to lead to a major magnitude change at any receptors located within close proximity to OHTL and WF construction areas. No cumulative impact is expected if construction periods don't coincide.
Soil, Geology and Groundwater	
Impacts from Khizi 3 WF	Impacts on soil could arise from a number of activities including excavation, accidental spills or leaks, disposal. Based on the Hydrological report, groundwater is very rare in Khizi District and was not encountered at Khizi 3 project area, therefore, it is not expected that any contamination will reach groundwater. There will be no additional pressure on the groundwater resources since water needed for construction will be supplied via water trucks (licensed water supplier).
Impacts from Area 1 WF	Expected to be similar to the impacts identified for Khizi 3 WF

DEVELOPMENT	CONSTRUCTION
Impacts from OHTL	Similar to Khizi 3 WF
Cumulative Impacts	Most likely the impacts will be localised and limited within each Project boundary/ construction area, with very limited potential for cumulative effects. Therefore, the WF projects in conjunction with the OHTL will not result in any cumulative impact on geology, soil and groundwater especially as groundwater resources will not be used.
Solid Waste & Wastewater	
Impacts from Khizi 3 WF	Construction of the project may result in the generation of rubble waste due to excavations, packaging wastes, and very small quantities of hazardous wastes (such as used fuel containers, spent paint cans, lubricant cans and oil cans, vehicle/plant maintenance wastes).
Impacts from Area 1 WF	Expected to be similar to the impacts identified for Khizi 3 WF
Impacts from OHTL	Expected to be similar to the impacts identified for Khizi 3 WF
Cumulative Impacts	Disposal to landfills does have a number of environmental impacts including the production of methane (only from biodegradable organic waste), which is a greenhouse gas. The impact of landfill waste disposal from the Project will be cumulative.
Water Consumption	
Impacts from Khizi 3 WF	Water during the construction and commissioning phases of the Project are expected to be required for personal consumption, domestic use, dust control, civil works, concrete batching (if allocated on site) and commissioning. If not coordinated and managed properly, water demand may potentially create a shortage in water resources.
Impacts from Area 1 WF	Expected to be similar to the impacts identified for Khizi 3 WF
Impacts from OHTL	Expected to be similar to the impacts identified for Khizi 3 WF
Cumulative Impacts	Cumulative impacts to availability of water resources is anticipated if construction periods coincide particularly those that require water consumption such as concrete batching. It is important the Project does not place additional pressure on water sources utilised for the WF during construction. The EPC Contractor will consult with the water authority with regards to the water supply availability. Total water demand for both project for the duration of the construction activities is approximately 7,9261 m³ (from workers at site and construction of WFs – total of 37 WTGs).
Terrestrial Ecology	
Overall Assessment	Construction-phase impacts such as habitat loss, fragmentation and displacement can be regionally cumulative. However:

DEVELOPMENT	CONSTRUCTION
	• The anticipated significance of habitat loss (based on relatively small BUA footprint of windfarms) is not considered to be significant; • Displacement during active construction works is temporary and it is assumed that there are available adjacent habitats for fauna to utilize during disruptive works; and • Fragmentation is not anticipated to occur given that the wind farm and OHTL will not be fenced to prevent physical movement. Other construction phase impacts are relatively localised, such as mortality, disturbance and emissions-related impacts and it is not anticipated that they would be additive. Therefore, no cumulative impacts of significance on biodiversity receptors are anticipated to occur during the construction stage.
Impacts from Khizi 3 WF	Construction-phase impacts such as habitat loss, fragmentation and displacement have residual significance is rated as Minor. Disturbance, mortality and emissions will be managed with residual significance of minor or less.
Impacts from Area 1 WF	Construction-phase impacts such as habitat loss, fragmentation and displacement have residual significance is rated as Minor. Disturbance, mortality and emissions will be managed with residual significance of minor or less.
Cumulative Impacts	Habitat loss and fragmentation are not anticipated to be significant due to the nature of the project design (unfenced, low BUA). Other Construction Phase impacts are relatively localised, such as mortality, disturbance and emissions-related impacts. Therefore, no cumulative impacts of significance on biodiversity receptors are anticipated to occur during the construction stage.
Cultural Heritage	
Impacts from Khizi 3 WF	There are 41 archaeological sites recorded in the Project area. In addition, there is a potential for encountering unknown buried archaeology within the Project site during excavations. A Chance Find Procedure will ensure that any unexpected finds are not damaged and reported to the authorities.
Impacts from Area 1 WF	There are (5) archaeological sites recorded in the Project area. Potential of encountering unknown buried archaeology within the Project site during excavations is minimal. Nevertheless, a Chance Find Procedure will ensure that any unexpected finds are not damaged and reported to the authorities.
Impacts from OHTL	There are potential to for encountering unknown buried archaeology within the Project site during excavations. An archaeological survey is being carried out to identify any potential areas of significance along the route. A Chance Find Procedure will ensure that any unexpected finds are not damaged and reported to the authorities.

DEVELOPMENT	CONSTRUCTION
Cumulative Impacts	Minor to moderate potential cumulative impact. There is still a potential for encountering unknown buried archaeology within the Project sites during excavations. This is mitigated by Chance Find Procedures. Also, potential impact is accidental damage of existing archaeological during construction activities.
Landscape and Amenity	
Impacts from Khizi 3 WF	Temporary visual impacts from dust generation during construction.
Impacts from Area 1 WF	Expected to be similar to the impacts identified for Khizi 3 WF
Impacts from OHTL	Expected to be similar to the impacts identified for the WF for the receptors along the OHTL route.
Cumulative Impacts	No cumulative impact is expected if construction periods <u>don't coincide</u>. If construction period <u>coincides</u>, temporary cumulative impacts from WF and OHTL due to the generation of dust during construction activities.
Traffic & Transportation	
Impacts from Khizi 3 WF	Construction phase will see the transportation of workers, construction equipment/machinery and WTG components, materials by road. This will lead to increase in traffic in local roads which may also pose safety risk to the local residents and road users.
Impacts from Area 1 WF	Expected to be similar to the impacts identified for Khizi 3 WF
Impacts from OHTL	The transport route for the OHTL equipment and materials is not known at this stage, however this most likely will not involve new road development, road improvements or removal of obstacles as required for the transport of WTG components. However, if this coincides, transport and traffic activities will need to be coordinated and permits obtained from Ministry of Transport and other relevant authorities to align traffic and transport schedule for each project (WF and OHTL).
Cumulative Impacts	Temporary increase in traffic during construction of the project and delivery of material and the workforce. If the construction periods coincide, the impacts relating to increase in traffic in local roads is expected to be significant due to delivery of materials, WTG components and workers. An overall Traffic Management Plan and coordination between all projects will be undertaken to avoid pressure and traffic congestion on common roads as part of the transportation route. This will be undertaken in coordination with the relevant authorities.
Socio-economics	
Impacts from Khizi 3 WF	Seasonal herders and any other informal users will no longer be able to use the land for grazing during the construction phase. A temporary disruption will be experienced; however, the project area will be accessible once construction activities are complete. In addition, disruption will be limited to a short period during the Project

DEVELOPMENT	CONSTRUCTION
	construction as the Project area will not be fenced and will be accessible for grazing during operation. Therefore, this impact is reversible, short term, and considered to be minimal as herders/ users will have access to the wider area during construction. Positive impacts will include additional local employment and generation of electricity
Impacts from Area 1 WF	Expected to be similar to the impacts identified for Khizi 3 WF
Impacts from OHTL	Farms and agricultural lands located along the OHTL alignment will also lose access to part of their lands temporarily during construction; however, those lands will remain with their owners who can continue using them for their regular activities after construction is complete.
Cumulative Impacts	Positive impact in terms of cumulative in increase in local employment. Temporary disruption will be experienced.

20.4.2 Operation Phase

During operation, the cumulative impacts have been considered from the operation of both WFs (Area 1 and Khizi 3) and the existing Yeni Yashma WF. The VECs considered for operation phase include:

- Biodiversity (WFs and OHTL);
- Shadow Flicker (Khizi 3 WF and Yeni Yashma WF);
- Landscape and Visual; and
- Operation Noise (Khizi 3 WF and Yeni Yashma WF).

A brief assessment is provided below for each VEC.

BIODIVERSITY – OPERATION PHASE

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.

Neither wind farm nor the OHTL will be fenced; therefore, there will be no physical barriers to movement.

In some cases, turbines may deter migratory birds who exhibit macro-scale avoidance behaviour; longer migratory movements can increase stress and lower survivorship of migrants that expend more energy to navigate around wind farms.

The below avian receptors may be cumulatively affected by the presence of three wind farms operating simultaneously.

Receptor	Value/Sensitivity	Magnitude	Cumulative Significance
Endangered Birds	Very High	Moderate	Major
Threatened Birds	High	Moderate	Moderate to Major
Non-threatened Birds	Medium	Moderate	Moderate

The following mitigation measures are being applied at both Khizi 3 and Area 1 wind farms to reduce the impacts:

- Linear alignments such as OHTL overlapping with other linear infrastructure (Existing roads, other OHTL) where possible to minimize additional fragmentation.
- Restoration of areas to suitable habitat conditions post-construction.

With the above measures, the **residual** significance is presented in the following table.

Receptor	Value/Sensitivity	Magnitude	Residual Cumulative Significance
Endangered Birds	Very High	Minor	Moderate to Major
Threatened Birds	High	Minor	Minor to Moderate
Non-threatened Birds	Medium	Minor	Minor

Biodiversity Loss, Lowered Survivorship & Reproductive Success

Turbine Collision - Birds

The presence of three wind farms in the same migratory corridor may produce cumulative collision impacts.

The potential worst-case scenario for collisions for bird species produced by additive collision rates modelled at both Area 1 and Khizi 3 wind farms without any mitigation, are outlined in the following table.

Table 20-2 CIA – Cumulative Annual Collisions (Area 1 and Khizi 3 WF)

SPECIES	COLLISIONS/ YEAR (AREA 1)	COLLISIONS/ YEAR (KHIZI 3)	MAGNITUDE OF MITIGATED, CUMULATIVE EFFECT
Steppe Eagle	0.0743	0.2187	Negligible
Cinereous Vulture	0.428	8.429	Minor
Eurasian Griffon	0.601	13.20	Negligible
Eurasian Kestrel	2.12	9.319	Negligible
Eurasian Marsh-Harrier	0.260	0.07784	Negligible
European Honey-Buzzard	0.153	0.3953	Negligible
Lesser Kestrel	69.4	32.79	Minor
Long-legged Buzzard	0.403	0.8516	Negligible
Montagu's Harrier	0.0658	0.1696	Negligible

The residual significance of cumulative turbine collision impacts on all target species of birds are **Negligible to Minor**.

Spatial Analysis

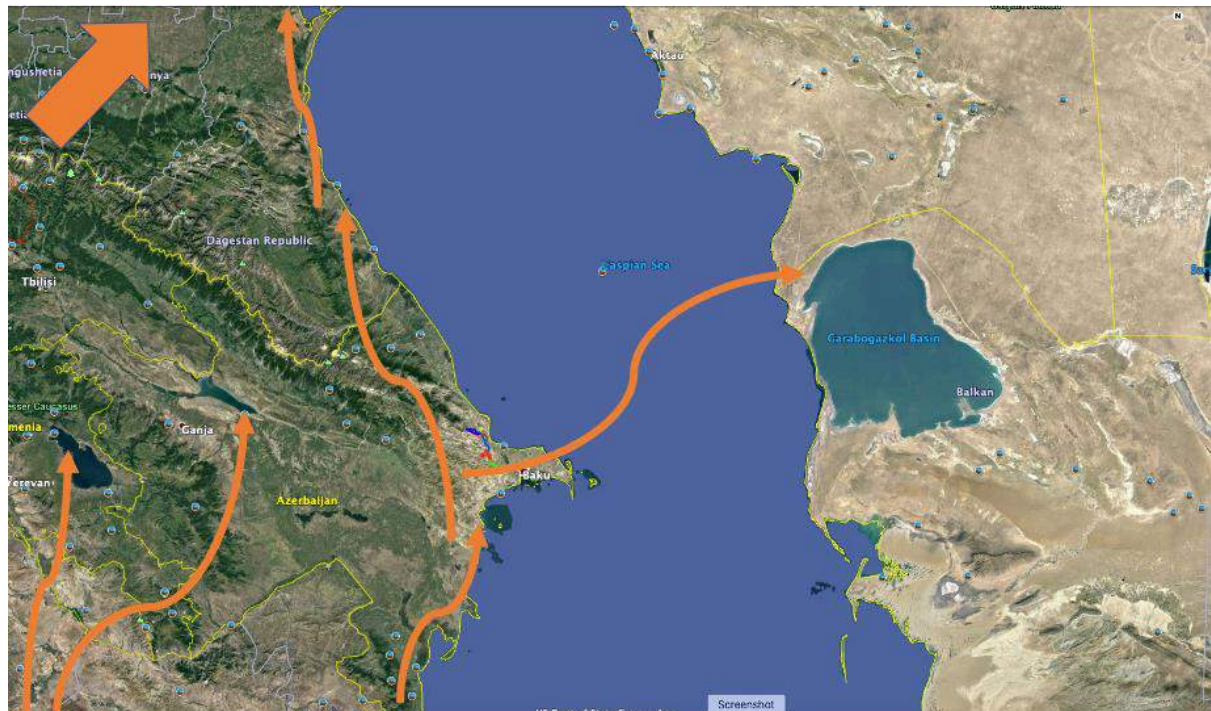
A third wind farm, Yeshma wind farm, is known to be operating in the close vicinity of Khizi 3. Without any quantitative data on the bird flight activity or mortality/collision rates, it is not possible to quantitatively assess the cumulative collision risk. However, a spatial analysis has been undertaken.

An assessment of the landforms surrounding the project site enables us to predict a general flight path of migratory flocks*, which typically avoids expanses of flat desert and mountain features, and follows along coastlines or river deltas to wetland staging areas and stopover sites. (*migratory flight path prediction is an imperfect science. Migration pathways vary by type of birds, species, age, and even individuals year by year. However, very broad, general patterns can be made based on these behavioural assumptions.)

The below provide indicative migratory flight paths for northbound spring migration and southbound autumn migration. Spring is of higher concern (and registered higher numbers for both Area 1 and Khizi 3) and it is possible that migrating birds will be exposed to all three or at least, two wind farms (Yeshma and Khizi 3) given the proximity and where they lay relative to each other, along the migration route.

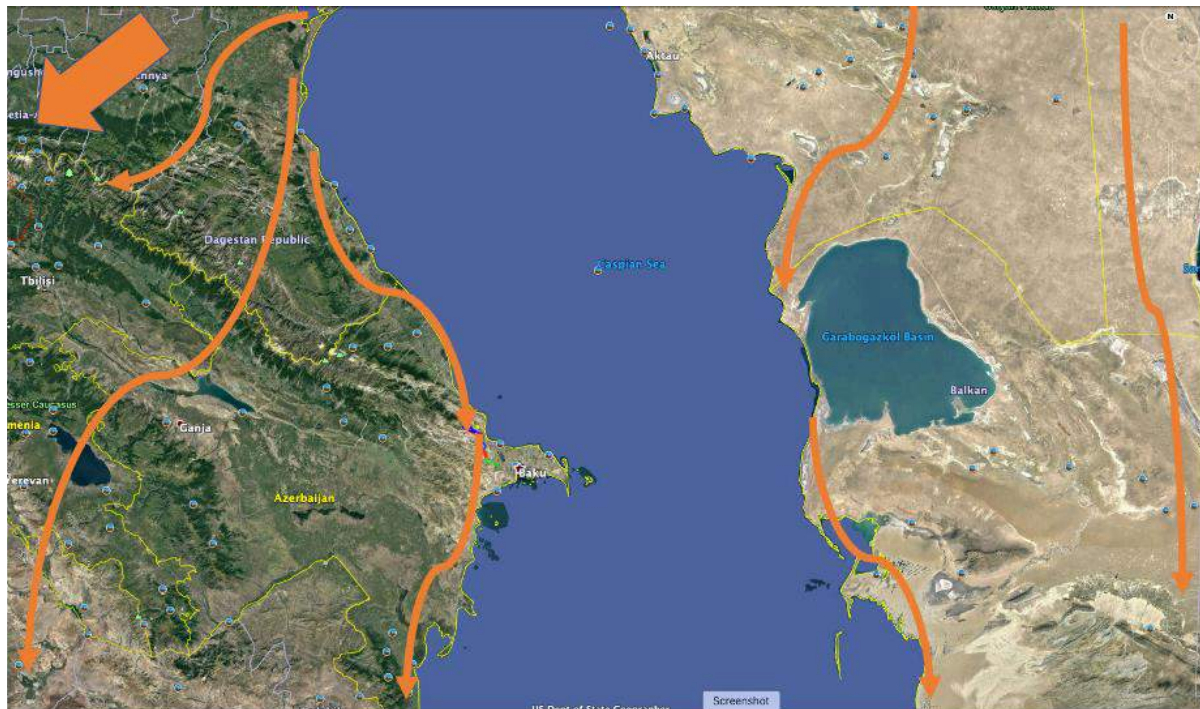
Northbound Spring Migration

Figure 20-2 Northbound Spring Migration



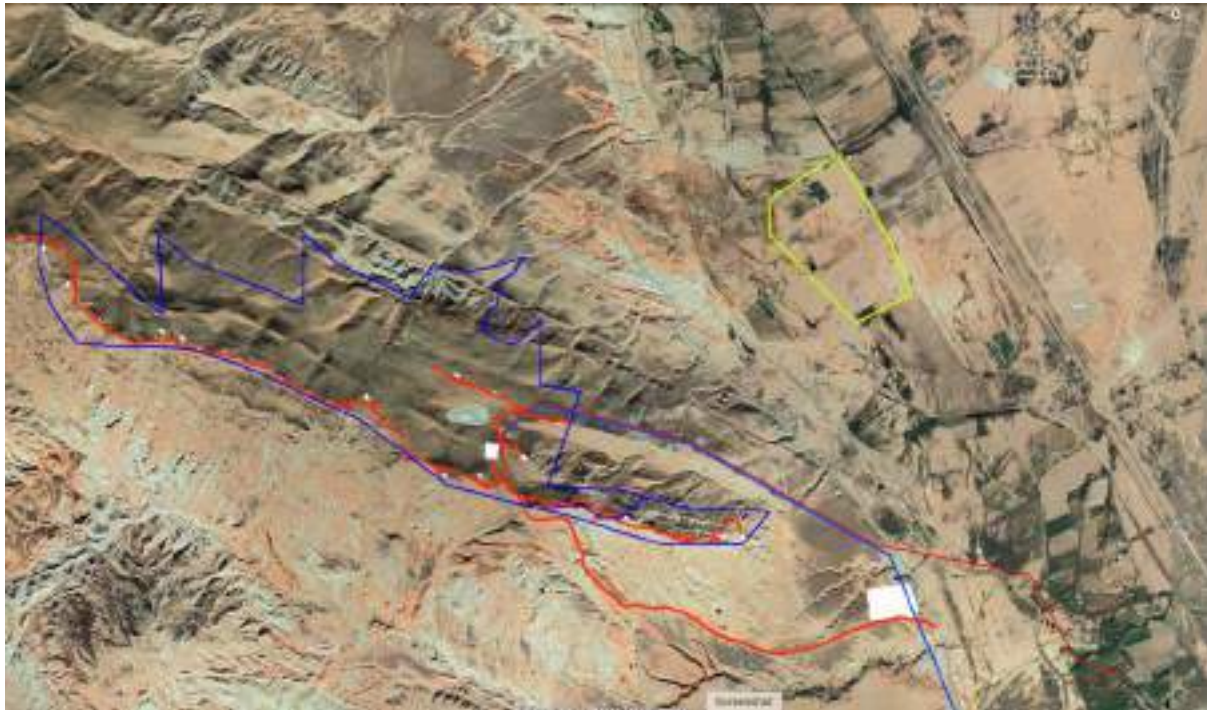
Southbound Autumn Migration

Figure 20-3 Southbound Autumn Migration



Of highest concern is the proximity of the Yeshma wind farm to Khizi 3. It can be predicted that birds, both residential and migratory, will regularly be subjected to collision risk from both wind farms.

Figure 20-4 Yeni Yashma WF, Khizi 3 WF and OHTL



It is plausible that collisions are already occurring at Yeshma wind farm in a similar magnitude as is predicted for Khizi 3. However, the data is not available to undertake a quantitative analysis. Taking the conservative approach that Yeshma wind farm is undergoing collision risk in the same level of magnitude as predicted for Khizi 3, and that currently no mitigative measures are available, the cumulative impact of all three wind farms (with mitigation in place at Khizi and Area 1, and no mitigation at Yeshma) may qualitatively be assessed as **Moderate**.

Collision Risk Management Plans will be developed for Area 1 and Khizi 3 to include Adaptive Mitigation that will be implemented in the event acceptable levels of annual losses due to the these projects are exceeded. Thresholds for acceptable levels of annual losses, will be determined for species identified as Critical or Potential Biodiversity Features (PBF) through a Potential Biological Removal (PBR) analysis which will further inform on the potential cumulative impact of the wind farm projects. Post-Construction Fatality Monitoring Programs will be undertaken for 3 years until the risk to birds is considered 'negligible' in consultation with the lenders.

Turbine Collision – Bats

Bats may be cumulatively affected by the presence of multiple regional wind farms operating simultaneously. In the absence of any mitigation, cumulative impact is anticipated to be Major. Again, no information is known regarding the Yeshma Wind Farm impacts on bats, as no mortality or survey information was available. As a conservative approach it is assumed that there are no mitigative controls and that bat mortality is Major at Yeshma Wind Farm.

Curtailment programs at Area 1 and Khizi 3 will be in place to reduce collision to targeted accepted levels. Collision Risk Management Plans will be developed for Area 1 and Khizi 3 projects to include Adaptive Mitigation that will be implemented in the event acceptable levels of annual losses due to these projects are exceeded. Thresholds for acceptable levels of annual losses, will be determined for species identified as Critical or Potential Biodiversity Features (PBF) through a Potential Biological Removal (PBR) analysis which will further inform on the potential cumulative impact of the wind farm projects. Post-Construction Fatality Monitoring Programs will be undertaken for 3 years until the risk to bats is considered 'negligible' in consultation with the lenders.

Given appropriate mitigation will be in place at Area 1 and Khizi 3, the cumulative regional impact on all bat species including Yeshma Wind Farm can qualitatively be assessed as **Moderate**.

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 energized 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 below receptors may be cumulatively affected by the presence of three wind farms operating simultaneously.

RECEPTOR	VALUE/SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Endangered Birds: Highly Sensitive Raptors	Very High	Major	Major
Threatened Birds: Sensitive Raptors	High	Major	Major
Non-threatened Raptors	Medium	Major	Moderate to Major

However, OHTL design will take into consideration anti-electrocution measures such as insulator type and spacing requirements. Therefore, impacts from Khizi 3 and Area 1 will be Negligible and the resultant cumulative impact for all target species (even assuming no mitigation at Yeshma Wind Farm) will be Minor.

Receptor	Value/Sensitivity	Magnitude	Residual Cumulative Significance
Endangered Birds	Very High	Negligible	Minor
Threatened Birds	High	Negligible	Minor
Non-threatened Birds	Medium	Negligible	Negligible to Minor

OHTL Collision - Birds

Thin, dark wires used in overhead transmission lines as well as guylines for weather masts are visually difficult to detect. Bird mortality by collisions with these wires are 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 20-50m altitude, birds flying at night, birds flying in flocks, and / or large and heavy birds of limited manoeuvrability.

The below receptors may be cumulatively affected by the presence of three wind farms operating simultaneously.

Receptor	Value/Sensitivity	Magnitude	Significance
Endangered Birds: Highly Sensitive Raptors	Very High	Major	Major
Threatened Birds: Sensitive Raptors	High	Major	Major
Non-threatened Raptors	Medium	Major	Moderate to Major

However, OHTL design will take into consideration anti-collision measures such as implementation of bird visual markers as well as habitat modification to decrease flying behaviour through the risk zone. Therefore, impacts from Khizi 3 and Area 1 will be Negligible and the resultant cumulative impact for all target species (even assuming no mitigation at Yeshma Wind Farm) will be Minor.

Receptor	Value/Sensitivity	Magnitude	Residual Cumulative Significance
Endangered Birds	Very High	Negligible	Minor
Threatened Birds	High	Negligible	Minor
Non-threatened Birds	Medium	Negligible	Negligible to Minor

CONCLUSION

Other impacts arising during operation are relatively localized and thus do not present cumulative effects.

The below summarizes the potential cumulative effects on biodiversity receptors.

Table 20-3 Summary of Potential Cumulative Effects on Biodiversity Receptors (Operation)

Project	Operation
Impacts from Area 1 WF	Direct mortality and displacement are major operational impacts that could potentially be regionally additive. Collision risk for birds and bats will have a residual significance of minor given the stringent mitigation and management measures proposed. OHTL impacts likewise given the proposed design are predicted to be of negligible significance. Habitat

Project	Operation
	restoration is proposed as a compensatory offset to displacement and habitat degradation.
Impacts from Khizi 3 WF	Direct mortality and displacement are major operational impacts that could potentially be regionally additive. Collision risk for birds and bats will have a residual significance of minor given the stringent mitigation and management measures proposed. OHTL impacts likewise given the proposed design are predicted to be of negligible significance. Habitat restoration is proposed as a compensatory offset to displacement and habitat degradation.
Impacts from Yeshma WF	Wind Turbine Collision for birds and bats are possibly occurring. No data is provided.
Cumulative Impacts	Wind Turbine collision for birds and bats may have additive mortality effects. However, stringent mitigation will reduce residual significance to Minor or less. No significant residual cumulative impact is anticipated. Habitat restoration regionally for Khizi 3 and Area 1 may serve to support receptors affected by Yeshma wind farm as well.

SHADOW FLICKER – CUMULATIVE EFFECTS

Please refer to Landscape and Visual Chapter, Section 12.3.2 for the cumulative shadow flicker assessment.

LANDSCAPE AND VISUAL AMENITY

Cumulative landscape and visual impacts are expected as a result of the development of two (2) wind farms in relative proximity to the existing WFs. The difference between cumulative landscape impacts and cumulative visual impacts are described below:

Cumulative landscape impacts can change either the physical fabric or character of the landscape.

- Cumulative impacts on the physical fabric of the landscape arise when two or more developments affect landscape components such as mountainous areas; and
- Cumulative impacts on landscape character arise when two or more developments introduce new features into the landscape.

Cumulative impacts on visual amenity can be caused by combined visibility and/or sequential impacts.

- Combined visibility occurs where the observer is able to see two or more developments from one viewpoint; and
- Sequential impacts occur when the observer has to move to another viewpoint to see different developments. Sequential impacts should be assessed for travel along regularly-used routes like major roads, railway lines, ferry routes, popular paths, etc.

The study area for this Cumulative Landscape and Visual Impact Assessment (CLVIA) considers existing wind farms and known, planned/proposed wind farms. Therefore, the following wind farms are considered:

- Area 1 WF;
- Khizi 3 WF; and
- Yeni Yashma Wind Park;
- The two-turbine pilot project; and
- The four-turbine wind park.

Cumulative Landscape Character Impacts

As discussed in the Landscape and Visual Amenity chapter, there are three main landscape character areas (LCAs) within the study area and these are:

- Undeveloped Natural Ground;
- Undeveloped Hills / Mountain; and
- Developed Plains.

Both the proposed wind farms (Area 1 and Khizi 3) are to be located on 'Undeveloped Hills / Mountain' LCA while the other WFs have been developed on the 'Developed Plains' LCA.

Once both the Khizi 3 WF and Area 1 WF have been developed it is considered likely that they will be perceived as a key landscape characteristic and therefore change the landscape character of the area. Although it is of 'Medium' sensitivity, the 'Undeveloped Hills / Mountain' LCA is not considered to be scarce, and in fact there are many areas of similar landscape character to the north and west of the proposed wind farms. The magnitude of change is considered to be 'Moderate' and therefore the cumulative impacts on landscape character are considered to be 'Moderate'.

RECEPTOR	SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Landscape Character	Medium	Moderate	Moderate

Cumulative Visual Impacts

Due to the varying topography of the region and the area of elevation separating the two proposed windfarms there are few receptors to cumulative impacts for the Area 1 and Khizi 3 wind farms.

In contrast to this, there are a number of receptors which will have cumulative visual impacts as a result of the Khizi 3 proposed development and the existing Yeni Yashma WF. The Yeni Yashma WF as seen from the M1 highway looking west, is shown in the below figure. As is evident from the below figure, the Yeni Yashma WF is closer to the receptors (motorists using the M1 highway and the agricultural receptors to the east of the road) than the proposed Khizi 3 WF. During periods of good visibility, it is likely that Khizi 3 turbines will be visible in the background on the elevated terrain. It is important to note that the Yeni Yashma turbines are around 2 km from the road while the closest Khizi 3 turbines is over 6 km from the road.

Figure 20-5 Yeni Yashma WF From M1 Highway



Motorists travelling along the coastal roads to the east of the three wind farms, as highlighted in the red box in the following figure, will have a sequential view of the three wind farms. As discussed, the two proposed wind farms (Area 1 and Khizi 3) will have turbines on the elevated hills further west of the road while the existing Yeni Yashma WF and the other two (2) smaller WFs are sited closer to the road with the turbines located on an area of low elevation, similar to that of the road. The cumulative impact on motorists and the agricultural receptors to the east of the M1 highway is considered to be Major.

Figure 20-6 Cumulative Visual Impact on Motorists



The residents of Sitalchay may also be able to view turbines from both the Yeni Yashma WF and the Khizi 3 WF, the viewpoint (KLV4) is shown below. It is important to note that, due to the topography, it is likely only a few of Khizi 3 WTG (those furthest east) will be visible in the same view as the Yeni Yashma WF. The distance between Sitalchay Village and the nearest Yeni Yashma WTG is around 5 km and the distance between the village and the nearest Khizi 3 WTF is 8 km.

Table 20-4 Cumulative KLV4 Visual Impact



RECEPTOR	SENSITIVITY	MAGNITUDE	SIGNIFICANCE
Agricultural Receptors & Motorists (KLV3)	Low	Major	Minor to Moderate
Residents of Sitalchay Village (KLV4)	Medium	Moderate	Moderate

OPERATIONAL NOISE

To assess the potential noise influence of the existing Wind Farm (Yeni Yashma), a cumulative effects assessment has been undertaken. The Yeni Yashma wind farm, which has been operational since October 2018, is located 3.5 km North East of the Khizi project.

The Yeni Yashma project has twenty 'Fuhrlander FL 2500 WTGs (total capacity of 50 MW [10]) with the following specifications (data provided by Azerishiq OJSC):

- Hub Height: 85 m;
- Rotor Diameter: 90 m;
- Nominal Rotation: 15.9 periods/min;
- Initial Rotation: 10.4 periods/min;
- Minimum wind speed for operation: 4 m/s; and
- Noise octaves: 104.5 dB.

The noise levels to attributable to this wind farm as well as the Khizi Wind Farm are presented in Table below.

Table 20-5 Noise Levels at Receptors – First Floor Level – Yeni Yashma & Khizi Wind Farms (Reference wind speed 10m/s)

RECEPTOR	LOCATION	YENI YASHMA WIND FARM ONLY	CUMULATIVE YENI YASHMA & KHIZI WIND FARMS	NOISE INCREASE
		LA90,T dB		
SR-3	367593,4503969	23.5	37.5	0.2
SR-4	367717,4506483	31.7	38.3	1.1

SR-8	368579,4505462	27.7	35.6	0.8
SR-5	355790,4507056	12.2	41.2	0.0
SR-6	364519,4503524	20.5	41.7	0.0
SR-7	367145,4507373	35.2	39.3	2.1
SR-11	360543,4504223	16.7	39.7	0.0
SR-12	357857,4505488	14.1	39.2	0.0
SR-13	353566,4503210	8.2	28.0	0.0

Table 20-6 Noise Levels at Receptors - First Floor (4m above ground) (Khizi 3 WF only)

RECEPTOR	LOCATION	NEAREST TURBINE	DISTANCE TO NEAREST TURBINE	5M/s	6M/s	7M/s	8M/s	9M/s	10M/s
			(M)	LA90,T DB					
SR-3	367593,4503969	K27	2052	26.9	29.3	32.7	35.5	36.9	37.2
SR-4	367717,4506483	K27	2154	26.7	29.2	32.5	35.3	36.8	37.0
SR-8	368579,4505462	K27	2619	24.3	26.8	30.1	33.0	34.4	34.7
SR-5	355790,4507056	K5	1641	30.2	32.6	36.0	38.8	40.2	40.5
SR-6	364519,4503524	K25	1889	31.2	33.7	37.0	39.9	41.3	41.6
SR-7	367145,4507373	K27	2452	26.6	29.0	32.4	35.2	36.6	36.9
SR-11	360543,4504223	K16	2361	29.2	31.6	35.0	37.8	39.2	39.5
SR-12	357857,4505488	K11	2643	28.6	31.1	34.4	37.3	38.7	39.0
SR-13	353566,4503210	K5	6091	17.0	19.4	22.8	25.6	27.0	27.3

As presented in Tables above, all of the receptors (cumulative impacts) comply with either the night-time criteria set out by WBG/IFC General Guidelines or the criteria derived from the background noise levels and therefore mitigation measures are not required.

REFERENCES

ADB, 2021. Azerbaijan Country Gender Assessment.

ADB, 2019. Poverty Data: Azerbaijan. [online] Available at: <<https://www.adb.org/countries/azerbaijan/poverty>> [Accessed 30 June 2021].

ADE and Gopa, 2017. Country fact sheet Azerbaijan.

ARPA Consulting, 2021. Hydrology Study for Wind Power Project in Khizi Azerbaijan-Final Report.

Asian Infrastructure Investment Bank (AIIB), 2016 (Amended February 2019). Environmental and Social Framework. [online] Available at: <https://www.aiib.org/en/policies-strategies/_download/environment-framework/Final-ESF-Mar-14-2019-Final-P.pdf> [Accessed 5 April 2021].

Blue Water Shipping, 2020. Route Survey Alat Port - Khizi 3 + Goboustan, Azerbaijan REV00 02.11.2020.

Blue Water Shipping, 2020. Alat Port, Azerbaijan Port Survey REV00 23.11.2020.

Blue Water Shipping, 2020. Caspian Sea Access Way Russian Inland Waterway system and equipment REV00 06.11.2020.

Chen, J. L., Pekker, T., Wilson, C. R., Tapley, B. D., Kostianoy, A. G., Cretaux, J.-F., & Safarov, E. S., 2017. Long-term Caspian Sea level change. *Geophysical Research Letters*, 44(13), 6993–7001. URL: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2017GL073958>

CIA, 2021. The World Factbook Azerbaijan. [online] Available at: <<https://www.cia.gov/the-world-factbook/countries/azerbaijan/>> [Accessed 26 June 2021].

Climateknowledgeportal.worldbank.org. 2021. World Bank Climate Change Knowledge Portal. [online] Available at: <<https://climateknowledgeportal.worldbank.org/country/azerbaijan>> [Accessed 24 June 2021].

Ecoenergy, 2021. Desktop Review of Geological and Hydrology conditions addressing Geology, Landscape, Seismicity and NORM-Khizi 3.

Eco.gov.az. 2020. Laws of The Republic of Azerbaijan. [online] Available at: <<http://eco.gov.az/az/qanunvericilik/qanunlar>> [Accessed 23 April 2020].

Envision Energy Co., Ltd, n.d. EN-171/6.5 Wind Turbines Specification.

Epilepsysociety.org.uk. n.d. Photosensitive epilepsy | Epilepsy Society. [online] Available at: <<https://epilepsysociety.org.uk/photosensitive-epilepsy>> [Accessed 9 July 2021].

European Observatory, 2010. Health Systems in Transition Vol. 12 No. 3 2010, Azerbaijan Health system review.

FAO, 2018. Country profile – Azerbaijan Version 2008.

FAO, 2011. Food Security and Agriculture Highlights – Azerbaijan. April – June 2011. [online] Available at: < <http://www.fao.org/3/am598e/am598e00.pdf> > [Accessed 24 June 2021].

Gabulova, R., 2018. Country report State of Azerbaijan.

Goldwind Science & Technology Co. Ltd., 2021. Goldwind GW165-5.2(5.6)V42R01C100 Wind Turbine Specifications.

Harding, G., Wilkins, A.J., Erba, G., Barkley, G.L. and Fisher, R.S., 2005. Photic - and pattern - induced seizures: expert consensus of the Epilepsy Foundation of America Working Group. *Epilepsia*, 46(9), pp.1423-1425.

<https://opecfund.org>. 2021. OPEC Fund for International Development. [online] Available at: <<https://opecfund.org/>> [Accessed 30 November 2021].

IEA. 2020. Renewable Energy Target of Azerbaijan – Policies - IEA. [online] Available at: <<https://www.iea.org/policies/5340-renewable-energy-target-of-azerbaijan>> [Accessed 13 April 2020].

International Renewable Energy Agency (IRENA), 2019. Renewables Readiness Assessment: Republic of Azerbaijan. [online] Available at: <https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2019/Dec/IRENA_RRA_Azerbaijan_2019.PDF> [Accessed 16 March 2021].

Khizi District Executive Authority of the Republic of Azerbaijan, 2021. [online] Available at: <<http://www.khizi-ih.gov.az/page/13.html>> [Accessed 30 June 2021].

Jica.go.jp. 2021. JICA Environmental Policy. [online] Available at: <https://www.jica.go.jp/english/our_work/social_environmental/policy/index.html> [Accessed 29 November 2021].

JICA, 2013. The Basics of the Environmental and Social Considerations (Introduction to JICA Guidelines for Environmental and Social Considerations). [online] Available at: <https://www.jica.go.jp/english/our_work/social_environmental/guideline/c8h0vm0000013gbd-att/esc_rev.pdf> [Accessed 29 November 2021].

Labour Code. [online] ILO, NATLEX database, 1999. Available at: <<https://www.ilo.org/dyn/natlex/docs/WEBTEXT/54131/65184/E99AZE01.htm#c1d1>> [Accessed 23 June 2021].

Ministry of Ecology and Natural Resources of Azerbaijan Republic, 2021. Rivers, Lakes and Reservoirs of Azerbaijan Republic. [online] Available at:

<<https://web.archive.org/web/20140702101035/http://www.eco.gov.az/en/hid-chay-gol-suanbar.php>> [Accessed 14 July 2021].

Naumann, G., Alfieri, L., Wyser, K., Mentaschi, L., Betts, R. A., Carrao, H., . . . Feyen, L, 2018. Global Changes in Drought Conditions Under Different Levels of Warming. *Geophysical Research Letters*, 45(7), 3285–3296.

The State Statistical Committee of the Republic of Azerbaijan, 2020. Environmental Protection. [online] Available at: < <https://www.stat.gov.az/source/environment/?lang=en> > [Accessed 3 July 2021].

The State Statistical Committee of the Republic of Azerbaijan, 2020. Environmental Protection. [online] Available at: < <https://www.stat.gov.az/source/environment/?lang=en> > [Accessed 3 July 2021].

The State Statistical Committee of the Republic of Azerbaijan, 2021. Population of Azerbaijan.

The State Statistical Committee of the Republic of Azerbaijan, 2021. Population. [online] Available at: <<https://www.stat.gov.az/source/demography/?lang=en>> [Accessed 27 June 2021].

The State Statistical Committee of the Republic of Azerbaijan, 2020. System of national accounts and balance of payments. [online] Available at: <https://www.stat.gov.az/source/system_nat_accounts/?lang=en> [Accessed 27 June 2021].

The State Statistical Committee of the Republic of Azerbaijan, 2021. Labour Market. [online] Available at: <<https://www.stat.gov.az/source/labour/?lang=en>> [Accessed 27 June 2021].

The State Statistical Committee of the Republic of Azerbaijan, 2020. Education, science and culture. [online] Available at: <<https://www.stat.gov.az/source/education/?lang=en>> [Accessed 27 June 2021].

The State Statistical Committee of the Republic of Azerbaijan, 2020. Health, Social Protection and Sport. [online] Available at: <<https://www.stat.gov.az/source/healthcare/?lang=en>> [Accessed 30 June 2021].

The State Statistical Committee of the Republic of Azerbaijan, 2020. Agriculture, Forestry and Fishing. [online] Available at: <<https://www.stat.gov.az/source/agriculture/?lang=en>> [Accessed 30 June 2021].

State Statistical Committee of the Republic of Azerbaijan, 2021. Women and Men in Azerbaijan. Statistical yearbook. [online] Available at: <<https://www.stat.gov.az/source/gender/?lang=en>> [Accessed 4 March 2022].

State Statistical Committee of the Republic of Azerbaijan, 2021. Environment in Azerbaijan. Statistical Yearbook. [online] Available at: <<https://www.stat.gov.az/source/environment/?lang=en>> [Accessed 15 April 2022].

The World Bank Group/IFC, 2015. Environmental, Health, And Safety Guidelines For Wind Energy. [online] Available at: <[https://www.ifc.org/wps/wcm/connect/b82d0563-b39a-42a7-b94e-](https://www.ifc.org/wps/wcm/connect/b82d0563-b39a-42a7-b94e-0b926b4a82f9/FINAL_Aug%2B2015_Wind%2BEnergy_EHS%2BGuideline.pdf?MOD=AJPERES&CVID=mpusVXy)

[0b926b4a82f9/FINAL_Aug%2B2015_Wind%2BEnergy_EHS%2BGuideline.pdf?MOD=AJPERES&CVID=mpusVXy](https://www.ifc.org/wps/wcm/connect/b82d0563-b39a-42a7-b94e-0b926b4a82f9/FINAL_Aug%2B2015_Wind%2BEnergy_EHS%2BGuideline.pdf?MOD=AJPERES&CVID=mpusVXy)> [Accessed 22 March 2021].

Treaties.un.org. 2020. UNTC. [online] Available at: <https://tbinternet.ohchr.org/_layouts/15/TreatyBodyExternal/Treaty.aspx?CountryID=11&Lang=EN> [Accessed 23 June 2020].

Treaties.un.org. 2020. UNTC. [online] Available at: <https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-d&chapter=27> [Accessed 23 June 2020].

UNECE, 2011. Environmental Performance Reviews, Azerbaijan, Second Review.

Unece.org. 2020. UNECE calls for decisive action to close the Gender Pay Gap in the region | UNECE. [online] Available at: <<https://unece.org/media/press/1090>> [Accessed 15 February 2022].

UNHCR, 2009. Azerbaijan: Analysis of Gaps in the Protection of Internally Displaced Persons (IDPs).

WageIndicator, 2019. Minimum Wage - Azerbaijan. [online] Available at: <<https://wageindicator.org/salary/minimum-wage/azerbaijan>> [Accessed 27 June 2021].

World Bank Group, 2018. Challenges on the Path to Universal Health Coverage: The Experience of Azerbaijan. Universal Health Care Coverage Series 28.

World Bank, 2021. Unemployment, total (% of total labor force) (modeled ILO estimate) - Azerbaijan. [online] Available at: <<https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?end=2020&locations=AZ&start=2019>> [Accessed 2 July 2021].

Zoï Environment Network, 2013. Waste and Chemicals in Azerbaijan a Visual Synthesis.