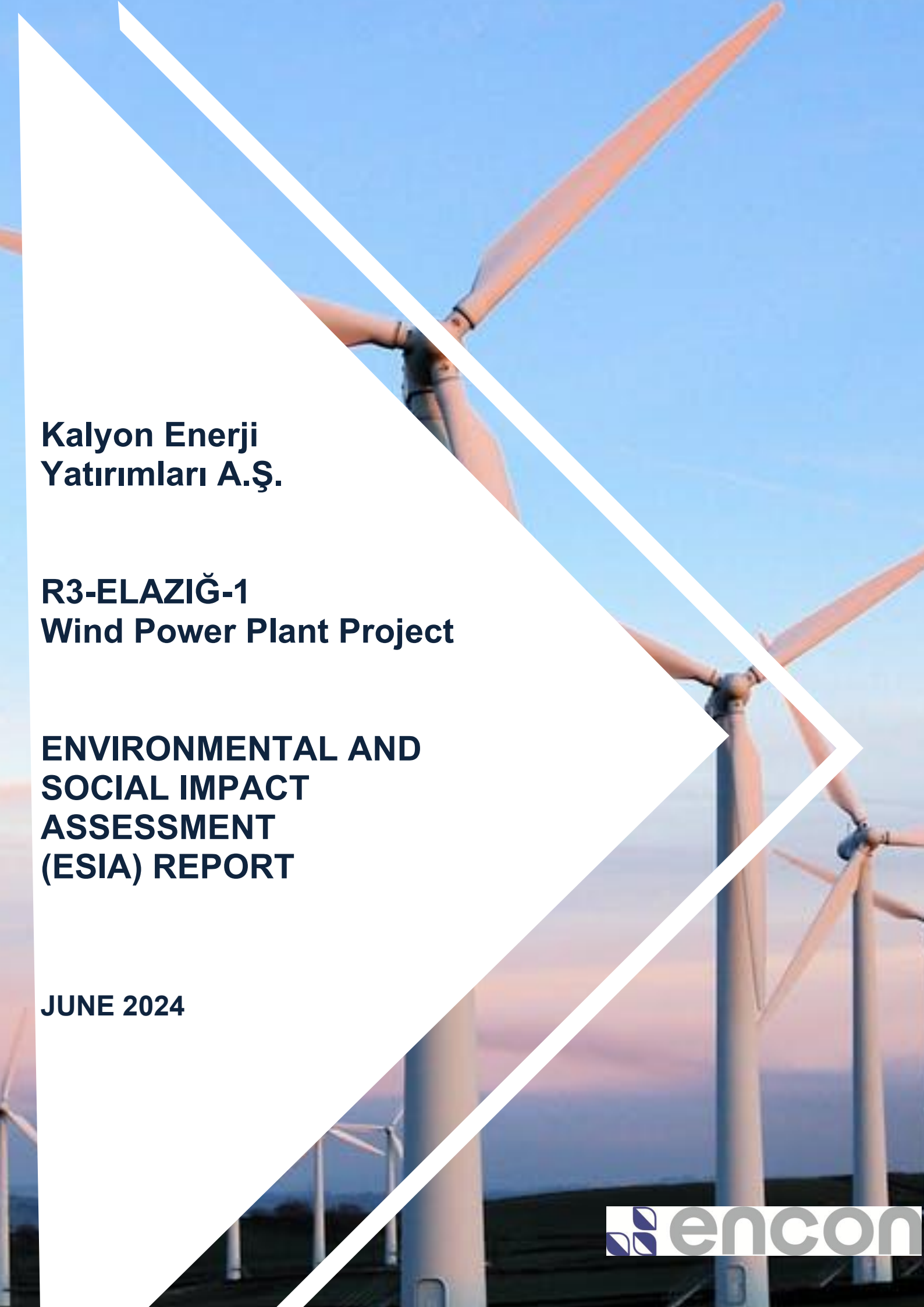


Kalyon Enerji Yatırımları A.Ş.

R3-ELAZIĞ-1 Wind Power Plant Project

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) REPORT

JUNE 2024

REVISION HISTORY

Rev.	Date of Issue	Issue Reason	Client	Project Owner	Consultant
A	March 2024	First submission	Kalyon Enerji Yatırımları A.Ş.	YEKA RES 3 Rüzgar Enerjisi Yatırımları A.Ş.	ENCON
B	June 2024	Revision	Kalyon Enerji Yatırımları A.Ş.	YEKA RES 3 Rüzgar Enerjisi Yatırımları A.Ş.	ENCON

TABLE OF CONTENTS

REVISION HISTORY....2
TABLE OF CONTENTS....3
LIST OF TABLES....7
LIST OF FİGURES....11
LIST OF ABBREVIATIONS....13
I. INTRODUCTION....15
I.1 Project Background and Rationale....15
I.2 Purpose and Scope of the ESIA Report....16
II. PROJECT PURPOSE AND DESCRIPTION....18
II.1 Project Location....20
II.2 Land Ownership Status....26
II.3 Project Components....28
II.4 Project Schedule....29
II.5 Lifetime of the Project....32
II.6 Summary of Project Activities....32
III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK....34
III.1 Turkish Legislation....35
III.1.1 Turkish Environmental, Health and Safety Legislation....36
III.1.2 Expropriation Process under Turkish Expropriation Law....42
III.1.3 Cultural Heritage Management under Law on the Conservation of Cultural and Natural Assets 43
III.1.4 Labor Law....43
III.1.5 Law on the Right to Information....44
III.1.6 Permits....45
III.2 International Agreements and Standards....50
III.2.1 IFC Standards and Guidelines....51
III.2.2 Equator Principles IV....56
III.2.3 EBRD Environmental and Social Policy and Performance Requirements....57
III.2.4 EU Directives....60
III.2.5 CITES....63
III.2.6 Bern Convention....64
III.2.7 IUCN Red List of Threatened Species....64
III.2.8 DNV GL Safety, Operation and Performance of Grid- Connected Energy Storage Systems 65
III.2.9 Green or Social Loan Principles....65
III.3 Project Standards....66
IV. BASELINE CONDITIONS....73
IV.1 Physical Environment....73

IV.1.1 Geographical Location and Topography 73
IV.1.2 Land Use and Property 76
IV.1.3 Air Quality 78
IV.1.4 Climate Conditions and Meteorology 79
IV.1.5 Soil and Soil Quality 83
IV.1.6 Natural Hazards and Seismicity 87
IV.1.7 Geology, Hydrogeology and Hydrology 89
IV.1.8 Waste and Water/Wastewater Management 100
IV.1.9 Noise and Vibration 100
IV.2 Ecology and Biodiversity 103
IV.2.1 Definition of the Study Area 104
IV.2.2 Methodologies 106
IV.2.3 Findings 114
IV.2.4 Protected Areas 117
IV.2.5 Critical Habitat Assessment 143
IV.3 Cultural Heritage 150
IV.3.1 Methodology 150
IV.3.2 Baseline Conditions 154
IV.4 Socio-Economic Baseline 172
IV.4.1 Methodology 172
IV.4.2 Project Standards 180
IV.4.3 Baseline Conditions 181
IV.4.4 Summary of Baseline Findings and Vulnerable Receptors 196
V. ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT 199
V.1 Scoping of Environmental and Social Risks and Impacts 199
V.2 Scope-in/Scope-out Process 201
V.3 Impact Assessment Approach and Methodology 204
V.4 Area of Influence 204
V.5 Determination of Environmental and Social Impact Level and Significance 210
V.6 Physical Environmental Risks and Impacts 214
V.6.1 Air Quality 214
V.6.2 Climate Change 215
V.6.3 Soil and Soil Quality 219
V.6.4 Natural Hazards and Seismicity 221
V.6.5 Geology, Hydrogeology 222
V.6.6 Water Resources and Water Quality 222
V.6.7 Noise and Vibration 223
V.6.8 Use of Resources and Waste Management 226
V.7 Biological Environment 233
V.7.1 Impact Assessment 233
V.7.2 Ecosystem Services 248

V.8 Social Impacts of the Project 250
V.8.1 Population/ Demography 250
V.8.2 Land Acquisition 250
V.8.3 Economy/ Employment and Livelihoods 251
V.8.4 Education and Health Services 254
V.8.5 Vulnerable/Disadvantaged Groups 255
V.8.6 Infrastructure Services 255
V.8.7 Working Conditions and Labour Management 256
V.8.8 Community Health and Safety 260
V.8.9 Landscape and Visual 265
V.9 Cultural Heritage 267
V.9.1 Impact Assessment and Management 267
V.9.2 Conclusion of Impact Assessment 273
V.9.3 General Assessment and Results 275
V.10 Cumulative Impact Assessment 276
VI. ASSESSMENT OF PROJECT ALTERNATIVES 283
VI.1 Energy Source Alternatives 283
VI.2 Location Alternatives 283
VI.3 Technology Alternatives 284
VI.4 No Project Alternative 284
VII. MITIGATION AND MONITORING PLANS 285
VII.1 Mitigation Plans 285
VII.2 Monitoring Plans 298
VIII. ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM 304
VIII.1 Environmental and Social Policy 305
VIII.2 Environmental and Social Management Plans 307
VIII.3 Institutional Arrangements and Capacity Building 308
VIII.3.1 Environmental and Social Management Structure 308
VIII.3.2 Roles and Responsibilities 310
VIII.3.3 Capacity Building and Training 314
VIII.4 Emergency Preparedness and Response 319
VIII.5 Monitoring and Reporting of the Project 320
IX. STAKEHOLDER ENGAGEMENT 321
IX.1 Previous Stakeholder Engagement Activities 322
IX.1.1 Stakeholder Engagement in the Pre-ESIA Process 322
IX.1.2 Stakeholder Engagement as part of the ESIA Process 323
IX.2 Stakeholder Identification 324
IX.2.1 Identification of Vulnerable Groups 324
IX.3 Resources and Responsibilities for Implementing Stakeholder Engagement Activities 327
IX.3.1 Resources 327
IX.3.2 Management Functions and Responsibilities 327

IX.4 Grievance Mechanism 329
IX.4.1 Grievance Mechanism at the National Level 329
IX.4.2 Project Level Grievance Mechanism 329
X. CONCLUSION 331
REFERENCES 333

LIST OF TABLES

Table II.1 Project Components 19
Table II.2 Distance of Project Area to Settlements 20
Table II.3 Distances between Turbines 20
Table II.4 Site Coordinates 21
Table II.5 Turbines Coordinates 22
Table II.6 Switchyard Center Coordinates 22
Table II.7 Project Area and Land Status 27
Table II.8 Turbine Specifications 28
Table II.9 Project Schedule 30
Table II.10 Summary of Project Activities 33
Table III.1 Turkish EHS Legislation Related to the Project 37
Table III.2 Summary of Responses from Authorities 46
Table III.3 Performance Standards 51
Table III.4 Applicability of IFC's Performance Standards 52
Table III.5 International Union for Conservation of Nature (IUCN) Categories 64
Table III.6 Project Standards 67
Table III.7 Gap Analysis between IFC, EBRD and National Legislation 69
Table IV.1 Sensitive Receptors Location Information of the Project 78
Table IV.2 Limit Values and Air Quality Measurement Results 78
Table IV.3 Settled Dust Measurements 79
Table IV.4 Long Term Meteorological Data of Elazığ Province (1939-2022) 80
Table IV.5 Agricultural Potentials Represented by Different Land Use Capability Classes and Their Characteristics 83
Table IV.6 Analysis Results of Soil Samples of Project Area 86
Table IV.7 Groundwater Analysis Results 95
Table IV.8 Surface Water Measurement Results 99
Table IV.9. Environmental Noise Limits Values for Industrial Plants provided in RENC 100
Table IV.10. Noise Level Limit Values in IFC General EHS Guidelines 101
Table IV.11 Background Noise Level Measurement Results 101
Table IV.12 Vibration Measurement Results 102
Table IV.13 Biodiversity Field Study Calendar 103
Table IV.14 Coordinates of Bat Sound Recording Station and Bird Observation Points 104
Table IV.15 Bird Monitoring Hours Chart 109
Table IV.16 Characteristics of the Selected Stations 113
Table IV.17 EUNIS Habitat Types and Habitat Loss Calculation 115
Table IV.18 Coordinates of Endemic Species in the Project Area 119
Table IV.19 Native and Migratory Bird Species Detected in the WPP Area 123
Table IV.20 Frequencies of Native and Migratory Species Observed in the Risk Area in Autumn 123
Table IV.21 Total Observation Time for Bird Observations in the Risk Zone 124
Table IV.22 Estimation of Total Number of Migratory Birds 124
Table IV.23 Estimated Number of Birds Expected to Pass Through Turbine Blades 125
Table IV.24 Step 1: Determination of the Number of Birds Flying at the Risky Height/Region 125
Table IV.25 Step 2: Calculation of Collision Risk for Selected Domestic Species 126
Table IV.26 Bird Species Observed or Observable in the BSA during Autumn Season 127
Table IV.27 Songbirds Seen in the BSA in the Autumn Season 128
Table IV.28 Bat Species Information Identified as a Result of the Analysis. 130
Table IV.29 Wind Speed Values (m/s) of the Study Dates 131
Table IV.30 Flora Species of R3-ELAZIG-1 WPP 133
Table IV.31. Fauna Species of R3-ELAZIG-1 WPP Area 139

Table IV.32 CHA According to Criterion-1 145
Table IV.33 CHA According to Criterion-2 145
Table IV.34 CHA According to Criterion-3 146
Table IV.35 Bird Species Triggering IBAs around the Project Area 147
Table IV.36: CHIA Borders 150
Table IV.37: Archaeological and Immovable Cultural Heritage Sites within and in the Vicinity of the Project Area 156
Table IV.38: Site Classification Criteria 159
Table IV.39: Cultural Heritage Sites Identified within the Study Area 159
Table IV.40: Distribution of Registered and Unregistered Sites 159
Table IV.41: Cultural Heritage Sites within the Study Area 161
Table IV.42: Intangible Cultural Heritage Items Registered in UNESCO Representative List of Intangible Cultural Heritage of Project Area Vicinity 165
Table IV.43: Intangible Cultural Heritage Items Registered in the National Inventory of Project Area Vicinity 166
Table IV.44: Internationally Recognised Cultural Heritage Areas (World Heritage List and World Heritage Tentative List of UNESCO) 171
Table IV.45: Legally Protected (Registered) Cultural Heritage Site Within the Study Area 171
Table IV.46. Land Requirement by Ownership Type 174
Table IV.47. Affected Number of Parcels by Ownership and by Settlements 175
Table IV.48 Sample Size for Household Survey and Performed Social Surveys 179
Table IV.49 Summary of the Social Field Studies Conducted as part of the ESIA 180
Table IV.50 Population Change, 2018-2022 184
Table IV.51 Population Change and Reason of Change by Settlements 184
Table IV.52 Population Data of the Settlements 185
Table IV.53 Percentage of Population by Gender 185
Table IV.54 Percentage of Population by Age Groups 185
Table IV.55 Income Sources 186
Table IV.56 The Average Annual Income of Households 186
Table IV.57 Agricultural Activities 187
Table IV.58 The Number of Cattle and Ovine Animals 188
Table IV.59 Beekeeping Activities 190
Table IV.60 Literacy Rate in the Districts of AoI 191
Table IV.61 Education Status Türkiye, Elazığ and Settlements at the AoI by Gender (%) 191
Table IV.62 Vulnerable Groups in Settlements 192
Table IV.63. Some Information on Settlements 195
Table V.1 PS List Concerning the Project 200
Table V.2 Color Code Used in the Scope-in/Scope-out Process 201
Table V.3 Potential Interactions between Project Activities and Environmental Parameters 203
Table V.4 Potential Interactions between the Project Activities and Social/Socio-economic Receptors 203
Table V.5 Impact Significance Matrix* 204
Table V.6 Information of Nearby Settlements Covered in SAoI 206
Table V.7 Population Changes of Project Districts 206
Table V.8 Matrix Table with Identification of Impact Level in Terms of Environmental and Social Attributes 211
Table V.9 Pre-Construction and Construction Phase Machinery-Equipment List 214
Table V.10 Maximum Exhaust Emissions from Construction Vehicles/Machinery 214
Table V.11 Controlled and Uncontrolled Dust Emissions 215
Table V.12 Pollutant Emission Coefficients for Moving Sources and Machines Used Off-Road (Diesel Fuel) 216

Table V.13 Details Used for Emission Calculations for the Pre-construction and Construction Phases of the Project 216
Table V.14 Scope 1 GHG Emission Calculations for Pre-construction Phase 217
Table V.15 Scope 1 GHG Emission Calculations for Construction Phase 217
Table V.16 R3-ELAZIĞ-1 WPP Access Roads and Pad Areas Soil Budget Table 220
Table V.17 Construction Equipment and Sound Power of Each Equipment 224
Table V.18 Noise During Construction Phase 224
Table V.19 Noise During Operation Phase 225
Table V.20. List of Possible Waste Types to be Generated during Pre-construction and Construction Phase of the Project 227
Table V.21 List of Possible Waste Types to be Generated during Operation Phase 232
Table V.22 Criteria for Sensitivity/Value of Resource/Receptor (Ecology and Biodiversity) 233
Table V.23 Sensitivity of Biodiversity Receptors 234
Table V.24. Project Actions and Related Impact Factors during Construction Phase 236
Table V.25 The Magnitude of Construction Impacts on Terrestrial Flora-Fauna Species and Habitat Types 237
Table V.26. Project Actions and Related Impact Factors during Operation Phase 237
Table V.27 EUNIS Habitat Types and Habitat Loss Calculation 237
Table V.28 The Magnitude of Operation Impacts on Bird Species 238
Table V.29 The Magnitude of Operation Impacts on Bat Species 239
Table V.30 Biodiversity Monitoring Table of Construction Phase 244
Table V.31 Biodiversity Monitoring Table of Operation Phase 244
Table V.32 Summary of the Biodiversity Assessments of Construction Phase 246
Table V.33 Summary of the Biodiversity Assessments of Operation Phase 247
Table V.34 Criteria to Define the Value of Ecosystem Services 248
Table V.35 Summary of the Ecosystem Services 249
Table V.36 Land Requirement by Expropriated Rates 253
Table V.37 Locations of Houses 266
Table V.38 Shadow Hours According to the Worst Case Scenario 266
Table V.39 Sources of Impacts on Cultural Heritage Receptors during All Project Phases 267
Table V.40 Criteria for the Value of Cultural Heritage Receptors 268
Table V.41 Value of the Registered and Unregistered Tangible Cultural Heritage Sites Identified within Study Area 269
Table V.42 Criteria for Magnitude of Change for Tangible Cultural Heritage (ICOMOS 2011) 269
Table V.43 Cultural Heritage Impact Significance Assessment Matrix (ICOMOS 2011) 270
Table V.44 Cultural Heritage Authorities Responsible 271
Table V.45 General Management Measures Applicable to Different Classification of Sites 271
Table V.46 Criteria for the Sensitivity of Intangible Cultural Heritage Receptors and Magnitude of Impact 272
Table V.47 Construction Impacts, Proposed Mitigation Measures and Residual Impacts (Tangible Cultural Heritage) 274
Table V.48 Other Projects/Activities/Developments in AoI 277
Table V.49 Interaction of Projects with Selected VECs 280
Table V.50 Significance of Potential Cumulative Impacts 282
Table VII.1 Mitigations for the Pre-Construction and Construction Phase 286
Table VII.2 Mitigations for the Operation Phase 294
Table VII.3 Monitoring Plan for the Pre-construction and Construction Phase 299
Table VII.4 Monitoring Plan for the Operation Phase 302
Table VIII.1 Roles and Responsibilities 312
Table VIII.2 Parties Responsible for the Management of the Project 312
Table VIII.3 Training Program 317

Table VIII.4 Requirements of Such Processes 320
Table IX.1 Governmental Stakeholders Involved in the Scoping, Review and Evaluation of the National EIA Process 322
Table IX.2 Summary of the Social Field Studies Conducted as part of the ESIA 323
Table IX.3 Roles and Responsibilities for Social Engagement Framework 328

LIST OF FİGURES

Figure II.1 Photos of Project Area **18**
Figure II.2. Project Area **24**
Figure II.3 Turbine Points **25**
Figure IV.1 Digital Elevation Model Map of Project Area and Turbines **75**
Figure IV.2 Photographs Taken from the Project Area **76**
Figure IV.3 Land Use Characteristic for Project Area **77**
Figure IV.4 Projected Average Mean Surface Air Temperature Changes of Elazığ per Decade until 2050 according to SSP2-4.5 and SSP3-7.0 ..... **81**
Figure IV.5 Projected Average Mean Surface Air Temperature Change Distributions of Elazığ according to SSP2-4.5 and SSP3-7.0 ..... **81**
Figure IV.6 Projected Precipitation Changes of Elazığ per Decade until 2050 according to SSP2-4.5 and SSP3-7.0 ..... **82**
Figure IV.7 Projected Precipitation Change Distributions of Elazığ according to SSP2-4.5 and SSP3-7.0 ..... **82**
Figure IV.8 Major Soil Groups and Land Use Capability Classes for the Project Area **85**
Figure IV.9 Earthquake Hazard Map of Türkiye **88**
Figure IV.10 Generalized Stratigraphic Column Section of the Project Area and Its Surroundings **90**
Figure IV.11 Geology Map of the Project Area **92**
Figure IV.12 Sampling Locations Map **94**
Figure IV.13 Hydrology Map of Project Area and Turbines **97**
Figure IV.14 Map of the Biodiversity Study Area **105**
Figure IV.15 Map of the Bird Observation Area **110**
Figure IV.16 EUNIS Habitat Map of the Project Area **116**
Figure IV.17 National Protected and Internationally Recognized Areas around the Project Area **118**
Figure IV.18 Distribution of Flora Species Requiring Conservation Measures in the Project Area **121**
Figure IV.19 Breeding Distribution Map of the *Neophran percnopterus* (http://kustr.org/kusatlasi/tur-listesi/) **127**
Figure IV.20 Number of Bat Flights Detected at the BSA. **130**
Figure IV.21 Daily/hourly Wind Speed Variation for the Days of the Study. **131**
Figure IV.22 Bird Migration Routes and Location of the Project Area **146**
Figure IV.23 The Flight Route Map of Bird Species Triggering Criterion-3 ..... **149**
Figure IV.24: Study Area **151**
Figure IV.25 Tangible Cultural Heritage Sites within and in the Vicinity of the Project Area **158**
Figure IV.26: Locations of the Cultural Heritage Sites within the Study Area **162**
Figure IV.27: (1) Çitli (Hilindir) Fortress (registered) outside the Project Area **163**
Figure IV.28: (2) Dutpınar Bridge (registered) outside the Project Area **164**
Figure IV.29: Stone Hunting Blind Located Near Turbine 10 ..... **168**
Figure IV.30: Internationally Recognised Cultural Heritage Sites **170**
Figure IV.31. Socio-Economic Area of Influence **176**
Figure IV.32. Socio-Economic Development Level by District (2022) **182**
Figure IV.33. Population of Maden District (2007-2022) **183**
Figure IV.34. Distribution of Households Income Group **187**
Figure V.1 Area of Influence (AoI) Map **207**
Figure V.2 Socio-Economic Area of Influence Map **208**
Figure V.3 Community Health and Safety Area of Influence Map **209**
Figure V.4. Waste Management Hierarchy **226**
Figure V.5. Composition of Municipal Waste (*former Ministry of Science, Industry and Technology, 2014)* **229**
Figure V.6 EUNIS Habitat Types of the Project Area **235**

Figure V.7 Map of Turbines and Houses Locations 263
Figure V.8 Map of Worst-Case Scenario Showing Shadow 264
Figure V.9 Secondary Projects in the Cumulative Impact Assessment Area 279
Figure V.10 Projects and VECs Considered in the Scope of Cumulative Impact Assessment 281
Figure VIII.1 Elements of ESMS (IFC, 2015) 304
Figure VIII.2 Flowchart of the ESIA Process 309
Figure VIII.3 Environmental and Social Management Structure 310
Figure VIII.4 Organizational Structure of the YEKA RES 3 311
Figure VIII.5 Organizational Structure of the Contractors 311

LIST OF ABBREVIATIONS

AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
AoI	The Area of Influence
AZE	Alliance for Zero Extinction
CHIA	Cultural Heritage Impact Assessment
CIA	Cumulative Impact Assessment
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DEM	Digital Elevation Model
DLP	Defects Liability Period
E&S	Environmental and Social
EBRD	European Bank for Reconstruction and Development
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EMRA	Energy Market Regulatory Authority
ENCON	ENCON Çevre Danışmanlık Ltd. Şti.
EPDK	Enerji Piyasası Düzenleme Kurumu
EPFIs	Equator Principles Financial Institutions
EPs	Equator Principles
ESHR	Environmental, Social and Human Rights
ESIA	Environmental and Social Impact ;Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMRs	Environmental and Social Monitoring Reports
ESMS	Environmental and Social Management System
ESP	Environmental and Social Policy
ESPRs	Environmental and Social Progress Reports
ESRs	Environmental and Social Reports
ETL	Electricity Transmission Line
EU	European Union
EU	European Union
EUNIS	European Nature Information System
FEBAS	Febas Çevre Laboratuvarı Analiz SAN. ve TİC.LTD.ŞTİ
FGD	Focus Group Discussions
FI	Financial Intermediary
GBV	Gender Based Violence
GHG	Green House Gas
GIIP	Good International Industry Practice
GLP	The Green Loan Principles
GM	Grievance Mechanism
GMR	Grievance Mechanism Report
IBA	Important Bird Area
IBRD	The International Bank for Reconstruction and Development
IESC	Independent Environmental and Social Consultant
IFC	International Finance Corporation
IFI	International Finance Institutions

ILO	International Labor Organization
IPA	Important Plant Area
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
Kalyon	Kalyon Enerji Yatırımları A.Ş.
KGM	General Directorate of Highways
KPIs	Key Performance Indicators
LIMP	Labor and Influx Management Plan
MoENR	Ministry of Energy and Natural Resources
MoEUCC	Ministry of Environment, and Urbanization and Climate Change
MoH	Ministry of Health
MoLSS	Ministry of Labor and Social Security
MoTMAC	Ministry of Transport, Maritime Affairs and Communications
NGOs	Non-Governmental Organizations
OHS	Occupational Health and Safety
OHTL	Overhead Transmission Line
PAPs	Project Affected Persons
PGA	Peak Ground Acceleration
PIF	Project Introduction File
PM	Particulate Matter
PR	Performance Requirement
PS	Performance Standards
RAMSAR	Convention on Wetlands of International Importance, Especially as Waterfowl Habitat
REGIO	REGIO Cultural Heritage Management Consultancy
RENC	Regulation on Environmental Noise Control
SAoI	Social Area of Influence
SEA/SH	Sexual Exploitation Abuse / Sexual Harassment
SEP	Stakeholder Engagement Plan
SPSS	Statistical Package for the Social Sciences Program
TEIAS	Turkish Electricity Transmission Corporation
TEMA	Turkish Foundation for Combating Soil Erosion, Reforesting and the Protection of Natural Habitats
The Project	R3-ELAZIĞ-1 Wind Power Plant
TurkStat	Turkish Statistical Institute
UKEF	UK Export Finance
UNFCCC	Framework Convention on Climate Change
VECs	Valued Ecosystem Components
WEEE	Waste Electrical and Electronic Equipment
WHO	World Health Organization
WPP	Wind Power Plant
WTG	Wind Turbine Generator
YEKA	Renewable Energy Resource Areas

I. INTRODUCTION

I.1 Project Background and Rationale

YEKA RES 3 Rüzgar Enerjisi Yatırımları A.Ş. (“Project Sponsor”), a subsidiary of Kalyon Enerji Yatırımları A.Ş. (Kalyon Enerji), is contemplating the development and construction of Wind Power Projects (WPP) under the Renewable Energy Resource Area, YEKA RES 3 Contest announced by the Ministry of Energy and Natural Resources (MoENR) in Türkiye's Official Gazette dated May 29, 2021, numbered 31495. By winning the competition announced by MoENR regarding the allocation of Renewable Energy Resource Areas and Connection Capacities based on Energy, Kalyon Enerji secured authorization for 5 WPP areas across different cities. The Storm Project is composed of 5 different sub-projects as defined above in Ankara, Bilecik, Bayburt, Elazığ and Trabzon. This ESIA Report has specifically been prepared for R3-ELAZIĞ-1 Wind Power Plant Project (the “Project”). Project Sponsor is responsible for the implementation of the Project at the local level.

Within the scope of the "Contest Announcement on the Allocation of Renewable Energy Resource Areas and Connection Capacities Based on Solar Energy" published in the Official Gazette dated May 29,2021 and 31495 numbered; YEKA RES-3 competitions were held on June 14,2022. YEKA (Renewable Energy Resource Areas) Right of Use Contract was signed on July 20, 2022 between the winner of the competition, Kalyon Enerji - and the Ministry of Energy and Natural Resources and handed over to the Project Sponsor. Local EIA studies were completed. Public Participation meetings were held and the MoEUCC issued an ‘EIA Positive’ decision on October 16, 2023 (given in Annex 1). Pre-license was given by the Ministry of Industry and Technology, numbered ÖN/11826-16/05444 and dated May 4, 2023. YEKAs are determined within the scope of administrative and technical studies carried out by the Ministry of Energy and Natural Resources and announced in the Official Gazette. Therefore, those who will participate in YEKA competitions know for which area they will apply.

The Project Sponsor has been developing R3-ELAZIĞ-1 Wind Power Plant Project with a total installed capacity of 42.6 MWm/40 MWe on an area of 1993.42 hectares. 10 turbines will be installed in the Project. R3-ELAZIĞ-1 WPP will be located in Elazığ Province, and Maden District and Akboğa, Hanevleri, Çayırköy, Dutpınar, Camikebir settlements in Türkiye. The maximum electricity production amount in the Project is planned as 127,578.9 MWh/year within the scope of the Project. Additionally, the production Pre-License for the Project has been issued by the Ministry of Energy and Natural Resources with License No: ÖN/11826-16/05444 and dated May 4, 2023 (see Annex-2).

Wind power plants play an important role in renewable energy sources, providing clean energy, energy independence, being cost-effective, and supporting rural development. Wind is an inexhaustible source of energy. Harnessing wind energy contributes to sustainability. Wind energy reduces air pollution impact and combats climate change by producing electricity without emitting greenhouse gases or pollutants. The establishment, development and maintenance of wind power plants create employment opportunities in various sectors. Wind farms often benefit rural communities by providing rental payments to landowners and/or creating local economic opportunities. Türkiye aims to reduce CO_2 emissions by 66.6 million tons by 2030. The share of renewable energy sources in the total installed capacity in Türkiye is 55 percent[1]. Wind Power Plants are among the cleanest and most sustainable resources. With the R3-ELAZIĞ-1 Wind Power Plant Project, Türkiye's climate target will be contributed, and renewable energy resources will be increased.

This Environmental and Social Impact Assessment report has been prepared based on the baseline conditions, the site visit realized in August 2023, information obtained from the Project Sponsor, internationally accepted principles and procedures and national legislation.

[1] *https://iklim.gov.tr/2053-yili-itibariyla-net-sifir-emisyon-hedefini-gerceklestirmeyi-ongoruyoruz-haber4173#:~:text=2030%20senesine%20kadar%20emisyon%20azalt%C4%B1m%C4%B1,pay%C4%B1n%C4%B1%20y%C3%BCzde%2055'e%20y%C3%BCkselttik.*

I.2 Purpose and Scope of the ESIA Report

The Project Sponsor is considering obtaining support from Export Credit Agencies who follows OECD Common Approaches and from Local Development Banks, which requires compliance with EP4, WB EHS Guidelines, IFC Performance Standards and Good International Industry Practices. Within this respect, a scoping report previously prepared by ENCON Environmental Consultancy Co. ("ENCON") in August 2023, has identified the requirement for a full-scale or a limited or focused environmental and social impact assessment (ESIA) and identified the environmental and social issues and impacts that are likely to be important and thus establish the scope of the assessment report to be prepared. This ESIA Report has been prepared by ENCON (ESIA Consultant or "ENCON") in the scope of the Environmental and Social Impact Assessment (ESIA) conducted for the STORM Project which includes the construction and operation of 5 wind power sub-project in Ankara, Bilecik, Bayburt, Elazığ and Trabzon. This ESIA Report -has been specifically prepared for R3-ELAZIĞ-1 Wind Power Plant Project (the "Project").

A detailed description of the national and international legal framework for the R3-ELAZIĞ-1 Wind Power Plant Project is given in Chapter III of this Report. Based on a detailed review and evaluation of a number of screening criteria defined in International Finance Cooperation's (IFC) policies and guidelines, Turkish EIA Regulation as well as Equator Principles, and European Bank for Reconstruction and Development (EBRD) Environmental and Social Policy and Performance Requirements, R3-ELAZIĞ-1 Wind Power Plant Project, with its specifically identified physical elements, aspects and facilities that are likely to generate potentially significant adverse environmental and social risks and impacts, has been proposed as a "Category A" Project. For "Category A" projects, a comprehensive full-scale ESIA is required to be conducted. Category A Projects are business activities with potential significant adverse environmental or social risks and/or impacts that are diverse, irreversible, or unprecedented (IFC Environmental and Social Categorization).

The specific reasons for this categorization are;

- Appendix 2 of EBRD ESP includes; "Large-scale wind power installations for energy production (wind farms)," where the Project with 42.6 MWm/40 MWe of installed capacity is considered as large scale.
- IFC Guidance Note 1 on the Assessment and Management of Environmental and Social Risks and Impacts states that "for certain projects, and particularly for greenfield investments and projects (including, but not limited to, major expansion or transformation-conversion activities) involving specifically identified physical elements, aspects and facilities that are likely to generate potentially significant adverse environmental and social risks and impacts, the client should conduct a comprehensive full-scale ESIA". R3-ELAZIĞ-1 WPP with its' associated facilities are considered among these greenfield projects.
- There are extensive mining activities in the area surrounding the R3-ELAZIĞ-1 WPP site. EBRD explicitly mentions consideration of cumulative environmental and social impacts for categorization of projects as Category A. For the R3-ELAZIĞ-1 WPP Project, it is imperative to comprehensively assess the potential cumulative impacts, especially considering the associated facilities (mainly access roads and electric transmission lines) and their interaction with the activities in the area, during the ESIA process.

To provide further evaluation in the scope of national and international categorization criteria for R3-ELAZIĞ-1 WPP, Turkish EIA Regulation is also considered as described below.

As Türkiye gained a candidate country status in EU access process in 1999, the Turkish EIA Regulation has been harmonized with the EU's EIA Directive with several revisions and amendments made on the regulation since then. In parallel to the categorization approach of EU's EIA Directive, the Turkish EIA Regulation requires an EIA Report to be prepared for the activities listed under Annex-1 of the EIA Regulation. Wind Power Plant projects are listed as Annex-1 activities (Annex 1, item 41). Thus, R3-ELAZIĞ-1 WPP is an Annex-1 activity according to the Turkish EIA Regulation.

This ESIA report summarizes project specific environmental and social measures and translates them into specific management actions. It will be continuously reviewed and updated as the Project progresses through detailed design and construction, by taking into account the following:

- Changes in national legislation and international standards;
- Changes to the Project design parameters during the detailed design and tender document preparation stages (if any); and
- Monitoring results.

The ESIA was developed based on the following source documents and information:

- Information provided by the Project Sponsor,
- R3-ELAZIĞ-1 Wind Power Plant Project Environmental Impact Assessment Final Report prepared by ENÇEV on September 2023,
- Technical papers from literature (in Turkish and English),
- Findings of the site visit performed by ENCON - on August 9, 2023,
- The requirements specified in the Terms of Reference (ToR) for the preparation of the ESIA,

The objectives of this ESIA are as follows:

- To conduct all Project activities in accordance with the applicable national legislation and in compliance with the IFC Performance Standards (PSs);
- To identify environmental and social risks and impacts and related mitigation measures by adopting the mitigation hierarchy, which anticipates and avoids, minimizes, and, where residual impacts remain, compensates or offsets risks and impacts;
- To prevent or compensate for any loss to the affected person;
- To enhance positive environmental and social outcomes;
- To ensure maximizing efficiency and minimizing costs in complying with environmental and social legislation and standards;
- To ensure that all stakeholders' concerns are addressed.

The content of this document is as follows:

- Chapter I: Introduction. This chapter introduces the Project background and rationale and also the purpose and the scope of the ESIA.
- Chapter II: Project Purpose and Description. This chapter is a description of the Project including its location, components, technical specifications, and a proposed schedule for implementation.
- Chapter III: Policy, Legal and Administrative Framework. This chapter explains national and international legal requirements, and also environmental agreements that are relevant to the Project.
- Chapter IV: Environmental and Social Baseline Condition. This chapter describes the baseline conditions in and around the proposed Project area, including physical, biological and socio-economic conditions.
- Chapter V: Environmental and Social Impact Assessment. This chapter assesses the potential positive and negative impacts/risks of the Project.
- Chapter VI: Project Alternatives. This chapter evaluates Project alternatives.
- Chapter VII: Environmental and Social Mitigation Measures and Monitoring. This chapter describes potential environmental and social mitigation measures associated with the project impacts. This chapter also describes planned monitoring activities.
- Chapter VIII: Environmental and Social Management System. This chapter gives information about environmental and social management structure, policies, capacity building implementations, and training.
- Chapter IX: Stakeholder Engagement. This chapter gives summary information about stakeholder activities which is included in detail in a separate plan.
- Chapter X: Conclusion. This chapter summarizes the ESIA by giving a brief summary of findings, assessment of significance, future considerations, and overall assessment.

II. PROJECT PURPOSE AND DESCRIPTION

The Project information given in this Chapter and the assessments to be done in the following chapters of the ESIA Report have been prepared based on the design information provided by the Project Sponsor. Project Sponsor plans to develop, construct and operate the R3-ELAZIĞ-1 WPP Project, consisting of 10 turbines, in Maden District of Elazığ. Within the scope of the Project, the annual maximum electricity production amount is planned as 127,578.9 MWh/year as per the EIA Report of the Project. Site visit work was carried out within the scope of the Project in August 2023. Field photos are shown in Figure II.1.



Figure II.1 Photos of Project Area

The 28th Conference of the Parties (COP28[2]) held in Dubai marked a pivotal moment as countries were urged to shift away from fossil fuels in their energy systems. Against this backdrop, Türkiye, a nation striving for sustainability, outlined ambitious goals at the conference, including becoming a net-zero emission country by 2053 and reducing absolute emissions by at least 35% by 2030[3]. Embracing the vision, Türkiye focuses on harnessing renewable energy, particularly through the strategic deployment of wind power plants. The alignment of Türkiye's aspirations with the European Union's Green Deal underscores the global commitment to combat climate change and transition towards cleaner, more sustainable energy sources. The outlined aims in Türkiye's Performance Report, such as increasing the ratio of renewable energy in electrical installed power and strengthening institutional capacities in the energy sector, highlight the nation's dedication to advancing its energy landscape. As Türkiye targets a significant increase in wind energy capacity by 2024,

[2] COP28 was the 28th annual United Nations (UN) climate meeting, where governments discuss how to limit and prepare for future climate change.

3 https://enerji.gov.tr/Media/Dizin/EIGM/tr/Raporlar/TUEP/T%C3%BCrkiye_National_Energy_Plan.pdf

these efforts contribute not only to national energy goals but also to the broader global agenda of mitigating climate change and promoting a sustainable future.

According to the Performance Report (2023 Performance Report[4]) published by the Ministry of Energy and Natural Resources of Türkiye, among Türkiye's 2024 aims are;

- The ratio of electrical installed power based on domestic and renewable energy sources to the total installed power will be increased from 59% to 60%.
- Studies will be carried out to increase energy efficiency.
- Institutional and sectoral capacity in energy fields will be strengthened.

Türkiye aims to increase the electricity installed capacity based on wind energy to 12,482 MW by 2024[5]. Within the scope of the Project, renewable energy production capacity will increase with both the WPP to be established in Elazığ and the other 4 sub-projects of the Project Sponsor.

Before starting the design within the scope of the Project, detailed desk studies and site evaluation were carried out by the Project Sponsor to determine wind resource, topography and grid connection feasibility. Within the scope of the Project, construction works are expected to last 12 months and the Project components are presented in the Table II.1.

Table II.1 Project Components

Project Component	Explanation
Turbine	10 turbines are planned
Switchyard Center	The switchyard center will be established. The plant will be managed from the Switchyard Center Building located in the switchyard center, which includes offices, toilets and teahouse (cafeteria).
Access Roads	The roads will be improved for ease of transportation between turbines.
Transmission Line	An energy transmission line will be established between switchyard and Maden transmission line.

Within the scope of the Project, the annual maximum electricity production amount is planned as 127,578.9 MWh/year with 10 turbines as per the EIA Report of the Project. The power plant area is 1993.42 ha and it is planned to construct 10 turbines, switchyard center, connection roads and transmission lines

As part of the Project, turbines complying with Occupational Health and Safety (OHS) Standard ISO 45001, Quality Management System ISO 9001, Environmental Management System ISO 14001, and Energy Management System ISO 50001 certifications will be utilized. Specifically, the ENERCON E138 EP3 E2 turbine model has been chosen for implementation.

The Project information given in this Chapter and the assessments to be done in the following chapters of the ESIA Report has been prepared based on the design information obtained at the time of Reconnaissance Site Visit, which was conducted in August 2023 and information obtained from the Project Sponsor.

[4] https://enerji.gov.tr//Media/Dizin/SGB/tr/Performans_Programlari/2023PP.pdf
[5] https://enerji.gov.tr//Media/Dizin/SGB/tr/Performans_Programlari/2023PP.pdf

II.1 Project Location

The Project will be carried out in Maden district of Elazığ. Elazığ is located in the Upper Euphrates Section, in the southwest of the Eastern Anatolia Region. The R3-ELAZIĞ-1 WPP Project is planned to be built and operated by YEKA RES 3 Rüzgar Enerjisi Yatırımları A.Ş. in the neighborhoods of Akboğa, Hanevleri, Çayırköy, Dutpınar of Maden district in Elazığ. The total area of the power plant site is 1993.42 hectares.

The turbine areas planned to be installed and operated are located approximately 40 km from Elazığ city center, 3.5 km from Maden district center. The distances of the Project area to settlements are presented in Table II.2.

Table II.2 Distance of Project Area to Settlements

Location	Distance (km)
Elazığ City Center	40
Maden District Center	3.5
Akboğa Village	0.75
Hanevleri Village	0.9
Çayırköy Village	0.75
Dutpınar Village	1.85

The turbines will be installed on the route determined in Maden district. The distances between turbines are presented in Table II.3.

Table II.3 Distances between Turbines

Turbines	Distance (m)
T1-T2	~ 360
T2-T3	~ 320
T3-T4	~ 1,260
T3-Switchyard	~ 630
Switchyard-T4	~ 680
T4-T5	~ 350
T5-T6	~ 325
T6-T7	~ 560
T7-T8	~ 300
T8-T9	~ 440
T9-T10	~ 380

The coordinates of the Project area are presented in Table II.4, the coordinates of the turbines are presented in Table II.5, and the switchyard center coordinates are presented in Table II.6.

Table II.4 Site Coordinates

UTM ED50 ZONE:35 DOM:27			Slice Middle Longitude (6˚-ED50)	
Point Name	Y	X		
K1	550812	4255717	K1	39
K2	551293	4255362	K2	39
K3	551483	4254820	K3	39
K4	551362	4254357	K4	39
K5	550931	4253762	K5	39
K6	550924	4253293	K6	39
K7	550459	4252709	K7	39
K8	549679	4252749	K8	39
K9	549567	4252309	K9	39
K10	549165	4251919	K10	39
K11	548790	4251340	K11	39
K12	549737	4251300	K12	39
K13	550167	4250758	K13	39
K14	551508	4250402	K14	39
K15	551967	4250372	K15	39
K16	552509	4250355	K16	39
K17	552897	4250631	K17	39
K18	553290	4250691	K18	39
K19	553673	4250612	K19	39
K20	554335	4250517	K20	39
K21	554774	4250136	K21	39
K22	554700	4248749	K22	39
K23	553453	4248749	K23	39
K24	552878	4248513	K24	39
K25	552653	4248403	K25	39
K26	551507	4248463	K26	39
K27	551322	4248546	K27	39
K28	550987	4248775	K28	39
K29	550780	4249116	K29	39
K30	550729	4249551	K30	39
K31	550543	4249784	K31	39
K32	550406	4249689	K32	39
K33	550251	4249257	K33	39
K34	550045	4249065	K34	39
K35	550009	4248745	K35	39
K36	549781	4248318	K36	39

UTM ED50 ZONE:35 DOM:27			Slice Middle Longitude (6˚-ED50)	
Point Name	Y	X		
K37	549543	4248197	K37	39
K38	549277	4248257	K38	39
K39	548820	4248300	K39	39
K40	548513	4248533	K40	39
K41	548418	4248951	K41	39
K42	548391	4249347	K42	39
K43	548547	4250003	K43	39
K44	548522	4253723	K44	39
K45	549220	4254177	K45	39
K46	549673	4255280	K46	39
K47	549993	4255640	K47	39

Table II.5 Turbines Coordinates

UTM ED50 ZONE:35 DOM:27			Mid Longitude (6˚ ED50)	
Point Name	Y	X		
T1	549408	4249822	T1	39
T2	549793	4249810	T2	39
T3	550105	4249942	T3	39
T4	551104	4249213	T4	39
T5	551437	4249297	T5	39
T6	551753	4249424	T6	39
T7	552243	4249279	T7	39
T8	552562	4249421	T8	39
T9	552965	4249578	T9	39
T10	553250	4249752	T10	39

Table II.6 Switchyard Center Coordinates

UTM ED50 ZONE:35 DOM:27			Mid Longitude (6˚ ED50)	
Point Name	Y	X		
1	550605,8536	4249796,974	1	39
2	550733,4984	4249799,698	2	39
3	550735,4315	4249709,754	3	39
4	550627,7183	4249707,522	4	39
5	550607,4626	4249726,069	5	39

The selection of the location for the Project is done by the Ministry of Energy and Natural Resources (MoENR). The methodology for determining the Project area and Project alternatives are detailed in Chapter VI.

The Renewable Energy Resource Areas (YEKA) Regulation, numbered 29852, was officially gazette and enforced on October 9, 2016. This regulation outlines the process for capacity allocation of areas designated for energy production. As part of the YEKA regulation, the MoENR is responsible for identifying the location of the Project area in coordination with other relevant Ministries. Subsequently, legal entities that successfully win the competition organized by the MoENR are obligated to execute the Project within the specified area, in accordance with the contract signed with MoENR.

The selection of the Project's location is influenced by several crucial factors, which can be summarized as wind speed, topography, accessibility, infrastructure and environment. The map showing the location of the Project is presented in Figure II.2 and the map showing the turbine points and switchyard location is presented in **Figure II.3**.

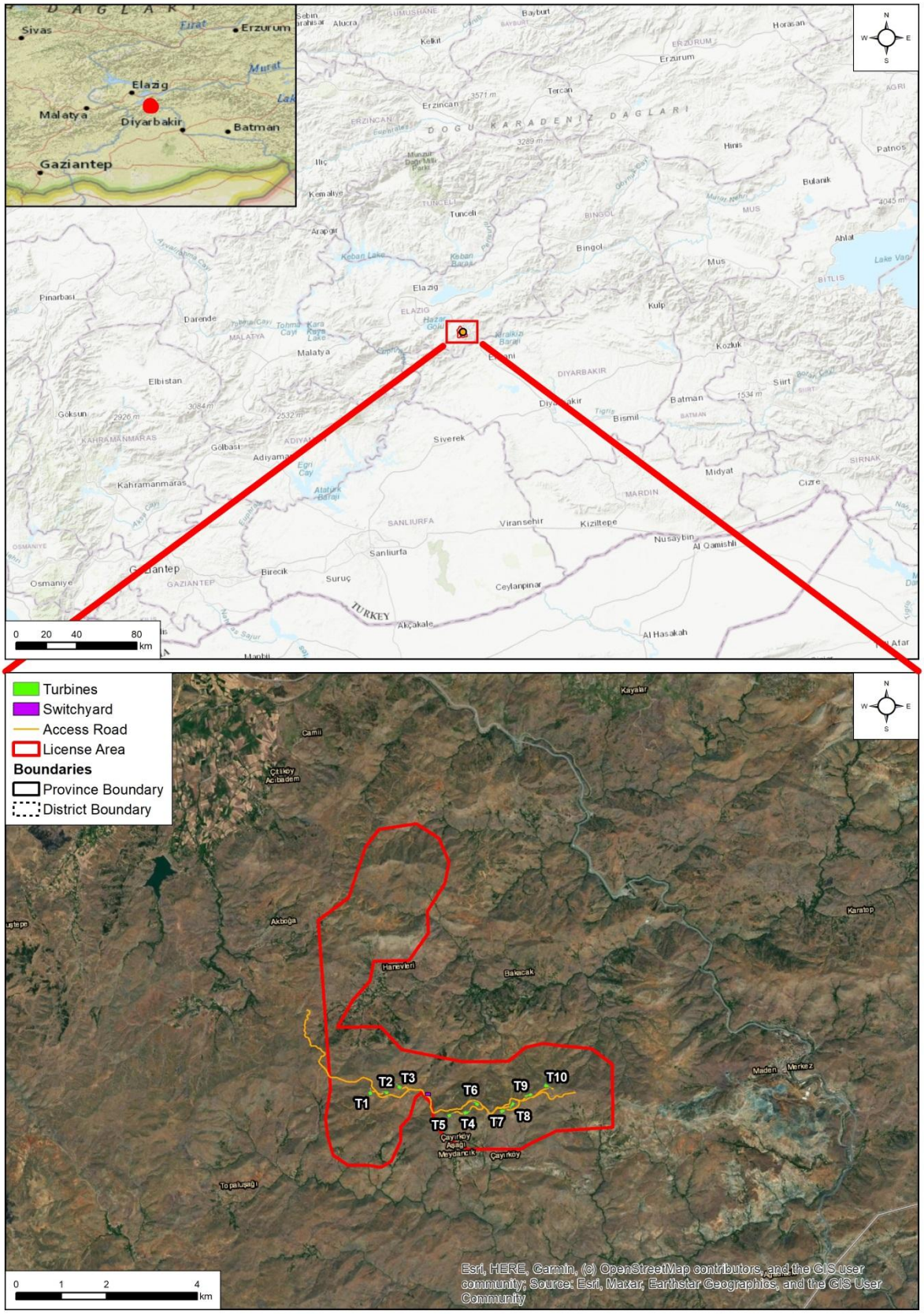


Figure II.2. Project Area

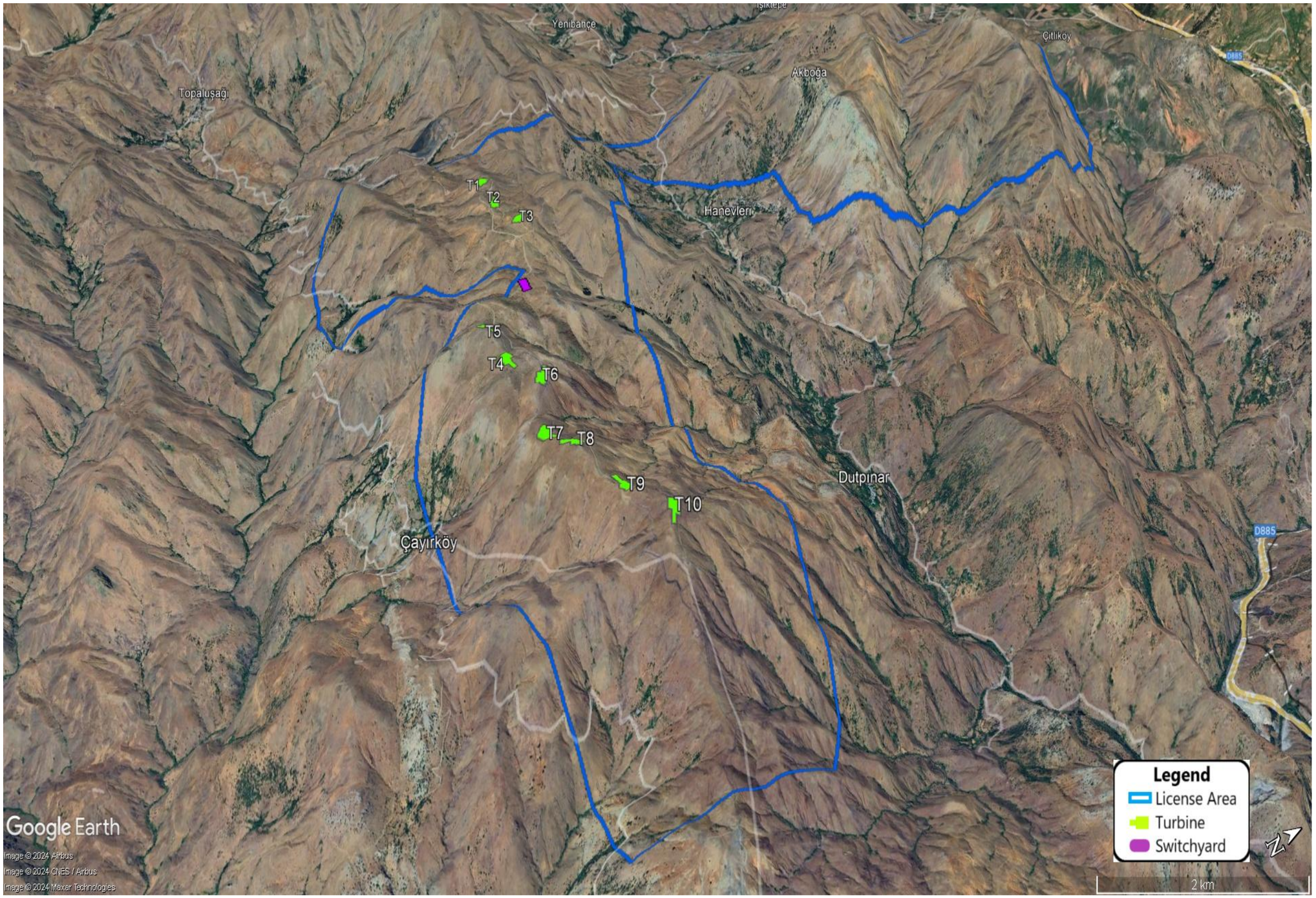


Figure II.3 Turbine Points

II.2 Land Ownership Status

The Project site is located in Elazığ Province Maden district; Çayırköy neighborhood. When the power plant area of the Project is evaluated, it is observed that it consists of pasture, forest, agriculture, bare land and settlement areas, and turbine areas consist of pasture, woodland, bare land, stony and rocky areas. The closest agricultural area to the turbine area is located at a distance of 700 m.

The parcels in the license area, land sizes and qualities, and the percentage of the land covered by the license area are presented in the Table II.7.

Table II.7 Project Area and Land Status

Row Labels	Number of Affected Parcels	Percent (%)	Total Area of the Affected Parcel (m^2)	Area to be Expropriated (m^2)	Area to be Easement Right Established (m^2)	Total Area to be Acquired (m^2)	Percent of Area to be Acquired (%)
Akboga	**25**	**48.1**	**1,095,052.05**	**16,241.04**	**0**	**16,241.04**	**4.4**
Treasury	11	21.2	1,038,362.32	14,435.27	0	14,435.27	3.9
Private	14	26.9	56,689.73	1,805.77	0	1,805.77	0.5
Cayirkoy	**2**	**3.8**	**7,606,778.57**	**249,036.46**	**2,671.86**	**251,708.32**	**68.1**
Treasury	1	1.9	5,177,192.14	112,426.71	1,427.45	113,854.16	30.8
Public Common Goods	1	1.9	2,429,586.43	136,609.75	1,244.40	137,854.16	37.3
Dutpinar	**1**	**1.9**	**3,862,645.92**	**35,975.36**	**1,730.68**	**37,706.04**	**10.2**
Public Common Goods	1	1.9	3,862,645.92	35,975.36	1,730.68	37,706.04	10.2
Hanevleri	**1**	**1.9**	**929,564.45**	**48,551.80**	**0**	**48,551.80**	**13.2**
Public Common Goods	1	1.9	929,564.45	48,551.80	0	48,551.80	13.2
Isıktepe	**18**	**34.7**	**1,456,478.08**	**12,024.08**	**0**	**12,024.08**	**3.3**
Treasury	5	9.6	6,571.00	4,750.17	0	4,750.17	1.3
Village Legal Entity	3	5.9	6,331.58	331.6	0	331.6	0.1
Public Common Goods	1	1.9	1,409,071.25	1,807.58	0	1,807.58	0.5
Private	9	17.3	34,504.25	5,134.73	0	5,134.73	1.4
Çitli	**5**	**9.6**	**605,404.23**	**2,892.72**	**0**	**2,892.72**	**0.8**
Private	5	9.6	605,404.23	2,892.72	0	2,892.72	0.8
Grand Total	**52**	**100.00**	**15,555,923.30**	**364,721.46**	**4,402.54**	**369,124.00**	**100.00**

II.3 Project Components

Within the scope of the Project, the annual maximum electricity production amount is planned as 127,578.9 MWh/year with 10 turbines as per EIA report of the Project. The power plant area is 1993.42 ha and it is planned to construct 10 turbines, switchyard center, connection roads and transmission lines.

Turbines:

ENERCON E138 EP3 E2 model will be installed within the scope of the Project. There will be 10 transformers with 0.63/33.6 kV 5000 kVA specifications inside the turbines. ENERCON turbine specifications are described in the Table II.8.

Table II.8 Turbine Specifications

Turbine Specifications	**E138 EP3 E2**	
Nominal Power	4.200 kW	
Wind Class	IEC SA	
Rotor Diameter	138.25 m	
Hub height	96 m	
Blade length	67.795m	
Gearbox type	Gearless	
Grid frequency	50/60 Hz	
Estimated Noise level	106 dB	
Guaranteed Availability	97%	
Characteristic	**Value**	**Unit**
Nominal power (power-optimised operating mode)9	4200	kW
Max. sound power level (power-optimised operating mode)	106.0	dB(A)
Nominal wind speed (power-optimised operating mode)	15	m/s
Nominal speed (power-optimised operating mode)	10.8	rpm
Speed setpoint (power-optimised operating mode)	11.1	rpm
Cut-in wind speed	2	m/s
Power reduction wind speed	22	m/s
Cut-out wind speed	28	m/s
Maximum idle speed	2.5	rpm
Minimum power consumption	19	kW
Maximum power consumption	124	kW
Operating range with standard equipment	-25 to +40	°C
Operating range with cold climate equipment	-40 to +40	°C
Operating range with hot climate equipment	-25 to +40	°C
Nominal power range with standard equipment	-15 to +25	°C
Nominal power range with cold climate equipment	-30 to +25	°C
Nominal power range with hot climate equipment	-15 to +33	°C

Switchyard and Switchyard Center Building:

The electrical energy to be obtained as a result of the establishment of 10 turbines in the Wind Power Plant will be transferred to the transformers as AC (42.6 MWm/40 MWe alternating current) electricity, and the electricity collected in the individual transformers will come to the switchyard through the transmission channel to be laid between the turbines and underground. There will be one transformer with 33.6/154 kV 50/62.5 MVA specifications within the switchyard. The coordinates of the switchyard center were also given in the Table II.6. The plant will be managed from the Switchyard Center Building, which includes offices, toilets and teahouse (cafeteria) that is located within the switchyard area and there will be no additional buildings outside the switchyard area.

Electricity Transmission Line (ETL)

An approximately 8 km long ETL that will consist of 32 towers will be constructed to transmit the electricity to be generated by the Project. The Project Sponsor will construct the ETL and the Electricity Transmission Corporation (TEİAŞ) will be responsible for the operation of the ETL in line with the national requirements. The transmission line will be in the form of a single line. The electrical energy to be obtained in the R3-ELAZIĞ-1 Wind Power Plant will be transferred to the transformers as AC (alternating current) electricity, and the electricity collected in the individual transformers will come to the switchyard through the transmission channel to be laid between the turbines and underground. The energy coming from the turbines will be transferred to the interconnected system via Maden WPP TM with 1272 MCM, 154 kV overhead line. Electrical energy transmission lines with a voltage of 154 kV (kilovolt) and above and a continuous length of 5 km and above are subject to the Annex-2 list in the Turkish EIA Regulation. The Electricity Transmission Line is the associated facility of the Project and its financing will be provided by TEİAŞ. It is also subject to Annex-2 list of the EIA Regulation. An institutional opinion was given for ETL by the Energy Market Regulatory Authority (EMRA), Electricity Market Department on 09.04.2023 (see Annex-3).

Access Roads

Within the scope of the Project, after the construction site facility is established, the existing roads will be improved for the access to turbine locations if necessary according to the Route Survey conducted by the EPC Company for the Project (see Annex 4). Material will be supplied to the Project area from İzmir and İskenderun. According to the Route Survey, there are access difficulties on the roads. In this context, road improvements will be provided. Access to the Project site is provided from the D885 (Diyarbakır Elazığ Road) Highway.

Improvement of Access Roads for Transfer of Turbines

Turbine components are planned to be transported from three separate locations, namely the TPI Blade Factory Warehouse in İzmir Çiğli, the facility of Ateş Wind Power Company in İzmir and the İskenderun Port. The following activities will be carried out during the transportation of turbine components within the scope of Project activities:

- As an alternative to the narrow roads identified as a result of the route study, a new side road will be constructed to be suitable for passage.

Also, no tree felling is foreseen as part of the Project's road improvements.

II.4 Project Schedule

It is planned that the engineering and construction phase of the Project will last for 12 months and the operation phase will be started. After the completion of the Project construction, the Defects Liability Period

(DLP) begins and lasts for 12 months. The license period of the Project is foreseen as 49 years. Details of the Project schedule are shown in Table II.9.

Table II.9 Project Schedule

Subject	Start	Finish
NTP- WTG Manufacturer	01-Jun-23	16-Jun-23
Permits & Approvals	20-Jul-22	16-Aug-24
Signing of the Renewable Energy Source Contract	20-Jul-22	
Technical Interaction Analysis Report	01-Jan-23	15-Jan-24
Taking the Decision within the Scope of the EIA Regulation	01-Jan-23	15-Jan-24
Bird Migration Routes Monitoring	01-Jan-23	15-Jan-24
Wind Measurement Station Data Collection	02-Jan-23	06-Jul-24
ETL Etude (Projecting, EIA, Ownership, Exploration)	14-Apr-23	22-Jul-24
Obtaining the Pre-License	17-Apr-23	
Current Map Purchases and Approval	15-Jan-24*	06-Mar-24
Preparation of Road Projects	15-Jan-24*	14-Feb-24
TEİAS Connection Agreement	15-Jan-24	18-Feb-24
TEİAS Pre-Facility Works Contract	15-Jan-24	06-Feb-24
Private Land Expropriation	15-Jan-24*	02-May-24
Obtaining the Opinions of the Institution Based on the Development	15-Feb-24*	15-Mar-24
Change of Purpose of Allocation of Pasture Land	15-Feb-24*	02-Jun-24
MoENR Preliminary Project Approval	19-Feb-24*	12-Mar-24
Pre-License Amendment (Turbine Location and Switchyard)	07-Mar-24*	20-Apr-24
Development Plan Application and Approval	03-Jun-24*	01-Aug-24
Treasury Land Easement Rights	03-Jun-24	16-Jul-24
Obtaining Construction License	02-Aug-24	06-Aug-24
Obtaining Production License	07-Aug-24	11-Aug-24
MoENR Final Project Approval	12-Aug-24	16-Aug-24
MoENR Temporary Admission	12-Aug-24	16-Aug-24
Progress Reports	07-Mar-23	15-Jan-24
Engineering	04-May-23	14-Mar-24
WF Engineering	04-May-23	10-Dec-23
Substation Contracting & Engineering	01-Dec-23	01-Jan-24
OHTL Contracting, Engineering & Legal Permits	30-Nov-23	14-Mar-24
Access Roads & Erection Crane Platform Engineering	04-May-23	30-Sep-23
Procurement	21-Jan-24	15-Sep-24
WTG Components 01 (Tower, Nacelle, Hub & Blades etc.)	20-May-24*	07-Jun-24
WTG Components 02 (Tower, Nacelle, Hub & Blades etc.)	03-Jun-24*	16-Jun-24
WTG Components 03 (Tower, Nacelle, Hub & Blades etc.)	03-Jun-24*	16-Jun-24

Cables	07-Jun-24	11-Jun-24
WTG Components 04 (Tower, Nacelle, Hub & Blades etc.)	20-Jun-24*	04-Jul-24
WTG Components 05 (Tower, Nacelle, Hub & Blades etc.)	04-Jul-24*	17-Jul-24
SCADA & Plant Controller	18-Jul-24	22-Jul-24
WTG Components 06 (Tower, Nacelle, Hub & Blades etc.)	18-Jul-24*	31-Jul-24
WTG Components 07 (Tower, Nacelle, Hub & Blades etc.)	18-Jul-24*	31-Jul-24
WTG Components 08 (Tower, Nacelle, Hub & Blades etc.)	02-Aug-24*	16-Aug-24
WTG Components 09 (Tower, Nacelle, Hub & Blades etc.)	16-Aug-24*	29-Aug-24
WTG Components 10 (Tower, Nacelle, Hub & Blades etc.)	02-Sep-24*	15-Sep-24
Foundation	21-Jan-24	03-Apr-24
Construction	01-Oct-23	26-Sep-24
Mobilization at Site	01-Nov-23	14-May-24
Construction of Access Roads & Crane Pads	01-Nov-23	15-Feb-24
SCADA Installation & Commissioning	23-Jul-24	21-Aug-24
WTG-01- Civil Works	01-Oct-23	29-Feb-24
WTG-01- Mechanical & Electrical Installation	01-Dec-23	18-Jun-24
WTG-02- Civil Works	03-Oct-23	03-Mar-24
WTG-02- Mechanical & Electrical Installation	02-Dec-23	27-Jun-24
WTG-03- Civil Works	05-Oct-23	06-Mar-24
WTG-03- Mechanical & Electrical Installation	03-Dec-23	29-Jun-24
WTG-04- Civil Works	07-Oct-23	09-Mar-24
WTG-04- Mechanical & Electrical Installation	04-Dec-23	15-Jul-24
WTG-05- Civil Works	09-Oct-23	12-Mar-24
WTG-05- Mechanical & Electrical Installation	05-Dec-23	28-Jul-24
WTG-06- Civil Works	11-Oct-23	15-Mar-24
WTG-06- Mechanical & Electrical Installation	06-Dec-23	11-Aug-24
WTG-07- Civil Works	13-Oct-23	18-Mar-24
WTG-07- Mechanical & Electrical Installation	07-Dec-23	13-Aug-24
WTG-08- Civil Works	15-Oct-23	21-Mar-24
WTG-08- Mechanical & Electrical Installation	08-Dec-23	27-Aug-24
WTG-09- Civil Works	17-Oct-23	24-Mar-24
WTG-09- Mechanical & Electrical Installation	19-Dec-23	09-Sep-24
WTG-10- Civil Works	19-Oct-23	27-Mar-24
WTG-10- Mechanical & Electrical Installation	30-Dec-23	26-Sep-24
Substation Construction	15-Jan-24*	27-Jun-24
OHTL Construction	15-Mar-24*	27-Jun-24
Final Acceptance & Commercial Operation of WF		21-Aug-24
Substation Provisional Acceptance	03-Jul-24	17-Jul-24

OHTL Provisional Acceptance	28-Jun-24	02-Jul-24

II.5 Lifetime of the Project

The lifespan of wind turbines can be more than 30 years with regular maintenance and repair. According to the final EIA report approved for the Project, the license period of this Project is 49 years. The lifespan of the Project in question is determined as 49 years. Equipment that has completed its life will be renewed and put into operation again. However, if the activity does not continue, the equipment in question will be dismantled and the areas it covers will be returned to its natural state. It will be reintroduced to nature by carrying out planting works appropriate to the topographic, climatic and vegetation structure.

II.6 Summary of Project Activities

The Project's main component is construction of WPP. In addition, the energy transmission line is the associated facility of the Project. It is planned to construct 10 turbines, switchyard center, connection roads and transmission lines.

For the Project, the pre-construction works will start and last for one month. The continuation of this process is the construction phase of the Project, which will last 11 months.

There will be 10, 80 and 10 employees during the pre-construction, construction and operation phases of the Project, respectively. During the pre-construction and construction phases of the Project, there will be a camp area where the employees can meet their basic requirements such as toilets, but there will be no accommodation on the construction site. Employees will stay in nearby hotels and/or rental houses or own homes. The prefabricated structures in the camp area will include administrative offices, cafeteria, storage area, and toilets (7-8 containers). During operation phase of the Project, all facilities such as offices, toilets, cafeteria etc. will be located in the Switchyard Center Building. Workers will stay in nearby hotels and/or rental houses or in their own homes, as during the construction phase.

The activities to be carried out during the phases of the Project, their descriptions, impacts on environmental and social attributes, timeline, personnel and resource requirements and generation of waste and wastewater are summarized in **Table II.10**.

Table II.10 Summary of Project Activities

Phase	Activities	Description	Timeline	Personnel and Resources Requirements	Generated Waste/Wastewater	Impacts on E&S attributes
Pre-Construction	**Access Road Construction**	• Construction of access roads to the site to facilitate transportation of construction materials and equipment	All pre-construction activities will last 1 month	• 10 personnel for pre-construction • Machinery, vehicles and equipment • Domestic water for employees' use (2.28 m^3/day) • Food for employees' use • Water for dust suppression (8 m^3/day) • Office materials • Oil and fuel	• 11.3 kg/day solid waste • 1.970 m^3/day wastewater	• Air Quality • Climate Change • Soil and Soil Quality • Water Resources and Water Quality • Noise and Vibration • Use of Resources and Waste Management • Landscape and Visual • Socioeconomic Environment • Community Health and Safety and Security • Labor Force and Working Conditions • Biological Environment • Cultural Heritage
	Mobilization to the site	• Transportation of all necessary equipment, tools, project documents, machines and vehicles to the site • Arrival of the first pre-construction employees to the project location				
	Installation of Temporary Facilities	• Installation of administrative offices, cafeteria, storage area and toilets				
	Vegetation Clearing and Land Preparation	• Grading and preparation of the construction site, including excavation and transportation of soil where necessary				
Construction	**Safety and Security**	• Installation of security elements, fencing and security systems to protect employees and prevent unauthorized access	All construction activities will last 11 months	• 80 personnel • Machinery, vehicles and equipment • Domestic water for employees' use (18.24 m3/day) • Food for employees' use • Water for dust suppression (8 m3/day) • Office materials • Oil and fuel	• 90.4 kg/day solid waste • 15.760 m3/day wastewater	• Air Quality • Climate Change • Soil and Soil Quality • Water Resources and Water Quality • Noise and Vibration • Use of Resources and Waste Management • Landscape and Visual • Socioeconomic Environment • Community Health and Safety and Security • Labor Force and Working Conditions • Biological Environment • Cultural Heritage
	Electrical Setup	• Putting in place electrical systems, control panels, and wiring				
	Foundation Excavation and Pouring	• Excavation of foundation pits for wind turbine towers and pouring concrete to firmly anchor the tower bases				
	Switchyard Center Construction	• The switchyard center will be established. The plant will be managed from the Switchyard Center Building, which includes offices, toilets and teahouse (cafeteria).				
	Turbine Component Transportation and Assembly	• Transportation of turbine components to site and their assembly, including tower assembly, blade assembly and nacelle assembly				
	Electrical Infrastructure Installation	• Installation of electrical infrastructure, including transformers, substations and underground cables				
	Erection of Wind Turbine Towers	• Erecting wind turbine towers with proper alignment				
	Testing and Commissioning	• Conducting tests and inspections to ensure that turbines and related infrastructure are operational and meet safety and performance standards				
Operation	**Turbine Operation and Maintenance**	• Performing routine maintenance activities on turbines, including inspections, lubrication and component replacement	The lifespan of the Project is 49 years	• 10 personnel • Machinery, vehicles and equipment • Domestic water for employees' use (2.28 m3/day) • Food for employees' use • Office materials • Oil and fuel	• 11.3 kg/day solid waste • 1.970 m^3/day wastewater	• Air Quality • Climate Change • Soil and Soil Quality • Water Resources and Water Quality • Noise and Vibration • Use of Resources and Waste Management • Landscape and Visual • Socioeconomic Environment • Community Health and Safety and Security • Labor Force and Working Conditions • Biological Environment • Cultural Heritage
	Access Road Maintenance	• Maintenance of access roads to ensure they remain passable for maintenance and emergency vehicles				
	Decommissioning	• Dismantling and removal of decommissioned turbines and infrastructure at the end of their operational life				

III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

This chapter is constructed to elucidate the main aspects of the legal and administrative framework followed in the design of this ESIA. Various national legislation and international standards explained in the following sections are also to be complied with during different phases of the Project, including land preparation, construction and operation.

Administrative structure in Türkiye is governed by central and local administrations. The central administration is organized so that the country is divided into provinces and the provinces into further smaller divisions (i.e., districts, municipalities, villages/neighborhoods) according to geographic and economic conditions and the need for public services. For the purpose of meeting collective local needs, the populations of provinces, municipalities and villages/neighborhoods are administered by units of local government established by law (Toksoz, F., 2006).

Ministries are the units of central administration. Ministry of Environment, Urbanization and Climate Change (MoEUCC) and The Ministry of Energy and Natural Resources are the key central administrations in the scope of the R3-ELAZIĞ-1 Wind Power Plant Project. Under the Ministry of Energy and Natural Resources (MoENR), YEKA RES 3 Rüzgar Enerjisi Yatırımları A.Ş. is the authority responsible from the implementation of the Project. Local branches of ministries area composed of provincial organizations subordinate to governors and district organizations subordinate to the district governors (Hacettepe University, 2015)[6]. At the local level, municipality mayors and the headmen of the villages/neighborhoods (mukhtar) are the representatives of the administrative structure.

In Türkiye, the Ministry of Environment, Urbanization and Climate Change (MoEUCC) is the responsible organization for the implementation of policies adopted for the protection and conservation of the environment and for sustainable development and management of natural resources. Thus, the MoEUCC and MoENR will be the authorities which the Project Sponsor will collaborate with regarding the management of environmental aspects of the Project in national context.

The MoEUCC has an overall coordinating role for the development and implementation of environmental policies in Türkiye, including the approximation process for the EU Environmental Acquis. The MoEUCC is composed of 22 different general directorates and departments. The general directorates, which are relevant to or may have an interest in the R3-ELAZIĞ-1 Wind Power Plant Project, are listed below:

- General Directorate of Environmental Management
- General Directorate of EIA, Permit and Inspection
- General Directorate of Spatial Planning
- General Directorate for Protection of Natural Assets
- General Directorate of National Estate
- General Directorate of Meteorological Services

Main environmental responsibilities of the MoEUCC are summarized below:

- Prepare the legislation on environment, public works, and housing development and monitor and audit the related implementations.
- Identify the principles and policies on environmental protection, rehabilitation of environment and prevention of environmental pollution, develop standards, criteria and programs in this context; outline the principles for implementing and monitoring these standards and criteria; undertake the works related to climate change.
- Assess the impacts of all facilities/activities that pollute the environment due to their activities resulting in solid, liquid or gaseous waste disposal/discharge into receiving environments; monitor, audit and issue the permits of such facilities/activities;
- Perform the measurements/analyses and monitoring studies concerning receiving environments.
- Establish the plans and policies regarding the global climate change and measures to be taken against its effects.

[6] *Hacettepe University, Department of Political Science and Public Administration, April, 2015*

For the management of environmental issues, MoEUCC collaborates with other ministries, government agencies and relevant stakeholders. Ministries (through related General Directorates), which would be relevant to or may have an interest in the Project, are listed below:

- Ministry of Energy and Natural Resources
  - General Directorate of Energy Affairs
  - Department of Energy Efficiency and Environment
  - Energy Market Regulatory Authority
  - Türkiye Electricity Transmission Corporation (TEİAŞ)
- Ministry of Transport and Infrastructure
  - General Directorate of Highways (KGM)
- Ministry of Agriculture and Forestry
  - General Directorate of Nature Protection and National Parks
  - General Directorate of Water Management
  - General Directorate of State Hydraulic Works
  - General Directorate of Forestry
  - General Directorate of Agricultural Reform
- Ministry of Culture and Tourism
  - General Directorate of Cultural Heritage and Museums
- Ministry of Labor and Social Security
  - General Directorate of Occupational Health and Safety
  - General Directorate of Labor
- Ministry of Health
  - General Directorate of Health Services

Provincial, regional and district level administrations are the field organizations of the Ministries. Under the MoENR Regional Directorate is the related local authority.

MoEUCC, Ministry of Agriculture and Forestry, Ministry of Culture and Tourism and Ministry of Health have provincial directorates in the province under the related governorates. Also, these governorates have Energy Management Units that cooperate with MoENR related energy projects. Provincial directorates under the Elazığ Governorate are the local governmental authorities related with the Project.

Regarding the cultural heritage, Elazığ Regional Directorate of the Conservation of Cultural Assets under the Ministry of Culture and Tourism will be the responsible authority.

III.1 Turkish Legislation

The key national laws and regulations presented in this section include the legal requirements to reduce the potential environmental impacts that may arise from the construction and operational activities of the Project. Turkish Legislation related to the Project is presented in the following sections under relevant subtopics.

Turkish Environmental Law (Law No: 2872), which came into force in 1983, handles environmental issues on a very broad scope. Under the Environmental Law, environmental regulations have been developed in line with national and international initiative and standards, and some of them have been revised recently to be harmonized with the European Union (EU) Directives in the scope of pre-accession efforts of Türkiye.

Complementary to the Environmental Law and its regulations, the laws listed below also govern the protection and conservation of the environment, prevention and control of pollution, implementation of measures for the prevention of pollution, health and safety and labor issues:

- Electricity Market Law (Law No: 6446)
- Energy Efficiency Law (Law No: 5627)
- Expropriation Law (Law No: 2942)
- Forestry Law (Law No:6831)
- Groundwater Law (Law No: 167)
- Labor Law (Law No:4857)
- Law on the Conservation of Cultural and Natural Assets (Law No:2863)
- Law on Soil Protection and Land Use (Law No:5403)
- Municipality Law (Law No: 5393)
- National Parks Law (Law No: 2873)
- Pasture Law (Law No:4342)
- Public Health Law (Law No: 1593)
- Traffic Law (Law No:2918)

III.1.1 Turkish Environmental, Health and Safety Legislation

Environmental Law No.2872, which is ratified in August 1983 (Official Gazette dated August 11, 1983 and numbered 18132), is one of the principal legislations related to the Project. Several by-laws, regulations and decrees are enforced under the Environmental Law.

The Environmental Impact Assessment (EIA) Regulation (Official Gazette dated July 29, 2022 and numbered 31907) defines the administrative and technical procedures and principles to be followed throughout the EIA process and is largely in line with the EU Directive on EIA. When an activity (a Project) is planned, the Project developer is responsible for preparing an EIA Report along with many other permits required to realize the Project. However, facilities are subject to the preparation of an EIA Report depending on the type of facility, its capacity or the location of the activity. The activities that are subject to the provisions of the Environmental Impact Assessment Regulation are listed in Annex I and Annex II of the Regulation. For Annex I activities a full EIA Report is required and those Projects go through the full EIA process. For Annex II activities, a Project Introduction File (PIF) is prepared in accordance with the outline given in the Regulation and the relevant process has to be conducted. As a result of the submission of PIF, if “EIA is required” decision is given, a full EIA Report is prepared.

The EIA process starts with submitting a brief report (EIA Application File), summarizing the characteristics of the Project and the impact area, and the potential environmental impacts and mitigation measures, prepared according to the format provided in Annex III of the EIA Regulation to the Ministry of Environment, Urbanization and Climate Change (MoEUCC). Then the MoEUCC, General Directorate of EIA, Permit and Inspection forms a committee from related governmental and non-governmental agencies, which also includes the Project Owner and the consultant that would prepare the EIA report. With the formation of this committee the scoping phase starts.

This committee aims to define the scope of the EIA report to be prepared for the Project. The EIA scope is defined based on findings of the committee and the comments and suggestions received from public information and participation meeting to be held at the Project site. The purpose of the meeting is to give information regarding the Project and take the opinion of the public and answer their questions regarding the Project.

In addition, the MoEUCC shall announce that the EIA process regarding the Project has been initiated and information regarding the EIA process may be obtained also via the internet. The scoping phase is completed with a meeting of this committee during which the EIA scope is agreed on. Based on the agreed scope, the EIA studies are conducted, and the report is prepared. After the submission of the EIA Report to

the General Directorate of EIA, Permit and Inspection, it is checked with regard to the contents to decide whether the report is suitable for starting the review process. If the content of the report is found to be appropriate, the review period starts and ends with either a positive or negative decision.

MoEUCC and the governorships are responsible for informing the public that the review period of the EIA Report is started via announcements using local and national media, boards, internet etc. Thus, the public will be able to access the EIA Report from the web site of the MoEUCC or the relevant Provincial Directorate and comment on the report. Those comments are reviewed in the Review Commission meeting and the results are reflected in the EIA Report.

The rest of the Turkish Environmental, Health and Safety (EHS) Legislation that the Project will comply with are presented in **Table III.1**.

Table III.1 Turkish EHS Legislation Related to the Project

Legislation*	Official Gazette Date	Official Gazette Number	Implications for the Project Phases
Waste Management			
Waste Management Regulation	April 2, 2015	29314	• Management of waste generated by construction staff during the construction phase and by operation staff during the operation phase • Hazardous waste generated at construction and operation phases
Regulation on Landfill of Wastes	March 26, 2010	27533	• Disposal of wastes that cannot be recycled in the project to landfill facilities
Waste Oil Management Regulation	December 21, 2019	30985	• Waste oils generated at construction and operations phases.
Regulation on the Control of Packaging Waste	June 26, 2021	31523	• Packaging wastes generated at construction and operation phases.
Regulation on the Control of Medical Waste	January 25, 2017	29959	• Medical waste generated at construction and operation phases.
Regulation on the Control of End-of-Life Tires	November 25, 2006	26357	• End-of-Life tires generated at construction and operation phases.
Regulation on the Control of Waste Batteries and Accumulators	August 31, 2004	25569	• Waste batteries and accumulators generated at construction and operation phases.
Regulation on the Management of Waste Electrical and Electronic Equipment	December 26, 2022	32055	• Management of to be generated waste electrical and electronic goods that to be used in construction and operation stages.
Regulation on the Control of Excavation Soil, Construction and Demolition Waste	March 18, 2004	25406	• Excavation materials, construction and demolition wastes generated during construction phase.
Regulation on the Control of End-of-Life Vehicles	December 30, 2009	27448	• Management of waste vehicles generated in the Project Area.
Regulation on Zero Waste	July 12, 2019	30829	• Determining the general principles of the zero waste management system which aims to protect the environment and human health and all resources in the waste management processes of raw materials and natural resources.
Regulation On Health and Safety Measures in Working with Asbestos	January 25, 2013	28539	• Preventing the exposure of employees to asbestos dust in asbestos removal, demolition, repair, maintenance and removal works and protecting them from health risks arising from this exposure, determining limit values and other special precautions during construction phase.
Water Quality Control and Management			

Legislation*	Official Gazette Date	Official Gazette Number	Implications for the Project Phases
Water Pollution Control Regulation	December 31, 2004	25687	• Preventing the pollution of water resources by wastewater generated by construction site personnel during the construction phase and by operation personnel during the operation phase, and by wastewater generated as a result of cleaning/washing of vehicles.
Regulation on the Water Intended for Human Consumption	February 17, 2005	25730	• Drinking water supplied during construction and operation phases.
Regulation on the Control of Pollution Caused by Hazardous Substances in and around Water Environment	November 26, 2005	26005	• Management of hazardous substances at construction and operation phases in and around water resources.
Air Quality Control and Management			
Regulation on the Control of Air Pollution from Heating	January 13, 2005	25699	• Heating of the operational buildings/stations during construction and operation phase.
Regulation on the Assessment and Management of Air Quality	June 6, 2008	26898	• Emissions during construction and operation phase.
Industrial Air Pollution Control Regulation	July 3, 2009	27277	• Dust emissions due to the construction activities performed at construction phase.
Regulation on Exhaust Gas Emission Control	March 11, 2017	30004	• Operation of Project vehicles at all phases of the Project.
Noise Control and Management			
Regulation on the Environmental Noise Emissions Caused by Equipment Used Outdoors	December 30, 2006	26392	• Noise levels caused by noise sources within the Project site at the construction and operation phases.
Regulation on Environmental Noise Control	November 30, 2022	32029	• Noise emissions at construction and operation phases
Soil Quality Control and Management			
Regulation on the Control of Soil Pollution and Lands Contaminated by Point Sources	June 8, 2010	27605	• Risks of soil contamination at construction and operation phases.
Environmental Management, Permitting and Planning			
Environmental Impact Assessment Regulation	July 29, 2022	31907	• Impacts during construction and operation phases.
Environmental Auditing Regulation	June 12, 2021	31509	• Environmental audits conducted by either Project Owner or governmental authorities during construction and operation phases.
Environmental Permits and Licensing Regulation	September 10, 2014	29115	• Required environmental permits and licenses at all phases of the Project.
Occupational and Community Health and Safety			
General Sanitation Law No: 1593	May 6, 1930	1489	• Health and sanitation measures to be taken during construction and operation phases.
Occupational Health and Safety Law No. 6331	June 30, 2012	28339	• Health and safety measures to be taken during construction and operation phases.
Regulation on Occupational Health and Safety Services	December 29, 2012	28512	• Establishment of OHS units to carry out occupational health and safety services, cancellation of authorization certificates, duties, authorities and responsibilities and working procedures and principles
Regulation on Risk Assessment for Occupational Health and Safety	December 29, 2012	28512	• Management of occupational health and safety risk assessment during construction and operation phases
Regulation on Health and Safety Conditions Regarding Use of	April 25, 2013	28628	• Work equipment to be used during construction and operation phases.

Legislation*	Official Gazette Date	Official Gazette Number	Implications for the Project Phases
Work Equipment			
Manual Handling Operations Regulation	July 24, 2013	28717	• Health and safety measures to be taken during manual handling activities at construction and operation phases.
Preparation, Completion and Cleaning Works Regulation	April 28, 2004	25446	• Health and safety measures to be taken during preparation, completion and cleaning works at construction and operation phases.
Personal Protection Equipment Regulation	May 1, 2019	30761	• Personal protection equipment to be used during construction and operation phases.
Regulation on the Use of Personal Protection Equipment at Workplaces	July 2, 2013	28695	• Personal protection equipment to be used during construction and operation phases.
First Aid Regulation	July 29, 2015	29429	• In case of a first aid requirement during construction and operation phases.
Regulation on Emergency Situations in Workplaces	June 18, 2013	28681	• Measures to be taken during emergency situations in workplaces in all phases of the Project.
Regulation on Health and Safety Precautions Regarding Working with Chemicals	August 12, 2013	28733	• Chemical handling and necessary precautions to be taken during construction and operation phases.
Regulation on the Methods and Essentials of Occupational Health and Safety Trainings for Workers	May 15, 2013	28648	• Health and safety training to be performed during construction and operation phases
Regulation on the Protection of Workers from Noise Related Risks	July 28, 2013	28721	• Health and safety measures to be taken against the noise impacts during construction and operation phases.
Regulation on Management of Dust	November 5, 2013	28812	• Management of to be generated dust during construction phase in terms of occupational health and safety.
Regulation on Machinery Safety	March 3, 2009	27158	• Ensuring the safety of machinery in installation, maintenance and repair during construction and operation phases.
Health and Safety Signs Regulation	September 11, 2013	28762	• Health and safety signs to be placed during construction and operation phases.
Regulation on the Occupational Health and Safety for Temporary or Fixed Term Jobs	August 23, 2013	28744	• Health and safety measures to be taken for temporary workers during construction and operation phases.
Regulation on the Occupational Health and Safety in Construction Works	October 5, 2013	28786	• Minimum occupational health and safety requirements for construction works during construction phase.
Regulation on Highway Traffic	July 18, 1997	23053	• Ensuring traffic order on the highways during the construction and operation phase of the Project.
Regulations on Traffic Signs	June 19, 1985	18789	• Traffic signs to be applied on highways for the purpose of ensuring traffic order and safety during construction and operation phase of the Project.
Management of Chemicals and Other Dangerous Substances			
Water Pollution Control Regulation	December 31, 2004	25687	• To prevent pollution of water resources by chemicals and hazardous goods to be used during construction and operation phases.
Regulation on the Classification, Labelling and Packaging of Materials and Mixtures	December 11, 2013	28848	• Chemicals and mixtures to be used during construction and operation phases.
Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals	June 23, 2017	30105	• To ensure a high level of protection of human health and the environment during the construction and operation phases, to evaluate the damages of the substances used, to have information on the

Legislation*	Official Gazette Date	Official Gazette Number	Implications for the Project Phases
			registration, evaluation, permission and restriction of those chemicals.
Regulation on Safety Data Sheets on Hazardous Materials and Mixtures	December 13, 2014	29204	• Preparation and distribution of safety data sheets in order to ensure effective control and surveillance against the negative human health and the environment effects of hazardous substances and mixtures that may be used during construction and operation phases.
Regulation on the Road Transportation of Hazardous Goods	June 18, 2022	31870	• Hazardous goods to be transported during construction and operation phases.
General			
Regulation on the Implementation of the Law Concerning Private Security Services	October 7, 2004	25606	• Private security services to be used during construction and operation phases
Use of the Right to Petition Law No: 3071	November 10, 1984	18571	• Management of proposal/grievance for all phases of the Project.
Law on the Right to Information (No. 4982)	October 24, 2003	25269	• Individuals will utilize their right to information in accordance with democratic and transparent during all phases of the Project.
Regulation on the Principles and Procedures for the Enforcement of the Law on the Right to Information	April 27, 2004	25445	• Regulating the principles and procedures for the implementation of the Law on the Right to Information.
Law on the Protection of Personal Data	April 7, 2016	29677	• Protection of fundamental rights and freedoms of individuals, especially the privacy of private life, in the processing of personal data during all stages of the project.
Regulation on Subcontractors	September 27, 2008	27010	• Management of the conditions for the establishment of the principal employer-subcontractor relationship, the notification and registration of the workplace belonging to the subcontractor, the issues that should be included in the subcontractor agreement.
Türkiye Building Earthquake Regulation	March 18, 2018	30364	• Construction works within the scope of the Project.
Regulation on Structures to be built in Natural Disaster Areas	July 14, 2007	26582	• Construction works within the scope of the Project.
Regulation on the Protection of Buildings from Fire	December 19, 2007	26735	• Measures to be taken for fire protection during construction and operation phases.
Regulation Concerning the Ozone Depleting Substances	April 07, 2017	30031	• Substances to be used during construction and operation phases.
Regulation Concerning the Increase in the Efficiencies of Energy Consumption and Energy Resources	October 27, 2011	28097	• Energy consumption during construction and operation phases.
Criminal Law	October 12, 2004	25611	• To protect individual rights and freedoms, public order and security, the rule of law, community health and environment, public peace and to prevent crime during construction and operation phases.

**Relevant amendments of the listed legislation will be applicable.*

The Project Sponsor shall comply with the requirements of the current national legislation and codes of practice and fulfill all other legal requirements. Therefore, during each phase of the planned Project and

implementation of related management plans, all activities will be carried in accordance with certain standards and limits set by the above-mentioned laws and regulations and any license and/or permit required for the upcoming phases of the Project will be acquired accordingly.

III.1.1.1 *EIA Process under Turkish EIA Regulation*

Under Article 10, Environmental Law sets out the general scope of the Environmental Impact Assessment (EIA) procedure in Türkiye, indicating that institutions, agencies and establishments that lead to environmental problems as a result of their planned activities are obliged to prepare Environmental Impact Assessment Report or Project Introduction File. Based on this legal framework, the EIA Regulation was put into force for the first time after being published in the Official Gazette numbered 21489 and dated on February 7, 1993. Since then there had been several amendments in the first regulation and new EIA regulations were published in 2008 and 2013 repealing the former regulations in force. The latest EIA Regulation (2022 EIA Regulation) has been published in the Official Gazette dated 29.07.2022 and numbered 31907, which repealed the 2017 EIA Regulation.

Under its annexes, the EIA Regulation categorizes investments as projects subject to full EIA (Annex-1) and projects subject to screening-elimination criteria (Annex-2). This categorization is done based on the type of activity and/or plant capacity. If the planned investment is defined as an activity under Annex-1 of the EIA Regulation, a full EIA Report is required. For Annex-2 activities, first a Project Introduction File is prepared in accordance with a limited format specified in the Annex-4 of the EIA Regulation and the MoEUCC evaluates the need for a full EIA process for the project.

Individuals or legal entities planning to carry out a project within the scope of this Regulation are obliged to prepare Environmental Impact Assessment (EIA) Application File and EIA Report for projects subject to Environmental Impact Assessment, and Project Introduction File for projects subject to Preliminary Environmental Impact Assessment and Evaluation. These documents must be prepared by institutions/organizations authorized by the Ministry, and they are responsible for submitting them to the relevant authority and adhering to the commitments made within the project.

The Ministry is authorized to make "EIA Required" or "EIA Not Required", "EIA Positive", "EIA Negative" decisions for projects subject to this Regulation.

The Project Sponsor plans to construct and operate the "R3-ELAZIĞ-1 Wind Power Plant (10 turbines – 42.6 MWm/40 MWe)" in Elazığ Province. R3-ELAZIĞ-1 WPP will be located in Elazığ Province, and Maden District and Akboğa, Hanevleri, Çayırköy, Dutpınar, Camikebir settlements in Türkiye. The total area of the power plant site is 1993.42 hectares. The Project aims to achieve a maximum annual electricity production of 127,578.9 MWh/year.

The subject of the Project, the investment, is within the scope of "Article 41- Wind Power Plants" in Annex-1 List of Projects to which Environmental Impact Assessment will be applied by the Environmental Impact Assessment Regulation, which was published in the Official Gazette dated 29.07.2022 and numbered 31907. Therefore, the EIA Report has been prepared. On 14.12.2022, the EIA Application File was submitted to the MoEUCC. The prepared EIA Report was examined and "Environmental Impact Assessment Positive" decision was given by the MoEUCC on 16.10.2023.

In the EIA Report; the definition and characteristics of the investment subject to the Project, the current environmental characteristics of the Project location and impact area, the environmental effects of the Project during the construction and operation phases and the measures to be taken are introduced with its general dimensions under the headings of the environmental monitoring plan and the sustainability plan.

Within the scope of the Project, the provisions of the Environmental Law No. 2872, the Law on Amending the Environmental Law and the regulations issued pursuant to this law will be meticulously complied with. Within the scope of the Project, all relevant legislative provisions will be meticulously complied with.

The Project in question is within the scope of the Environmental Impact Assessment Regulation, which entered into force after being published in the Official Gazette dated 29.07.2022 and numbered 31907, "Article 41 - Wind Power Plants" in the Annex-1 List of Projects to which Environmental Impact Assessment will be applied. The Final EIA Report prepared within the scope of the Project, submitted to and approved by MoEUCC, was prepared in accordance with the format specified in Annex-3 of the EIA Regulation.

III.1.2 Expropriation Process under Turkish Expropriation Law

As it is known, expropriation is the most widely used method for land acquisition. Article 46 of the Turkish Constitution explains that state and legal public entities, in cases of public benefit, are entitled to entirely or partially expropriate immovable properties in private possession, on condition that the real value of those immovable properties are paid in advance and in cash; and to establish easement (servitude) on these immovable properties in compliance with the procedures and principles set by Expropriation Law.

There are a large number of laws and regulations relevant to the implementation of land acquisition. Those can cited as follows; Expropriation Law (Law No: 2942), Resettlement Law (Law No: 5543), Code of Civil Law (Law No: 4721), Cadastral Law (Law No: 3402), Forest Law (Law No: 6831), Environment Law (Law No: 2872), Municipalities Law (Law No: 5393), Pasture Law (Law No: 4342) and Village Law (Law No: 442) and several implementation regulations pertaining to the above-mentioned laws. Expropriation implementation activities based on Turkish laws and regulations can be summarized in line with the following stages:

- Project approval (public benefit decision)
- Preparation of expropriation plans
- Identification of property owners and address investigation
- Expropriation decision
- Establishment of a “Valuation Commission” and the Valuation Process
- Establishment of a “Negotiation Commission” and purchasing process

The process under Turkish Expropriation Law starts with the approval of relevant ministry/authority of the expropriation works on behalf the public interest. This decision is made public at the office of village/neighborhood head for 15 days and then it is regarded as “cutoff date”. After the approval of the Project, expropriation plans are prepared. The actual size and boundaries of the immovable assets and resources are determined by land surveys and a scaled (usually with a scale of 1/5.000) expropriation map is prepared. Expropriation maps shall demonstrate the boundaries, surface area and kind of immovable assets and resources to be expropriated. Mainly title deeds, taxes and state registers, on site researches and/or external researches are used for identification of the owners.

Stage by stage (in accordance with the expropriation priority) the project responsible agency takes the “expropriation decision” for designated areas and informs/requests to the Land Titling and Cadastral Directorate to put an “expropriation note” on the register of the relevant property. The responsible agency establishes a Valuation Commission of at least three experts to determine the values of assets and resources. Valuation commission determines the unit and ceiling values of assets and resources to be expropriated. Then, responsible agency establishes a negotiation commission within its own entity to reconcile with property owners on the value. Each negotiation commission comprises of at least three members. The commission sends an official invitation letter to each property owner without declaring the value for the asset that was previously estimated by valuation commission.

Article 27 of the Expropriation Law, states that; for the expropriation of immovable properties in situations for which Minister of Councils takes decision regarding the need or urgency for national defense in the scope of the implementation of the Law on National Defense Obligations (Law No: 3634) or during emergencies foreseen by special laws, the immovable property subject to expropriation may be seized by the related administration on condition that the procedures other than valuation shall be completed afterwards. In this process, following the request of the related administration, compensation amount for the immovable property shall be appraised by the court within 7 days through the experts assigned as per Article 10 and 15

of the Expropriation Law. Seizure shall only be made following the invitation to be done in accordance with Article 10 and the amount is deposited to the bank specified in the announcement.

The evaluation of the power plant area of the Project reveals that it consists of "Pasture," "Agricultural," "Cemetery," and "Rocky" areas. On the other hand, the evaluation of the turbine areas shows that they consist of "Pasture" and "Soil" areas. Expropriation procedures to be carried out within the scope of the project will be carried out in accordance with the "Expropriation Law" No. 2942. Since expropriation is not possible for forest areas, permission will be obtained in these areas in accordance with Article 17 of the Forest Law No. 6831, and permit work and procedures will be carried out in accordance with the relevant instructions of the General Directorate of Forestry. Regarding pasture areas, an application will be made to the Provincial Pasture Commission within the scope of Article 14 of the Pasture Law No. 4342. Within the scope of the Soil Conservation and Land Use Law No. 5403, the necessary permits will be obtained and the prescribed measures will be taken.

III.1.3 Cultural Heritage Management under Law on the Conservation of Cultural and Natural Assets

According to the Law on the Conservation of Cultural and Natural Assets (Law no: 2863), all cultural and natural properties requiring protection are considered as state property. As stated in the same law, the Ministry of Culture and Tourism and its local branches (Boards for Preservation of Cultural Assets, Museums) are the main national government institutions who have the authority of conducting the works of identification and registration of cultural assets and defining the conditions of conservation. In this respect, Elazığ Regional Board for Preservation of Cultural Assets is the sole competent authority within the scope of the R3-ELAZIĞ-1 Wind Power Plant Project.

As part of the Project activities, if any Cultural Heritage, Natural Heritage, Protected Area, or Conservation site is identified during the course of the work, the ongoing activities will be immediately halted, and relevant authorities will be informed promptly.

All necessary opinions and permissions will be obtained from the Ministry of Culture and Tourism of the Governorate of Elazığ within the scope of the project.

As indicated in the institution's opinion that is dated 13.09.2023 with reference number 7363078 from the Provincial Directorate of Environment, Urbanization and Climate Change of Governorship of Elazığ, the requested project area does not fall within the boundary of a registered natural protected area or a nature conservation area. In case any natural heritage element (such as a potentially registered monument tree, cave, etc.) that requires protection is encountered during the project activities, according to Article 4 of Law No. 2863, information will be provided to the Governorate of Elazığ (Provincial Directorate of Environment, Urbanization, and Climate Change).

According to the opinion dated 20.09 2023 with reference number 4211483 from Cultural Affairs Branch Directorate of the Provincial Directorate of Culture and Tourism of the Elazığ Governorship, it was stated that the Directorate has no objection for the Project since no cultural assets requiring protection was found on the surface of the areas. In addition, the parcel in question is not within the places allocated for tourism in the zoning plan, and that if any cultural property requiring protection is encountered during the applications to be carried out in the area in question, the nearest Museum Directorate or the Local Administrative Authority should be notified.

III.1.4 Labor Law

The Turkish Labor Law (Law No: 4857) was enacted on 22.05.2003 and published in the Official Gazette dated 10.06.2003 and numbered 25134. The purpose of this Law is to regulate the working conditions and work-related rights and obligations of employers and employees working under an employment contract. This Law applies to all establishments and to their employers, employer's representatives and employees, irrespective of the subject matter of their activities with the exception of the activities and employment relationships listed in Article 4 of this Law. Some examples to these exceptions are; sea and air transport activities, any construction work related to agriculture which falls within the scope of family economy, domestic services, sportsmen, etc. This Law regulates the labor related subjects such as; the principle of

equal treatment which aims to avert discrimination based on language, race, gender, political opinion, philosophical belief, religion or similar reasons; the transfer of the establishment or one of its sections which defines the process of the transfer paying attention to not to victimize anyone; temporary employment relationships in order to protect the rights of both parties. Also, Labor Law regulates the employment contracts, types and terminations, wages, organization of work, employment service, supervision and inspection of working conditions, administrative penal provisions and supplementary, transitional and concluding provisions of labor related subjects.

Turkish Labor Law does not cover forced labor issues. However, the Constitution of the Republic of Türkiye, Article 18 prohibits forced labor. “No one shall be forced to work. Forced labor is prohibited. Work required of an individual while serving a sentence or under detention provided that the form and conditions of such labor are prescribed by law; services required from citizens during a state of emergency; and physical or intellectual work necessitated by the needs of the country as a civic obligation shall not be considered as forced labor.” Article 80 of the Penal Code penalizes human trafficking and Article 117 penalizes violation of the freedom to work and labor. Türkiye has ratified the International Labor Organization (ILO) Convention No. 29 on Forced Labor and ILO Convention No. 105 on the Abolition of Forced Labor.

Turkish Labor Law sets the minimum age at which a child can be employed as well as the conditions under which children can work (Article 71, Chapter 4). The minimum employment age is 15, but in certain cases of vocational training, mild work may be allowed for 14-year-olds. According to Turkish Labor Law, Article 73, Men under the age of 18 and women irrespective of their age must not be employed on underground or underwater work like in mines, cable-laying and the construction of sewers and tunnels.

The Regulation on the Procedures and Principles of Employment of Children and Young Workers, which entered into force by publishing in the Official Gazette dated 06.04.2004 and numbered 25425, aims to determine the principles of working and to prevent economic exploitation of children and young workers without jeopardizing their health and safety, physical, moral and social development or education. This Regulation has been prepared on the basis of Article 71 of the Labor Law No. 4857, published in the Official Gazette dated 10.6.2003 and numbered 25134.

The National Programme on the Elimination of Child Labor (2017-2023) by the Ministry of Labor and Social Security (MoLSS) came into effect in 2017 and implemented in cooperation with relevant institutions/organizations, social partners and NGOs. In the program, the priority target groups have been identified as “Working on the Streets”, “Working in Heavy and Hazardous Works in Small and Medium-Sized Enterprises” and “Working in Mobile and Temporary Agricultural Labor Except for Family Business”; children under 18 years of age are particularly prohibited from working in these areas.

Article 32 of Labor Law defines the wages as; “in general terms, wages are the amount paid to someone by the employer or third parties in exchange for a job and paid in money. As a rule, wages, premiums and bonuses are paid, in Turkish Lira, to a bank account opened at the workplace or privately. If the wage has been decided in terms of a foreign currency, it may be paid in Turkish money according to the currency rate on the date of payment. Wage payment must not be made in bonds, coupons or another paper claimed to represent the national currency valid in the country or by any other means whatsoever.

Wage may be paid on a monthly basis at the latest. The time of remuneration may be reduced down to one week by employment contract or by collective agreement. Statutory limitation on wage claims is five years.” The minimum wage limit is regulated by the Turkish Labor Law, Article-39.

III.1.5 Law on the Right to Information

The Turkish Law on the Right to Information (Law No: 4982) was adopted in 09.10.2003 and published in the Official Gazette dated 24.10.2003 and numbered 25269. The main objective of this Law is to regulate the procedure and provide the basis of the right to information according to the principles of equality, impartiality and openness that are the necessities of a democratic and transparent government. This Law applies to the activities of public institutions and professional organizations, which qualify as public institutions. The Law which is divided into five parts in total explains the legal rights and obligations about information disclosure processes. The first part of the Law defines the objective, scope and definitions of terms that are used in the Law. The second part of the Law makes statements about the subjects of the Right to Information

and the Obligation to Provide Information. According to Articles 4 and 5 of this Law found in this part, everyone has the right to information and the responsible parties are obligated to provide information. The application process for accessing information is explained in the third part of the Law. In the fourth part of the Law, the information that is restricted is described and some examples are: information and documents pertaining to the state secrets, information and documents pertaining to the economic interests of the state, etc. Finally, the last part of the Law describes the miscellaneous aspects of this law such as entry into force and execution.

III.1.6 Permits

Within the scope of the Project, all necessary permits will be obtained from the relevant authority as defined below. During national EIA studies, opinions were received from related authorities. A summary of the authority opinions which are related with the commitments and requirements to be followed during the implementation of the Project are given in below Table III.2.

Table III.2 Summary of Responses from Authorities

Authority	Related Subject	Authority Opinion	Date
General Directorate of State Airports Authority, Department of Electronics	Obtaining information about the project	It has been assessed that this project will not have any negative impact on the instrument descent, standard instrument take-off and arrival procedures and CNS Electronic Systems under the responsibility of the organization.	29.09.2023
Ministry of Culture and Tourism, General Directorate of Investment and Enterprises	Obtaining information about the project development plan studies	The project area in question does not fall within the borders of any declared Culture and Tourism Protection and Development Zone or Tourism Center and there is no work carried out by General Directorate in the mentioned area.	28.09.2023
Ministry of National Defense, General Directorate of Logistics, Malatya Regional Directorate of Construction Real Estate	Obtaining information about the project development plan	As a result of the examination, it has been determined that there are no military areas, military prohibited and security zones and NATO fuel pipelines under the responsibility of the Ministry of National Defense within the scope of the project. In the works to be carried out within the scope of the said project, since it is necessary to notify the General Directorate of Mapping when antennas, buildings, chimneys, towers, etc. higher than 30 meters outside the settlements and higher than 60 meters inside the settlements and all kinds of overhead lines without height limitations and energy transmission and distribution line poles, cable car / chairlift line poles, etc. are installed on these overhead lines, following the construction of structures containing vertical obstacles on these overhead lines, https://devt. map.gov.tr address, it is considered that it will be appropriate to fill in the vertical obstacle attribute information tables on the map.gov.tr address and send them digitally to the General Directorate of Mapping in one of the "shp", "kml" or "kmz" formats.	29.09.2023
General Directorate of Highways 8th Regional Directorate	Obtaining information about the project development plan	Since the parcels in question are outside our road, there is no inconvenience for our organization.	11.09.2023
Elazığ Governorship, Provincial Directorate of Environment, Urbanization and Climate Change	Obtaining information about the project development plan	The requested project area does not fall within the boundary of a registered natural protected area or a nature conservation area.	13.09.2023
Ministry of Energy and Natural Resources, General Directorate of Energy Affairs	Obtaining information about the project development plan	The project has been declared as a renewable energy resource area as a result of the contests held and has been found appropriate according to the principles of the Regulation on the Technical Evaluation of Electricity Generation Applications Based on Wind Resources, and the General Directorate has no objection to the realization of the project.	20.09.2023
Elazığ Governorship, Provincial Directorate of	Obtaining information about the project development plan	In order for the final Non-Agricultural Land Use Permit to be issued by the Provincial Directorate regarding the activity planned to be carried out within the specified route area, the following conditions must be fulfilled;	07.09.2023

Agriculture and Forestry		• "Agricultural Land Assessment and Information System "TAD Portal" must be made through the web address https://tad.tarim.gov.tr and the TAD Portal application number must be notified to the Provincial Directorate with the application letter, only the expropriation areas need to be entered and there is no need to enter the easement areas to the TAD Portal. • Specifying the finalized activity route boundaries and parcel information (island-parcel-quality) of the immovable property where 13 turbines will be installed, as well as the amount of area covered by 13 turbines separately on the immovable property, • Sending a copy of the appropriate opinion letter received from the relevant unit of DSI for the requested area, • Sending KML and NCZ files for the requested area on CD.	
General Directorate of Forestry, Elazığ Regional Directorate of Forestry, Elazığ Forest Management Directorate	Obtaining information about the project development plan	It has been observed that the area subject to the project and the area where the Authority's opinion was asked for drawing a development plan correspond to Forest parcels numbered 103/1, 102/1 and 110/1 in Hanevleri Village. It is not possible to subject forest areas to zoning. Since forest areas cannot be subject to zoning, zoning application cannot be made to the project area corresponding to the forest area, but the right to establish a permit easement can be granted. Permission must be obtained from the Regional Directorate of Forestry for the forest area.	14.09.2023
Ministry of Agriculture and Forestry, General Directorate of State Hydraulic Works, DSI 9th Regional Directorate, Basin Management Monitoring and Allocations Branch Directorate	Obtaining information about the project development plan	As a result of the examination; it has been determined that there are some stream beds in the area in question, and the following issues should be considered in the development plan studies; • On the planned route, a distance of at least 30 m should be left between the boundary of flowing and dry stream beds and pole locations, measures should be taken to protect the poles against drainage and flood problems that may arise from the surrounding stream beds and surface rainfall, and excavation, rubble, etc. should not be thrown into flowing and dry stream beds during the works. • No work or road crossing should be carried out in the creek bed. • On both banks of the streams, a distance of at least 6 meters parallel and continuous to the stream should be set aside to be used for service maintenance road purposes, and any work in these areas should be should not be built. • The constructions to be built on the stream banks should be built at least 1 meter above the upper point of the stream slope. • After the works to be carried out in terms of flooding are approved by the Institution, the works and productions to be carried out must be under the control of the Institution. • In the works to be carried out, underground and surface water resources should not be damaged. • All kinds of liquid and solid wastes that will pollute the stream beds should not be discharged into the receiving environment in any way. Wastewater ponds should be constructed to collect wastewater and these wastes should be collected and transferred to the sewerage system, and if there is no sewerage system, the septic tanks to be created should be sealed and the wastes should be safely discharged and removed from the environment. • Stream beds are subject to a continuous change in the direction of flow over the years. The Authority shall not be held responsible for any flood damages that may occur as a result of changes in the flow direction in the following years and for any damage and loss of third parties that may arise from the facility during the construction phase, all kinds of responsibility shall belong to the owner and necessary precautions shall be taken. It will be assumed that the transmission line and nearby fixed facilities are constructed with this risk in mind. Measures to be taken to eliminate these risks should be carried out in a way that will not obstruct the flow in the stream / tea / river beds and will not cause flood risk. The electricity transmission line to be installed must be constructed in such a way that it does not interfere with any kind of mechanized cleaning work to be carried out in the stream beds, and the necessary warning signs must be left at certain and visible points. • Streams should not be covered and should not be subject to registration.	27.09.2023

		• No intervention should be made to narrow the stream cross-section and prevent its flow, the stream cross-section should not be narrowed by taking measures against slope flows, work that may cause flooding should not be carried out, and if necessary, measures should be taken against possible flood risk by constructing a Flood Protection Facility by those concerned. In the light of these principles, there is no drawback in the establishment of the project.	
Ministry of Energy and Natural Resources, General Directorate of Turkish Electricity Transmission Corporation (TEİAŞ), Department of Environment and Expropriation	Obtaining information about the project development plan	There was no objection to the installation of the turbines taking into account the approach distance to the WPP.	06.10.2023
Elazığ Governorship, Provincial Directorate of Health	Obtaining information about the project development plan	During the investigation, it was determined that a total of 10 wind power plants are intended to be established in the specified locations, that the total electricity generation capacity of the WPP to be established will be 40 MWm, and that there is no water source within the area where drinking water is intended to be supplied to the settlements. In the event that the necessary permits, licenses, licenses and all necessary measures for the protection of the environment and public health are taken for the establishment of WPPs in the location in question, there is no objection to making a zoning plan for the wind power plants in question.	01.09.2023
Elazığ Governorship, Provincial Directorate of Environment, Urbanization and Climate Change	Obtaining information about the project development plan	It has been determined that the area where the wind power plant is planned to be established is not covered by the Coastal Law No. 3621. The parcel in question is located in areas defined as "Agricultural Lands" and "Forest Area" in terms of general land use decisions within the scope of the Malatya-Elazığ-Bingöl-Tunceli Planning Region 1/100.000 scale Environmental Plan approved by the Ministry. According to the relevant plan provisions of the Environmental Plan, provided that the site selection criteria for wind, solar and geothermal production areas are complied with and the opinion of the Ministry is obtained, the master and implementation zoning plans prepared in line with the permits obtained from the relevant institutions and organizations and the opinions of the relevant institutions and organizations within the scope of the license to be issued by the Energy Market Regulatory Authority are approved by the relevant administration and sent to the Ministry to be entered into the database. The following criteria will be followed in the site selection of wind, solar and geothermal production areas; • It is essential that investments in areas covered by the "Forest Law" are realized primarily in areas that have lost their forest quality by obtaining the necessary permits. • The geological survey report shall be complied with during the development plan phase. • For investments to be made on agricultural lands within the scope of the Soil Conservation and Land Use Law No. 5403, which is essential to be protected for agricultural production purposes, it is mandatory to obtain "Permission for Non-Agricultural Use" within the scope of the provisions of Law No. 5403.	07.09.2023

		• For the applications to be made in the areas where use is restricted in the Environmental Plan and in the areas (ecologically important areas, flood areas, aquaculture production areas), dune areas, reed marshes, wetlands, wetland protection zones and drinking and utility water protection belts, it is obligatory to prepare an Ecosystem Assessment Report by the relevant departments of universities, explaining the possible effects of the activity on the environment and the measures to be taken, during the preparation of the development plans. Implementation will be made in these areas in line with the provisions of the relevant legislation and the Ecosystem Assessment Report. • In areas subject to special laws such as Culture and Tourism Conservation and Development Zones, Special Environmental Protection Areas, National Parks, Nature Parks, Nature Reserves, Wildlife Protection Development Areas within the plan boundary, appropriate opinions shall be obtained from the relevant institutions in accordance with the provisions of the relevant laws.	
Elazığ Governorship Provincial Directorate of Culture and Tourism Cultural Affairs Branch Directorate	Obtaining information about the project development plan	As a result of the examination; no cultural assets defined in Law No. 2863 were found on the the parcel. In addition, the parcel in question is not within the places allocated for tourism in the zoning plan within the scope of the Tourism Incentive Law No. 2634. However, if any cultural property is found during the construction and physical works to be carried out, it is necessary to notify the nearest Museum Directorate or the mukhtar in the village or the local administrative authorities in other places within three days at the latest.	20.09.2023
Ministry of National Defense Fuel Supply and NATO POL Facilities Management Directorate Department of Fuel Supply and Operation	Obtaining information about the project development plan	There are no NATO fuel pipelines and facilities in the project area.	04.10.2023

For the Project the below given permit process has been and/or will be followed:

- Following a competition held by the Ministry of Energy and Natural Resources (MoENR), a Renewable Energy Resource Areas (YEKA) Agreement has been signed between Kalyon and the MoENR.
- Upon signing the agreement, the Pre-License process was initiated, and for the international financing, Environmental and Social Impact Assessment (ESIA) process has been concurrently started.
- After the completion of Pre-License applications, a Technical Interaction Analysis Report for the wind energy-based production facility was prepared, and permission is obtained from the Radar Performance and Tracking Analysis Center (RAPSIM) of TÜBİTAK BİLGEM.
- Concurrently with the signing of the YEKA Agreement, the Environmental Impact Assessment (EIA) approval process was initiated.
- After obtaining EIA approval, an application is submitted to the Energy Market Regulatory Authority (EMRA) for the acquisition of immovable property. EMRA manages correspondences related to the status of the property and grants the company the right of easement for land use.
- With the easement right and EIA approval in place, an application for Construction Permit is submitted.
- In parallel with the above-mentioned permit processes, the following permit processes are also conducted:
  - Upon obtaining Pre-License, a System Connection Agreement is signed with the Türkiye Electricity Transmission Corporation (TEİAŞ), and Preliminary Project approval is obtained.
  - After EIA approval, relevant permit processes are carried out if necessary for changing the qualifications of non-Treasury-owned lands during the Land Acquisition process (forest, pasture, agriculture, etc.).
- Once the above permits are completed, construction phase activities can be initiated according to the Employer's schedule.
- With the commencement of Pre-Construction activities, all environmental permits (water, wastewater, waste, electricity, etc.) required for the Construction phase are obtained.
- After obtaining the license, completing Pre-Construction activities and permits, Main Construction activities begin with Final Project approval.
- In parallel with the construction process, a System Usage Agreement is signed with TEİAŞ, and upon the completion of construction activities, partial acceptances are conducted by the EMRA, transitioning the plant into operation. Environmental permits for structures to be used during the operation phase are obtained, and Urban Planning and Housing Permits are acquired.
- Following the acquisition of Urban Planning permits, an Energy Performance Certificate is obtained for permanent structures.
- Upon obtaining Urban Planning permits, all environmental permits necessary for the operational phase (water, wastewater, waste, electricity, etc.) are obtained, and the business is completed by obtaining a business opening and operating license.

Detailed schedule for the above given permit process is included in Annex-5.

III.2 International Agreements and Standards

International financial institutions follow certain policies and procedures regarding assessment and management of environmental and social impacts/risks of the Projects to be financed. As requirements of international support for the Project, environmental and social database and impact assessment studies will be undertaken guarantee that the Project's design, construction and operation will be satisfactory for international environmental standards alongside national legislation.

The relevant environmental and social requirements of these institutions are mainly based on World Bank Group's (WBG) E&S Safeguard Policies. For the private sector financing, International Finance Corporation's (IFC) Environmental Health and Safety Guidelines and Performance Standards on Environmental and Social Sustainability have become the one of the most important international requirements. These standards have also been adopted by the major international private banks through the

so called Equator Principles (EPs). These principles aim to ensure that projects to be financed by these banks are developed in a socially and environmentally sound manner.

The ESIA Report to be prepared for the R3-ELAZIĞ-1 Wind Power Plant Project will be in accordance with the Equator Principles (IV) and IFC's Performance Standards on Environmental and Social Sustainability and general as well as sector-specific Environmental, Health and Safety Guidelines. Additionally, EBRD Environmental and Social Policy and Performance Requirements and EU Directives will be taken into account for the preparation of the ESIA Report. Key points of each international principle, standard and guideline is provided in the following sections. It should be noted that when Turkish (host country) regulations differ from the levels and measures presented in the EHS Guidelines, the Project will aim to achieve whichever is more stringent.

III.2.1 IFC Standards and Guidelines

Performance Standards on Environmental and Social Sustainability

IFC published its current Policy on Environmental and Social Sustainability in 2012. Within the framework of this Policy, it applies a comprehensive set of Performance Standards to manage social and environmental risks and impacts and to enhance development opportunities in its private sector financing in the member countries eligible for financing. The Performance Standards may also be applied by other financial institutions electing to apply them to projects in emerging markets.

The following eight Performance Standards establish the requirements that the client has to meet throughout the life of an investment supported by IFC or other relevant financial institution using these Standards:

Table III.3 Performance Standards

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

In brief, the objectives of Performance Standard 1 are;

- To identify and evaluate environmental and social risks and impacts of the project,
- To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and where residual impacts remain, compensate/offset risks and impacts to workers, Affected Communities, and the environment,
- To promote improved environmental and social performance of clients through the effective use of management systems,
- To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately,
- To promote and provide means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.

Performance Standards 2 through 8 describe potential environmental and social risks and impacts that require particular attention. Where environmental or social risks and impacts are identified, the client is required to manage them through its Environmental and Social Management System (ESMS) consistent with Performance Standard 1, which is applicable to all projects that may have environmental and social risks and impacts. Applicability of IFC's Performance Requirements/Standards is summarized in Table III.4.

Table III.4 Applicability of IFC's Performance Standards

IFC	Performance Standards (2012)	Applicability (Yes/No)
PS 1	Assessment and Management of Environmental and Social Risks and Impacts	Yes
PS 2	Labor and Working Conditions	Yes
PS 3	Resource Efficiency and Pollution Prevention	Yes
PS 4	Community Health, Safety and Security	Yes
PS 5	Land Acquisition and Involuntary Resettlement	Yes
PS 6	Biodiversity Conservation and Sustainable Management of Living Natural Resources	Yes
PS 7	Indigenous Peoples	No
PS 8	Cultural Heritage	Yes

Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts

The main objective of Performance Standard 1 is to ensure that clients of the IFC identify, assess, and manage the environmental and social risks and impacts associated with their projects. This standard emphasizes a systematic approach to understanding and addressing potential adverse effects on the environment and affected communities.

PS1 stresses the importance of engaging with and consulting relevant stakeholders throughout the project life cycle. This includes obtaining input from affected communities, considering their concerns, and providing opportunities for meaningful participation. The project is required to disclose certain information regarding its environmental and social performance. This transparency helps build trust among stakeholders and enables informed decision-making.

Compliance with PS1 is a prerequisite for IFC financing, and it establishes a framework for responsible and sustainable project development. The IFC provides guidance and support to clients to help them meet the requirements of Performance Standard 1.

Performance Standard 2: Labor and Working Conditions

PS2 focuses on promoting employment opportunities and ensuring employees have fair and favorable working conditions. This includes issues such as working hours, wages, benefits and the right to form and join workers' organizations.

This standard emphasizes the necessity of a safe and healthy working environment. This standard includes identifying and mitigating potential occupational health and safety hazards, providing access to necessary facilities, and creating emergency preparedness and response plans.

Performance Standard 3: Resource Efficiency and Pollution Prevention

This standard provides guidelines for managing the environmental impact of projects financed by IFC. These guidelines; It includes environmental assessment, management of environmental and social risks, prevention and reduction of pollution, waste management, emissions, resource efficiency, public health and safety, biodiversity protection and sustainable natural resource management.

It emphasizes the importance of conducting an environmental assessment to determine potential project impacts, taking into account environmental, social and health issues. It requires the project owner to establish an Environmental and Social Management System (ESMS) to manage and reduce environmental and social risks throughout the project lifecycle. As part of this system, pollution prevention measures are adopted and cleaner production technologies are supported. It encourages the reduction, reuse and recycling of waste generated by the project. It also requires the Project owner to minimize air emissions.

Performance Standard 4: Community Health, Safety and Security

This standard aims to ensure that the project activity does not pose unacceptable risks to the health and safety of employees, affected communities, project visitors and to ensure the safety of people and assets.

IFC PS4 includes occupational health and safety, community health and safety, emergency preparedness and response, and stakeholder engagement. The standard requires projects to identify and assess potential health and safety risks and implement measures to prevent accidents and injuries. It also assesses and addresses the potential health and safety impacts of the project on local communities. PS4 requires projects to establish security arrangements to ensure the safety of project personnel, affected communities, and project assets

Performance Standard 5: Land Acquisition and Involuntary Resettlement

The purpose of PS5 is to ensure that individuals and communities affected by a project are fairly compensated and assisted in their efforts to improve or, at the very least, restore their standard of living if adversely affected by land acquisition or involuntary resettlement. This standard aims to facilitate communication with affected communities, conduct social assessments including the displacement or loss of livelihoods endeavor to restore or enhance livelihoods, provide equitable compensation for assets and properties affected by the project, and safeguard cultural heritage sites and monuments that may be affected.

Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

This standard focuses on the Conservation of Biodiversity and Sustainable Natural Resource Management. The aim of the standard is to promote the conservation of biodiversity and the sustainable management of natural resources within the scope of the project.

According to this standard, projects should avoid operating within protected areas. In exceptional cases where this is not possible, measures should be taken to minimize and mitigate impacts, and the conservation objectives of the protected area should be supported. The ecosystem services provided by natural habitats should be acknowledged, and sustainability should be preserved whenever possible. Communication with relevant stakeholders, including local communities and users involved, is essential for maintaining the biological diversity and sustainable natural resource management of the project.

Performance Standard 8: Cultural Heritage

The aim of PS8 is to ensure that projects respect and take into account the cultural heritage of affected communities and avoid negative impacts on cultural resources. This standard provides a comprehensive identification and evaluation of cultural heritage, including tangible and intangible elements

related to the project area, communication with affected communities, preventing the impact on cultural heritage, minimizing the impact if it cannot be prevented, and informing the affected public.

General Environmental, Health and Safety (EHS) Guidelines

In addition to the Performance Standards, IFC publishes health and safety guidelines that provide examples of general and subject-specific Good International Industry Practices (GIIP). In this respect, IFC published General EHS Guidelines in April 2007. The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. The document provides guidance for effective management of environmental, occupational health and safety, and community health and safety aspects of the projects including their construction and decommissioning phases.

The World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines) are technical reference documents with general and industry-specific examples of GIIP. IFC uses the EHS Guidelines as a technical source of information during project appraisal. The EHS Guidelines contain the performance levels and measures that are normally acceptable to IFC, and that are generally considered to be achievable in new facilities at reasonable costs by existing technology. For IFC financed projects, application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets with an appropriate timetable for achieving them. The environmental assessment process may recommend alternative (higher or lower) levels or measures, which, if acceptable to IFC, become project- or site-specific requirements. The General EHS Guideline contains information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors. It should be used together with the relevant industry sector guideline(s).

The client will refer to the EHS Guidelines or other internationally recognized sources, as appropriate, when evaluating and selecting resource efficiency and pollution prevention and control techniques for the project. The EHS Guidelines contain the performance levels and measures that are normally acceptable and applicable to projects. When host country regulations differ from the levels and measures presented in the EHS Guidelines, clients will be required to achieve whichever is more stringent. If less stringent levels or measures than those provided in the EHS Guidelines are appropriate in view of specific project circumstances, the client will provide full and detailed justification for any proposed alternatives through the environmental and social risks and impacts identification and assessment process. This justification must demonstrate that the choice for any alternate performance levels is consistent with the objectives of this Performance Standard.

Besides the General EHS Guidelines, IFC has published sector-specific guidelines for a variety of industries including the Electric Power Transmission and Distribution and Wind Energy, as described below.

Environmental, Health and Safety (EHS) Guidelines for Electric Power Transmission and Distribution

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of GIIP.

When one or more members of the World Bank Group are involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. These industry sector EHS Guidelines are designed to be used together with the General EHS Guidelines document, which provides guidance to users on common EHS issues potentially applicable to all industry sectors. For complex projects, use of multiple industry sector guidelines may be necessary.

The EHS Guidelines for Electric Power Transmission and Distribution include information relevant to power transmission between a generation facility and a substation located within an electricity grid, in addition to power distribution from a substation to consumers located in residential, commercial, and industrial areas.

Electric power transmission is the bulk transfer of electricity from one place to another. Typically, power transmission occurs between a power generation facility and a substation located in close proximity to consumers. Power distribution refers to the delivery of electricity from a substation to consumers located in residential, commercial, and industrial areas.

Due to the large amount of power involved, transmission-level voltages are generally considered those above 110 kilo volts (kV). Voltages between 110 kV and 33 kV are typically considered sub-transmission voltages, but are occasionally used for long transmission systems with light loads. Voltages of less than 33 kV are representative of distribution projects.

Electric power transmission and distribution systems are often located in conjunction with highway, road, and other rights-of-way to minimize both costs and disturbance to ecological, socioeconomic and cultural resources. Other factors, including land value, view sheds, archaeological resources, geotechnical hazards, accessibility, parks and other important features also contribute to the locating of transmission and distribution line right-of-way alignments.

Project development and construction activities typically include access road construction or upgrade, site preparation and development, removal of select vegetation, if any, and the grading and excavation of soils for the installation of structural foundations and site utilities. These activities are typical of industrial development projects and depend upon a number of factors, including topography, hydrology, and desired site layout, among others. Activities generally associated with the development and construction of power transmission and distribution include land clearing for transmission line rights-of way, access road construction or upgrade, equipment staging areas, substation construction and / or upgrade, site preparation, and installation of transmission line components (e.g. transmission towers and substations, access and maintenance roads).

Operational activities may include maintenance of access to the transmission lines, towers and substations (e.g. low-impact trails or new / improved access roads) and vegetation management. Upgrades and maintenance for existing infrastructure are a consideration throughout the life cycle of the project.

Power transmission and distribution facilities are decommissioned when they are obsolete, damaged (e.g. by corrosion) or replaced due to increased power demand. Many power facilities are replaced with new or updated equipment at the same site or right-of-way. Decommissioning activities depend on the proposed subsequent use of the site, environmental sensitivities (e.g. natural grasslands) and the project specifics (e.g. aboveground or underground power lines). Activities may include demolition and removal of the installed infrastructure (e.g. transmission towers, substations, aboveground and underground utilities and road decommissioning) and reclamation of the project site, including ground stabilization and re-vegetation.

As explained above, both the construction and operation phases of the project will include electricity use and transmission. Therefore; this guideline would be taken into account during both the construction and operation phases of the project.

Environmental, Health and Safety (EHS) Guidelines for Wind Energy

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of GIIP. IFC uses the EHS Guidelines as a technical source of information during project appraisal. The EHS Guidelines contain the performance levels and measures that are normally acceptable to IFC, and that are generally considered to be achievable in new facilities at reasonable costs by existing technology. These industry sector EHS Guidelines are designed to be used together with the General EHS Guidelines document, which provides guidance to users on common EHS issues potentially applicable to all industry sectors. For complex projects, use of multiple industry sector guidelines may be necessary.

The EHS Guidelines for wind energy include information relevant to environmental, health, and safety aspects of onshore and offshore wind energy facilities. It should be applied to wind energy facilities from the earliest feasibility assessments, as well as from the time of the environmental impact assessment, and continue to be applied throughout the construction and operation phases. Annex A of this guideline contains a

full description of industry activities for this sector. EHS issues associated with the construction and operation of transmission lines are addressed in the EHS Guidelines for Electric Transmission and Distribution.

III.2.2 Equator Principles IV

The Equator Principles (EPs) is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. The EPs apply globally to all industry sectors.

Most of the large private international banks (so called Equator Principles Financial Institutions-EPFIs) have officially adopted these principles (based on EPs IV that have been effective from July 2020), summarized below, to ensure that the projects financed or advised by them are developed in a manner that is socially responsible and reflect sound environmental management practices.

Principle 1: Review and Categorization

When a Project is proposed for financing, the EPFI will, as part of its internal environmental and social review and due diligence, categorize it based on the magnitude of its potential environmental and social risks and impacts. Such screening is based on the environmental and social categorization process of IFC (Category A, B or C). Using categorization, the EPFI's environmental and social due diligence is commensurate with the nature, scale and stage of the Project, and with the level of environmental and social risks and impacts.

Principle 2: Environmental and Social Assessment

For all Category A and Category B Projects, the EPFI will require the client to conduct an Assessment process to address, to the EPFI's satisfaction, the relevant environmental and social risks and impacts of the proposed Project. The Assessment Documentation should propose measures to minimize, mitigate, and offset adverse impacts in a manner relevant and appropriate to the nature and scale of the proposed Project.

Principle 3: Applicable Environmental and Social Standards

The Assessment process should, in the first instance, address compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues.

Principle 4: Environmental and Social Management System and Equator Principles Action Plan

For all Category A and Category B Projects, the EPFI will require the client to develop or maintain an Environmental and Social Management System. Further, an Environmental and Social Management Plan (ESMP) will be prepared by the client to address issues raised in the Assessment process and incorporate actions required to comply with the applicable standards.

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 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.

Principle 6: Grievance Mechanism

For all Category A and, as appropriate, Category B Projects, the EPFI will require the client, as part of the Environmental and Social Management System, to establish a grievance mechanism designed to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance. The grievance mechanism is required to be scaled to the risks and impacts of the Project and have Affected Communities as its primary user.

Principle 7: Independent Review

For all Category A and, as appropriate, Category B Projects, an Independent Environmental and Social Consultant, not directly associated with the client, will carry out an Independent Review of the Assessment Documentation including the ESMPs, the Environmental and Social Management System, and the Stakeholder Engagement process documentation in order to assist the EPFI's due diligence, and assess Equator Principles compliance.

Principle 8: Covenants

An important strength of the Equator Principles is the incorporation of covenants linked to compliance. For all Projects, the client will covenant in the financing documentation to comply with all relevant host country environmental and social laws, regulations and permits in all material respects.

Principle 9: Independent Monitoring and Reporting

To assess Project compliance with the Equator Principles and ensure ongoing monitoring and reporting after Financial Close and over the life of the loan, the EPFI will, for all Category A and, as appropriate, Category B Projects, require the appointment of an Independent Environmental and Social Consultant, or require that the client retain qualified and experienced external experts to verify its monitoring information which would be shared with the EPFI.

Principle 10: Reporting and Transparency

For all Category A and, as appropriate, Category B Projects, the client will ensure that, at a minimum, a summary of the ESIA is accessible and available online; and the client will publicly report GHG emission levels during the operational phase for Projects emitting over 100,000 tons of CO_2 equivalent annually. The EPFI will encourage the client to share commercially non-sensitive Project-specific biodiversity data with the Global Biodiversity Information Facility (GBIF) and relevant national and global data repositories, using formats and conditions to enable such data to be accessed and re-used in future decisions and research applications.

III.2.3 EBRD Environmental and Social Policy and Performance Requirements

The European Bank for Reconstruction and Development (EBRD) is committed to promoting "environmentally sound and sustainable development" in the full range of its activities pursuant to the Agreement Establishing the EBRD. EBRD recognizes that environmental and social sustainability is a fundamental aspect of achieving outcomes consistent with its transition mandate. Therefore, the projects that foster environmental and social sustainability are within the highest priorities of EBRD's activities.

EBRD Performance Requirement 1: Assessment and Management of Environmental and Social Risks and Impacts

This Performance Requirement (PR) recognizes the importance of an integrated assessment to identify the environmental and social risks and impacts associated with projects and the client's management of environmental and social performance throughout the life of the project. A successful and efficient Environmental and Social Management System (ESMS) promotes sound and sustainable environmental and social performance, and can lead to improved financial, environmental and social outcomes. It is a dynamic, continuous process, initiated and supported by management, and involves meaningful communication between the client, its workers, the local communities affected by the project and, where appropriate, other stakeholders.

This PR outlines the responsibilities of the client in the process of assessing the potential environmental and social risks and impacts associated with the project, and developing and implementing procedures for managing and monitoring these risks and impacts.

EBRD Performance Requirement 2: Labour and Working Conditions

This Performance Requirement (PR) recognizes that for clients and their business activities, the workforce is a valuable asset, and that good human resources management and a sound worker-management relationship based on respect for workers' rights, including freedom of association and the right to collective bargaining, are key ingredients to the sustainability of business activities.

EBRD Performance Requirement 3: Resource Efficiency and Pollution Prevention and Control

This Performance Requirement (PR) outlines a project-level approach to climate impacts and greenhouse emissions, resource management and pollution prevention and control. It builds on the mitigation hierarchy, the principle that environmental damage should as a priority be rectified at its source, and the "polluter pays" principle. The project related risks and impacts associated with resource use, and the generation of waste and emissions need to be assessed in the context of project location and local environmental conditions. Appropriate mitigation measures, technologies and practices should be adopted for efficient and effective resource use, pollution prevention and control and avoidance, minimization and reduction of greenhouse gases (GHG) emissions.

This PR also recognizes the emerging concept and practice of Circular Economy and or resources recovery where usable and valuable products can be created or derived from what has been previously viewed as waste.

This PR recognizes the importance of using best available techniques and good international practice to optimize resource use and efficiently prevent and control pollution.

EBRD Performance Requirement 4: Health, Safety and Security

This Performance Requirement (PR) recognizes the importance of managing health, safety and security risks to workers, project-affected communities and consumers associated with project activities, in accordance with the hierarchy of risk control. By providing workers with safe, healthy and secure working conditions, clients may create tangible benefits, such as enhancement of the efficiency and productivity of their operations.

Project activities, equipment, and infrastructure may increase the potential for worker and community exposure to health, safety and security risks, including those associated with mobilization, construction, commissioning, operation, maintenance, decommissioning or closure, reinstatement and the transport of goods and services.

The client has the primary responsibility to provide safe and healthy conditions for their workers and informing, instructing, training, supervising and consulting workers on health and safety. Workers have the responsibility to cooperate actively with their employer and take care of their own health and safety and the health and safety of others.

While acknowledging the role of relevant authorities in protecting and promoting the health and safety of the public, the client has the duty to manage health, safety and security risks to project-affected communities.

EBRD Performance Requirement 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement

This Performance Requirement (PR) addresses impacts of project-related land acquisition, including restrictions on land use and access to assets and natural resources, which may cause physical displacement (relocation, loss of land or shelter), and/ or economic displacement (loss of land, assets or restrictions on land use, assets and natural resources leading to loss of income sources or other means of livelihood). The term “involuntary resettlement” refers to both of these impacts and the processes to mitigate and compensate these impacts. Resettlement is considered involuntary when affected persons or affected communities do not have the right to refuse land acquisition or restrictions on land use, other assets and natural resources, even if compulsory acquisition is used only as a last resort after a negotiated process.

Application of this PR is consistent with the universal respect for, and observance of, human rights and freedoms, specifically the right to private property, the right to adequate housing and to the continuous improvement of living conditions.

Unless properly managed, involuntary resettlement may result in long-term hardship and impoverishment for affected persons and communities, as well as environmental damage and adverse socio-economic impacts in areas to which they have been displaced. The client shall consider feasible alternative project designs and sites to avoid or minimize land acquisition or restrictions on land use, other assets and natural resources while balancing environmental, social, and financial costs and benefits, and paying particular attention to gender impacts and impacts on vulnerable persons. Where it cannot be avoided through design, displacement shall be minimized and appropriate measures to mitigate adverse impacts on affected persons and host communities shall be carefully planned and implemented.

EBRD Performance Requirement 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

This Performance Requirement (PR) recognizes that the conservation of biodiversity and sustainable management of living natural resources are fundamental to environmental and social sustainability.

This PR recognizes the importance of maintaining the core ecological function of habitats, biodiversity and ecosystem services. All ecosystems support a complexity of living organisms and vary in terms of richness, abundance and importance of species.

The objective of biodiversity conservation and sustainable management of living resources must be balanced with the potential for utilizing the multiple economic, social and cultural values of biodiversity and living natural resources in an optimized manner.

EBRD Performance Requirement 8: Cultural Heritage

This Performance Requirement (PR) recognizes the importance of cultural heritage for present and future generations. The aim is to protect cultural heritage and to guide clients to avoid or mitigate adverse impacts on cultural heritage in the course of their business operations. The clients are required to be precautionary in their approach to the management and sustainable use of cultural heritage.

Both tangible and intangible cultural heritage are important assets for economic and social development, and are an integral part of the continuity of cultural identity and practices (including traditional skills, knowledge, beliefs and/or minor dialects and languages).

In pursuing these aims of protection and conservation, this PR is guided by applicable international conventions and other instruments. It also recognizes the need for all parties to respect the laws and regulations that pertain to cultural heritage that could be affected by a project and the obligations under relevant international treaties and agreements ratified by host countries. These laws may be on cultural heritage or antiquities, planning or building permits, conservation areas, protected areas, and other laws and regulations governing the built heritage, or laws relating to the protection of cultures of indigenous peoples. Detailed requirements for protecting indigenous peoples are in PR 7.

EBRD Performance Requirement 9: Financial Intermediaries

This Performance Requirement (PR) recognizes that financial intermediaries (FIs) are a key instrument for promoting sustainable financial markets and provide a vehicle to channel funding to the micro, small and medium sized enterprise sector. FIs include a variety of financial service providers including, inter alia, private equity funds, banks, leasing companies, insurance companies and pension funds.

The nature of intermediated financing means that the FIs will assume delegated responsibility for environmental and social assessment, risk management and monitoring as well as overall portfolio management. The nature of delegation may take various forms depending upon a number of factors, such as the type of finance provided. The effectiveness of the FIs environmental and social risk management will be evaluated and monitored on a continuous basis throughout the project life-cycle.

EBRD Performance Requirement 10: Information Disclosure and Stakeholder Engagement

This Performance Requirement (PR) recognizes the importance of an open and transparent engagement between the client, its workers, worker representatives, local communities and persons affected by the project and, where appropriate, other project stakeholders as an essential element of good international practice and corporate citizenship. Such engagement is also a way of improving the environmental, social and overall sustainability of projects. In particular, effective community engagement, appropriate to the nature and scale of the project, promotes sound and sustainable environmental and social performance, and can lead to improved financial, social and environmental outcomes, together with enhanced community benefits.

Stakeholder engagement is central to building strong, constructive, and responsive relationships which are essential for the successful management of a project's environmental and social risks and impacts. It is an inclusive and on-going process which is most effective when initiated at an early stage of the project and is an integral part of the assessment, management and monitoring of environmental and social risks and impacts of the project.

III.2.4 EU Directives

A "directive" is a legislative act that sets out a goal that all EU countries must achieve. However, it is up to the individual countries to devise their own laws on how to reach these goals.

EU Renewable Energy Directive

The EU Renewable Energy Directive, implemented in 2009, embodies the European Union's progressive stance on addressing climate change and promoting sustainable energy practices. This pivotal directive mandates each member state to set binding national targets with the goal of significantly increasing the share of renewable sources in their final energy consumption. Emphasizing technology neutrality, the directive encourages member states to adopt a diverse range of renewable energy technologies. It

establishes a framework for robust support schemes to ensure fair competition among different renewable sources and to foster the development of grids for seamless integration into the broader energy market.

Furthermore, the directive introduces collaboration mechanisms, enabling member states to work more effectively together in achieving their individual renewable energy objectives. Through this cooperative approach, the EU seeks to create a unified and interconnected internal market for renewable energy. This not only promotes investment in innovative and sustainable technologies but also enhances energy security by reducing reliance on traditional fossil fuels. Additionally, the Renewable Energy Directive aligns with the EU's broader climate objectives, contributing to the reduction of greenhouse gas emissions and mitigating the environmental impact of energy production.

EU Energy Efficiency Directive

First adopted in 2012, the Directive was updated in 2018 and 2023, setting rules and obligations to meet the EU's ambitious energy efficiency targets. The Directive plays a pivotal role in the EU's overarching strategy to enhance energy efficiency across various sectors. It supports the EU's target to reduce final energy consumption by 11.7% by 2030 (based on a 2020 baseline scenario) and the EU's target to reduce greenhouse gas emissions by at least 55% by 2030. It also requires Member States to take stringent measures in industry, transport and buildings. It advocates for the adoption of energy-conserving practices, the establishment of ambitious national energy efficiency targets, and the promotion of energy services and audits to identify areas for improvement.

Acknowledging that energy efficiency is a fundamental aspect of sustainable development, the directive offers a multitude of advantages. By optimizing energy consumption, it not only makes a significant contribution to reducing overall energy demand but also enhances competitiveness, generates employment, and fosters innovation in energy-efficient technologies. Aligned with the EU's dedication to building a resilient and sustainable energy future, the Energy Efficiency Directive establishes a comprehensive framework that addresses both environmental and economic imperatives.

EU Industrial Emissions Directive

Enacted in 2010, the Industrial Emissions Directive plays a pivotal role in the European Union's efforts to align industrial expansion with environmental sustainability. This directive addresses the environmental consequences of industrial activities, extending its scope to include sectors involved in renewable energy production. It sets stringent limits on pollutant emissions and promotes the adoption of the best available techniques for preventing or mitigating pollution. By integrating principles of prevention and control, the directive aims to achieve a high level of protection for the environment, human health, and overall well-being.

The Industrial Emissions Directive highlights the importance of continual improvements in environmental performance, reflecting the EU's commitment to fostering sustainable industrial growth. Through the establishment of clear standards and the promotion of advanced technologies, the directive seeks to minimize the impact of industrial activities on air, water, and soil quality. In doing so, it contributes to broader EU objectives, including the shift to a circular economy, the reduction of carbon emissions, and the promotion of a harmonious coexistence between industrial development and environmental conservation.

EU Waste Electrical and Electronic Equipment (WEEE) Directive

As of the current version, the EU WEEE (Waste Electrical and Electronic Equipment) Directive 2012/19/EU, provides the regulatory framework for managing waste electrical and electronic equipment across the European Union. This directive mandates the collection, treatment, recycling, and disposal of such waste to mitigate its environmental impact. It emphasizes the promotion of reuse, recycling, and recovery of electrical and electronic equipment waste while minimizing disposal. Additionally, the directive imposes producer responsibility requirements, holding manufacturers and importers accountable for managing the waste generated by their products.

EU Batteries and Accumulators Directive

The Directive on batteries and accumulators 2006/66/EC, known as the Battery Directive, is the current text in force regarding the manufacture and disposal of batteries in the European Union. Last amended in 2018, it aims at improving the protection, preservation and quality of the environment.

The Directive mainly covers batteries containing hazardous elements such as mercury, cadmium, or lead which, when incinerated or landfilled, present a risk to the environment and human health. It sets maximum quantities for certain types of metals and chemicals contained in batteries, and sets targets for waste battery collection rates, as well as financial liability for waste collection and management.

The Habitats Directive

The Habitats Directive aims to protect over a thousand species, including mammals, reptiles, amphibians, fish invertebrates, and plants, and 230 characteristic habitat types.

The overall objective is to ensure that these species and habitat types are maintained, or restored, to a favorable conservation status within the EU. In addition to halting the further decline or disappearance of these species and habitats, the Directive aims to allow them to recover and thrive over the long-term.

The Habitats Directive (Council Directive 92/43/EEC) was adopted in 1992, thirteen years after the Birds Directive. Like the Birds Directive, the Habitats Directive requires all Member States to establish a strict protection regime for species listed in Annex IV, both inside and outside Natura 2000 sites.

In particular, Member States must prohibit:

- All forms of deliberate capture or killing in the wild
- Deliberate disturbance, e.g. during breeding, rearing, hibernation and migration
- Deterioration or destruction of breeding sites or resting places
- Deliberate destruction of nests or eggs, or the picking, collecting, cutting, uprooting or destruction of protected plants in the wild
- The use of all indiscriminate means of capture or killing capable of causing local disappearance and serious disturbance to populations of such species, and
- The keeping, transport and sale of specimens taken from the wild

Member States must also take measures, where necessary, to ensure that the taking or exploitation of specimens of species listed in Annex V is compatible with their being maintained at a favorable conservation status.

Member States must designate, protect and manage core areas for habitat types listed in Annex I and species listed in Annex II of the Habitats Directive. Sites are selected on scientific grounds using the criteria laid down in the Directive (Annex III).

1. Each Member State first proposes a national list of important sites to be protected for those species and habitats present on their territory.
2. The Commission then selects, with the help of the Member States, the European Environment Agency and scientific experts, Sites of Community Importance (SCIs).
3. The selected Sites of Community Importance become part of the Natura 2000 Network.
4. Member States then have up to six years to designate them as Special Areas of Conservation (SAC) and to introduce the necessary management measures to maintain or restore the species and habitats present to a good condition.

EU Habitats Directive would also be considered in the study for conservation importance of species. In this regard, this directive classifies species in Annex II, IV, and V as the following:

- Annex II - Animal and Plant Species of Community Interest whose Conservation Requires the Designation of Special Areas of Conservation
- Annex IV - Animal and Plant Species of Community Interest in need of Strict Protection
- Annex V - Animal and Plant Species of Community Interest whose taking in the Wild and Exploitation may be subject to Management Measures

The Birds Directive

The Birds Directive aims to protect all naturally occurring wild bird species present in the EU and their most important habitats. In addition to halting the decline or disappearance of bird species, the Directive aims to allow bird species to recover and thrive over the long-term.

Protecting and Restoring Birds Habitats

For all wild bird species, Member States must preserve, maintain and re-establish bird habitats to ensure a sufficient diversity and area of habitats.

For threatened bird species, Member States must classify Special Protection Areas (SPAs) for 197 species and sub species listed in Annex I of the Birds Directive, as well as for other migratory birds, paying particular attention to the protection of wetlands of international importance.

SPAs are protected areas that form an integral part of the Natura 2000 network which also includes Special Areas of Conservation (SACs) designated under the Habitats Directive. Collectively these sites are often referred to as “Natura 2000 sites” and are now the largest coordinated network of protected areas anywhere in the world. Today, thanks to the Birds Directive, Member States have classified over 5400 SPAs across the EU. Combined, this covers more than 832,000 km2 of land and sea – an area greater than Germany, Poland and Greece put together.

Member States must ensure that in all Natura 2000 sites:

- Damaging activities are avoided that could significantly disturb the species or deteriorate the habitats for which the site is designated; and
- Positive conservation measures are taken, where necessary, to maintain and restore the species present and their habitats, taking account of the economic, social and cultural requirements and regional and local characteristics of the area concerned.
- There is also an obligatory permitting procedure for any plans or projects that are likely to have a significant effect on one or more Natura 2000 sites, either individually or in combination with other plans and projects.

III.2.5 CITES

CITES is a multilateral treaty to protect endangered plants and animals from the threats of international trade. It was drafted as a result of a resolution adopted in 1963 at a meeting of members of the International Union for Conservation of Nature.

Species covered in CITES are given under three different appendices according to their conservation status. Appendix I covers the species, which are under the threat of extinction. Trade in the specimens of these species is not allowed except extraordinary circumstances. Appendix II includes species, which are not threatened with extinction, but trade in specimens is restricted in order to prevent utilization incompatible with their survival. Appendix III includes species, for which other parties of CITES is applied for assistance in controlling trade and which are conserved at least in one country.

III.2.6 Bern Convention

BERN Convention aims at conserving and promoting biodiversity, developing national policies for the conservation of wild flora and fauna and their natural habitats, protection of the wild flora and fauna from the planned development and pollution, developing trainings for protection practices, promoting and coordinating the researches made regarding this subject. It has been signed by 38 member states of the European Council (as well as Türkiye) with the aim of conserving the wild life in Europe. Species that are protected under the Bern Convention are classified according to the following categories:

- Appendix I: Strictly protected flora species
- Appendix II: Strictly protected fauna species
- Appendix III: Protected fauna species

III.2.7 IUCN Red List of Threatened Species

The International Union for Conservation of Nature is an international organization working in the field of nature conservation and sustainable use of natural resources. It is involved in data gathering and analysis, research, field projects, advocacy, and education.

To determine the threatening status of species IUCN classifications are also used, which are used in Turkish classification as well. IUCN Red List is published to highlight those species that are facing a risk of extinction. A species may be listed in IUCN Red List after studies on its population decrease. Thus, since IUCN List is based on research (annual updates are being made for species lists of countries), many countries attach more importance to species taking place in IUCN list than species taking place in Bern List.

The IUCN categories were updated in 2001 as ver. 3.1 (compared to 1994 as ver 2.3) and are provided below:

Table III.5 International Union for Conservation of Nature (IUCN) Categories

IUCN Red List Categories and Criteria, 1994 (ver. 2.3)		**IUCN Red List Categories and Criteria, 2001 (ver. 3.1)**	
EX	: Extinct	**EX**	: Extinct
EW	: Extinct in Wild	**EW**	: Extinct in Wild
CR	: Critically Endangered	**CR**	: Critically Endangered
EN	: Endangered	**EN**	: Endangered
VU	: Vulnerable	**VU**	: Vulnerable
LR	: Low Risk		
	cd : conservation dependent	**NT**	: Near Threatened
	nt : near threatened	**LC**	: Least Concern
	lc : least concern		
DD	: Data Deficient	**DD**	: Data Deficient
NE	: Not Evaluated	**NE**	: Not Evaluated

Since 2001, all new IUCN assessments have used version 3.1 of the categories and criteria.

III.2.8 DNV GL Safety, Operation and Performance of Grid- Connected Energy Storage Systems

This recommended practice (RP) aims to accelerate safe and sound implementation of grid-connected energy storage by presenting a guideline for safety, operation and performance of electrical energy storage systems.

This RP:

- Covers a broad range of energy storage technologies, instead of focusing on one (e.g. batteries),
- Has a system-level approach, instead of being limited to a small number of key components,
- Has a comprehensive and structured approach. Future updates of this RP are likely to expand the range of technology-specific recommendations.

The objective of this RP is to provide a comprehensive set of recommendations for grid-connected energy storage systems. It aims to be valid in all major markets and geographic regions, for all applications, on all levels from component to system, covering the entire life cycle. End users, operators and other stakeholders will be able to take this RP as their single all-encompassing document for such systems, providing them with direct guidance or referencing through other guidelines and standards.

III.2.9 Green or Social Loan Principles

The green loan market aims to facilitate and support environmentally sustainable economic activity. The Green Loan Principles (GLP) have been developed by an experienced working party, consisting of representatives from leading financial institutions active in the global syndicated loan markets, with a view to promoting the development and integrity of the green loan product.

The GLP define green loans as follows:

Green loans are any type of loan instrument made available exclusively to finance or re-finance, in whole or in part, new and/ or existing eligible Green Projects. Green loans must align with the four core components of the GLP, as set out in the GLP. This definition will be reviewed on a regular basis in light of the development and growth of Green Loans. Whilst it is recognized that definitions of green and green projects may vary depending on sector and geography, the GLP do contain a non-exhaustive list of indicative categories of eligibility for Green Projects (Appendix 1 of the GLP).

The UNFCCC Climate Agreement, ratified in 2016 (known as the “Paris Agreement”), and the publication of the UN Sustainable Development Goals (SDGs) in 2015 are important drivers behind sustainable financing solutions. Companies are increasingly devising green and sustainable strategies, incorporating them into their business strategy and aligning their funding mechanisms to their sustainable development commitments. Entering into a green loan in this context has a number of wide ranging advantages for borrowers and lenders.

These benefits could potentially include, but are not limited to:

- Positive impact on the environment and/or climate change mitigation and/or adaptation;
- Positive impact on reputation and credibility;
- Building stronger, values-based relationships with stakeholders;
- Gaining access to new markets, providing greater resilience to market disruption caused by climate change and decreasing risk across portfolios;
- Gaining access to a wider/more diverse pool of investors, particularly those seeking investment with a positive environmental or environmental, social and governance (ESG) focus;
- Meeting regulatory and policy targets/commitments; and
- Increasing ability to attract and retain staff who see SDG contribution as an important part of their personal and working lives.

III.3 Project Standards

Project Sponsors are committed to comply with the requirements of applicable national legislation as well as EBRD requirements, Equator Principles (EPs) and IFC's environmental and social performance standards and general/sector specific environmental, health and safety guidelines. When the measures, standards and levels/limit values specified in national legislation differ from the ones specified by IFC or EPs, the Project will aim to meet whichever is more stringent. Specific measures, standards, levels and/or limit values applicable to each environmental or social subject are defined in the relevant individual ESIA chapter of this report. Project standards to be complied with, and gap analysis between IFC, EBRD and National Legislation are presented in **Table III.6** and

Table III.7, respectively.

Table III.6 Project Standards

No	Topic	National Standards/ Requirements	Limit Values in National Legislation	International Standards/ Requirements	Limit Values in International Legislation	Project Standards
1	Noise	Regulation on Environmental Noise Control (Official Gazette Date/Number: 30.11.2022/32029) Annex- 2 "Table-1 Limit Values for ambient noise level"	Noise source: Industrial Facilities, Transportation: Day time (07:00-19:00): $LA_{eq,\ 5\ min.}$< 65 dB(A) Evening time (19:00-23:00): $LA_{eq,\ 5\ min.}$< 60 dB(A) Night time (23:00-07:00): $LA_{eq,\ 5\ min.}$< 55 dB(A)	IFC General EHS Guidelines: Environmental Noise Management Table 1.7.1 – Noise Level Guidelines Noise impacts should not exceed the levels specified in the Table 1.7.1, or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.	Receptor: Residential; institutional, educational: Day time (07:00-22:00): One Hour L_{Aeq} dB(A) < 55 dB(A) Night time (22:00-07:00): One Hour L_{Aeq} dB(A) < 45 dB(A) Receptor: Industrial, commercial.: Day time (07:00-22:00): One Hour L_{Aeq} dB(A) < 70 dB(A) Night time (22:00-07:00): One Hour L_{Aeq} dB(A) < 70 dB(A)	Receptor: Industrial, commercial: Day time (07:00-19:00): $LA_{eq,\ 5\ min.}$< 65 dB(A) Evening time (19:00-23:00): $LA_{eq,\ 5\ min.}$< 60 dB(A) Night time (23:00-07:00): $LA_{eq,\ 5\ min.}$< 55 dB(A)
2	Air Quality	Regulation on the Assessment and Management of Air Quality (Official Gazette Date/Number: 06.06.2008/26898) Annex – 1	PM_{10} 1-Year: 40 µg/m3 24-Hour: 50 µg/m3 (not to be exceedance more than 35 times per year)	IFC General EHS Guidelines: Environmental Air Emissions and Ambient Air Quality Table 1.1.1.: WHO Ambient Air Quality Guidelines	PM_{10} 1-Year: 20 µg/m^3 24-Hour: 50 µg/m^3 (99th percentile (i.e.3-4 exceedance days per year) $PM_{2.5}$ 1-Year: 10 µg/m^3 24-Hour: 25 µg/m^3 (99th percentile (i.e.3-4 exceedance days per year)	Turkish Legislation has not described a limit value for $PM_{2.5}$. Therefore, in the assessment of the measurement result, the limit value set forth by the Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) and IFC 24-hour limit values are used, which is 25 µg/m3 for both of them. PM_{10} 1-Year: 20 µg/m^3 24-Hour: 50 µg/m^3 (99th percentile (i.e.3-4 exceedance days per year) $PM_{2.5}$1-Year: 10 µg/m^3 24-Hour: 25 µg/m^3 (99th percentile (i.e.3-4 exceedance days per year)
		Industrial Air Pollution Control Regulation (Official Gazette Date/Number: 03.07.2009/27277 revised in the Official Gazette Date/Number: 6.11.2020/31296) Annex- 2 "Table-2.2"	(2024 and after) SO_2: 350 µg/m3 (hourly), 60 µg/m3 (Long Term Limit Value) NO_2: 200 µg/m3 (hourly), 40 µg/m3 (annual) PM_{10}: 50 µg/m3 (24 hours), 40 µg/m3 (annual) CO: 10 µg/m3 (maximum daily 8-hour average) H_2S: 100 µg/m3 (hourly), 20 µg/m3 (Short Term Limit Value) TOC: 280 µg/m3 (hourly), 70 µg/m3 (Short Term Limit Value) Settled dust: 390 µg/m3 (Short Term Limit Value), 210 µg/m3 (Long Term Limit Value)	IFC General EHS Guidelines: Environmental Air Emissions and Ambient Air Quality	IFC General EHS Guidelines: Environmental Air Emissions and Ambient Air Quality mention that: "Emissions do not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and standards by applying national legislated standards, or in their absence, the current WHO Air Quality Guidelines" Since National Standards exist, compliance with National Standards will be ensured.	The limit values for exhaust gas defined in Industrial Air Pollution Control Regulation will be complied in Project. (2024 and after) SO_2: 350 µg/m3 (hourly), 60 µg/m3 (Long Term Limit Value) NO_2: 200 µg/m3 (hourly), 40 µg/m3 (annual) PM_{10}: 50 µg/m3 (24 hours), 40 µg/m3 (annual) CO: 10 µg/m3 (maximum daily 8-hour average) H_2S: 100 µg/m3 (hourly), 20 µg/m3 (Short Term Limit Value) TOC: 280 µg/m3 (hourly), 70 µg/m3 (Short Term Limit Value) Settled dust: 390 µg/m3 (Short Term Limit Value), 210 µg/m3 (Long Term Limit Value)
3	Surface Water Quality	Regulation on Surface Water Quality-Water Quality Classes (Official Gazette Date/Number: 30.11.2012/ 28483) Annex – 5)	<table><tr><th>Parameter</th><th>Unit</th><th colspan="3">Surface Water Quality Regulation Water Quality Classes</th></tr><tr><th></th><th></th><th>I (very good)</th><th>II (good)</th><th>III (moderate)</th></tr><tr><td>Ammonium (NH_4^+)</td><td>mg/L</td><td><0.2</td><td>1</td><td>>12</td></tr><tr><td>Colour</td><td>m^{-1}</td><td>RES 436 nm: ≤ 1,5 RES 525 nm: ≤ 1,2 RES 620 nm: ≤ 0,8</td><td>RES 436 nm: 3 RES 525 nm: 2,4 RES 620 nm: 1,7</td><td>RES 436 nm: > 4,3 RES 525 nm: > 3,7 RES 620 nm: 2,5</td></tr></table>	IFC General EHS Guidelines: Environmental Wastewater and Ambient Water Quality	IFC General EHS Guidelines Environmental-Wastewater and Ambient Water Quality mention that: " Discharges to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria or, in the absence of local criteria, other sources of ambient water quality." Since National Standards exist, compliance with National Standards will be ensured.	<table><tr><th>Parameter</th><th>Unit</th><th colspan="3">Surface Water Quality Regulation Water Quality Classes</th></tr><tr><th></th><th></th><th>I (very good)</th><th>II (good)</th><th>III (moderate)</th></tr><tr><td>Ammonium (NH_4^+)</td><td>mg/L</td><td><0.2</td><td>1</td><td>>12</td></tr><tr><td>Colour</td><td>m^{-1}</td><td>RES 436 nm: ≤ 1,5 RES 525 nm: ≤ 1,2 RES 620 nm: ≤ 0,8</td><td>RES 436 nm: 3 RES 525 nm: 2,4 RES 620 nm: 1,7</td><td>RES 436 nm: > 4,3 RES 525 nm: > 3,7 RES 620 nm: 2,5</td></tr></table>

No	Topic	National Standards/ Requirements	Limit Values in National Legislation	International Standards/ Requirements	Limit Values in International Legislation	Project Standards
			Oil and Grease: mg/L, <0.2, 0.3, >0.3 Biological Oxygen Demanded BOD(BOD_5): mg/L, <4, 8, >8 Dissolved Oxygen (DO): mg/L, >8, 6, <6 Conductivity: µS/cm, <400, 1000, >1000 Chemical Oxygen Demanded (COD): mg/L, <25, 50, >50 Nitrate (NO_3^-): mg/L, <3, 10, >10 pH: -, 6-9, 6-9, 6-9 Total Phosphorus, (TP): mg/L, <0.08, 0.2, >0.2 Orthophosphate (o-PO_4^-): mg/L, <0.05, 0,16, >0.16 Total Kjeldahl Nitrogen(, TKN): mg/L, <0.5, 1.5, >1.5 Total Nitrogen, (TN): mg/L, <3.5, 11.5, >11.5 Fluoride: µg/L, ≤1000, 1500, >1500 Manganese: µg/L, ≤100, 500, >500 Selenium: µg/L, ≤10, 15, >15 Sulphur: µg/L, ≤2, 5, >5			Oil and Grease: mg/L, <0.2, 0.3, >0.3 Biological Oxygen Demanded BOD(BOD_5): mg/L, <4, 8, >8 Dissolved Oxygen (DO): mg/L, >8, 6, <6 Conductivity: µS/cm, <400, 1000, >1000 Chemical Oxygen Demanded (COD): mg/L, <25, 50, >50 Nitrate (NO_3^-): mg/L, <3, 10, >10 pH: -, 6-9, 6-9, 6-9 Total Phosphorus, (TP): mg/L, <0.08, 0.2, >0.2 Orthophosphate (o-PO_4^-): mg/L, <0.05, 0,16, >0.16 Total Kjeldahl Nitrogen(, TKN): mg/L, <0.5, 1.5, >1.5 Total Nitrogen, (TN): mg/L, <3.5, 11.5, >11.5 Fluoride: µg/L, ≤1000, 1500, >1500 Manganese: µg/L, ≤100, 500, >500 Selenium: µg/L, ≤10, 15, >15 Sulphur: µg/L, ≤2, 5, >5
4	Groundwater Quality	Regulation of Water Intended for Human Consumption (RWIHC) issued by Ministry of Health, which was published in the Official Gazette dated 17.02.2005 and numbered 25730 (Amended: RG-20/10/2016-29863)	Ammonium: 0.5 mg/L Arsenic: 10 µg/L Mercury: 1 µg/L Boron: 1,000 µg/L Conductivity: 2500 µS/cm Cadmium: 5 µg/L Chloride: 250 mg/L Lead: 10 µg/L Nitrate: 50 mg/L Sulphate: 250 mg/L Total Cyanide: 50 µg/L Total Pesticide: 0.5 µg/L	WHO Standards (Guidelines for Drinking Water Quality" developed by the World Health Organization (WHO, 2022))	Arsenic: 10 µg/L Mercury: 6 µg/L Boron: 2,400 µg/L Cadmium: 3 µg/L Chloride: 5 mg/L Lead: 10 µg/L Nitrate: 50 mg/L Trichloroethylene: 8 µg/L	Cadmium: 3 µg/L Chloride: 5 mg/L Trichloroethylene: 8 µg/L For the other parameters (Ammonium, Arsenic, Boron, Mercury, Conductivity, Lead, Nitrate, Sulphate, Total Cyanide and Total Pesticide) limit values defined for the Regulation of Water Intended for Human Consumption will be used.

No	Topic	National Standards/ Requirements	Limit Values in National Legislation	International Standards/ Requirements	Limit Values in International Legislation	Project Standards
			Trichloroethylene: 10 µg/L pH : 6.5-9.5			
5	Soil Quality	Regulation on Soil Pollution Control and Point Source Contaminated Fields (Official Gazette Date/Number: 08.06.2010/27605 revised in the Official Gazette Date/Number: 11.07.2013/28704), (Annex-1)	Antimony: 31 mg/kg Arsenic: 0.4 mg/kg Boron: - Cadmium: 70 mg/kg Chromium (VI): 235 mg/kg Copper: 3129 mg/kg Lead: 400 mg/kg Mercury: 23 mg/kg Nickel: 1564 mg/kg Selenium: 391 mg/kg Silver: 391 mg/kg Zinc: 23464 mg/kg Tin: 46929 mg/kg Titanium: 312857 mg/kg Total Petroleum Hydrocarbons (TPH): - Total Organic Halogens (TOX): -	IFC General EHS Guidelines: Environmental	Since limit values regarding soil quality are not given at IFC General EHS Guidelines: Environmental, compliance with National Standards will be ensured.	Antimony: 31 mg/kg Arsenic: 0.4 mg/kg Boron: - Cadmium: 70 mg/kg Chromium (VI): 235 mg/kg Copper: 3129 mg/kg Lead: 400 mg/kg Mercury: 23 mg/kg Nickel: 1564 mg/kg Selenium: 391 mg/kg Silver: 391 mg/kg Zinc: 23464 mg/kg Tin: 46929 mg/kg Titanium: 312857 mg/kg Total Petroleum Hydrocarbons (TPH): - Total Organic Halogens (TOX):-

Table III.7 Gap Analysis between IFC, EBRD and National Legislation

No	E&S Issue	Reference Standards	Findings	Gap Status (Full/ Partial/ No)	Gaps	Actions to be Taken to Bridge the Gap
1	**Assessment and Management of Environmental and Social Risks and Impacts**					
1.1	Policy	IFC PS1 EBRD PR1	No corporate policies other than OHS Policy and Environmental Policy.	Partial Gap	Other corporate policies are needed to be developed.	Develop other policies such as Human Resources Policy, Corporate Social Responsibility Policy, etc. to cover wider environmental, social and OHS issues.
1.2	Identification of Risks and Impacts	IFC PS1 EBRD PR1	EIA or PIF reports were prepared for this Project. The impact assessments mostly focused on environmental issues. The PIF and EIA Reports have separate impact area definitions for specific impact types.	Partial Gap	Environmental impact assessment processes conducted do not include social impacts related to construction and operation the project. No detailed assessment of Project's potential contribution to cumulative impacts. No assessment of Project's associated facilities. No clear definition of impact areas. No ESMS in line with the IFC and/or EBRD requirements. No Contractor Management Plan.	A comprehensive environmental and social impact assessment (ESIA) study is required for the Project. The study shall be conducted in line with the IFC PS1 and/or EBRD PR1 requirements along with national legislation. Project needs to constitute an Environmental and Social Management System (ESMS) that is in line with both national legislation and international standards, such as IFC PSs and/or EBRD PRs. A Contractor Management Plan in line with IFC PSs and EBRD PRs needs to be developed as part of ESMS to ensure contractors are following Kalyon standards.
1.3	Management Plans	IFC PS1 EBRD PR1	An EIA study was conducted within the scope of impact assessment.	Partial Gap	No systematic and centralized ESMS that meets international standards.	An ESMS with its sub-plans, procedures, forms, instructions, etc. should be developed. During the preparation of sub-plans, the requirements defined by IFC PSs and/or EBRD PRs should also be considered along with the national legislation.
1.4	Organizational Capacity and Competency	IFC PS1 EBRD PR1	Organizational charts are available for existing activities. OHS teams are directly reporting to operation managers. Same for environmental team.	Partial Gap	Environmental, social, and health and safety teams need to be strengthened considering the risks of current and future activities of Kalyon.	Number of OHS Technicians and medical staff should be increased for maximum supervision. OHS Chief should be assigned to coordinate OHS experts and technicians. A manager responsible for both OHS and environmental and social teams should be assigned to coordinate teams. A Community Liaison Officer, whose roles and responsibilities are defined in the SEP, should be assigned to manage stakeholder relations and external Grievance Mechanism.

No	E&S Issue	Reference Standards	Findings	Gap Status (Full/ Partial/ No)	Gaps	Actions to be Taken to Bridge the Gap
1.5	Emergency Preparedness and Response Plan	IFC PS1 EBRD PR1	A framework and general measures for prevention of emergency risks are provided in the PIF and EIA Reports. Emergency Plans are in place.	No Gap	No gaps identified.	No additional actions required.
1.6	Monitoring and Review	IFC PS1 EBRD PR1	A monitoring program has been prepared in the extent of the EIA and PIF studies. Monitoring of emissions, flora-fauna elements, noise, water quality, and soil quality is conducted by YEKA RES 3. No definition and systematic monitoring of social impact parameters.	Partial Gap	No Environmental and Social Management Plan.	An Environmental and Social Management Plan should be developed within the scope of ESMS to ensure structured and systematic management of monitoring and mitigation activities. The monitoring and mitigation programs should be implemented throughout the lifetime of the Project.
1.7	Stakeholder Engagement	IFC PS1 EBRD PR1 EBRD PR10	No structured and systematic stakeholder engagement activity. There are no records from stakeholder engagements.	Full Gap	No Stakeholder Engagement Plan (SEP).	Develop a SEP that is in compliance with IFC PS1, EBRD PR 1 and PR10, and IFIs guidelines on stakeholder engagement. SEP should define grievance mechanism and all aspects of engagement activities such as identification of affected communities, disadvantaged or vulnerable stakeholders in the affected communities, engagement methods, engagement schedule, etc.
1.8	Disclosure of Information	IFC PS1 EBRD PR1 EBRD PR10	Disclosure of project information is limited to once-off public participation meetings during EIA processes.	Partial Gap	A structured disclosure process is not available.	Possible risks and impacts and the supporting management plans, SEP and grievance mechanism should be disclosed to affected communities. Project information package should also been disclosed from Kalyon website, which also needs to be updated.
1.9	External Communications	IFC PS1 EBRD PR1 EBRD PR10	The project owner should implement and maintain a procedure for external communications that includes methods to (i) receive and register external communications from the public; (ii) screen and assess the issues raised and determine how to address them; (iii) provide, track, and document responses, if any; and (iv) adjust the management program, as appropriate. In addition, clients are encouraged to make publicly available periodic reports on their environmental and social sustainability.	Partial Gap	No systematic CSR planning and implementation. There is no External Communications Procedure available.	A separate CSR Management Plan should be developed. SEP should include a section to define External Communications Procedure.
1.10	Grievance Mechanism	IFC PS1 EBRD PR1 EBRD PR10	In areas with Affected Communities, the client will establish a grievance mechanism designed to receive and facilitate the resolution of concerns and complaints regarding the client's environmental and social performance. The mechanism's scale should be commensurate with the risks and adverse impacts of the project, with Affected Communities being the primary users. It aims to address concerns promptly through a clear, culturally appropriate, and easily accessible consultative process. This process should be transparent and understandable, incurring no costs or retribution to the party raising the issue. Importantly, the mechanism should not obstruct access to legal or administrative remedies. The client will inform Affected Communities about this mechanism during the stakeholder engagement process.	Full Gap	Structured grievance mechanism is not available.	As part of the Stakeholder Engagement Plan (SEP) preparation, it is necessary to establish a grievance mechanism. This mechanism should be comprehensive, covering all grievances associated with YEKA RES 3's activities, whether they are internal or external, and whether they are communicated verbally or in writing. The implementation of this grievance mechanism is required for the entire duration of the project.
1.11	Ongoing Reporting to Affected Communities	IFC PS1 EBRD PR1 EBRD PR10	The project proprietor is required to provide regular reports to the Affected Communities detailing the progress in implementing the project's Action Plans. These reports should specifically cover issues with ongoing risks or impacts on the Affected Communities and matters identified through the consultation process or grievance mechanism as concerns to those communities. In cases where the management program results in significant alterations or additions to the mitigation measures or actions outlined in the Action Plans related to community concerns, these updated measures will be communicated to the communities. The frequency of these reports will be determined by the concerns of the Affected Communities but should not occur less than annually.	Full Gap	There is no specified obligation for reporting to the affected communities, and if such reporting is deemed necessary, there are no clear guidelines on the content and frequency of the disclosed reports.	Ensure that the Stakeholder Engagement Plan (SEP) to be developed evaluates reporting needs for affected communities.
2	**Labour and Working Conditions**					
2.1	HR Policies and Procedures	IFC PS1 IFC PS2 EBRD PR1 EBRD PR2	The project owner is required to embrace and execute human resources policies and procedures that suit its scale and workforce. These policies should outline the approach to worker management in alignment with the stipulations of this Performance Standard and national legislation. Additionally,	Partial Gap	The absence of a Human Resources Policy and a corresponding Human Resources Management Plan, inclusive of working conditions, worker relationships, and a grievance mechanism, is noted. These documents should align with the standards set by IFC PS2 and/or	A Human Resources Policy and Human Resources Management Plan aligned with relevant national legislation and meeting the requirements of IFC PS2 and/or EBRD PR2, must be developed.

No	E&S Issue	Reference Standards	Findings	Gap Status (Full/ Partial/ No)	Gaps	Actions to be Taken to Bridge the Gap
			the client must furnish workers with clear and comprehensible documented information about their rights under national labor and employment laws, as well as any relevant collective agreements. This information, covering aspects such as working hours, wages, overtime, compensation, and benefits, should be provided at the initiation of the working relationship and whenever significant changes occur.		EBRD PR2. Employee contracts currently provide limited coverage of environmental, social, and occupational health and safety (OHS) issues, falling short of the requirements outlined in IFC PS2 and/or EBRD PR2. Similarly, contractor contracts also inadequately address environmental, social, and OHS issues.	The Human Resources Management Plan should encompass various aspects, including working conditions, terms of employment, fair treatment, prevention of discrimination, equal opportunities, retrenchment procedures, regulations on working age and child labor, prevention of forced labor, labor union considerations, provision of occupational health and safety, accommodation conditions, and the establishment of a grievance mechanism applicable to all personnel, including contractors. It is essential to strengthen employee and contractor contracts to ensure consistent adherence to the same standards, specifically IFC PS2 and/or EBRD PR2. Contractor contracts should explicitly incorporate the environmental, social, and Occupational Health and Safety (OHS) standards practiced by YEKA RES 3, along with the obligations outlined in YEKA RES 3 Environmental and Social Management System (ESMS). YEKA RES 3 bears significant responsibility for overseeing contractors' activities to ensure strict compliance with the established standards.
2.2	Occupational Health and Safety • Training • PPE • Chemicals • Equipment • Health and Safety Signs	IFC PS1 IFC PS2 IFC PS4 EBRD PR1 EBRD PR2 EBRD PR4	OHS risk sources for construction and operation phases are described and measures that will be applied to manage these risks are included in the PIF and EIA Reports. These assessments include Project specific risks. Commitments for compliance with related legislation are also included.	Partial Gap	In general, management of OHS issues should be structured, systematic and in line with the requirements of IFC PS2 and EBRD PR2 Risk assessment studies were made considering only national legislative standards.	The Environmental and Social Management System (ESMS) designed for the Project should incorporate sub-plans specifically addressing Occupational Health and Safety (OHS) topics. The plans identified in the gaps column should also be integrated into the ESMS.
2.3	Grievance Mechanism	IFC PS1 EBRD PR1 EBRD PR10	The client will establish a mechanism for workers (and their organizations, if applicable) to express concerns about workplace issues. Workers will be informed of this grievance mechanism during the recruitment process, and it will be easily accessible to them. The mechanism should involve an appropriate level of management, promptly address concerns through a transparent and comprehensible process, offer timely feedback without any retaliatory actions. Additionally, it should permit the submission and resolution of anonymous complaints. Importantly, the mechanism should not hinder access to other legal or administrative remedies available under the law or through existing arbitration procedures. It also should not replace grievance mechanisms specified in collective agreements.	Full Gap	No Workers Grievance Mechanism in place.	A Workers Grievance Mechanism should be developed either as a separate document or within the scope of SEP. Ensure its implementation on-site.
3	**Resource Efficiency and Pollution Prevention**					
3.1	Resource Efficiency	IFC PS3 EBRD PR3	The project owner is required to adopt measures that are technically and financially viable, as well as cost-effective, to enhance efficiency in the utilization of energy, water, and other resources, particularly in core business activities. These measures should incorporate the principles of cleaner production into both product design and production processes, aiming to conserve raw materials, energy, and water. Additionally, when benchmarking data is accessible, the client should conduct a comparison to determine the relative level of efficiency.	Partial Gap	No KPIs for the monitoring of resource efficiency of Kalyon.	Create a set of Key Performance Indicators (KPIs) for overseeing resource efficiency, energy usage, resource consumption, etc. Establish targets with the aim of reducing these consumptions.
3.2	Pollution Prevention and GHG Emissions	IFC PS3 EBRD PR3	The project owner must prevent the release of pollutants, and when avoidance is not possible, reduce and/or control the intensity and mass flow of such releases. This applies to pollutants released into the air (including greenhouse gas emissions), water, and land under routine, non-routine, and accidental circumstances that could have local, regional, and transboundary impacts. In cases of historical pollution, such as land or groundwater contamination, the project should assess its responsibility for mitigation measures. Addressing potential adverse impacts on existing ambient conditions, the client will consider various factors, including existing ambient conditions,	Partial Gap	IFC and/or EBRD standards are not followed in the national EIA and PIF studies.	Create a Pollution Prevention Plan that aligns with national laws, IFC PS3, and EBRD PR3. The plan should incorporate a well-organized monitoring and mitigation strategy, along with the identification of vulnerable receptors.

No	E&S Issue	Reference Standards	Findings	Gap Status (Full/ Partial/ No)	Gaps	Actions to be Taken to Bridge the Gap
			finite assimilative capacity of the environment, existing and future land use, the project's proximity to areas crucial for biodiversity, and the potential for cumulative impacts with uncertain and/or irreversible consequences. Beyond complying with resource efficiency and pollution control measures mandated by this Performance Standard, if the project could be a significant source of emissions in an already degraded area, additional strategies and measures should be considered. These may include evaluating alternative project locations and implementing emissions offsets to avoid or minimize negative effects.			
4	**Community Health, Safety and Security**					
4	Community Health, Safety and Security	IFC PS4 EBRD PR4	The project should anticipate and avert any adverse impacts on the health and safety of the Affected Community. It must give precedence to safeguarding both personnel and property, following pertinent human rights principles and implementing measures to avoid or minimize risks to the Affected Communities.	Partial Gap	Several shortcomings in PS4 are connected to the absence of social impact assessments and the lack of a Community Health and Safety Management Plan. Corrective measures will be initiated based on the plan and the findings of the Environmental and Social Impact Assessment (ESIA).	Develop a Community Health and Safety Management Plan that is consistent with PS4 and PR4. This plan should cover all issues outlined in the PS4 and PR4 sections of this table.
5	**Land Acquisition and Involuntary Resettlement**					
5.1	Land Acquisition and Involuntary Resettlement	IFC PS5 EBRD PR5	In the absence of proper management, involuntary resettlement can lead to enduring hardships, impoverishment, environmental damage, and adverse socio-economic effects on affected communities and individuals in the areas they are relocated to. To prevent these negative outcomes, it is advisable to avoid involuntary resettlement whenever possible. In cases where it becomes unavoidable, efforts should be made to minimize its impact, and suitable measures to alleviate the consequences for displaced persons and host communities must be meticulously planned and executed. Given that governments often play a central role in land acquisition and resettlement processes, including compensation determinations, they are crucial third parties in many situations. Project planning should incorporate anticipation of land acquisition procedures, and clients are encouraged to engage in resettlement activities whenever feasible. Negotiated settlements are suggested as an option for clients to consider.	Full Gap	Develop a Land Acquisition, Compensation, and Resettlement Framework that aligns with the standards set by PS5 and PR5. This framework should articulate management plans to be formulated in the event that the Project necessitates land in the future.	Develop Land Acquisition, Compensation and Resettlement Framework in line with PS5 and PR5.
6	**Biodiversity Conservation and Sustainable Management of Living Natural Resources**					
6.1	Biodiversity Conservation and Sustainable Management of Living Natural Resources	IFC PS6 EBRD PR6	The project should investigate strategies for the sustainable management of living natural resources as well as the protection and conservation of biodiversity.	Full Gap	No evaluation of KBA criteria.	Throughout the Environmental and Social Impact Assessment (ESIA) studies, an assessment of the Key Biodiversity Area (KBA) criteria for the Project sites should be conducted.
8	**Cultural Heritage**					
8.1	Chance Find Procedures	IFC PS8 EBRD PR8	The project needs to establish a procedure for addressing accidental discoveries, encompassing both the planning and construction phases of the project.	Partial Gap	The term "Chance Finds Instructions" lacks clarity in defining the regulatory framework, specifying roles and responsibilities, and outlining monitoring and training requirements.	The enhancement of Chance Finds Instructions should involve transforming them into a comprehensive Chance Finds Procedure, incorporating the requirements outlined in PS8 and PR8.

IV. BASELINE CONDITIONS

IV.1 Physical Environment

IV.1.1 Geographical Location and Topography

Elazığ is located in the Upper Euphrates Section, in the southwest of the Eastern Anatolia Region. The R3-ELAZIĞ-1 WPP (10 turbines- 42.6 MWm/40 MWe) Project, which consists of 10 turbines, is planned to be built and operated by Project Sponsor in the Maden district of Elazığ. Project area covers the neighbourhoods of Akboğa, Hanevleri, Çayırköy, Dutpınar, Camikebir of Maden district.

In order to better understand the topography, a regional Digital Elevation Model (DEM) was generated. The Digital Elevation Model (DEM) map including the A-A' section profile in W-E direction is also shown in Figure IV.1. According to the Digital Elevation Model created, the highest point of the Project area is 1,824 m and the lowest point is located at an altitude of 1,330 m.

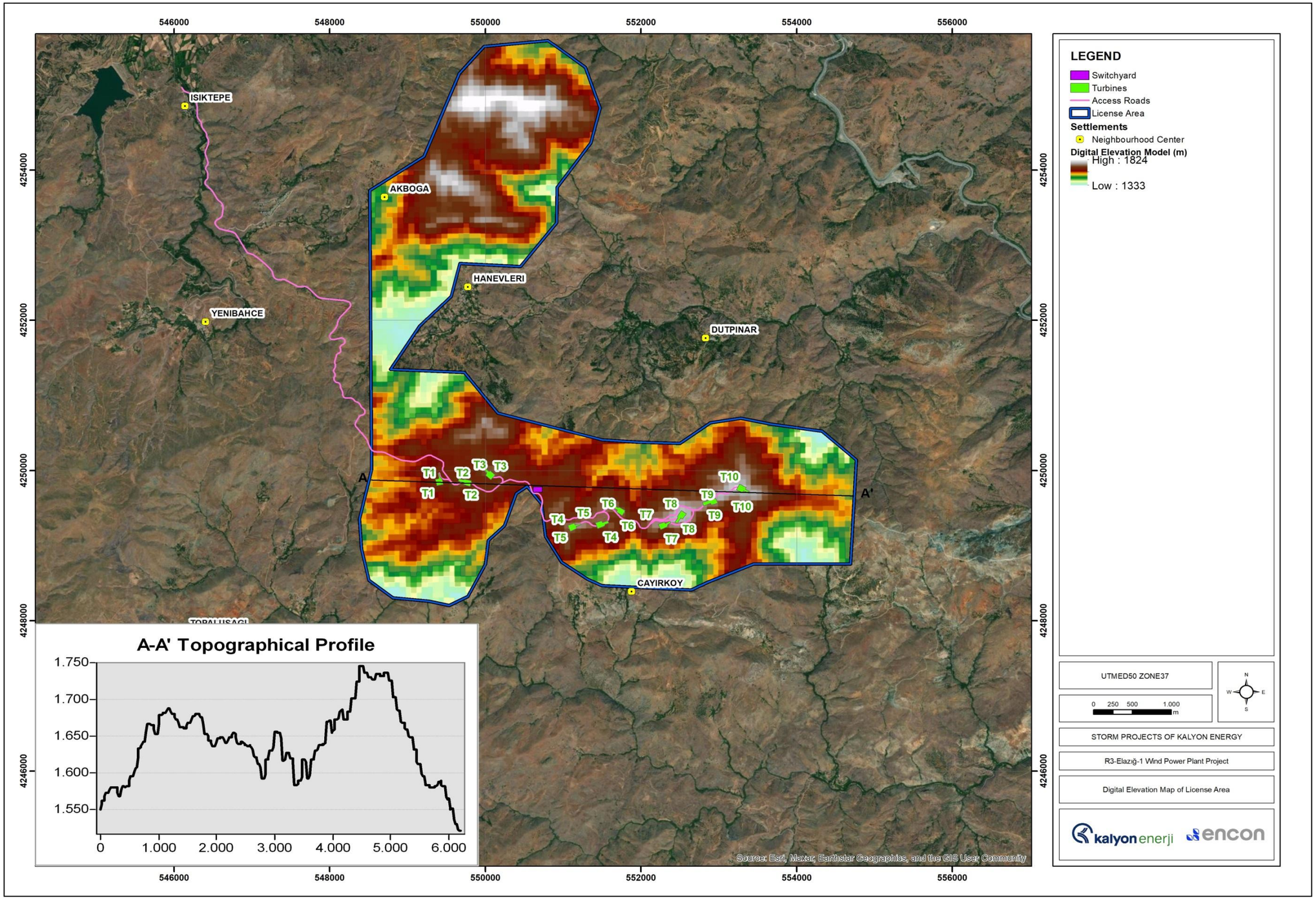

546000
548000
550000
552000
554000
556000
4254000
4252000
4250000
4248000
4246000
ISIKTEPE
AKBOGA
HANEVLERI
YENIBAHCE
DUTPINAR
CAYIRKOY
TOPALUSAGI
A
A'
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
A-A' Topographical Profile
1.750
1.700
1.650
1.600
1.550
0
1.000
2.000
3.000
4.000
5.000
6.000
LEGEND
Switchyard
Turbines
Access Roads
License Area
Settlements
Neighbourhood Center
Digital Elevation Model (m)
High : 1824
Low : 1333
UTMED50 ZONE37
0 250 500 1.000 m
N
W
E
S
STORM PROJECTS OF KALYON ENERGY
R3-Elazığ-1 Wind Power Plant Project
Digital Elevation Map of License Area
kalyon enerji
encon
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Figure IV.1 Digital Elevation Model Map of Project Area and Turbines

IV.1.2 Land Use and Property

The Project site is planned to be constructed in Çayırköy, Akboğa, Hanevleri, Dutpınar neighborhoods of the Merkez district of Elazığ province. Within the scope of the Project, the annual maximum electricity production amount is planned as 127,578.9 MWh/year with 10 turbines. The Project area is 1993.42 ha and it is planned to construct 10 turbines, switchyard center, connection roads and transmission lines.

The Ministry of Energy and Natural Resources decided on the Project area and there is no parcel in the area that would require private land acquisition. The Project area parcel list and parcel status table are presented in Chapter II Table II.7.

Photographs taken from the field visit conducted by ENCON on August 2023 are provided in Figure IV.2. Photograph on the left shows the T2 turbine area and photograph on the right shows T9 turbine area.



Figure IV.2 Photographs Taken from the Project Area

Since the main source of the Project is wind, wind potential was determined in site selection. Environmental factors such as wildlife habitats, protected areas or legal restrictions on land use were taken into account when determining the area. Turbine layout was designed to maximize energy production and minimize interaction between turbines.

According to CORINE 2018 data, the land use types for the area of turbines and access roads are natural grasslands and sparsely vegetated areas. In addition, the switchyard will be located on sparsely vegetated area. The Land Use Map according to CORINE 2018 data is given in Figure IV.3. The closest agricultural area to the turbine area is located at a distance of 700 m.

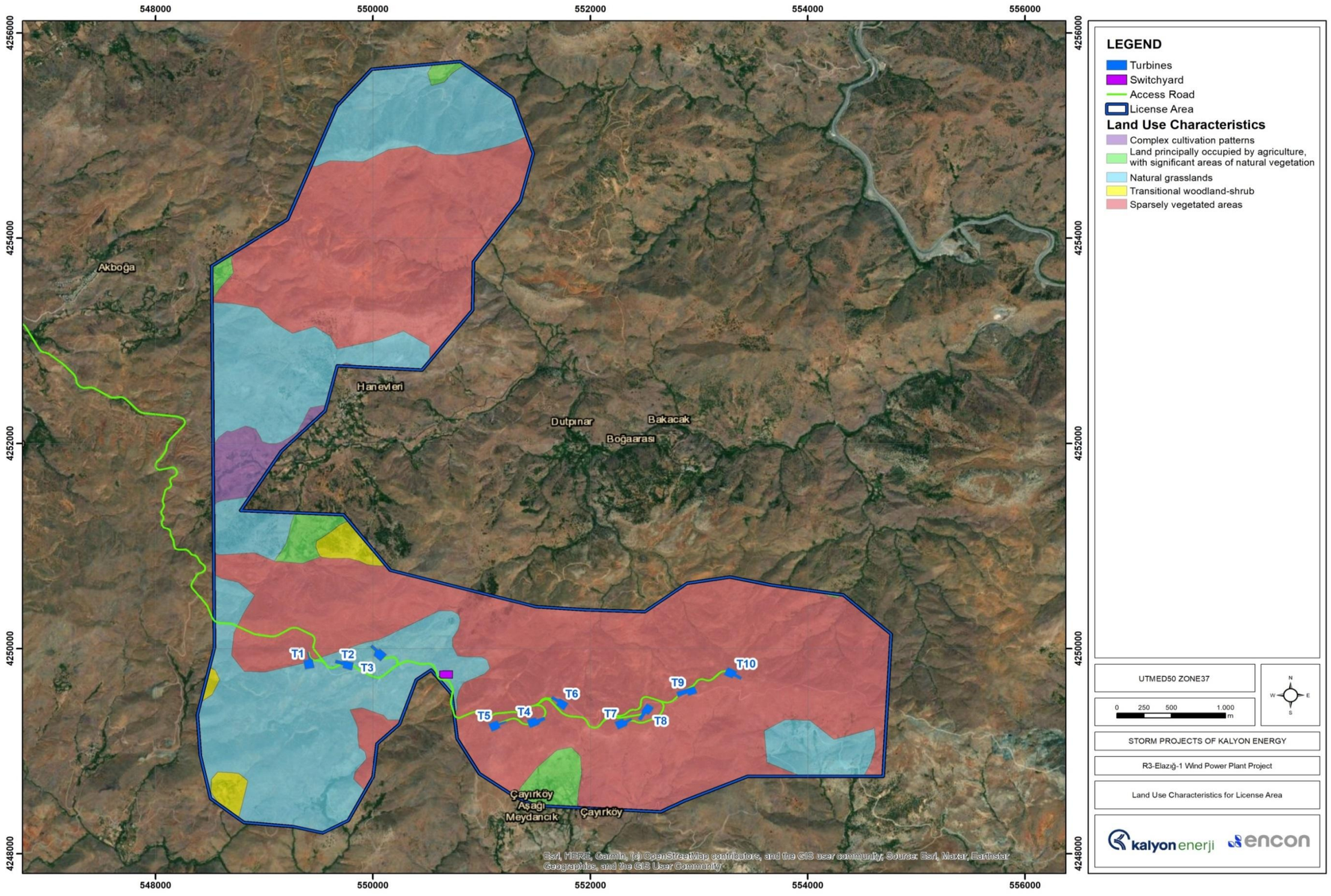


Figure IV.3 Land Use Characteristic for Project Area

IV.1.3 Air Quality

An analysis was conducted by FEBAS in order to understand the baseline condition of the air quality of the Project Area. $PM_{2.5}$ and PM_{10} measurements were made in 3 days between 10-13 October, 2023. Also, settled dust measurements were made in one-month periods for a total of 2 months between October 9-November 8 and November 8-December 8, 2023. Air quality measurement results are given in Table IV.2 and Table IV.3 together with the limit values defined in IFC EHS Guideline and national legislation. Air quality measurement locations are shown in Figure IV.12. Points named A-N-1, A-N-2, A-N-3, A-N-4 and A-N-5 are 20 m, 900 m, 200 m, 1100 and 3800 m located away from the Project Area, respectively. The locations of air sampling points are selected to represent the Project's possible impacts on the closest sensitive receptors. More information on the mentioned receptors is given in the Table IV.1. Detailed laboratory analysis reports are given in Annex-6.

Table IV.1 Sensitive Receptors Location Information of the Project

Sampling Point	Receptor Name / Measurement Location	Distance to the Project Area (m)	Closest Turbine Name	Distance to Closest Turbine (m)
A-N-1	Çayırköy Village / On the Settlements	20	T7	900
A-N-2	Çayırköy Village (Yukarı Meydancık Neighborhood) / North of the Settlements	900	T1	2000
A-N-3	Hanevleri Village / South of the Settlements	200	T3	2200
A-N-4	Dutpınar Village / On the Settlements	1100	T10	2000
A-N-5	Maden District (Bahçelievler) / Northwest of the Settlements	3800	T10	5300

Table IV.2 Limit Values and Air Quality Measurement Results

Parameter	Measurement Date	Averaging Period	IFC EHS Guideline Limit Value in µg/m³	National Legislation Limit Value in µg/m³	Results in µg/Nm³				
					A-N-1	A-N-2	A-N-3	A-N-4	A-5
PM_{10}	10.10.2023-13.10.2023	1-Year	20	40*	18.44	14.96	17.43	15.32	21.25
		24-Hour	50	50*					
$PM_{2.5}$		1-Year	10	-**	6.98	6.27	8.69	8.11	10.60
		24-Hour	25						

**Regulation on the Assessment and Management of Air Quality*
***Turkish Legislation has not described a limit value for $PM_{2.5}$. Therefore, in the assessment of the measurement result, the limit value set forth by the Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) and IFC 24-hour limit values are used, which is 25 µg/m³ for both of them.*

Table IV.3 Settled Dust Measurements

Sampling Point	Coordinates (UTM/WGS) (36T)		Measurement Results 1.Period (09.10.2023-08.11.223)	Measurement Results 2.Period (08.11.2023-08.12.2023)	Limit Value (mg/m²day)	
	East (X)	North (Y)	(mg/m²day)		National Legislation**	IFC*
A-N-1	38.380921	39.594052	79	71	390/210	-
A-N-2	38.387223	39.543440	68	63	390/210	-
A-N-3	38.413904	39.567501	88	76	390/210	-
A-N-4	38.410970	39.605830	81	74	390/210	-
A-N-5	38.402021	39.669505	104	88	390/210	-

** IFC has not described a limit value for settled dust.*
***Regulation on Control of Industrial Air Pollution*

According to the Industrial Air Pollution Control Regulation, PM_{10} values should not exceed 50 µg /Nm³ more than 35 times in a year. On the other hand, according to IFC General EHS Guidelines: Environmental - Air Emissions and Ambient Air Quality, PM_{10} and $PM_{2.5}$ values should not exceed 50 µg/Nm³ and 25 µg /Nm³, respectively. PM_{10}, $PM_{2.5}$ and settled dust baseline measurement results are below both national and IFC General EHS Guidelines ambient air quality limit values.

IV.1.4 Climate Conditions and Meteorology

Continental climate prevails in the Elazığ province. In addition to the continental climate, it has the characteristics of the Mediterranean climate in places. This climate change has occurred after the establishment of the Keban Dam. The climate of Elazığ also shows a transition feature between the Mediterranean and continental climates. Summers are hot and dry, winters are cold and harsh. The hottest month is July, and the coldest month is January. The temperature ranges between -22°C and +42°C. The annual precipitation average is 417 mm. The most precipitation belongs to spring. Detailed meteorological statistics are presented in Table IV.4.

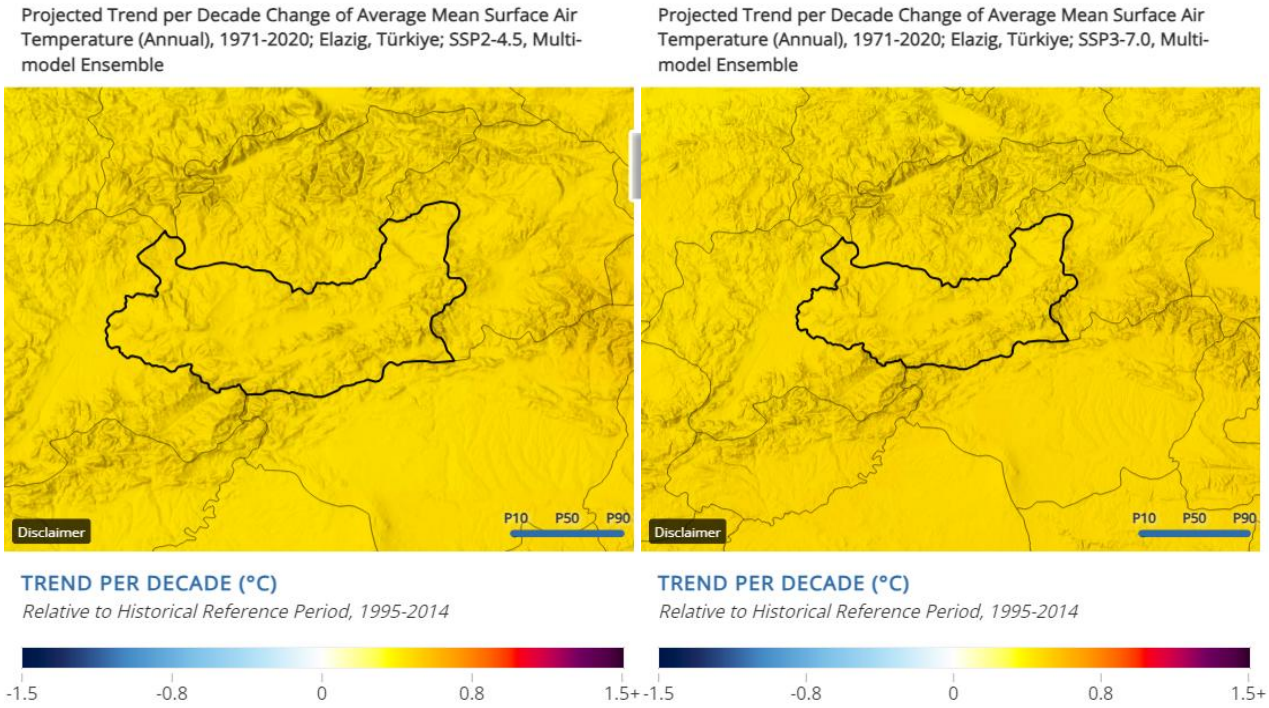
Table IV.4 Long Term Meteorological Data of Elazığ Province (1939-2022)

Parameter	January	February	March	April	May	June	July	August	September	October	November	December	Annual
	Last Climate Period (1939-2022)												
Avg. Temperature (°C)	-0.8	0.7	5.6	12.0	17.2	22.8	27.2	27.0	22.0	15.0	7.5	1.8	13.2
Highest Avg. Temperature (°C)	3.0	5.2	10.9	17.9	23.7	29.8	34.3	34.3	29.5	21.7	12.8	5.5	19.1
Lowest Avg. Temperature (°C)	-3.9	-2.9	0.9	6.4	10.9	15.4	19.4	19.3	14.6	9.0	3.2	-1.3	7.6
Avg. Sunshine Duration (hour)	2.7	3.8	5.1	6.6	8.7	11.0	11.9	11.1	9.6	6.9	4.6	2.4	7.0
Average Number of Rainy Days	12.31	11.40	12.57	12.11	10.79	4.19	1.15	0.79	2.13	6.96	9.12	11.82	95.3
Average Monthly Amount of Rain (mm)	42.0	42.6	56.1	62.9	53.1	12.4	3.3	1.8	8.5	39.5	48.9	45.7	416.8
	Measurement Period (1939-2022)												
Highest Temperature (°C)	13.0	18.6	26.4	32.2	36.6	38.6	42.4	42.2	39.7	32.4	24.3	19.6	42.4
Lowest Temperature (°C)	-22.6	-21.4	-17.0	-7.0	0.0	4.0	6.7	10.2	1.0	-2.2	-15.2	-22.6	-22.6

Source: Turkish State Meteorological Service, 2024[7]

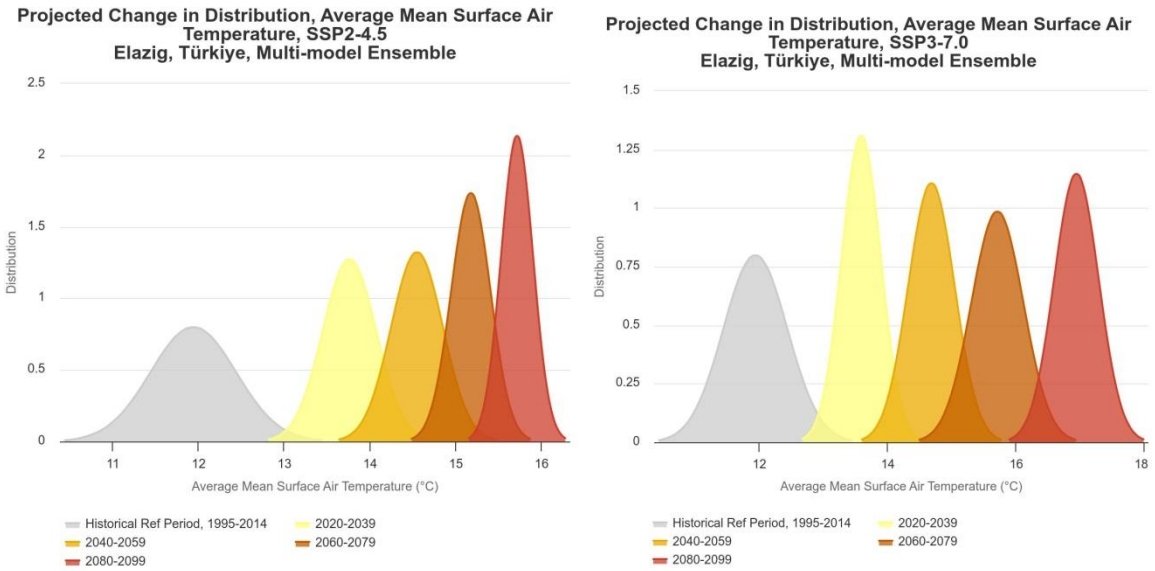
Changes in the air temperature and precipitation regimes in the future years are expected due to the impacts of the climate change. In order to analyze mentioned and other impacts of the climate change, modeling studies are carried out by generating various scenarios. These scenarios are defined as a specific pathway or storyline within the Shared Socioeconomic Pathways (SSPs) framework. The SSPs are developed by the Intergovernmental Panel on Climate Change (IPCC) to explore different possible futures based on varying combinations of socioeconomic development and climate policies. Based on the evaluations on these scenarios, two of these scenarios were chosen to assess the climate change vulnerability of the Project. The two selected scenarios are SSP2-4.5 and SSP3-7. The SSP2-4.5 scenario represents a future world where there is moderate sustainable development with efforts to mitigate greenhouse gas emissions, aiming to stabilize global warming. The scenario indicates that it falls within the middle-of-the-road category of socioeconomic development. This suggests a future where trends in demographic, economic, social, and technological factors follow moderate paths without extreme deviations. Whereas the SSP3-7 scenario represents a future world characterized by high challenges to mitigation and adaptation, leading to a trajectory where greenhouse gas emissions continue to rise, resulting in substantial climate change impacts. The scenario indicates that it falls within the category of regional rivalry. This suggests a future where geopolitical tensions and regional competition are prominent, potentially leading to fragmented international cooperation and limited efforts to address global challenges collaboratively (World Bank, Climate Change Knowledge Portal, 2024). Future projections of precipitation and mean temperature changes for each scenario are given for Elazığ in the figures below.

[7] *https://www.mgm.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx*



Source: World Bank, Climate Change Portal, 2024[8]

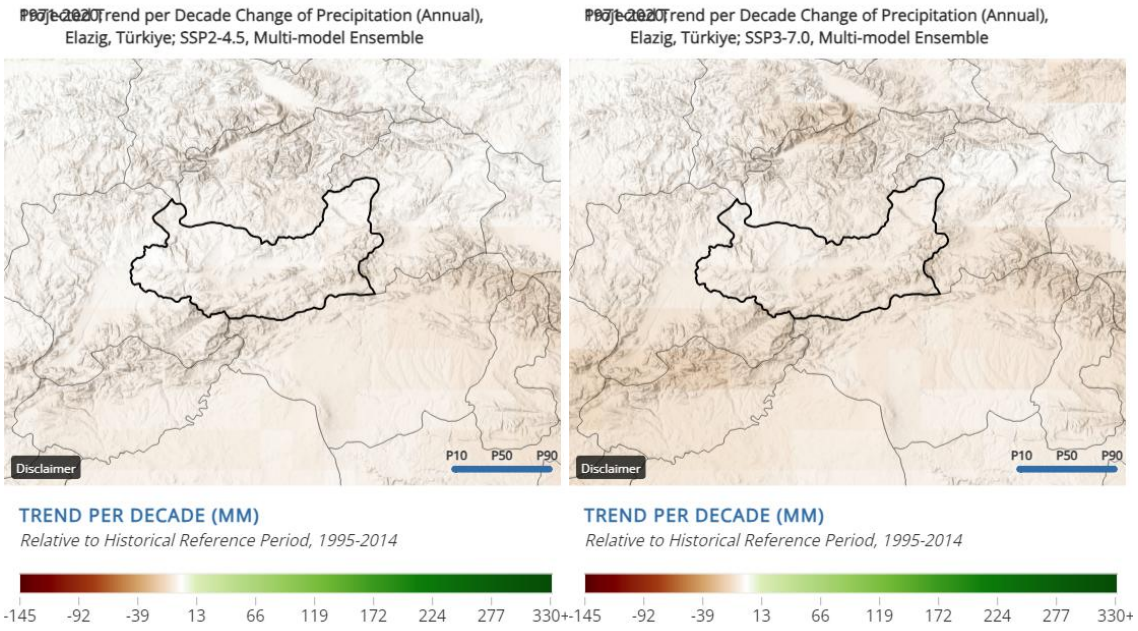
Figure IV.4 Projected Average Mean Surface Air Temperature Changes of Elazığ per Decade until 2050 according to SSP2-4.5 and SSP3-7.0



Source: World Bank, Climate Change Portal, 2024

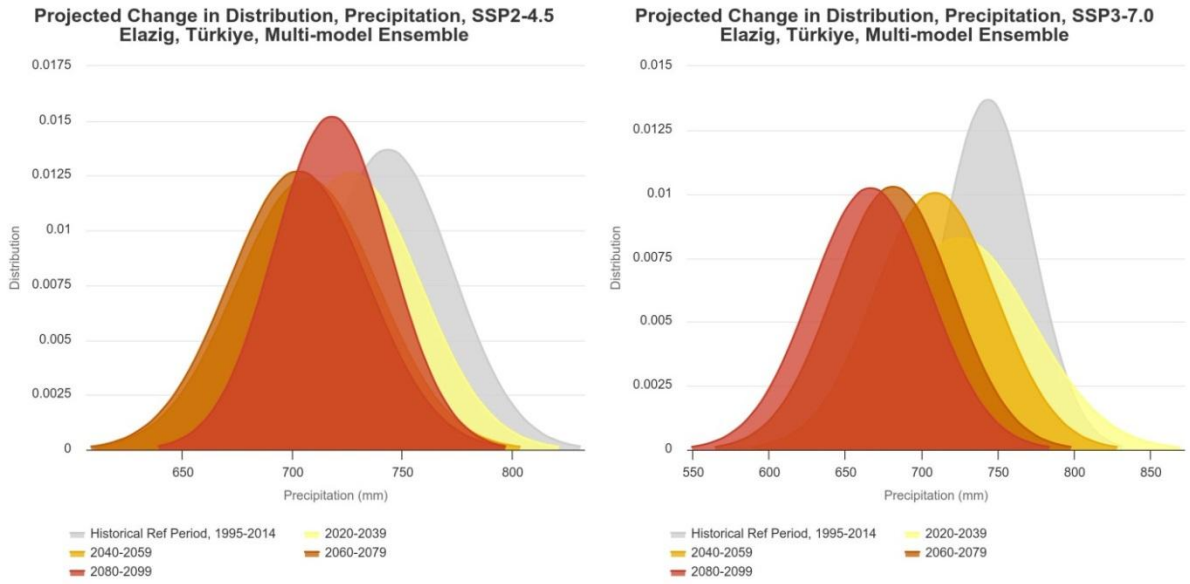
Figure IV.5 Projected Average Mean Surface Air Temperature Change Distributions of Elazığ according to SSP2-4.5 and SSP3-7.0

[8] *https://climateknowledgeportal.worldbank.org/country/turkiye/trends-variability-projections*



Source: World Bank, Climate Change Portal, 2024 [9]

Figure IV.6 Projected Precipitation Changes of Elazığ per Decade until 2050 according to SSP2-4.5 and SSP3-7.0



Source: World Bank, Climate Change Portal, 2024

Figure IV.7 Projected Precipitation Change Distributions of Elazığ according to SSP2-4.5 and SSP3-7.0

The summary of the evaluations of the given images above are comprised below:

- According to SSP2-4.5 scenario, the average air temperature is expected to increase by 1.8 degrees by 2039, 2.6 degrees by 2059 and 3.2 degrees by 2079 while average

[9] *https://climateknowledgeportal.worldbank.org/country/turkiye/trends-variability-projections*

precipitation is expected to decrease by 17 mm to 726 mm by 2039, decrease to 706 mm by 2059 and decrease further to 702 mm by 2079 in Elazığ.

- According to SSP-3-7.0 scenario, the average air temperature is expected to increase by 1.7 degrees by 2039, 2.7 degrees by 2059 and 3.8 degrees by 2079 while average precipitation is expected to decrease by 19 mm to 724 mm by 2039, decrease to 708 mm by 2059 and decrease further to 681 mm by 2079 in Elazığ.

Both of the scenarios foresee higher average temperatures, less average precipitation, increase in extreme temperature days, and flash flood/heavy rain days. As a result of this, it is predicted that there would be an increase in events of erosion, fire, high winds, water scarcity and floods in the future.

IV.1.5 Soil and Soil Quality

Turkish General Directorate for Rural Services database defines the land use capabilities in eight (8) different classes as summarized in Table IV.5. These classes represent the agricultural potential of the soil. In this classification system, soils are categorized between Class I, which represent the arable lands on which agricultural activities can be conducted in the most efficient, economic and simplest way without causing erosion, and Class VIII, which represent the lands that are not arable, cannot even be used as grassland or forest areas but support only wildlife development or can be used by people as a recreation area or national park. Characteristics of each class are summarized in Table IV.5 (*Former Ministry of Agricultural and Rural Services, July 2008*).

Table IV.5 Agricultural Potentials Represented by Different Land Use Capability Classes and Their Characteristics

Class	Agricultural Potential	Definition of Land Use Capability
Class I	Agricultural lands suitable for agricultural soil cultivation	Class I lands are; flat or near flat, deep, fertile and easily cultivated so that the conventional agricultural methods can be applied; potential for water and soil erosion are minimal; have good drainage; are not prone to flood damage exposure; suitable for hoe plants and other intensively grown crops; Class I irrigated lands with low precipitation rates have slope values less than 1% slope, loamy structure, good water holding capacity and medium level permeability.
Class II		Class II lands are decent lands that can only be processed after taking some special precautions. Their difference from Class I lands is one or more of the limiting factors such as slight slope, moderate exposure to erosion, moderately thick soil, exposure to occasional moderate floods and a moderate level of moisture that can easily be isolated.
Class III		Class III lands are moderately good lands for hoe plants which can generate solid income provided they are utilized with a good cropping system and proper agricultural methods. Moderate slope, increased erosion sensitivity, excessive moisture, exposed soil, presence of stones, having a lot of sand and/or gravel, low water holding capacity and low yield are properties of this type of land.
Class IV		Class IV lands can be constantly utilized as meadows. Field crops can also be occasionally grown. High levels of slope, bad soil characteristics, erosion and climate are the factors limiting agricultural activities on these lands. Soils with low slopes and poor drainage are also classified as Class IV lands. These soils are not subject to erosion, but they are unsuitable for growing many agricultural products as they have a low yield and a tendency to suddenly dry up in the spring. In semi-arid regions, cropping systems incorporating legumes are generally not possible due to climate.
Class V	Agricultural lands not suitable for soil cultivation	Class V lands are reserved for long-life plantations such as meadows and forests as they generally are unsuitable for cultivated plants. A few factors such as stony structure and sogginess hinder cultivation here. The land is flat or near-flat. It is not subject to an excessive amount of wind and water erosion. Grazing and tree logging activities can be carried out on condition that a good soil cover is constantly maintained.
Class VI		Class VI lands require moderate precautions even when they are used as forest or meadow since they have quite a bit of slope and are subject to severe erosion. Exposed, soggy or very dry

Class	Agricultural Potential	Definition of Land Use Capability
		conditions make this type of land unsuitable for cultivation.
Class VII		Class VII lands have high slope, are stony and have been subject to violent erosion. Exposed soils, dry and/or some unfavorable conditions and swamps can be classified as Class VII soil. These can be used as forest or meadow without showing due care. If the vegetation on these soils diminishes, erosion can get quite violent.
Class VIII	Non-arable lands	Class VIII lands exhibit features that prevent them from being used as forest, meadow or cultivated land. This type of land is habitat to wild life and can also be used for recreational purposes or as catchment basins for streams. These include lands containing marshes, swamps, deserts as well as areas of high mountainous regions, rocky lands or lands with very deep craters.

Source: Former Ministry of Agricultural and Rural Services, July 2008

The map of major soil groups and land use capability classes for the Project Area is shown in Figure IV.8. According to the former Turkish General Directorate for Rural Services database analysis (1993), the major soil groups of the Project Area are reddish brown soil and brown forest soil. In terms of land use capability, the Project Area is evaluated under the categories of Class III, Class VI and Class VII.

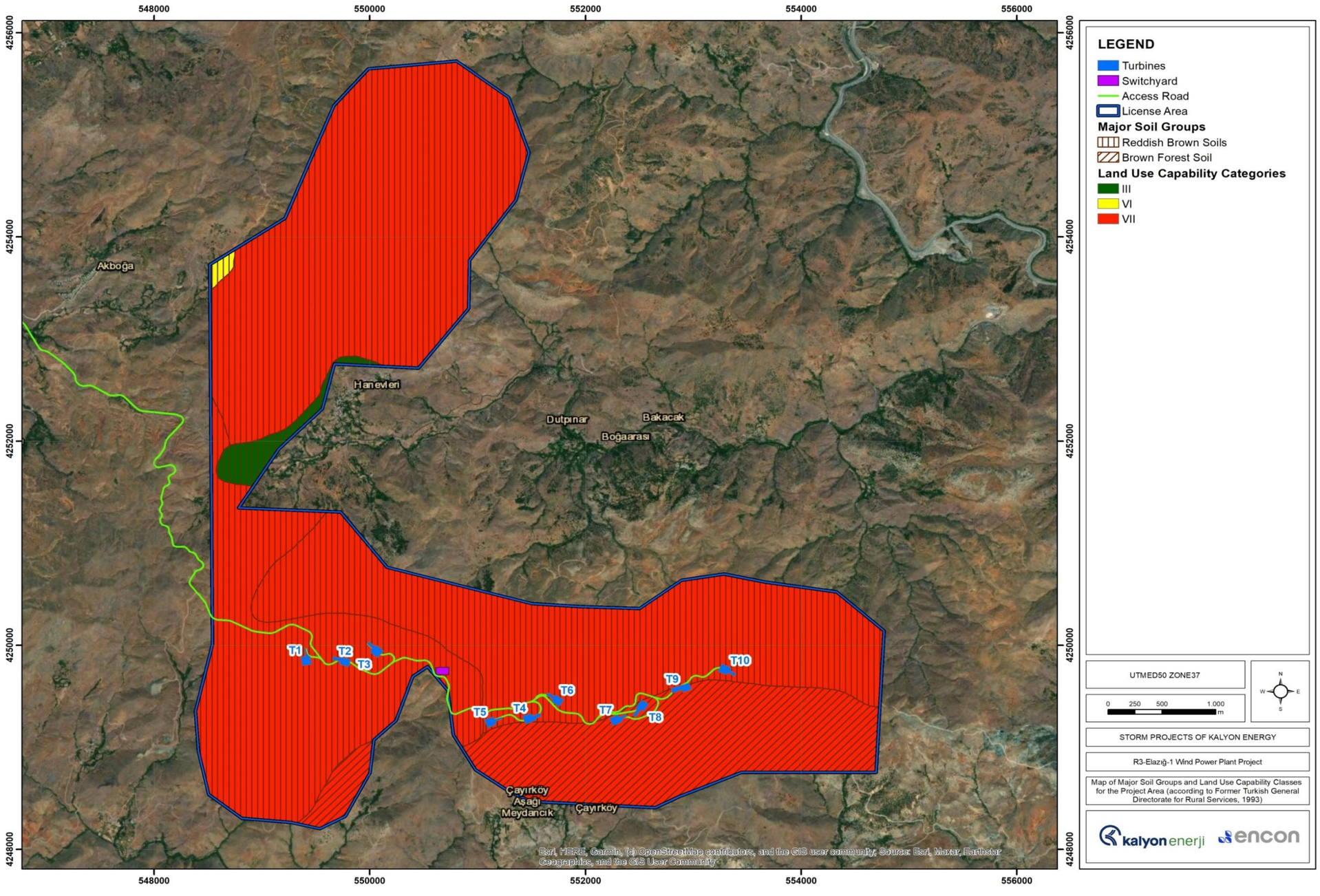


Figure IV.8 Major Soil Groups and Land Use Capability Classes for the Project Area

A soil quality analysis was carried out by FEBAS on the samples taken on October 12, 2023. The samples were taken from four (4) different locations Soil-1, Soil-2, Soil-3 and Soil-4 which are represented in Figure IV.12. Soil-1 sample is taken from outside of the Project Area near Hanevleri village. Soil-2 point is a composite sample which is formed by taking soil samples from different turbine points. Soil-3 is taken from in the Project Area nearby Çayırköy village. Soil-4 sample is taken from the switchyard area. The analysis results are presented in Table IV.6. The reason for choosing these measurement points is to understand whether there will be any impact on both the Project area and the neighboring land during the Project phases. Samples taken from Project area will represent the soil quality for baseline conditions. Considering that after construction starts there will be a need for a reference sampling point outside the Project area with similar characteristics which is taken from a point (Soil-1) 185 m away from the Project area. To compare the results of the sampling studies if there is any soil pollution on the site or not, the measurements are evaluated according to the Generic Pollutant Limit Values List in Annex-1 of the Regulation on Soil Pollution Control and Point Source Contaminated Sites. Detailed laboratory analysis reports are given in Annex-6.

Table IV.6 Analysis Results of Soil Samples of Project Area

Parameter	Measurement Date	Unit	Limit Values[10]	Soil-1 X: 38.413870 Y: 39.567571	Soil-2 X: 38.390222 Y: 39.591841	Soil-3 X: 38.382076 Y: 39.592985	Soil-4 X: 38.392775 Y: 39.579622
Total Organic Halogens (TOX)	12.10.2023	mg/kg	-	<10	<10	10.2	<10
Total Petroleum Hydrocarbons (TPH)		mg/kg	-	<100	<100	<100	<100
Arsenic		mg/kg	0.4	3.15	10.5	5.98	15.8
Boron		mg/kg	-	<2.5	<2.5	<2.5	<2.5
Barium		mg/kg	15643	73.9	64.6	38.6	115.7
Cadmium		mg/kg	70	0.161	0.187	0.211	0.234
Chromium		mg/kg	235	15.4	35.0	17.2	35.1
Copper		mg/kg	3129	10.2	39.0	40.4	50.1
Mercury		mg/kg	23	<0.1	<0.1	<0.1	<0.1
Molybdenum		mg/kg	391	<0.5	<0.5	<0.5	<0.5
Lead		mg/kg	400	24.2	14.8	6.52	23.5
Antimony		mg/kg	31	<0.2	<0.2	<0.2	<0.2
Selenium		mg/kg	391	0.452	0.651	0.669	<0.1
Zinc		mg/kg	23464	8.62	30.8	23.7	37.0

In evaluating the analysis results (of soil quality) to see if there is any soil contamination on the site, the measurements are evaluated according to the Generic Pollutant Limit Values List in Annex-1 of the Regulation on Soil Pollution Control and Point Source Contaminated Sites and the absorption limit values of

[10] *Regulation on Soil Pollution Control and Point Source Contaminated Fields, published in the Official Gazette dated 08.06.2010 and numbered 27605.*

the soil through ingestion and skin contact were taken as basis. Regarding the limit values specified in the regulation, only the arsenic concentrations were determined as above the limit value. Considering that it is the baseline value of the Project area before the construction activities, it can be evaluated that the baseline soil condition of the Project area has good quality except arsenic. Arsenic analysis result is above the limit value both in the Project area and at the measurement point outside the Project area. Therefore, it is thought that the geochemical soil structure of the region is of this nature.

IV.1.6 Natural Hazards and Seismicity

The earthquake potential of an area is obtained by examining the proximity of the active fault system to that area and the records of the earthquakes that occurred in previous historical periods. Türkiye is divided into 5 different earthquake zones as follows:

- First degree earthquake zone: estimated acceleration more than 0.40g
- Second degree earthquake zone: estimated acceleration between 0.40g and 0.30g
- Tertiary earthquake zone: estimated acceleration between 0.30g and 0.20g
- Fourth degree earthquake zone: estimated acceleration between 0.20g and 0.10g
- Fifth degree earthquake zone: estimated acceleration less than 0.10g

Prepared by considering the most recent earthquake source parameters, earthquake catalogs, and next-generation mathematical models, along with the map prepared in accordance with the Türkiye Building Earthquake Regulation published in the Official Gazette dated March 18, 2018 and numbered 30364, the areas of seismic activity are represented by the peak ground acceleration (PGA) values instead of earthquake zones. According to this PGA_475 value, the project area is located in the 0.538 g zone.

According to the data of the Earthquake Research Department; Karakoçan, Palu, Kovancılar, Arıcak, Maden, Alacakaya and Sivrice regions in Elazığ are stated as first degree earthquake zones.

No active faults are observed in the Project area, there is a Holocene Fault, Eastern Anatolian Fault Zone Palu Segment 9 km north of the Project Area and a Halocene Fault, Southeastern Anatolian Thrust, Çüngüş Segment-2 12 km south of the Project Area. In addition, 67 km south of the Project Area is the Dumlu Segment-2 of the Erzurum Fault Zone.

Within the scope of the Project, taking into consideration the ground characteristics of the area, the provisions of the 'Regulation on Buildings to be Constructed in Disaster Areas,' published in the Official Gazette dated 14.07.2007 and numbered 26582, and the 'Regulation on Buildings to be Constructed in Earthquake Zones,' published in the Official Gazette dated 06.03.2007 and numbered 26454, will be meticulously followed. The earthquake map of Türkiye is shown in the Figure IV.9.

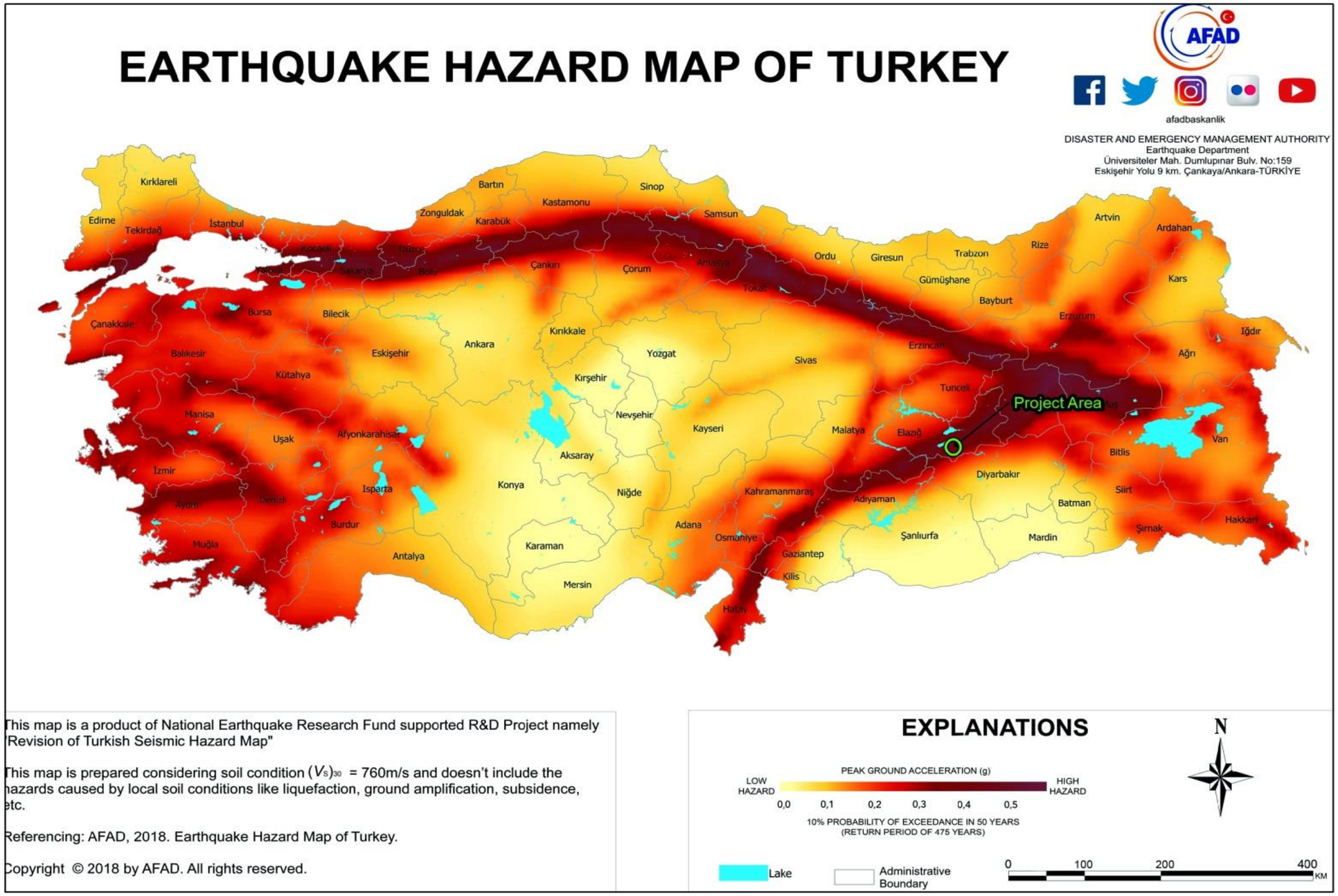


Figure IV.9 Earthquake Hazard Map of Türkiye

Sudden melting of snow or falling rain causes water to be added to the materials forming the slopes. In this case, the soil becomes saturated, becomes heavy, and slides without being able to hold back, and the water pressure (pore water pressure) increases between the ground grains in the slope and along the fractures and cracks of the rocks, triggering landslides.

Natural factors such as precipitation, topographical features, geological factors and water status play an important role in the occurrence of landslides in Elazığ province. According to the data in the 70-year period between 1950 and 2019, 301 landslides/rockfall events occurred in Elazığ province.

According to the Türkiye Landslide Intensity Map prepared by the abolished Ministry of Public Works and Settlement General Directorate of Disaster Affairs in October 2008, the Project area has been described as a "medium landslide density" region. Considering the landslide findings, there is no landslide risk in the Project area.

In Elazığ province, which has a relatively softer topography and climate compared to the rest of the region, small avalanches usually occur in residential areas. Avalanche-prone areas are observed in high altitude regions of the province. According to the data in the 70-year period between 1950 and 2019, 57 avalanche events occurred in Elazığ province.[11]

IV.1.7 Geology, Hydrogeology and Hydrology

Geology and Hydrogeology

In the region sedimentary rocks belonging to Southeastern Anatolia autochthon, occurred in an range of Upper Cretaceous-Quaternary, Kocalı-Karadut nappes, emplaced onto the region in the end of Upper Crateceous, and rock units of Bitlis-Pütürge-Malatya nappes, emplaced during Miocene, are exposed rock units. The oldest lithostratigraphic unit of the autochthon in the region, located in the northern tip of Southeastern Anatolia autochthon, is late Campanian Sayindere formation bearing clayey limestones. The succession is unconformably followed by Eocene-Early Oligocene Midyat group rocks, made up of carbonates in general. The lowermost unit of Midyat group is Early Eocene terrigenous clastics of Gercus formation. Gercus formation is overlain by Gaziantep formation of Eocene-Early Oligocene, built from clayey chalky limestone. Midyat group is overlain by Early Miocene Fırat formation including neritic limestone, and Lice formation made up of sandstone, shale, marl and limestone, and Middle-Late Miocene Selmo for formation consisting of conglomerate, sandstone, siltstone, shale and mudstone. In the region allochthonous Cretaceous Karadut melange belonging to Kocalı-Karadut nappes, comprising siliceous shale, clayey limestone, limestone and cherts and Late Jurassic-Early Cretaceous Kocali mélange, including basalt, spilite, radiolarite, chert, shale, chert limestone and dolomite, and Hezan unit of Early Triassic-Early Cretaceous, bearing limestone, dolomite and clastics, together emplaced onto the region in the end of Upper Cretaceous. Eocene-Early Miocene Cungus formation is exposed. Also in the region Eocene-Early Miocene aged Cungus formation crops out which is the lowermost structural unit of Bitlis- Pütürge -Malatya nappes and bears clastics, Guleman ophiolite in association with Bitlis- Pütürge -Malatya nappes, and Puturge metamorphics and marble in the region. Pütürge metamorphics are overlain by Early-Middle Eocene volcano-sediments of Maden formation besides Cefan, Arbo, Melefan, Kardere and Narltdere members unconformably.

The generalized stratigraphic column section of the Project area and its surroundings is given in Figure IV.10.

[11] *https://www.afad.gov.tr/kurumlar/afad.gov.tr/e_Kutuphane/KurumsalRaporlar/Afet_Istatistikleri_2020_web.pdf*

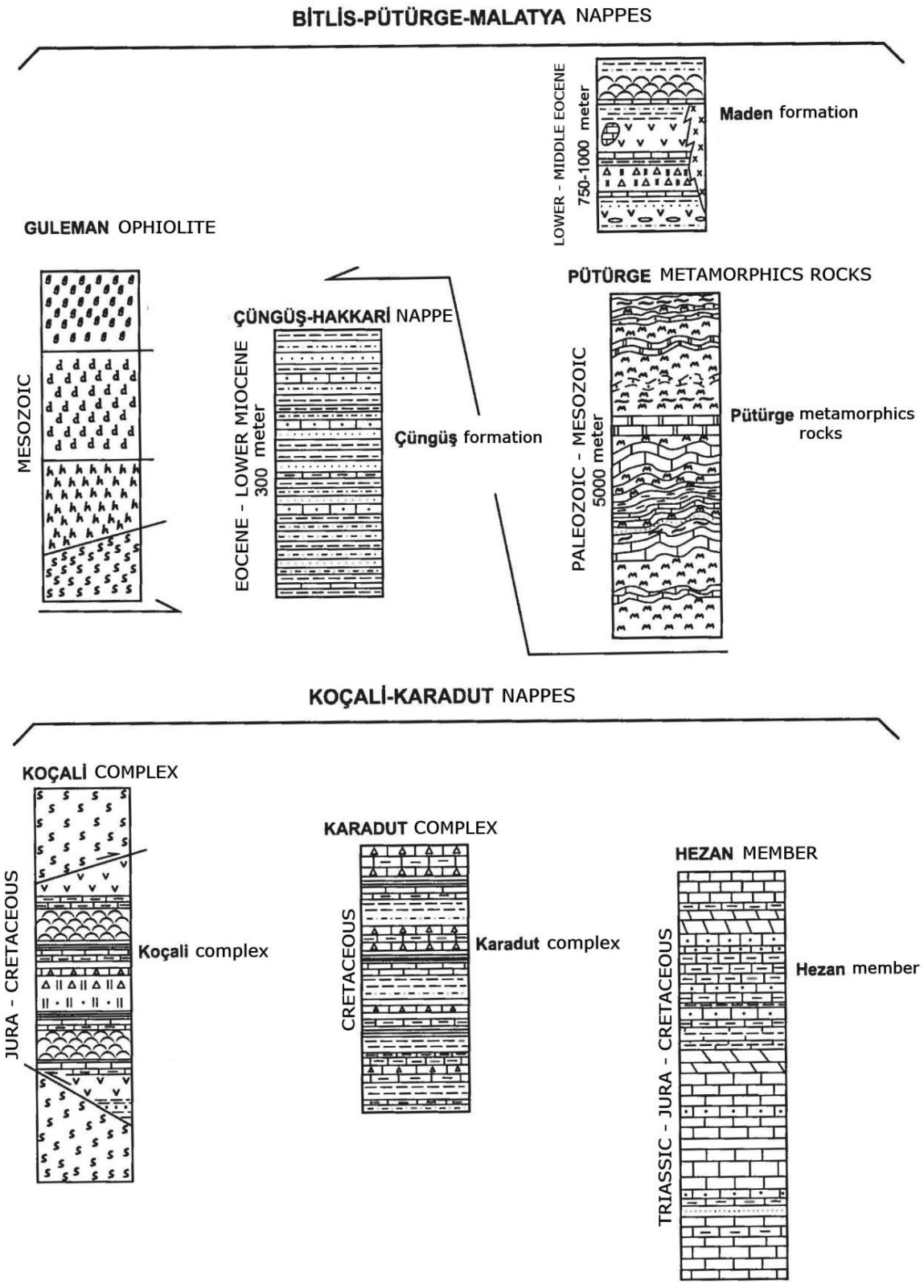


Figure IV.10 Generalized Stratigraphic Column Section of the Project Area and Its Surroundings

In the east side of the Project area, in the region where the T5-T6-T7-T8-T9-T10, turbine is located, and on the west side of the Project area, where the T1-T2 turbines are located, the Lower-Middle Eocene aged Maden formation belonging to the Bitlis-Pütürge-Malatya nappes are located. In the middle part of the Project area, where the T3-T4 turbines are located, the Lower-Middle Eocene aged Melefan member belonging to the Maden formation are located. Apart from this, the remaining part of the Project area is located on the Jurassic-Createceous aged Guleman ophiolite, Paleocene-Maastrictian aged Simaki formation, and other members of Maden formation, and Quaternary aged alluvium.

Lower-Middle Eocene aged Maden formation consisting of conglomerate, sandstone, limestone, limestone blocks, basalt, and Melefan member belonging to the Maden formation are hydrogeologically impermeable but are permeable at fractured cracked levels. Geology map of Project area and its surroundings is given in Figure IV.11.

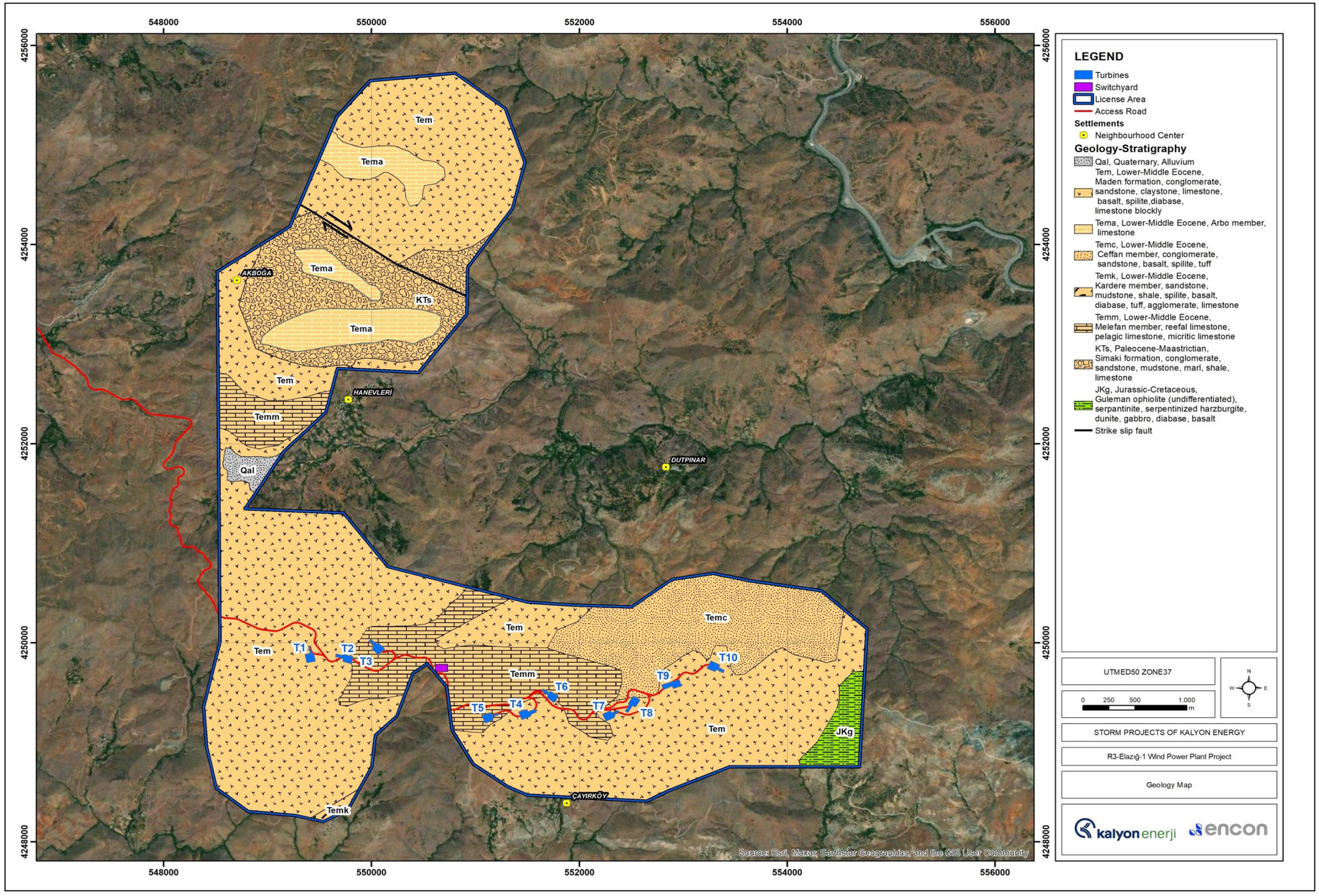


Figure IV.11 Geology Map of the Project Area

Groundwater sampling was conducted within the scope of the Project by FEBAS Environmental Laboratory (FEBAS) which is accredited laboratory from MoEUCC. Sampling was carried out in three locations presented in Figure IV.12. GW-1 point is a groundwater sampling point located approximately 20 m from the Project Area, while GW-2 point is a groundwater sampling point located approximately 800 m from the Project Area. Also, GW-3 point is a groundwater sampling point located approximately 200 m from the Project Area. The analysis results are given in Table IV.7. Detailed laboratory analysis reports are given in Annex-6.

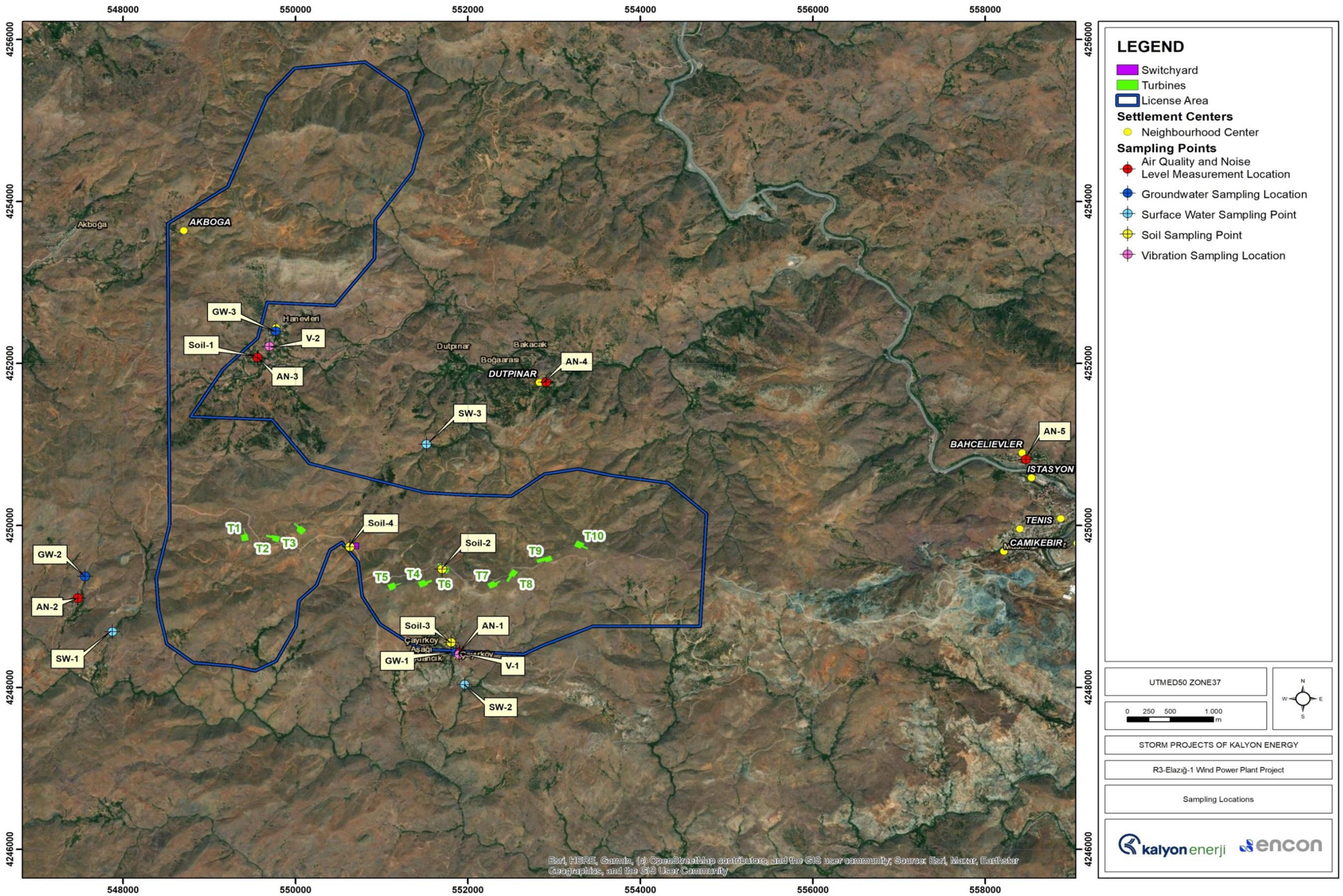


Figure IV.12 Sampling Locations Map

Table IV.7 Groundwater Analysis Results

PARAMETER	Measurement Date	Unit	GW-1	GW-2	GW-3	Drinking Water Limit Values			
			(38.380939 / 39.593574)	(38.389640 / 39.544410)	(38.416830 / 39.569960)	Turkish Drinking Water Standards[12]	EU Drinking Water Standards[13]	WHO Standards[14]	Strictest Regulation Value
Ammonium	12.10.2023	mg/L	<0.026	<0.026	<0.026	0.5	0.5	-	0.5
Arsenic		mg/L	<0.001	<0.001	<0.001	0.01	0.01	0.01	0.01
Mercury		mg/L	<0.001	<0.001	<0.001	0.001	0.001	0.006	0.001
Boron		mg/L	<0.025	<0.025	<0.025	1	1.5	2.4	1
Conductivity		µS/cm	338	280	356	2500	2500	-	2500
Cadmium		µg/L	<0.2	<0.2	<0.2	5	5	3	3
Chloride		mg/L	2.08	1.36	2.43	250	250	-	250
Lead		mg/L	<0.001	<0.001	<0.001	0.01	0.01	0.01	0.01
Nitrate		mg/L	8.18	9.69	3.91	50	50	50	50
Phosphate		mg/L	<0.31	<0.31	<0.31	-	-	-	-
Sulphate		mg/L	12.2	17.8	12.2	250	250	-	250
Total Cyanide		mg/L	<0.005	<0.005	<0.005	0.05	0.05	-	0.05
Total Pesticide		µg/L	<0.1	<0.1	<0.1	0.5	0.5	-	0.5
Trichloroethylene		µg/L	<0.1	<0.1	<0.1	10	10	8	8
Salinity		‰	0.19	0.21	0.23	-	-	-	-
pH		-	8.15	8.31	8.45	6.5-9.5	6.5- 9.5	-	6.5- 9.5
Oxygen saturation		%	68.4	74.4	63.9	-	-	-	-
Dissolved oxygen (DO)		mg/L	5.53	6.23	5.5	-	-	-	-
Total suspended solid (TSS)		mg/L	<10	<10	<10	-	-	-	-
Total Petroleum Hydrocarbon (TPH)		mg/L	<0.1	<0.1	<0.1	-	-	-	-
Temperature		°C	16.5	16.3	15.4	-	-	-	-

[12] *Regulation of Water Intended for Human Consumption (RWIHC) issued by the Ministry of Health, which was published in the Official Gazette dated 17.02.2005 and numbered 25730 (Amended: RG-20/10/2016-29863),*

[13] *Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the Quality of Water Intended for Human Consumption (recast)*

[14] *Guidelines for Drinking Water Quality" developed by the World Health Organization (WHO, 2022)*

Since the people of the region use these wells for drinking water, drinking water quality standards were used to examine the groundwater quality and to find out the parameters exceed the quality standards. These standards are:

- "Regulation of Water Intended for Human Consumption" (RWIHC) issued by the Ministry of Health, which was published in the Official Gazette dated 17.02.2005 and numbered 25730 (Amended: RG-20/10/2016-29863),
- Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the Quality of Water Intended for Human Consumption (recast),
- "Guidelines for Drinking Water Quality" developed by the World Health Organization (WHO, 2022).

The parameters analysed and the comparison of the values measured in these parameters with the values specified in the standards is given in Table IV.7. The smallest limit values determined in these standards were used in the comparisons. Therefore, no parameter exceeds the drinking water limit values.

Hydrology

The Project area is located within the Fırat-Dicle Basin which is among the water basins allocated throughout Türkiye. Although there are no seasonal creeks within the Project area, and to the west of the Project area, away from the planned turbines, there are continuously flowing creeks drained by seasonal creeks. These creeks are located approximately 600m southwest and 2 km northwest of the T1 turbine point.

The most important rivers in the basin are the Fırat River (Euphrates River) and the Dicle River (Tigris River). The total length of the Tigris is 1990 km. The part of it that is within the territory of Türkiye is approximately 512 km. The Dicle River originates from a spring near Yıldızhan on the south side of Mount Hazarbaba in the Maden Mountains in the Southeastern Taurus Mountains. After leaving the source, it passes in front of the town of Maden, takes the name of Maden Stream and flows towards the southeast. The Fırat River is Türkiye's most productive river with the highest water potential. The starting points of the Fırat River are the Murat River, which originates in Ağrı Diyadin, and the Karasu River, which originates in Erzurum Dumludağ. The Fırat River enters Syria and then Iraq after defining the provincial borders of Erzincan, Tunceli, Elazığ, Malatya, Diyarbakır, Adıyaman and Gaziantep. At a point not far from the sea in Iraq, it merges with the Dicle River to form the Shatt'ul-Arab and flows into the Persian Gulf.

Dicle River flows approximately 2.6 km east of the Project area. There is Işıktepe Pond approximately 3.3 km northwest of the Project area. Also, there is Hazar Lake approximately 9.5 km northwest of the Project area. The hydrology map showing the hydrological status of the Project area and its surroundings is shown in Figure IV.13.

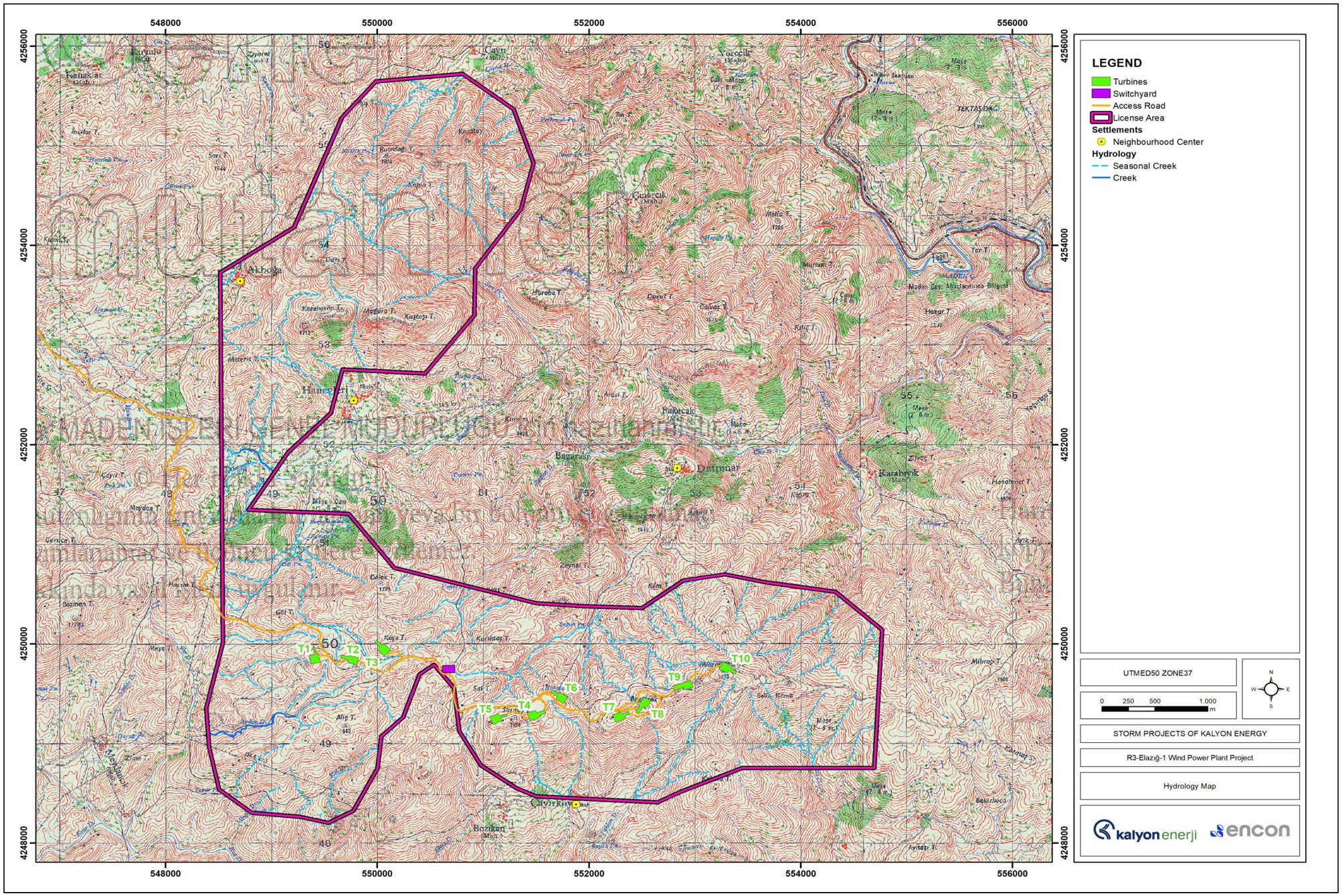


Figure IV.13 Hydrology Map of Project Area and Turbines

A surface water quality analysis was carried out by FEBAS on the samples taken on October 12, 2023. The samples were taken from three (3) different locations. These measurement points are SW-1, SW-2 and SW-3 which are located approximately 600, 400 and 600 m away from the Project Area respectively. The surface water quality sampling locations are shown in Figure IV.12. Surface water measurement results are given in Table IV.8 together with the water quality classification criteria stipulated in the Surface Water Quality Regulation. Detailed laboratory analysis reports are given in Annex-6.

Table IV.8 Surface Water Measurement Results

PARAMETER	Measurement Date	Unit	SW-1 (X: 38.383464 / Y: 39.547995)	SW-2 (X: 38.377356 / Y: 39.594744)	SW-3 (X: 38.404143/ Y: 39.589883)	Surface Water Quality Regulation Water Quality Classes		
						I	II	III
Ammonium	12.10.2023	mg/L	0.022	<0.02	0.035	<0.2	1	>1
Oil and Grease		mg/L	<10	<10	<10	<0.2	0.3	>0.3
Biological Oxygen Demanded (BOD)		mg/L	12.2	21.4	<4	<4	8	>8
Dissolved Oxygen (DO)		mg/L	8.20	7.54	7.90	>8	6	<6
Conductivity		µS/cm	311	925	328	<400	1000	>1000
Chemical Oxygen Demanded (COD)		mg/L	33.3	55.9	16.9	<25	50	>50
Nitrate		mg/L	0.218	<0.1	0.181	<3	10	>10
pH		-	8.28	8.32	8.27	6-9	6-9	6-9
Phosphate Phosphorus		mg/L	<0.1	<0.1	<0.1	-	-	-
Total Phosphorus (TP)		mg/L	<0.01	0.014	<0.01	<0.08	0.2	>0.2
Total Kjeldahl Nitrogen (TKN)		mg/L	0.110	0.182	0.238	<0.5	1.5	>1.5
Total Nitrogen (TN)		mg/L	0.328	0.182	0.419	<3.5	11.5	>11.5
Fluoride		µg/L	<100	<100	<100	≤1000	1500	>1500
Manganese		µg/L	<1	<1	<1	≤100	500	>500
Selenium		µg/L	<1	<1	<1	≤10	15	>15
Sulphur		µg/L	<2	<2	<2	≤2	5	>5
Color (436 nm)		m^{-1}	0.1	0	0.2	≤1.5	3	>4.3
Color (525 nm)		m^{-1}	0.2	0	0.1	≤1.2	2.4	>3.7
Color (620 nm)		m^{-1}	0.4	0.2	0	≤0.8	1.7	2.5
Temperature		°C	15	20.1	15.8	-	-	-

Source: FEBAS Çevre Laboratuvarı Test Reports dated 24.01.2024 (SW-1, SW-2 and SW-3)

As seen in Table IV.8, SW-1 is classified as Class III in terms of oil and grease and BOD parameters, Class II in terms of COD parameter and other measured parameters belong to Class I. SW-2 is classified as Class III in terms of oil and grease, BOD and COD parameters, Class II in terms of DO and conductivity parameters and other measured parameters belong to Class I. In addition, SW-3 is classified as Class III in terms of oil and grease parameter, Class II in terms of DO parameter and other measured parameters belong to Class I.

IV.1.8 Waste and Water/Wastewater Management

Pursuant to the Environmental Law No. 2872, it is prohibited to directly or indirectly deliver, store, transport, dispose of all kinds of waste and residues to the receiving environment, in violation of the standards and methods determined in the relevant regulation. Waste generated in the Maden district where the Project Area is located are managed in accordance with the requirements of the Waste Management Regulation.

According to 2021 Environmental Status Report for Elazığ Province prepared by MoEUCC Provincial Directorate, only the Central District Municipality has a solid waste sanitary landfill and other municipalities use wild storage.

The utility water to be used will be supplied from Elazığ Special Provincial Administration network points via tankers. No groundwater or surface water will be used for this purpose. Drinking water requirements of the Project personnel is expected to be met from local suppliers located in nearby settlements.

There are two (2) WWTPs near the project area, one is in Gezin and the other one is in Sivrice districts. There is also another WWTP located in Central District of Elazığ Province.

IV.1.9 Noise and Vibration

Environmental noise in Türkiye is regulated by the Regulation on Environmental Noise Control (RENC), which is published in the Official Gazette dated 30 November,.2022 and numbered 32029. This regulation is intended to ensure that precautions are taken to prevent disturbance to peace and tranquility, and to ensure the physical and mental health of persons potentially exposed to environmental noise. For this purpose, the regulation sets out requirements regarding noise mapping, acoustic reporting, environmental noise assessment for determination of noise exposure levels and preparation and application of action plans to prevent or mitigate negative impacts of noise exposure on human beings and the environment.

The operation noise limit values defined in the RENC are presented in Table IV.9.

Table IV.9. Environmental Noise Limits Values for Industrial Plants provided in RENC

Noise Source	Measured Parameter	Environmental Noise Level		
		Day	Evening	Night
Industrial plants, transportation resources	$LA_{eq,5min}$	65 dB(A)	60 dB(A)	55 dB(A)
Music broadcasting workplaces	$LA_{eq\ 63\text{-}250\ Hz}$	60 dB(A)	55 dB(A)	50 dB(A)
Workplaces	$LA_{eq,5min}$	Background + 5 dB(A)		Background +3 dB(A)
In case of multiple workplaces	$LA_{eq,5min}$	Background + 7 dB(A)		Background +5 dB(A)
All resources	LC_{max}	100 dB(C)		

IFC General EHS Guidelines

Noise limit levels are described under, IFC General EHS Guidelines: Environmental Noise. The noise limit values are based on World Health Organization (WHO) Guidelines for Community Noise. IFC General EHS Guidelines requires that noise impacts should not exceed the levels presented in Table IV.10, or result in a maximum increase in background noise levels of 3 dB at the nearest receptor location off-site.

Table IV.10. Noise Level Limit Values in IFC General EHS Guidelines

Receptor	One Hour L_{Aeq} (dBA)	
	Daytime 07:00 – 22:00	Nighttime 22:00 – 07:00
Residential, institutional, educational	55	45
Industrial, commercial	70	70

To determine the background noise level, a measurement study was conducted at five (5) locations presented in Figure IV.12.The background noise measurements were carried out in 15 minute periods for 2 days between October 13-14, 2023 by FEBAS, and the results are presented in Table IV.11. Detailed laboratory analysis reports are given in Annex-6. The locations of measurement points are selected to represent the Project's possible impacts on the closest sensitive receptors. More information on the mentioned receptors is given in the Table IV.1.

Table IV.11 Background Noise Level Measurement Results

Measurement Point	Measurement Date	Measurement Coordinates		Measurement Results and Limit Values (Leq) (dBA)				
				RENC			IFC General EHS Guideline	
		East (X)	North (Y)	Daytime (07.00-19.00)	Evening (19.00-23.00)	Night (23.00-07.00)	Daytime (07.00-22.00)	Nighttime (22.00-07.00)
A-N-1	13-14.10.2023	38.380921	39.594052	42.3	38.1	34.6	41.9	34.8
A-N-2		38.387223	39.543440	41.9	37.2	42.5	47.3	42.7
A-N-3		38.413904	39.567501	44.1	38.8	35.9	43.5	36.2
A-N-4		38.410970	39.605830	41.5	36.1	33.8	41.1	34.0
A-N-5		38.402021	39.669505	46.3	39.5	36.2	46.0	36.5
Limit values				65	60	55	55	45

As can be seen from Table IV.11, the background noise levels for the measurement location are below the limit values defined in RENC for daytime, evening and nighttime and IFC General EHS Guideline for daytime and nighttime.

In addition to noise measurements, vibration measurements were made in the surrounding neighborhoods on October 13, 2023 by FEBAS. Measurements were carried out at two (2) points in Çayırköy and Hanevleri villages. These measurement locations are shown in Figure IV.12 and the results are presented in Table IV.12. According to measurement results, all results are below the limit values.

Table IV.12 Vibration Measurement Results

Measurement Point	Measurement Date	Measurement Coordinates		Measurement Results and Limit Values (mm/s)		
		East (X)	North (Y)	X direction	Y direction	Z direction
V-1	13.10.2023	38.380710	39.594020	0.075	0.812	0.394
V-2		38.415143	39.569102	0.081	0.704	0.411
Limit values(Australian and New Zealand Environmental Standard AS2670)				5	5	5

IV.2 Ecology and Biodiversity

In the scope of the environmental and social impact assessment (ESIA) studies for R3-ELAZIĞ-1 WPP, ecological environment studies which included terrestrial flora and fauna and protected and recognized areas (e.g., KBAs, IBAs, national parks, etc.), is conducted.

To evaluate the project's potential impacts on the biodiversity element and habitats within and around the project area, the terrestrial biodiversity is studied to identify the existing biological conditions. This ESIA report's biodiversity section describes the study area's terrestrial flora and fauna and highlights sensitive species.

Biodiversity survey and monitoring field studies for R3-ELAZIĞ-1 WPP were done for two periods, as shown in Table IV.13. Bat surveys were done at the determined points in the Study Area. Two field studies were conducted for the flora and fauna surveys.

The autumn period starts mid-August and continues until mid-November (Kirwan et al., 2008). In Türkiye, the passage of autumn migratory birds begins in mid-August and continues until the end of October (Kirwan et al. 2008). Migration monitoring studies were carried out between August 20 and October 20, covering almost the entire autumn migration activity.

This Biodiversity Chapter of the ESIA report describes the ecological characteristics of the R3-ELAZIĞ-1 WPP area and identifies potential impacts on the biodiversity arising from the Project activities. The assessment follows the IFC Performance Standard 6 (PS6) recommendations and requirements: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

Table IV.13 Biodiversity Field Study Calendar

PERIOD	Summer	Autumn		
MONTH	August	September	October	November
FLORA-FAUNA				
DATE	23	-	-	4
BIRDS				
DATE	13	13	13	13
	14	14	14	14
	15	15	15	15
	16	16	16	16
	17	17	17	17
	18	18	18	18
	19	19	19	19
	20	20	20	20
	21	21	21	21
	22	22	22	22
	23	23	23	23
	24	24	24	24
BATS				
DATE	1	1	1	1

PERIOD	Summer	Autumn		
MONTH	August	September	October	November
	2	2	2	2
	3	3	3	3
	4	4	4	4
	5	5	5	5
	6	6	6	6

IV.2.1 Definition of the Study Area

The selection of biodiversity survey points also considers the potential impact of the WPP area on the local flora and fauna.

The projection of project units for flora species is the direct impact area. A 500-meter radius area of the turbines was researched in the flora studies. Additionally, a transect method was employed to conduct fieldwork along the road route that provides access to the turbine areas (see Figure IV.14).

The tangible impacts of pre-construction and construction activities are predominantly confined to the licensed area, but certain environmental effects, notably dust and air pollution emissions extend beyond the licensed boundaries. Therefore, the AoI of the Project is delineated as a 5-kilometre buffer zone surrounding the licensed area to encompass all potentially affected areas. The Biodiversity Study Area (BSA) is the AoI of the Project determined by considering the environmental impact of turbines and associated facilities (see Figure IV.14). BSA had been studied for terrestrial fauna determination and impact assessment.

The observation method from Vantage Points dominating the area is based on observation from points where the entire project area can be seen, and all birds passing through the project airspace can be monitored. In this study, bird monitoring was made at an observation point determined in previous studies, where most of the turbines in the project can be seen. Vantage Point is shown in Figure IV.14, and their coordinates are in Table IV.14.

Areas and roosts that could be food sources for bats were scanned throughout the BSA and at the turbine points. Additionally, stations where bat sound recordings would be made were determined to collect data. While determining the stations, vegetation characteristics, aspect, altitude characteristics and places where bats may fly were considered. Bat sound recording stations are shown in Figure IV.14, and their coordinates are in Table IV.14.

Table IV.14 Coordinates of Bat Sound Recording Station and Bird Observation Points

Station Name	Station No	Coordinates (WGS84, UTM36S)	
		East	North
Bat sound recording stations	BS-1	550246	4249644
	BS-2	551923	4249115
Bird observation point	VP-1	552221	4249104

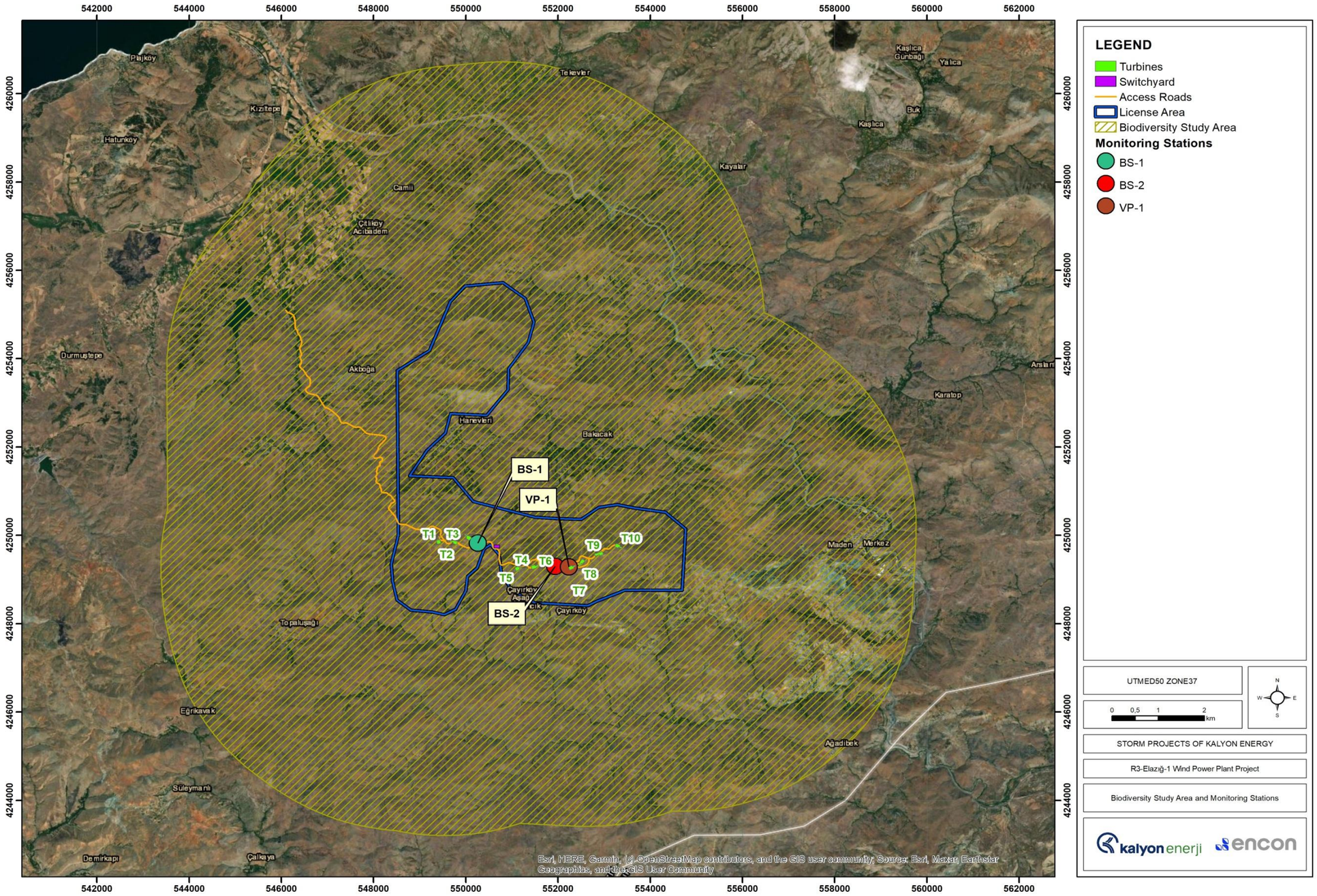


Figure IV.14 Map of the Biodiversity Study Area

IV.2.2 Methodologies

Flora and vegetation studies were conducted by Prof. Dr. Hayri Duman from Gazi University, herpetofauna and mammal studies by Prof. Dr. Zafer Ayaş from Hacettepe University, ornithology studies by Asst. Prof. Şafak Bulut from Hitit University and bat studies by Expert Biologist Emin Seyfi.

Flora

Field studies were conducted on two periods and two days, to identify the flora of the R3-ELAZIĞ-1 WPP area.

During the research in the Study Area, the areas designated for turbine constructed, the road route planned for opening, the impact area, and a broader area covering both were considered as the project area. Flora species recognized during the field studies were recorded in a field notebook. Species that could not be identified at the species level were collected, pressed, dried, and later identified. The floristic list, organized based on habitat, was prepared during field trips using findings and observations.

The floristic list includes ferns (Pteridophyta), gymnosperms (Gymnospermae), and angiosperms (Angiospermae), listed in alphabetical order by families within each group. When listing species, Turkish names, plant geography region, endemism status, endangerment category of endemics, and inclusion in Bern and CITES lists, EUNIS habitat type, and abundance within the area are detailed in Table IV.30.

Plants collected from the project area were identified using the book "Flora of Türkiye and East Aegean Islands." The Turkish names of identified plants were prepared primarily using the work "Turkish Plant Names" written by Prof. Dr. Turhan Baytop. In determining the threat categories of endemic plants, the "Red Data Book of Turkish Plants" prepared by Prof. Dr. Tuna Ekim and colleagues was used as the main reference. Furthermore, these threat categories were reinterpreted, considering the population and threat factors of endemic species within the area, based on the IUCN 2001 criteria.

Fauna (Amphibia, Reptilia, Mammalia)

The main objective of the terrestrial fauna studies was to determine the areas that are likely to be affected at the operation level of the project (biodiversity study area) and the terrestrial fauna elements in these areas (amphibians, reptiles, and mammals) at the species level, and thence to determine the biological activities of these species in the areas (breeding, nutrition, accommodation etc.). From this information, an assessment of appropriate mitigation measures was made by identifying possible impacts resulting from project activities. In this context, the principles and methods taken as the basis of the faunistic studies are outlined below in general terms:

- Terrestrial fauna studies and reports included the study of mammals (Mammalia), reptiles (Reptilia), and amphibians (Amphibia).
- Fauna studies were carried out to cover the BSA. In addition, the study area was further expanded in cases where a different fauna structure could arise from a variable topography and/or vegetation structure.
- Field studies were conducted in August, and November 2023 to determine the fauna elements.
- In addition, literature information, reports of previous fauna studies in the nearby environment, and survey information obtained from the local people, stakeholder engagement and consultation were also utilized. The scientific publications and other sources used are indicated in the reference lists at the end of this report.
- Species present in this region, according to the literature but not identified during field studies, are also included in the species lists based on habitat suitability.

- In determining the presence of animal species, direct observations were made in addition to the existence of suitable habitats, traces and signs belonging to animals (nest-cub-puke-footprint, feces-food residues, skin-antler-tortoise shell, and bone remains) were also utilized.
- During the faunistic field studies, hunting, gathering, and killing were not performed while identifying the area's species.
- Advanced optical instruments, cam traps, and bat sound recorders were used to identify species of mammals and birds. In identifying smaller mammals, reptiles, and amphibians, sweep nets, nets and live traps were used, and at the end of catches, animals whose species were identified were released back to nature.
- For reptile and small mammal species, observations, and non-living natural materials (especially dead reptile individuals and/or skin and tortoiseshell remain found in the field) were utilized. The literature belonging to the fauna elements related to this area, museum materials previously collected, and animal samples provided by the local people and amateurs also constituted some of the source material for the lists prepared.
- In the faunistic studies, 1/25000 scale maps and satellite images were used.
- During mapping studies, GPS was also used to determine elevations and geographical coordinates.
- Field work started early in the morning and continued until sunset.
- Concerning the field of activity, data on biotopes, biogenetic conservation areas, endemic species, endangered species, and wildlife habitats in the area were also collected and evaluated. The categories of fauna elements have been assessed according to national and international sources.
- In the species list tables prepared, next to each species, the data such as scientific names, Turkish-English names, whether it is inside and/or outside the project area, endemism, and international danger categories (IUCN, Bern Convention), relative location and the possibility of being affected are also indicated.

Mammalia

The methodologies applied in mammalian studies are summarized in general as follows:

- In the BSA, adults and offspring of mammal species were searched for by direct observation in existing habitats.
- During mammal observations, point mammal observations were applied in different habitats describing the whole area and Transect mammal observations were applied between these habitats. Monocular telescopes (Leica-20x60-80 magnification) and binoculars (Pentax-16x34 and Bushnell 10x50) were used in these studies. The observed species and the habitats of the areas were recorded, and photographs of some species were taken (Canon-x400 telelens).
- According to the referenced literature, pictures and photographs of the mammal species stated to be in this region were shown to the local people. Survey studies were conducted to verify the species' existence, and the species identified by the local people were also included in the list.
- In addition to the studies, the species in this region, according to the referenced literature, have been included in the species list, even if they were not observed, because they are "species that are likely to exist according to their habitat suitability".
- As a result, the list of mammal species in the Project area was created according to direct observation, literature data, surveys conducted with local people and habitat suitability.

Reptilia and Amphibia

- Adults and offspring of reptile species were searched for by direct observation in existing habitats in the BSA. In undertaking these studies, the underside of the stones in the exposed regions was checked by removing rocks and hollows, and the base of the grasses and shrubs was reviewed. The observed species and the habitats of the locations where they were found were recorded and photographed, and the captured individuals were released back to the field after species identification.
- The reptile species stated to be in this region according to the referenced literature are also included in the species list.
- Photographs of the reptile species stated to be in this region, according to the referenced literature, were shown to the local people. Survey studies were conducted to verify the existence of the species, and the species identified by the local people were also included in the list.
- In addition, according to the referenced literature, the species in this region are included in the species list, even if they were not observed, because they are "species that are likely to exist according to their habitat suitability".
- As a result, the list of reptile species in the project area was created according to direct observation, literature data, surveys conducted with local people and habitat suitability.

Birds

The survey is based on a Vantage Point (VP) methodology situated on high ground for both migratory and native species, as outlined in the Guidelines for Wind Farms published by Scottish Natural Heritage (SNH 2017). The VP methodology entails observations from fixed locations where the entire project area is visible, enabling the detection of all birds flying through the rotors. The guidelines established by this organization serve as the foundation for studies aimed at determining the ecological impact caused by wind farms. The World Bank's Environmental and Employee Health and Safety Guidelines also recommend adherence to Nature Scot guidelines (IFC 2016).

The number of observers or observation points in wind farms is crucial for survey efficiency. Detectability, defined as the proportion of birds detected by the observer, increases with the number of observers, with single observers exhibiting lower detectability than a team of two observers (Gregory et al., 1996). During periods of low bird density, the effectiveness of a single observer is reduced, resulting in a significant percentage of birds flying undetected. Conversely, in dense skies, a single observer is occupied scanning the horizon, leading to fewer undetected birds. Observers conduct their observations by scanning the area at a 180-degree angle every 5 minutes. Upon detecting a bird, the species is identified, the number is noted, and the minimum and maximum height is estimated. Additionally, the first and last sighting time is recorded using a standard field recording sheet (see Annex-7).

According to EU guidance (2011), most of the documented WPP impacts on birds are as follows:

- Collision fatalities,
- Discomfort and displacement,
- Barrier effect,
- Habitat loss and degradation,

The ornithological study and analysis aim to use a Collision Risk Model to estimate the potential collision risk of each target species observed in the area during the Vantage Points surveys.

Observation and Data Recording

The observer on duty at the WPP are scanned the sky every 5 minutes at the designated observation point. The entire area was scanned with a wide angle of approximately 180 degrees. The bird species detected due to the observations, the estimated ground height of each bird observed, and the risk of hitting the wings every 15 seconds during the entire flight time were recorded.

Turbine mast height considering 165 m and rotor radius 64 m, the height classes were determined as follows:

- >29 meters above the ground (a)
- Between 29 and 165 meters above ground level, which is considered the height at risk for collision (b)
- > 165 meters above ground (c)

Fieldwork was conducted between August 20 and October 20, 2023, with 75:00 hours of observation for 15 days. Field observations were carried out between 8:00 and 15:00 every day. Weekly/hourly data of the observations are given in Table IV.15.

Table IV.15 Bird Monitoring Hours Chart

Start	End	Mon	Tue	Wed	Thu	Fri	Sat	San	Total
20/8	20/8							3:30	3:30
21/8	24/8	05:00	04:00	08:00	06:00				23:00
13/9	17/9			06:00	07:00	05:00	04:00	06:00	28:00
16/10	20/10	02:00	02:40	07:30	07:30	01:00*			20:30
Total									**75:00**

*Observations could not be made due to adverse weather conditions.

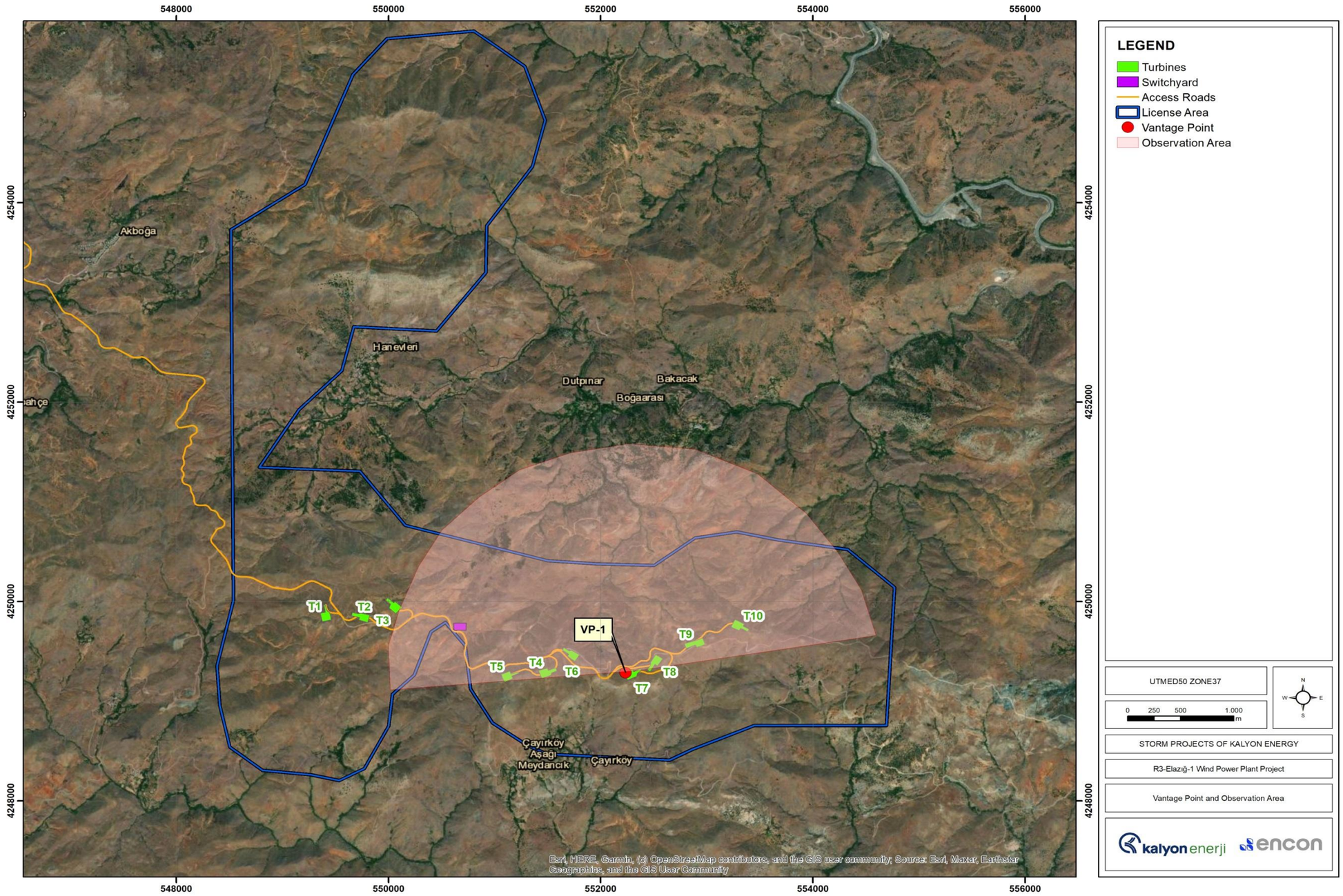


Figure IV.15 Map of the Bird Observation Area

Collision Risk Modeling

According to the SNH Guidelines, an assessment of collision risk is required to assess the full impact on ornithological surveys at WPP areas. For this purpose, a methodology is applied that involves a two-stage process (SNH 2010).

1) Quantitatively evaluate and calculate the status of birds flying near turbine rotors in two categories: native and migratory birds.
2) Calculate the probability of a bird being hit by a rotor in flight.

A bird that spends more time feeding, resting, and hunting is considered a native. A migratory bird is defined as one that typically passes through an area only once in a specific direction to migrate.

Calculation 1: Regular Flights over the WPP Area

This Calculation is designed for bird species that fly in a fixed direction over the WPP area (SNH 2010). This generally applies to species that exhibit regular flights between feeding and sleeping areas, such as wintering geese, gulls, and cranes.

To assess birds of prey, the criteria given in Calculation 1 have been modified to be applicable to migratory birds. Accordingly, the fact that the bird does not spend time in the area (does not roost, feed or exhibit other behaviors) was used to estimate the mortality rate of birds passing over or through the WPP area.

1) Determine a "risk frame", i.e. a frame along the general direction of flight of the birds with a width equal to the width of the WPP area and a height equal to the maximum height of the tallest turbine.

Cross-sectional area (W) = Width x Height.

2) Estimate the number of birds passing through the identified frame in one year (12 months) (i.e. estimate the total number of birds detected during the study period in 1 year)

3) Calculate the area A enclosed by the wind turbine blades:

$$\mathbf{A = N \times \pi R^2}$$

[N is the number of turbines and R is the rotor radius (= blade length)].

4) Calculate the ratio of the total Turbine area to the risk frame (A/W)

5) Number of birds passing through the turbines (n) = number of birds passing through the risk frame (A) x area covered by the turbine blades

(W) Ratio = n x (A/W)

Calculation 2: Birds Using the WPP Area

The second calculation is designed for birds that occupy a specific territory (birds of prey, etc.), and there is a specific understanding of the likely distribution of flights within that territory (SNH 2010).

In this analysis, it is adapted to estimate the mortality rate of territorial birds, i.e. birds that spend a certain amount of time hunting, defending territories, displaying, and nesting.

1) Define a "flight frame" (Vw) by multiplying the length of the WPP area by the height of the turbines.

2) Calculate the volume swept by the turbine blades.

$$Vr = N \times \pi R2 \times (d + l)$$

(N is the number of wind turbines, d is the front-to-back depth of the rotor and l is the wingspan of the bird)

3) Estimate the number of birds flying within the risk area (n). This is the time spent flying in the risk area over the period of the collision prediction (usually one year) x the number of birds present.
For good results, available data should only be based on actual observations within the wind farm area.
To obtain valid results from these calculations, the data used should only be within the WPP area data from existing observations (provided that the observations are made without disturbing the birds). However, in the absence of such data, it is risky to determine the number of birds flying at an estimated height by knowing only the number of birds and the proportion of the time the bird flies within its territory.

4) Calculation of the area enclosed by the turbine blades.

$$n \times (Vr / Vw) \text{ bird-sn}$$

5) Calculate the time it takes for a bird to pass through the turbine and for the wings to be completely cleaned:

$$t = (d + l) / v$$

where V m/sec is the speed of the bird passing through the rotor

6) To calculate the number of bird passes through the wings, divide the total number of bird-seconds of the volume swept by the wings by the passage time t: Number of birds passing through the wings = $n \times (Vr / Vw) / t$

Bats

The study determined bat monitoring activities by considering EUROBATS methodologies (Battersby, 2008). In the study area, observations were made in structures and habitats where bats can feed, shelter and roost. Field studies were conducted for seven days and six nights between August 26-30, 2023. Photographs of field studies are given in Annex-7.

During the bat monitoring activities in the R3-ELAZIĞ-1 WPP study area between the specified dates, points with a high probability of bat flights were selected in two different regions in the project area. Bat flights were recorded with ultrasonic sound recording devices for six nights at 2 points, one point in each project area. The recorded sounds were analyzed with special programs (Bat Sound-Bat Explorer), and bat sounds were distinguished.

In bat monitoring studies, the data obtained from the analysis of bat sounds obtained with sound recording devices in computer programs can never constitute definite species identification. Species determinations are made by evaluating sound analysis, field observations, temporary and permanent roost survey results, existing literature, and expert opinions.

a. Field survey in the Study Area: Biodiversity Study Area was surveyed for roosts and areas that could be food sources for bats.

b. Habitat Survey: Observations were made to determine whether there are habitats where bats can create niches in the project implementation area and its immediate surroundings. Sound measurements were made in the area with simultaneous bat sound listening devices during the hours when the bats started to fly in search of food.
c. Roost Survey: The monitoring studies investigated whether water sources in the region, caves, and rocky areas have shelter and feeding potential for bats, and if they have any, whether they harbor bats. Roost surveys in the project area were carried out in two ways: permanent roost and temporary roost surveys.

Permanent Roost survey: It was researched whether there were any bat caves, ancient or old structures that could harbor colonies or old trees that could harbor colonies.

Temporary Roost Survey: In the area, roosts suitable for daily or seasonal use by bats, such as settlements, animal shelters, old trees, ancient cities, and ruins, were researched.

d. Survey of areas that can be used for feeding purposes for bats: It was researched whether there are animal shelters, wetlands, and settlements in the BSA that may provide food for bats.
e. Conversations with people who are permanent users of the Project Area: The animal owners and farmers who use the area permanently were interviewed, and it was investigated whether there are caves and old structures that can create permanent and temporary roosts in the area. It was also inquired whether they had witnessed a bat flight in the past.
f. Bat Sound Recordings: Real-time bat sound recording devices were used in the monitoring studies for species identification. The sampling method with mist-net nets was not used to avoid damaging the bats, and 2 Bat loggers (S2 and A+) with full spectrum were used to record bat sounds in the region all night long. The bat sound recording devices are programmed daily and left at the point to be listened to and collected again in the early morning. The sounds from the collected devices are transferred to computers, which are continued for six days.The sound recorders used in the study record all sounds within the programmed sound ranges. Experts first examine these sounds individually in the computer program and identify the ones with bat sounds. Then, the sounds with bat sounds are analyzed in computer programs, and the species of the sounds are tried to be determined. Species predictions are created by comparing the species suggestions of the Bat Explorer program with the literature data for the available frequency ranges.
g. Installation location of the bat sound devices: When selecting the installation locations, two points at or around the turbine points that could provide the best sample for bat flights in the area was chosen. The sound recorders were fixed on trees found in the area. The vegetation/habitat characteristics of the stations selected for the devices installed for sound recording during six nights in the project implementation area and the operations carried out in the field are given in Table IV.16. The installation locations of the bat sound devices are shown on the map in Figure IV.14.

Table IV.16 Characteristics of the Selected Stations

Station no	Devices-Turbine No	Process
1	Devices number 1	Bat activity at night was searched with automatic sound recording devices.
	Steppe vegetation- pine plantation	
2	Devices number 2	
	Steppe vegetation- rocky area	

h. Programming of Devices: The bat sound recorders are programmed to automatically record every time a bat passes between 20:30 and 06:00. The sound discrimination frequency range of the devices is between 20 and 200 kHz and they record all kinds of sounds in this range. The recording time was set to 1 and 5 seconds and the sound sensitivity was set to "high".
i. Analysis of sounds recorded with devices: The sounds recorded with the sound recording devices are analyzed with Batsound 4.2 and the BatExplorer program developed by the company producing the devices. The bat sounds are separated, and sound diagrams of the sounds obtained are created. The sound diagrams are compared with the existing data in the literature and species identification studies are carried out. Bat sounds are analyzed again with the BatExplorer program (Annex-7) and compared with the data in the library of this program. As a result of this comparison, the species information suggested by the program is compared with the literature data to determine which bat species the sound belongs to. All these data are evaluated by the expert together with field observations, existing literature and records of the BSA, and the results of listening with real-time sound recorders in the field to determine the bat species present in the area. To avoid repetition in the report, one of the sounds and diagrams belonging to the same species are included from the bat sound recordings obtained from the field.
j. Climate Data: During the 6-day study at the BSA, the company's measuring devices provided daily wind speed data.

IV.2.3 Findings

IV.2.3.1 *Habitat and Ecosystems*

EUNIS Habitat Classification

Terrestrial habitats are classified as modified, natural or critical habitats according to IFC (2012). The EUNIS habitat type classification has been used in the habitat classification study. This comprehensive European system facilitates harmonized description and collection of data across Europe, including Türkiye, through habitat description criteria. Various habitat types were identified and mapped by analyzing appropriate satellite images and aerial photographs and taking the opinions of a flora expert as a result of fieldwork. The analysis also used the correlation framework described in Moss, Dorian, Davies and Cynthia E. 2002 Cross-references between the EUNIS habitat classification and the CORINE Land Cover nomenclature. Habitat types determined in the project area are given in this title with their EUNIS codes, descriptions and map representation.

The Project Area has two natural habitat types and three modified habitat type. Modified and natural habitats in the project area are listed in Table IV.17 and EUNIS Habitat Map of the project area is shown in Figure IV.16. Field photographs of habitat types are presented in Annex-7. The habitat types and characteristic species are as follows:

E1.2: Perennial Limestone Grassland and Steppe: Represents the most common habitat type in the project area. The dominant species in this habitat include *Astragalus plumosus, Astragalus amblolepis, Astragalus gummifer, Astragalus kurdicus, Astragalus pycnocephalus, Bromus tomentellus, Koeleria cristata, Phlomis armeniaca, Phlomis capitata, Festuca valesiaca, Hordeum bulbosum, Poa bulbosa, Thymus kotschyanus*. Regional endemic species *Rhabdosciadium microcalycinum and Sideritis vulcanica* also occur in this habitat. In addition, *Crataegus sinaica* and *Crataegus orientalis* species in shrub form and *Crocus pallasii* species from geophytes are rarely distributed in this habitat.

H3.6: Dry Rock Habitats: Represents the exposed limestone rock habitats in the project area. This habitat is particularly rich in chasmophytic species. Species such as *Campanula stricta, Aethionema capitatum, Sedum albüm* are present in this habitat.

Table IV.17 EUNIS Habitat Types and Habitat Loss Calculation

EUNIS Code	EUNIS Habitat Type	Status	Area (ha)	Habitat Loss (ha)
E1.2	Perennial Limestone Grassland and Steppe	Natural	322.10	0.00
H3.6	Dry Rock Habitats	Natural	846.64	4.81
X10	Mosaic landscapes with a woodland element (bocages)	Modified	919.79	8.66
J4.2	Road networks	Modified	9.50	1.00

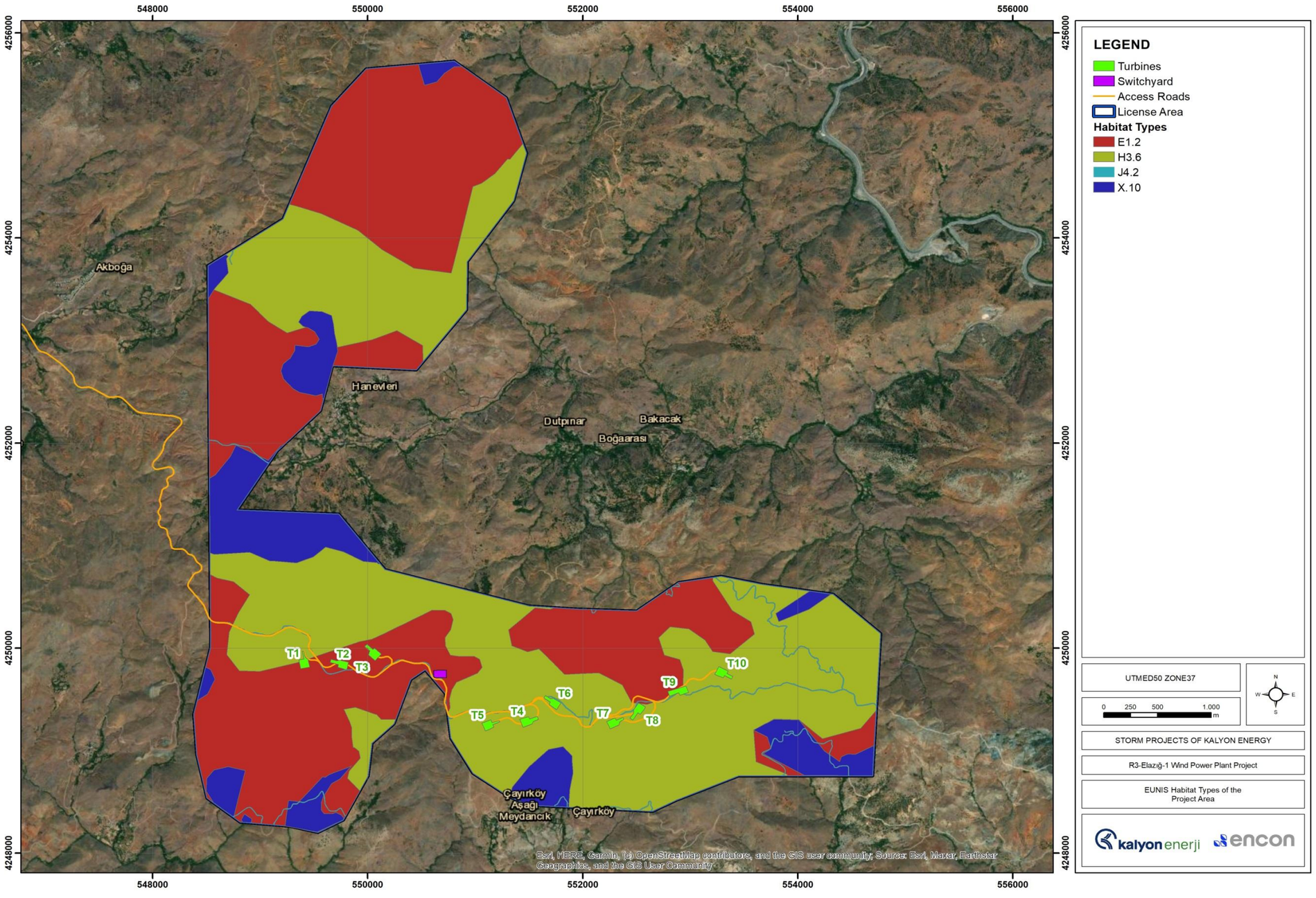


Figure IV.16 EUNIS Habitat Map of the Project Area

IV.2.4 Protected Areas

Key Biodiversity Areas (KBAs) are the most important places in the world for species and their habitats. The KBA Programme supports the identification, mapping, monitoring and conservation of KBAs to help safeguard the most critical sites for nature on our planet – from rainforests to reefs, mountains to marshes, deserts to grasslands and the deepest parts of the oceans. There are 265 KBAs defined in Türkiye.

The selection of Important Bird and Biodiversity Areas (IBAs) is achieved through the application of quantitative ornithological criteria grounded in up-to-date knowledge of the sizes and trends of bird populations. The criteria ensure that the sites selected as IBAs have true significance for the international conservation of bird populations and provide a common currency that all IBAs adhere to, thus creating consistency among and enabling comparability between sites at national, continental and global levels. There are 184 IBAs defined in Türkiye.

IPAs are key sites for exceptional botanical richness; rare, threatened and socio-economically valuable plant species; and rare and threatened habitats. There is 145 IPAs defined in Türkiye.

The Alliance for Zero Extinction[15] engages national and regional governments, multilateral institutions, local and Indigenous communities, and non-governmental biodiversity conservation organizations working to prevent species extinctions. AZE members have identified 2 AZE sites in Türkiye. These areas hold the last-remaining populations of one or more species evaluated as Endangered or Critically Endangered on the IUCN Red List.

Areas required to be protected in accordance with the Turkish legislation defined under Annex 5 (Sensitive Regions) of the EIA Regulation were determined for R3-ELAZIĞ-1 WPP. KBA, IBA, IPA and AZE data source was taken from the up-to-date website.

There are two national protected areas near the Project area: Hazar Lake Natural Park (22 km north of the Project Area) and Hazar Lake Wetland (3.8 km northwest of the Project Area). Additionally, there is an internationally recognized area known as South Keban Dam 14. 8 km north of the Project Area.

South Keban Dam, which is an internationally recognized area, is defined as Key Biodiversity Area (KBA) and Important Bird Area (IBA- see Figure IV.17).

[15] A global initiative that aims to prevent extinctions by identifying and safeguarding key sites which are home to the last population of Endangered or Critically Endangered species.

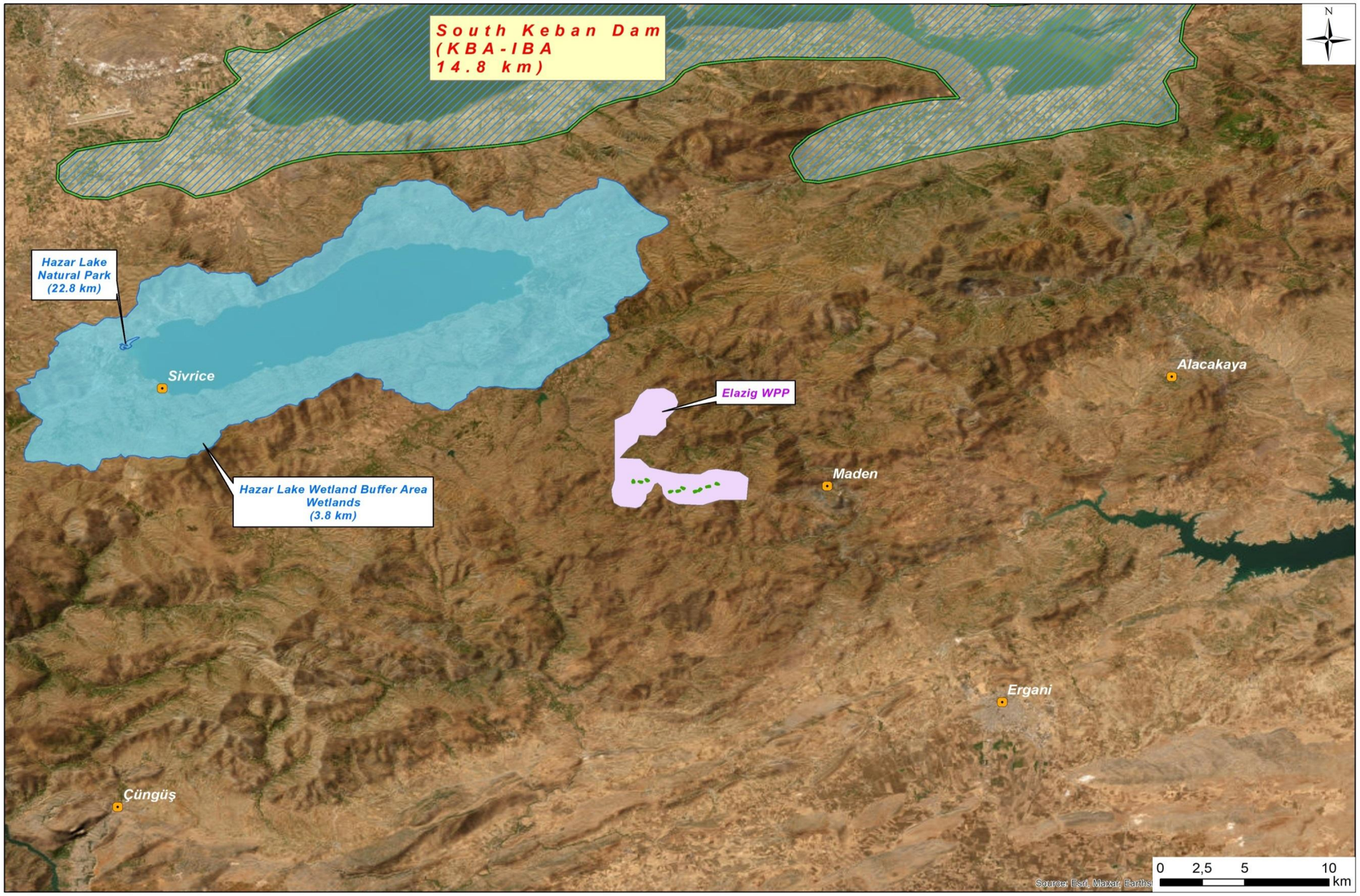


Figure IV.17 National Protected and Internationally Recognized Areas around the Project Area

IV.2.4.1 *Flora*

The habitat of the Project Area generally consists of perennial limestone steppe and dry rock habitats.

As a result of two different field studies conducted in the project area, a total of 179 species and subspecific taxa belonging to 36 families were identified (see Table IV.30). Twelve of these identified species are endemic to Türkiye. Two endemic taxa (*Rhabdosciadium microcalycinum, Sideritis vulcanica*) are regional and ten (*Alyssum pateri subsp. pateri, Isatis aucheri, Achillea magnifica, Helichrysum arenarium subsp. aucheri, Tanacetum cadmeum subsp. orientale, Astragalus leporinus, Marrubium globosum subsp. globosum, Phlomis capitata, Phlomis linearis, Papaver triniifolium*) are relatively widespread endemic.

Regional endemic *Rhabdosciadium microcalycinum* and *Sideritis vulcanica* species are distributed in Elazığ, Bingöl and Malatya provinces. Since the areas where these species are distributed are under grazing and field clearing pressure, the IUCN Categories are "Vulnerable, VU". The IUCN Category of the *Achillea magnifica* species, one of the relatively widespread endemics identified in the project area, is "Near Threatened, NT" because this species has a limited distribution in the steppe habitat only in the provinces of Maraş, Malatya, Erzincan and Elazığ. The IUCN Category of the widespread *Alyssum pateri subsp. pateri, Isatis aucheri, Helichrysum arenarium subsp. aucheri, Tanacetum cadmeum subsp. orientale, Astragalus leporinus, Marrubium globosum subsp. globosum, Phlomis capitata, Phlomis linearis, Papaver triniifolium* species is "Least Concern, LC". These species are distributed in a wide area, especially in Central Anatolia and Eastern Anatolia regions. For this reason, both in-situ and ex-situ conservation measures need to be taken for regional endemic species.

Photographs of the identified endemic species are given in Annex-7. Coordinates of endemic species in the project area are given in Table IV.18 and the "Distribution of flora species requiring conservation measures in BSA" map is shown in Figure IV.18.

Table IV.18 Coordinates of Endemic Species in the Project Area

Taxon name	Status of Threat (Red Data Book, 2000)	COORDINATES (UTM: WGS84 ZONE: 37S)
Rhabdosciadium microcalycinum	VU	553901-4249431
Sideritis vulcanica	VU	550147-4249615
Achillea magnifica	NT	553901-4249431; 552985-4249417; 552560-4249222; 552209-4249118; 551101-4249024; 551409-4249110; 550088-4249784; 550088-4249784
Alyssum pateri subsp. pateri	LC	552560-4249222
Helichrysum arenarium subsp. aucheri	LC	553901-4249431; 552560-4249222
Astragalus leporinus	LC	550088-4249784
Isatis aucheri	LC	552985-4249417; 552209-4249118; 551101-4249024; 550088-4249784; 549753-4249656; 549404-4249683
Tanacetum cadmeum subsp. orientale	LC	553901-4249431; 553233-4249556; 552560-4249222; 552209-4249118; 551748-4249241; 551409-4249110; 549404-4249683

Phlomis linearis	LC	551101-4249024
Phlomis capitata	LC	553901-4249431; 550088-4249784; 550088-4249784
Marrubium globosum subsp. globosum	LC	551101-4249024
Papaver triniifolium	LC	550147-4249615

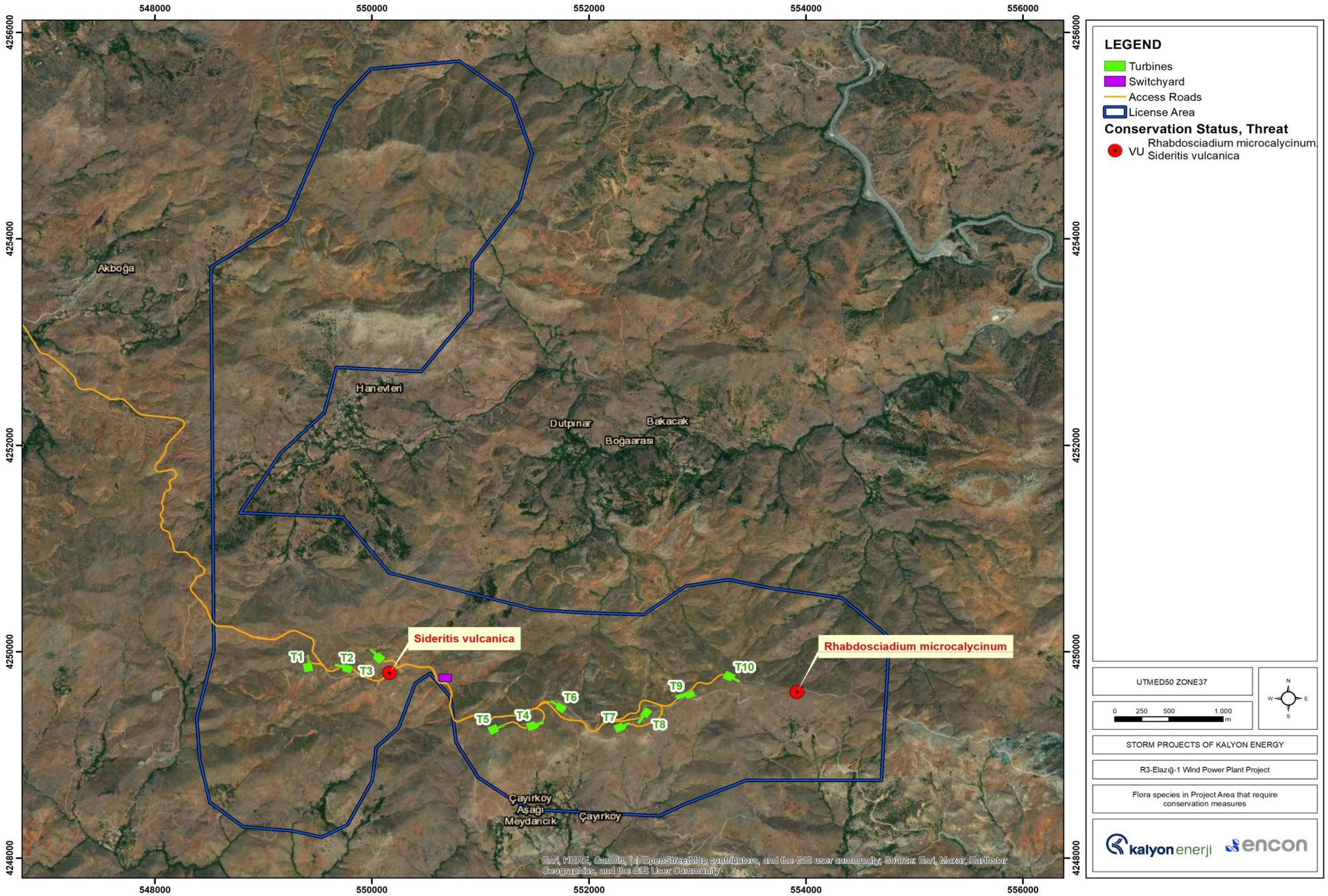


Figure IV.18 Distribution of Flora Species Requiring Conservation Measures in the Project Area

IV.2.4.2 *Fauna*

Herpetofauna

Within the BSA, five amphibian species have been identified to meet their biological needs in habitats such as small, flowing, and stagnant water edges, deciduous vegetation areas, and shrubs with humid conditions, as well as in rock crevices and under stones. Particularly, terrestrial species remain inactive during the day, becoming active at night for feeding and mating when the evening falls.

Table IV.31 provides information on the national and international conservation statuses of amphibian species identified in the BSA.

- According to IUCN, one of four amphibian species in the area is classified as “DD” and the other three are classified as “LC”
- According to the BERN Convention, three of these amphibian species is listed in Annex III.
- No endemic species are found among the amphibian species identified within the BSA.

For the assessment of biodiversity impacts under the R3-Elazığ-1 WPP, the reptile species in the area have been determined. Reptiles identified in the BSA inhabit rocky meadows, field edges, and shrubs. Observations and interviews in the area revealed the presence of 16 reptile species, including one turtle, nine lizards, and seven snakes.

Table IV.31 provides information on the national and international conservation statuses of reptile species identified in the BSA.

- According to IUCN, among the 16 reptile species, one is listed as “VU”, one is listed "NE" and the other 14 are categorized as "LC", indicating the lowest level of threat.
- Based on the Bern Convention, 4 reptile species in the area are listed in Annex II and 8 are in Annex III.
- According to the CITES convention, one reptile specie, Testudo graeca is listed in Annex II.
- According to EU Habitat Directive, five reptile species listed in Annex-IV.
- No endemic species have been found among the reptile species identified in the BSA.

Birds

Vantage Point Results

During the surveys of the observation points identified during the autumn survey, a total of 259 flights belonging to 12 bird species were detected in this area. 207 were identified as migrants and 52 as native birds. These numbers do not represent the total number of birds found in the area and includes multiple reports of the same bird (especially for natives). The most common species were the *Merops apister* and *Buteo buteo*. The migration rate for the autumn migration season was 2.76 birds/hour (Table IV.19).

Table IV.19 Native and Migratory Bird Species Detected in the WPP Area

Species	IUCN	Migrant	Native	Total
Merops apiaster	LC	82		82
Haliaeetus albicilla	LC	3		3
Pernis apivorus	LC	8		8
Accipiter nisus	LC		2	2
Circus macrourus	NT	1		1
Falco subbuteo	LC	11		11
Milvus migrans	LC	36		36
Falco tinnunculus	LC	4	29	33
Hieraaetus pennatus	LC	1		1
Clanga pomarina	LC	24	5	29
Buteo buteo	LC	37	8	45
Buteo rufinus	LC		8	8
Total		**207**	**52**	**259**
75:00 hours		**2.76**	**0.69**	**3.45**

Of the 177 bird flights observed from the observation points, 134 migratory and 43 local bird flights were reported to fly within the risk zone (maximum 500 m from the turbines) and below the risk height (a and b). *Merops apister* and *Buteo buteo* were the most frequent species entering the risk zone (see Table IV.20).

Table IV.20 Frequencies of Native and Migratory Species Observed in the Risk Area in Autumn

Species	IUCN	Migrant	Native	Total
Merops apiaster	LC	78	-	**78**
Haliaeetus albicilla	LC	1	-	**1**
Pernis apivorus	LC	6	-	**6**
Accipiter nisus	LC	-	1	**1**
Falco subbuteo	LC	10	-	**10**
Falco tinnunculus	LC	3	26	**29**
Hieraaetus pennatus	LC	1	-	**1**
Clanga pomarina	LC	10	5	**15**
Buteo buteo	LC	25	7	**32**
Buteo rufinus	LC	-	4	**4**
Total		**134**	**43**	**177**

A total of 265 bird flights were observed in the risk zone. 91 are native bird species, and 134 belong to migratory flights. The total time during which migratory and native species were observed in the risk area was 2475 seconds (41 minutes and 25 seconds) (Table IV.21). Flights where the observer could not distinguish between migratory or native species were not included in this calculation.

Table IV.21 Total Observation Time for Bird Observations in the Risk Zone

Species	Migrant	Native
Merops apiaster	345	-
Haliaeetus albicilla	15	-
Pernis apivorus	60	-
Accipiter nisus	-	30
Falco subbuteo	135	
Falco tinnunculus	30	705
Hieraaetus pennatus	30	-
Clanga pomarina	30	165
Buteo buteo	330	510
Buteo rufinus	-	90
Total	**975**	**1500**

Collision Risk Modeling

Calculation 1: Regular Flights over the WPP Area

During the autumn surveys, 134 migratory birds were observed in the risk zone during a 75:00 -hour survey period between August 20 and October 20, 2023. For this period, migration was assumed to occur within 10 hours of the day. Calculated for the total number of daylight hours between August and October (i.e. migration season), a total of 16434 birds were estimated to fly over the project area each spring (see Table IV.22.

Autumn period;

- A total of 1644 birds are expected to fly from the risk zone in the WPP area (see Table IV.22).
- 23 birds are expected to fly through the turbine blade area (step 5).
- The wings are expected to strike 3 birds if no measures are taken to avoid collision (see Table IV.23)

Table IV.22 Estimation of Total Number of Migratory Birds

Parameters	Value
Number of migratory birds flying in the risky area	134
Total Observation Time	75
Monitoring Time Range	August - October
Total Migration Time (DaysxSun Hours)	920 hours (92x10)
Estimated number of flights at risky altitude	**1643.7**

Table IV.23 Estimated Number of Birds Expected to Pass Through Turbine Blades

Regular Flights in the WPP Area		
Number of Turbines	N	10
Project Area	Width	6,190 m
	Height	1800 m
1. Define the risk frame W=width x height	W	11,142,000 m^2
2. Estimated number of birds (n) (Table 8)	n	1643.7
3. Area enclosed by the turbine blades A = N x πR^2	A	155,050,06 m^2
4. Ratio of the area enclosed by the turbine to the risk frame (A/W)	A/W	%1.39
5. Number of birds passing through the wings	n × (A/W)	22.84 birds
Probability that a bird passing through the wings will hit the wings		15%
Mortality without avoidance		3.43 birds
(1 - non-avoidance rate)		2%
Annual mortality rate		**0.07 birds**

Based on the autumn 2023 results, the estimated annual mortality rate for autumn was 0.07 birds. This is a very low value. Since the turbine was not installed in the project area, flight heights could not be determined exactly, and the calculated values were estimated. Actual values can be recalculated in the observations after the turbine installation is completed. Since the mortality rate (<1.0) is low (SNH, 2010), mortality rates were not calculated separately for each species flying in the risk area.

Calculation 2: Birds Using WPP Airspace

First, the number of native birds flying in the area identified as at risk was determined (see Table IV.24). The total time spent at the risk height/area and the total time in seconds was estimated for each species during the survey period. The sunshine duration during the autumn migration period was accepted as 12 hours for native species and used in the calculations. The calculation for the autumn period was carried out between August 20 and October 20.

Table IV.24 Step 1: Determination of the Number of Birds Flying at the Risky Height/Region

Calculation Criteria	**Value**
Number of native birds passing through the risk area	43
Total observation time	75:00
Operating range	August/October
Total daytime duration in working time (12 hours)	744 hours (62x12)
Estimated total number of birds	**426.5**

For the next step (step 2), some morphological characteristics (size, wingspan, etc.) of the most common predators in the area were considered. The Falcon (*Buteo buteo*) was chosen for this calculation. The speed of a bird gliding along the rotors in level flight was taken as 11 m/sec. The mortality rate was calculated as 1,65 (~2.0) for native birds for autumn 2023 (see Table IV.25).

Table IV.25 Step 2: Calculation of Collision Risk for Selected Domestic Species

Birds Using WPP Airspace		
Number of turbines	N	8,635,000 m^2
500 m radius buffer zone around turbine locations	Area	180 m
Height	height	1,554,300,000 m^3
1. Identify risky flight exceedance (Vw)	Vw	451,260,000 m^3
Escape area (area around the turbine)	281.909*2-9.900.000	67 m
	r	2 m
Width of turbine blades from front to back	d	0.60 m
Length of the bird	l	403,130.156 m^3
2. Calculation of the area enclosed by the turbine blades	Vr = N × πR2 × (d + l)	426.56 birds
3. Estimated number of birds (n)	n	0.11 birds
4. Bird occupancy rate of the area surrounded by turbine blades	n × (Vr/Vw)	11 m/sec
	v	0.32 sec
5. Calculate the time it takes for a bird to cross the wings	t = (d + l) / v	0.35
6. Number of birds passing through the wings	n × (Vr/Vw)/t	8,635,000
Frequency of bird strikes passing through the wings		**%2**
Mortality estimates for the study period		**0.006 (~0,0) birds**

Collision risk analysis was calculated for native species. In the autumn of 2023, it was determined that 0.006 (~0,0) birds were at risk of collision with turbine blades with avoidance. This value is since <1, according to SNH (2010; 2018); risk calculations not made separately for native species flying in the risk area. Accordingly, the collision risk not calculated on a species-specific basis

Coverage and Calculation Correction by the Observer

Analysis of the observer-generated flight lines revealed that the observer probably covered only 50% of the project area. CRM values should be multiplied by a factor of 2 to approximate the actual proportion of the expected number of bird collisions (SNH, 2000;2017).

Target Species List

Before the construction work started at R3-ELAZIĞ-1 WPP, the species that could be found in the region were determined (see Table IV.26). 10 of these species were detected in the observations made.

Neophran percnopterus, is in the EN category according to IUCN. Maps of the breeding areas of these species identified around the project area are given in Figure IV.19. No nests or nestlings of these species were detected within the project area. However, due to its habitat suitability, it has been included in the target species list and its monitoring will continue.

Table IV.26 Bird Species Observed or Observable in the BSA during Autumn Season

Species	IUCN
Accipiter brevipes	LC
Accipiter nisus	LC
Aegypius monachus	NT
Aquila chrysaetos	LC
Buteo buteo	LC
Buteo rufinus	LC
Ciconia ciconia	LC
Ciconia nigra	LC
Circus macrourus	NT
Clanga pomarina	LC
Falco subbuteo	LC
Falco tinnunculus	LC
Haliaeetus albicilla	LC
Hieraaetus pennatus	LC
Merops apiaster	LC
Milvus migrans	LC
Neophron percnopterus	EN
Pernis apivorus	LC
Phalacrocorax carbo	LC

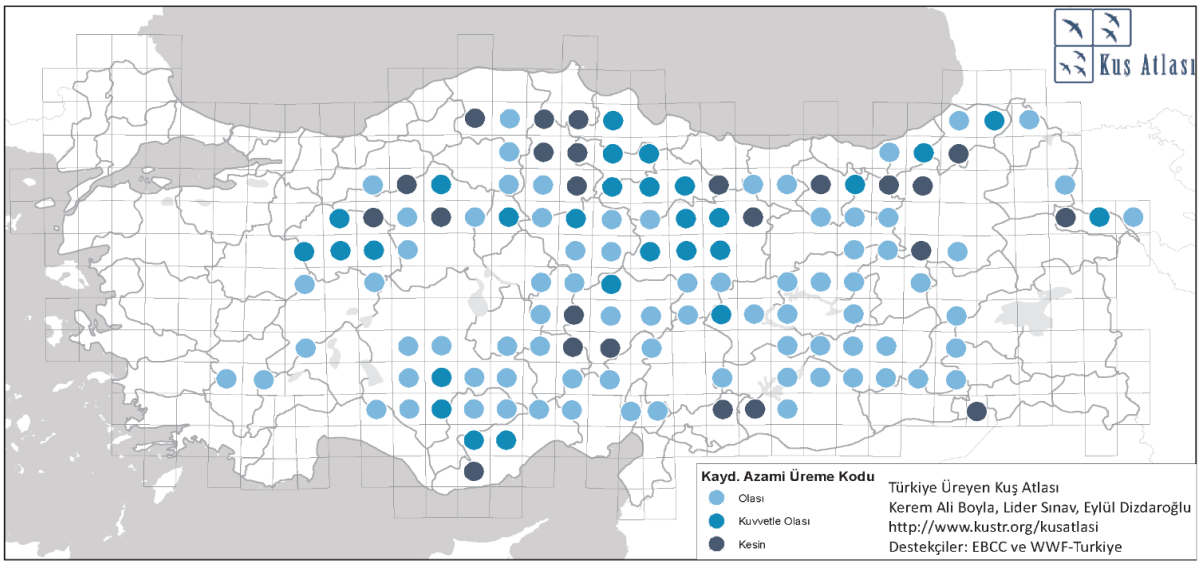


Figure IV.19 Breeding Distribution Map of the *Neophran percnopterus* (http://kustr.org/kusatlasi/tur-listesi/)

During the observations made in the project area, passerine species that are permanent and migratory in the project area were determined (see Table IV.27). Negative effects of project construction activities are expected on these species rather than the negative effects of turbine blades. Therefore, songbird species were not included in the collision risk analysis.

Table IV.27 Songbirds Seen in the BSA in the Autumn Season

Species	IUCN
Alectoris chukar	LC
Anthus trivialis	LC
Apus apus	LC
Carduelis cannabina	LC
Carduelis carduelis	LC
Hirundo rustica	LC
Lullula arborea	LC
Miliaria calandra	LC
Monticola saxatilis	LC
Oenanthe hispanica	LC
Oenanthe isabellina	LC
Parus caeruleus	LC
Pyrrhocorax pyrrhocorax	LC
Saxicola rubetra	LC
Sylvia communis	LC
Tachymarptis melba	LC

Table IV.31 provides information on the national and international conservation statuses of bird species identified in the BSA.

- According to IUCN, among the 36 bird species, *Neophron percnopterus is* in "EN" (Endangared), *Aegypius monachus and Circus macrourus are in NT (Near threatened),* and others categorized as "LC" (Least Concern).
- Based on the BERN Convention, 32 bird species in the area are listed in Annex II and 3 in Annex III.
- According to the CITES convention, 16 bird species are in Annex II.
- According to EU Bird Directive, 15 bird species are listed in Annex-I, one bird species is listed in Ann-II/A and five bird species are in Ann-II-B.
- No endemic species have been found among the bird species identified in the BSA.

Mammals

Field observations and meetings with local people were evaluated using the existing literature to determine the mammal species found in BSA.

As a result of fieldwork, literature evaluations and meetings conducted in BSA, 20 species were identified except bats. Table IV.31 provides information on the national and international conservation statuses of mammalian species identified in the BSA.

- According to IUCN, one is in the “DD” category, and 19 are categorized as "LC".
- According to BERN Convention, 7 are in Annex-III and 3 are in Annex-II.
- According to CITES Convention, three mammal species listed in Annex-II and two in Annex-III.
- According to Habitat Directive, one mammal species is listed in Annex-II and three is listed in Annex-IV.

Bats

Field survey in the BSA:

The vegetation and habitat of the BSA is predominantly the Eastern Anatolian high mountain steppe, with very sparse trees in shrub form and newly planted pine trees in some areas. The existing vegetation of the project area is covered with green meadows depending on the rainfall in the spring months, and these areas are used for grazing by the local people. The meadow areas dry up with the decrease in precipitation in the summer months. Near the BSA, large and small cattle breeding is generally practised on the plains close to settlements. No swamps, water ponds or rivers and streams have been identified within and near the BSA.

Habitat Survey:

The habitat survey conducted at the BSA reveals that the area generally consists of steppe vegetation, plantation pine forest and rocky areas. There are sparse shrubs and trees within the project area. There are settlements around the east-west oriented hills where the turbine installation is planned in the project area. These areas constitute bat sheltering and feeding areas.

Roost survey:

The permanent roosts and temporary roosts that bats could use were found in the project implementation area during the permanent roost and temporary roost survey. Still, no temporary or permanent roosts were detected during the controls. No historical buildings and caves were identified in the area and its immediate vicinity.

Survey of feeding areas:

There are meadow areas in and around the BSA that will support the insect population, which is bat food. Local people use these areas for animal grazing. Since the general vegetation of the region is steppe, the drying of the meadow areas in the summer and fall periods causes a decrease in bat activity in the region. Due to the changing elevation difference in and around the project area, there are no areas where agricultural activities can be carried out due to the topographical structure. This situation prevents the density of the insect population.

Meetings with people who are permanent users of the site:

In meetings with the people living in the villages within the project area, it was determined that they encountered bat flights, especially around water sources and in low-altitude regions close to the settlements. It was stated that these flights decrease in the summer and fall months.

Analysis results of the sounds recorded:

As a result of the first observations made in the project area, bat sound recorders were placed at the points where bat flight was possible. All sounds obtained from the study were analyzed with BatExplorer and BatSound programs. The analysis detected 229 flights belonging to 6 different species in the project area (see Table IV.19 and Figure IV.20). No bat activity was recorded on September 5-6 during five nights of bat activity monitoring in the project area. Additionally, the risk of the detected species hitting the turbines is evaluated in the table (EUROBATS, 2014).

As a result of the studies conducted at the WPP site, it was determined that bat activity was lower than expected. The fall period and the drying of the meadows in the area caused the insect population to decrease. Due to this situation, it is thought that bat activity in the project area does not occur for feeding purposes but during the transition between settlements and feeding areas. During the studies, 99 flights belonging to 5 different species were detected.

Table IV.28 Bat Species Information Identified as a Result of the Analysis.

No	Species	English Name	IUCN	Number of Sounds	Collusion Risk
1	Eptesicus serotinus	Serotine Bat	LC	2	Medium
2	Myotis myotis	Greater Mouse-eared Myotis	LC	12	Low
3	Pipistrellus kuhlii	Kuhl's Pipistrelle	LC	24	High
4	Pipistrellus nathusii	Nathusius' Pipistrelle	LC	6	High
5	Pipistrellus pipistrellus	Common Pipistrelle	LC	55	High

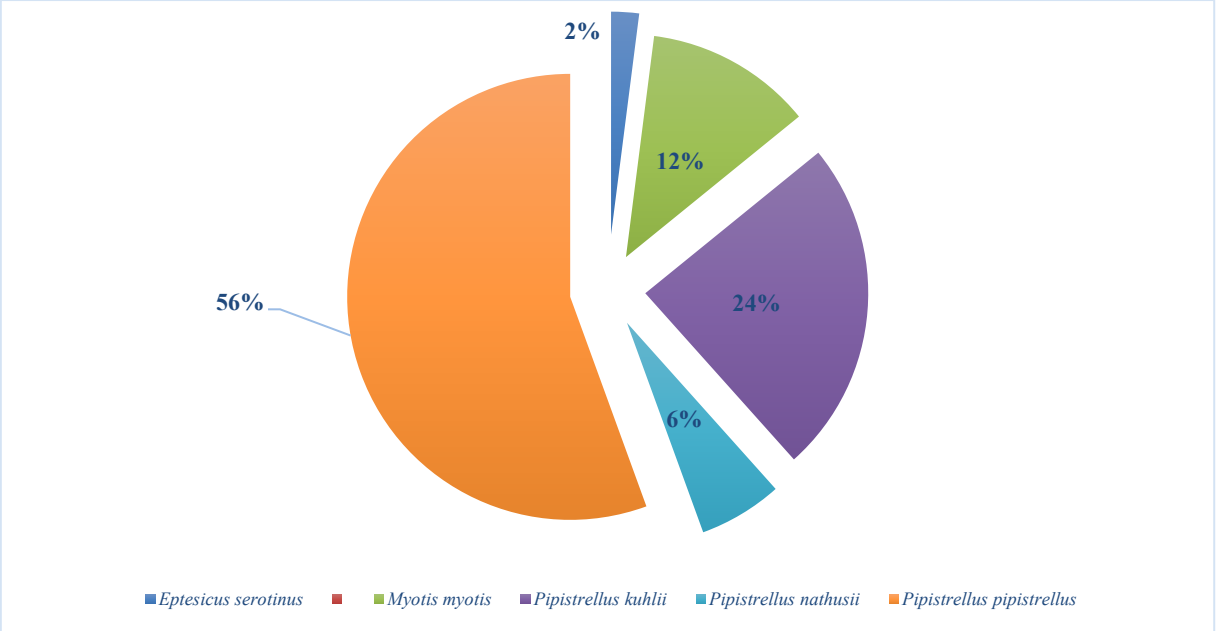


Figure IV.20 Number of Bat Flights Detected at the BSA.

In the sound recordings made in the areas where the turbine will be installed in the BSA, the highest activity among the bat flights obtained during five nights belongs to *Pipistrellus pipistrellus*, and the lowest activity belongs to *Eptesicus serotinus* species (see Figure IV.20).

Sound diagrams of 99 bat sounds (5 different species) detected in the sounds obtained from the analysis of the sounds recorded by ultrasonic sound recorders in the field studies were created with the BatExplorer program and are given in Annex-7.

Climate Data

Wind speed values for the dates of the study in the R3-ELAZIĞ-1 WPP area were obtained from wind measurement devices in the area and temperature values were obtained from meteorological data of the nearest center (see Table IV.29).

According to the data obtained from the wind measurement poles in the R3-ELAZIĞ-1 WPP area, it was determined that the average wind speed was above 6m/s on the dates of the study. This value is above the appropriate value for bat flight (see Figure IV.21). During the sound recordings in the area, bat flight was less than expected. This is related to the wind speed value. Bats usually fly on warm nights with less than six m/s wind. In contrast, they do not fly in rainy weather or when wind speeds exceed six m/s (EKO Energy, 2015).

Table IV.29 Wind Speed Values (m/s) of the Study Dates

Date/Time	20:00	21:00	22:00	23:00	00:00	01:00	02:00	03:00	04:00	05:00	06:00
1-2 September	2.4	2.9	3.2	3.3	3.5	2.3	4.7	3.9	3.2	3.3	2.5
2-3 September	3.9	3.0	3.2	1.5	1.3	3.5	5.4	4.9	7.7	7.4	7.0
3-4 September	9.2	7.7	6.2	6.2	4.7	4.8	6.6	6.3	6.9	7.4	7.0
4-5 September	5.4	5.1	5.3	4.0	2.4	1.4	1.4	2.0	3.7	6.4	6.7
5-6 September	4.3	3.7	2.8	3.1	3.6	2.8	1.7	1.7	3.0	3.9	4.9

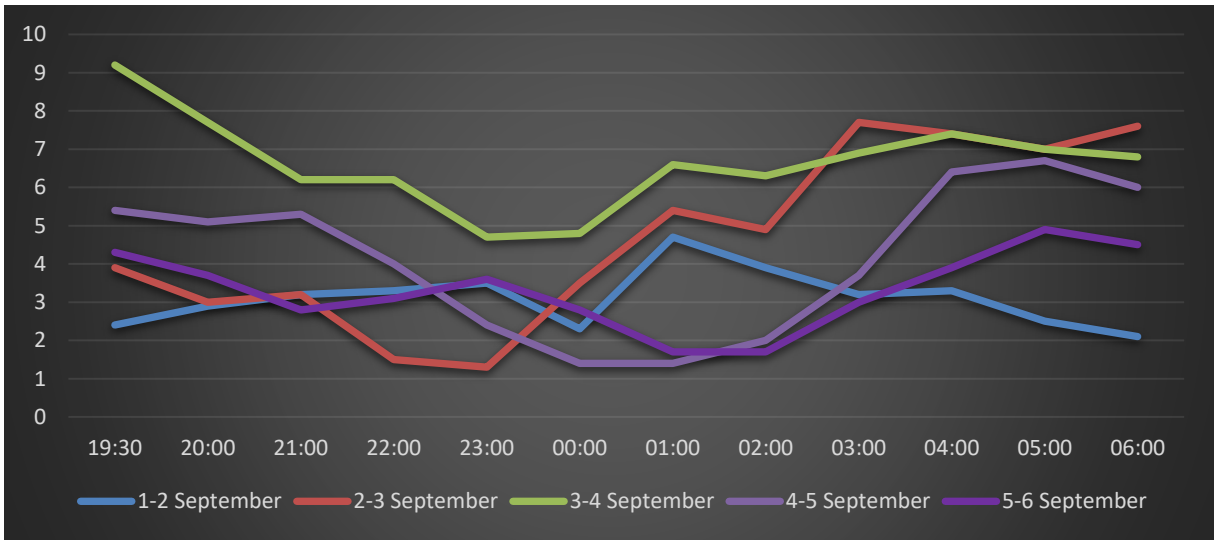


Figure IV.21 Daily/hourly Wind Speed Variation for the Days of the Study.

As a result of the observations made in the BSA, bat sound recorders were installed at the points where bat flight was possible. As a result of literature and field studies, it was determined that 18 bat species

could be in BSA (see Table IV.31). *Miniopterus schreibersii* and *Myotis capaccinii* species are in the VU category according to the IUCN, and no flights of this species have been detected in studies.

Table IV.30 Flora Species of R3-ELAZIG-1 WPP

FAMILY		TAXON	COMMON NAME	P.G.R	ENDEMISM		RDB	BERN	CITES			HABITAT		RELATIVE ABUNDANCE				
					R	W		Anx1	App1	App2	App3	1	2	1	2	3	4	5
SPERMATOPHYTA																		
GYMNOSPERMAE																		
EPHEDRACEAE	1	*Ephedra major* Host	Hum	Mediterranean								x	x		x			
ANGIOSPERMAE																		
DICOTYLEDONES																		
ACANTHACEAE	2	*Acanthus dioscoridis* L. var. *dioscoridis*	Lokman ayıpençesi	Widespread								x			x			
APIACEAE/UMBELLIFERAE	3	*Astradaucus orientalis* (L.) Drude.		Iran-Turan								x			x			
	4	*Bupleurum falcatum* L. Subsp. *cernuum* (Ten.) Arc.		Widespread								x			x			
	5	*Echinophora tournefortii* Jaub. & Spach	Dikenli çördük	Iran-Turan								x			x			
	6	*Falcaria vulgaris* Bernh.	Orakotu	Widespread								x			x			
	7	*Eryngium thrysoideum* Boiss.	Çökemotu	Iran-Turan								x			x			
	8	*Eryngium campestre* L.	Boğadikeni	Widespread								x			x			
	9	*Ferula orientalis* L.	Kıngor	Iran-Turan								x			x			
	10	*Malabaila secacul* Banks & Sol.	Davarotu	Widespread								x		x				
	11	*Pimpinella kotschyana* Boiss.	Kır anasonu	Iran-Turan								x			x			
	12	***Rhabdosciadium microcalycinum* Hand.-Mazz.**	**Somhandok**	**Iran-Turan**	**x**		**VU**					**x**			**x**			
	13	*Scandix australis* L. subsp. *grandiflora* (L.) Thell.		Widespread								x		x				
	14	*Smyrnium cordifolium* Boiss.	Kokarbaldıran	Iran-Turan								x			x			
	15	*Torilis arvensis* (Huds.) Link		Widespread								x			x			
	16	*Zosima absinthifolia* (Vent.) Link	Peynirotu	Widespread								x			x			
APOCYNACEAE	17	*Vinca herbacea* Waldts. & Kit.	Cezayir menekşesi	Widespread								x		x				
BERBERIDACEAE	18	*Berberis crataegina* DC.	Kadıtuzluğu	Iran-Turan								x			x			
BORAGINACEAE	19	*Alkanna orientalis* (L.) Boiss. var. *orientalis*	Kök boya	Iran-Turan								x			x			
	20	*Anchusa leptophylla* Roemer & Schultes subsp. *leptophylla*	Ballık	Widespread								x		x				
	21	*Buglossoides arvensis* (L.) Johnston		Widespread								x		x				
	22	*Echium italicum* L.	Kurtkuyruğu	Mediterranean								x			x			
	23	*Lappula barbata* (M.Bieb.) Gurke		Iran-Turan								x			x			
	24	*Rochelia disperma* (L.fil.) C. Koch var. *disperma*		Widespread								x			x			
BRASSICACEAE	25	*Aethionema arabicum* (L.) DC.		Widespread								x			x			
	26	*Aethionema capitatum* Boiss. & Bal.	Başmürselotu	Mediterranean								x			x			
	27	*Alyssum minutum* D.F.K. Schultes ex DC.		Widespread								x			x			
	28	***Alyssum pateri* Nyar. Subsp. *pateri***		**Iran-Turan**		**x**	**LC**					**x**			**x**			
	29	*Camelina rumelica* Vel.		Widespread								x			x			
	30	*Erysimum crassipes* Fisch. & C.M.Mey.		Widespread								x			x			

FAMILY		TAXON	COMMON NAME	P.G.R	ENDEMISM		RDB	BERN	CITES			HABITAT			RELATIVE ABUNDANCE			
	31	*Capsella bursa-pastoris* (L.) Medik.	Çoban çantası	Widespread								x			x			
	32	***Isatis aucheri* Boiss.**	**Pos çivitotu**	**Iran-Turan**		**x**	**LC**					**x**			**x**			
	33	*Isatis cappadocica* Desv. Subsp. *steveniana* (Trautv.) P. H. Davis	Oyalıçivit	Iran-Turan								x			x			
	34	*Thlaspi perfoliatum* L.		Widespread								x			x			
CAMPANULACEAE	35	*Asyneuma virgatum* (Labill.) Bornm. subsp. *virgatum*		Widespread								x			x			
	36	*Campanula stricta* L. var. *stricta*	Gür Çançiçeği	Iran-Turan								x	x		x			
	37	*Campanula involucrata* DC.	çan çiçeği	Iran-Turan								x			x			
CARYOPHYLLACEAE	38	*Arenaria drypidea* Boiss.	Ovakumotu	Iran-Turan								x			x			
	39	*Holosteum umbellatum* L. var. *umbellatum*		Widespread								x			x			
	40	*Bufonia tenuifolia* L.		Widespread								x			x			
	41	*Cerastium dichotomum* L. Subsp. *dichotomum*		Widespread								x			x			
	42	*Dianthus floribundus* Boiss.	Kırkkaranfili	Iran-Turan								x	x		x			
	43	*Minuartia hamata* (Hausskn.) Mattf.		Widespread								x			x			
	44	*Silene stenobotrys* Boiss. & Hausskn.	Maraş nakılı	Iran-Turan								x			x			
	45	*Silene supina* Bieb. Subsp. *pruinosa* (Boiss.) Chowdh.		Widespread								x			x			
	46	*Telephium imperati* L. Subsp. *orientale* (Boiss.) Nyman	Mezarlık otu	Iran-Turan								x		x				
	47	*Velezia rigida* L.	Tığotu	Widespread								x			x			
CHENOPODIACEAE	48	*Noaea mucronata* (Forssk.) Aschers & Schweinf. Subsp. *mucronata*	Hölmezotu	Widespread								x			x			
CISTACEAE	49	*Helianthemum ledifolium* (L.)Miller var. *microcarpum* Wilk		Widespread								x			x			
ASTERACEAE/COMPOSITAE	**50**	***Achillea magnifica* Hub.-Mor.**	**Civan perçemi**	**Widespread**		**x**	**NT**					**x**			**x**			
	51	*Achillea coarctata* Poir.	Civan perçemi	Widespread											x			
	52	*Anthemis wiedemanniana* Fisch. & C.A. Meyer	Bodur babuççа	Widespread								x			x			
	53	*Anthemis tinctoria* L. var. *tinctoria*	Papatya	Widespread								x			x			
	54	*Artemisia campestris* L.	Karayavşan	Widespread								x			x			
	55	*Carduus nutans* L.	Devedikeni	Widespread								x			x			
	56	*Carlina corymbosa* L.	Kırkbaşdikeni	Mediterranean								x			x			
	57	*Centaurea carduiformis* DC.	Peygamber çiçeği	Widespread								x			x			
	58	*Centaurea iberica* Trev. ex Sprengel	Deligöz dikeni	Widespread								x			x			
	59	*Centaurea solstitialis* L. subsp. *solstitialis*	Zerdali dikeni	Widespread								x			x			
	60	*Centaurea triumfettii* All.	Peygamber çiçeği	Mediterranean								x			x			
	61	*Centaurea urvillei* DC.	Peygamber çiçeği	Mediterranean								x			x			
	62	*Centaurea virgata* Lam.	Peygamber çiçeği	Iran-Turan								x			x			
	63	*Chardinia orientalis* (L.) Kuntze		Iran-Turan								x			x			
	64	*Chondrilla juncea* L. var. *juncea*	karakenger	Widespread								x			x			
	65	*Cichorium intybus* L.	Kara Hindiba	Widespread								x			x			
	66	*Cirsium lappaceum* (Bieb.) Fischer subsp. *anatolicum* Petrak	hamurkesen	Widespread								x			x			

FAMILY		TAXON	COMMON NAME	P.G.R	ENDEMISM		RDB	BERN	CITES			HABITAT			RELATIVE ABUNDANCE			
	67	*Crepis foetida* L. subsp *rhoeadifolia* (M. Bieb.) Celak	Tüylü Kanak	Widespread								x			x			
	68	*Crupina crupinastrum* (Moris) Vis.		Widespread								x			x			
	69	*Ecinops orientalis* Trautv.	Topuz	Iran-Turan								x			x			
	70	*Filago eriocephalaa* Guss.		Mediterranean								x			x			
	71	*Gundelia tournefortii* L. var. *armata* Freyn & Sint	Kenger	Iran-Turan								x			x			
	72	***Helichrysum arenarium* (L.) Moench subsp. *aucheri* (Boiss.) Davis & Kupicha**	**Ölmez Çiçek**	**Iran-Turan**		**x**	**LC**					**x**			**x**			
	73	*Helichrysum armenium* DC. Subsp. *armenium*	altınotu	Iran-Turan								x			x			
	74	*Picnomon acarna* (L.) Cass.		Mediterranean								x			x			
	75	*Picris strigosa* M. Bieb. Subsp. *strigosa*		Iran-Turan								x			x			
	76	*Pilosella piloselloides* (Vill.) Sojak subsp. *megalomastix* (NP.) Sell & West		Widespread								x			x			
	77	*Scariola orientalis* (Boiss.) Sojak	Sızıkamışkan	Iran-Turan								x			x			
	78	*Scorzonera cana* (C.A. Meyer) Hoffm. Var. *radicosa* (Boiss.) Chamb.		Widespread								x			x			
	79	*Senecio vernalis* Waldst. & Kit.		Widespread								x			x			
	80	***Tanacetum cadmeum* (Boiss.) Heywood subsp. *orientale* Grierson**	**Hoşdağçiçeği**	**Iran-Turan**		**x**	**LC**					**x**			**x**			
	81	*Xeranthemum annuum* L.	Ölmez Otu	Widespread								x			x			
CONVOLVULACEAE	82	*Convolvulus arvensis* L.	Kuzu sarmaşığı, Kaplumbağa otu	Widespread								x			x			
CRASSULACEAE	83	*Sedum album* L.	Damkoruğu	Widespread								x			x			
	84	*Sedum acre* L.	Damkoruğu	Widespread									x		x			
DIPSACACEAE	85	*Scabiosa argentea* L.	Uyuz Otu	Widespread								x			x			
EUPHORBIACEAE	86	*Euphorbia macraclada* Boiss.	Sütleğen	Iran-Turan								x			x			
	87	*Euphorbia denticulata* Lam.	Sütleğen	Iran-Turan								x			x			
FABACEAE/LEGUMINOSAE	88	*Astragalus plumosus* Willd. var. *plumosus*	Tavşantopağı	Iran-Turan								x				x		
	89	***Astragalus leporinus* Boiss. var. *leporinus***	**Iraz geveni**	**Iran-Turan**		**x**	**LC**					**x**			**x**			
	90	*Astragalus kurdicus* Boiss. var. *kurdicus*	Ahır geveni	Iran-Turan								x					x	
	91	*Astragalus amblolepis* Fischer	Küt geven	Iran-Turan								x				x		
	92	*Astragalus gummifer* Labill.	Sakızlı geven	Iran-Turan								x					x	
	93	*Astragalus pycnocephalus* Fischer var. *pycnocephalus*	Bozuk geven	Iran-Turan								x				x		
	94	*Coronilla varia* L.	Adi geven	Iran-Turan								x			x			
	95	*Lathyrus nissolia* L.		Widespread								x			x			
	96	*Medicago x varia* Martyn	Yonca	Widespread								x			x			
	97	*Trifolium arvense* L. Var. *arvense*	Üçgül	Widespread								x			x			
	98	*Trifolium campestre* Schreb.	Sarı dirfil	Widespread								x				x		
	99	*Trigonella fischeriana* Ser.	Çemen	Iran-Turan								x			x			
	100	*Trigonella monantha* C.A. Meyer. Subsp. *monantha*	Çemen	Iran-Turan								x			x			
	101	*Vicia cracca* L. Subsp. *stenophylla* Vel.	Fiğ	Widespread								x			x			
	102	*Onobrychis armena* Boiss. & Huet.	Korunga	Widespread								x			x			

FAMILY		TAXON	COMMON NAME	P.G.R	ENDEMISM		RDB	BERN	CITES			HABITAT			RELATIVE ABUNDANCE			
GLOBULARIACEAE	103	*Globularia trichosantha* Fisch. & Mey.	Küreçiçeği	Widespread								x			x			
HYPERICACEAE	104	*Hypricum scabrum* L.	Binbirdelikotu	Iran-Turan								x			x			
ILLECEBRACEAE	105	*Paronychia kurdica* Boiss. Subsp. *kurdica* var. *kurdica*	Bozkepekotu	Widespread								x			x			
	106	*Scleranthus uncinatus* Schur		Widespread								x	x		x			
LAMIACEAE	107	*Acinos rotundifolius* Pers.		Widespread								x			x			
	108	*Marrubium astracanicum* Jacq. Subsp. *astracanicum*		Widespread								x			x			
	109	***Marrubium globosum* Montbret & Aucher ex Bentham subsp. *globosum***	**Boz ot**	**Iran-Turan**		**x**	**LC**					**x**			**x**			
	110	*Nepeta nuda* L. subsp. *albiflora* (Boiss.) Gams		Widespread								x			x			
	111	*Phlomis armeniaca* Wild.	Şalba	Iran-Turan								x			x			
	112	***Plomis capitata* Boiss.**	**Şalba**	**Iran-Turan**		**x**	**LC**					**x**				**x**		
	113	***Phlomis linearis* Boiss. & Bal.**	**Yaylaotu**	**Iran-Turan**		**x**	**LC**					**x**			**x**			
	114	*Salvia multcaulis* Vahl	Kürtreyhanı	Iran-Turan								x				x		
	115	*Scutellaria orientalis* L. subsp. *pinnatifida* J.R.Edm.		Widespread								x			x			
	116	*Sideritis montana* L. subsp. *montana*		Mediterranean								x			x			
	117	***Sideritis vulcanica* Hub.-Mor.**	**Madençayı**	**Iran-Turan**	**x**		**VU**					**x**			**x**			
	118	*Stachys woronowii* (Schischkin ex Grossh.) R. Mill		Iran-Turan								x			x			
	119	*Teucrium chamaedrys* L.	Dalak Otu	Widespread								x			x			
	120	*Teucrium polium* L.	Kısamahmut, Acı Ot, Meryem Otu, Beyaz Ot	Widespread								x			x			
	121	*Thymus kotschyanus* Boiss. & Hohen. var. *kotschyanus*	Kekik	Iran-Turan								x				x		
	122	*Ziziphora capitata* L.		Iran-Turan								x			x			
LINACEAE	123	*Linum austriacum* L. subsp. *austriacum*	Yabani keten	Widespread								x			x			
MALVACEAE	124	*Malva neglecta* Wallr.	Ebegümeci	Widespread								x			x			
	125	*Alcea pallida* Waldst.& Kit.	Fatmaanagülü	Widespread								x			x			
PAPAVERACEAE	**126**	***Papaver triniifolium* Boiss.**	**Titrekızım**	**Iran-Turan**		**x**	**LC**					**x**			**x**			
PLUMBAGINACEAE	127	*Acantholimon acerosum* (Willd.) Boiss. var. *acerosum*	Pişik geveni	Iran-Turan								x			x			
	128	*Plumbago europaea* L.	Karakına	Avrupa- Sibirya								x	x		x			
POLYGALACEAE	129	*Polygala comosa* Schkuhr.		Widespread								x			x			
POLYGONACEAE	130	*Polygonum setosum* Jacq. Subsp. *setosum*	Ebemekmeği	Iran-Turan								x			x			
	131	*Polygonum cognatum* Meisssn.	Madımak	Widespread								x			x			
	132	*Rumex acetosella* L.	Kuzukulağı	Widespread								x			x			
PRIMULACEAE	133	*Androsace maxima* L.		Widespread								x			x			
RANUNCULACEAE	134	*Ceratocephalus falcatus* (L.) Pers.		Widespread								x			x			
	135	*Ranunculus arvensis* L.	Düğün çiçeği	Widespread								x			x			
	136	*Ranunculus illyricus* L. Subsp. *illyricus*	Düğün çiçeği	Widespread								x			x			
RESEDACEAE	137	*Reseda lutea* L. var. *lutea*		Widespread								x			x			
ROSACEAE	138	*Cotoneaster nummularia* Fisch. & Mey.	Dağ muşmulası	Widespread								x			x			

FAMILY		TAXON	COMMON NAME	P.G.R	ENDEMISM		RDB	BERN	CITES			HABITAT			RELATIVE ABUNDANCE			
	139	*Crataegus sinaica* Boiss.	Çöl alıcı	Iran-Turan								x			x			
	140	*Crataegus orientalis* Pallas ex Bieb. var. *orientalis*	Alıç	Widespread								x			x			
	141	*Potentilla recta* L.	Beşparmak Otu	Widespread								x			x			
	142	*Rosa canina* L.	Kuşburnu	Widespread								x			x			
	143	*Sanguisorba minor* Scop. Subsp. *muricata* (Spach) Briq.		Widespread								x			x			
RUBIACEAE	144	*Asperula orientalis* Boiss. & Hohen		Iran-Turan								x			x			
	145	*Cruciata taurica* (Pallas ex Wild.) Ehrend.		Iran-Turan								x			x			
	146	*Galium verum* L.	Yoğurt Otu	Widespread								x			x			
	147	*Galium incanum* Sm. subsp. *elatius* (Boiss.) Ehrend.		Iran-Turan								x			x			
SCROPHULARIACEAE	148	*Anarrhinum orientale* Benth.		Iran-Turan								x			x			
	149	*Bungea trifida* (Vahl.) C.A. Mey.	Ğçkernekotu	Iran-Turan								x			x			
	150	*Odontites aucheri* Boiss.		Iran-Turan								x			x			
	151	*Verbascum cheiranthifolium* Boiss. Var. *cheiranthifolium*	Sığırkuyruğu	Widespread								x			x			
	152	*Veronica multifida* L.	Devesabunu	Iran-Turan								x			x			
	153	*Veronica orientalis* Miller subsp. *orientalis*		Widespread								x			x			
	154	*Veronica pusilla* Kotschy var. *pusila*		Iran-Turan								x			x			
MONOCOTYLEDONES																		
POACEAE/GRAMINEAE	155	*Avena sativa* L.	Yulaf	Widespread								x			x			
	156	*Aegilops biuncialis* Vis.		Iran-Turan								x			x			
	157	*Bromus tomentellus* Boiss.		Avrupa- Sibirya								x					x	
	158	*Bromus japonicus* Thunb. subsp. *japonicus*		Widespread								x			x			
	159	*Cynodon dactylon* (L.) Pers.	Ayrık Otu	Widespread								x			x			
	160	*Dactylis glomerata* L. subsp. *hispanica* (Roth) Nyman	Parmak otu	Mediterranean								x				x		
	161	*Hordeum bulbosum* L.	Arpa	Widespread								x			x			
	162	*Hordeum murinum* L.	pisipisiotu	Widespread								x			x			
	163	*Koeleria cristata* (L.) Pers.		Widespread								x			x			
	164	*Phleum exaratum* Hochst. ex Griseb. Subsp. *exaratum*		Widespread								x			x			
	165	*Phleum phleoides* (L.) Karsten		Avrupa- Sibirya								x			x			
	166	*Elymus hispidus* (Opiz) Melderis subsp. *hispidus*		Widespread								x			x			
	167	*Festuca valesiaca* Schleicher ex Gaudin		Widespread								x				x		
	168	*Poa alpina* L. subsp. *fallax* F. Hermann		Widespread								x				x		
	169	*Poa bulbosa* L.	Yumrulu Salkım Otu	Widespread								x			x			
	170	*Stipa lessingiana* Trin. & Rupr.		Widespread								x				x		
	171	*Stipa holosericea* Trin.		Iran-Turan								x				x		
	172	*Taeniatherum caput-medusae* Nevsk subsp. *crinitum* (Schreber) Melderis		Mediterranean								x			x			
IRIDACEAE	173	*Crocus pallasii* Goldb.	Güzçimi	Widespread								x			x			

FAMILY		TAXON	COMMON NAME	P.G.R	ENDEMISM		RDB	BERN	CITES			HABITAT			RELATIVE ABUNDANCE			
LILIACEAE	174	*Allium dictyoprasum* C.A. Meyer ex Kunth	Top soğan	Iran-Turan								x			x			
	175	*Allium rotundum* L.	Yabani soğan	Widespread								x			x			
	176	*Tulipa julia* C. Koch	Yabanlalesi	Iran-Turan								x			x			
	177	*Colchicum triphyllum* G. Kuntze	Acıçiğdem	Mediterranean								x			x			
	178	*Muscari armeniacum* Leichtlin ex Baker	Dağ sümbülü	Widespread								x			x			
	179	*Ornithogalum oligophyllum* E.D. Clarke	Ak yıldız	Widespread								x			x			

Table IV.31. Fauna Species of R3-ELAZIG-1 WPP Area

Ordo/Familia	Taxon	Turkish Name	English Name	IUCN	BERN	CITES	EU Habitat/ Bird Directive	RDB/Status
AMPHIBIA								
URODELA								
Bufonidae	*Bufo bufo*	Siğilli Kurbağa	Common Toad	LC	Ann-III	-	-	-
Bufonidae	*Bufo variabilis*	Gece Kurbağası	Green Toad	DD	-	-	-	-
Bufonidae	*Rana macrocremis*	Uludağ Kurbağası	Long-legged wood frog	LC	Ann-III	-	-	nt
Ranidae	*Pelophylax ridibundus*	Ova kurbağası	Eurasian Marsh frog	LC	Ann-III	-	-	
REPTILIA								
TESTUDINES								
Tesdudinidae	*Testudo graeca*	Tosbağa	Spur-thighed Tortoise	VU	Ann-II	Ann-II	Ann-II/Ann-IV	-
SQUAMATA								
Gekkonidae	*Mediodactylus kotschyi*	İnceparmaklı keler	Kotschy's Gecko	LC	Ann-II	-	Ann-IV	nt
Agamidae	*Trapelus lessonae*	Bozkır keleri	Steppe Agama	LC	Ann-III	-	-	nt
Lacertıdae	*Apathya cappadocica*	Kapadokya Kertenkelesi	Anatolian lizard	LC	Ann-III	-	-	nt
Lacertıdae	*Lacerta media*	Sivas Kertenkelesi	Three-lined Lizard	LC	-	-	-	nt
Lacertıdae	*Parvilacerta parva*	Cüce Kertenkele	Dwarf lizard	LC	Ann-II	-	-	nt
Lacertıdae	*Ophisops elegans*	Tarla Kertenkelesi	Snake-eyed lizard	LC	Ann-II	-	Ann-IV	nt
Scıncıdae	*Eumeces schneideri*	Sarı Kertenkele	Schneider's Skink	LC	Ann-III	-	-	nt
Scıncıdae	*Heremites vittata*	Şeritli Kertenkele	bridled skink	LC	Ann-III	-	-	nt
Typholophidae	*Typhlops vermicularis*	Kör Yılan	European blind snake	LC	Ann-III	-	-	nt
Colubridae	*Dolichophis caspius*	Hazer Yılanı	Schmidt's whip snake	LC	Ann-III	-	Ann-IV	nt
Colubridae	*Dolichopis jugularis*	Kara Yılan	Large whip snake	LC	Ann-II	-	Ann-IV	nt
Colubridae	*Dolichopis schmidti*	Kırmızı Yılan	Red Snake	LC	Ann-III	-	-	nt
Colubridae	*Elaphe sauromates*	Sarı Yılan	Yellow snake	LC	-	-	-	nt
Colubridae	*Natrix natrix*	Yarısucul Yılan	Grass Snake	LC	Ann-III	-	-	nt
Viperidae	*Macrovipera lebetina*	Koca Engerek	Lebetine viper	NE	Ann-II	-	Ann-II/Ann-IV	nt
AVES								
Ciconiiformes								
Ciconiidae	*Ciconia ciconia*	Leylek	White Stork	LC	Ann-II	-	Ann-I	GY
Ciconiidae	*Ciconia nigra*	Kara Leylek	Black Stork	LC	Ann-II	Ann-II	Ann-I	GY
Accipitriformes								
Accipitridae	*Accipiter brevipes*	Yoz Atmaca	Levant Sparrowhawk	LC	Ann-II	Ann-II	Ann-I	Y
Accipitridae	*Accipiter nisus*	Atmaca	Eurasian Sparrowhawk	LC	Ann-II	Ann-II	Ann-I	Y

Ordo/Familia	Taxon	Turkish Name	English Name	IUCN	BERN	CITES	EU Habitat/ Bird Directive	RDB/Status
Accipitridae	*Aegypius monachus*	Kara Akbaba	Cinereous Vulture	NT	Ann-II	Ann-II	Ann-I	Y
Accipitridae	*Aquila chrysaetos*	Kaya Kartalı	Golden Eagle	LC	Ann-II	Ann-II	Ann-I	Y
Accipitridae	*Buteo buteo*	Şahin	Eurasian Buzzard	LC	Ann-II	Ann-II	-	G
Accipitridae	*Buteo rufinus*	Kızıl Şahin	Long-legged Buzzard	LC	Ann-II	Ann-II	Ann-I	Y
Accipitridae	*Circus macrourus*	Bozkır Delicesi	Pallid harrier	NT	Ann-III	Ann-II	Ann-I	Y
Accipitridae	*Clanga pomarina*	Küçük Orman Kartalı	Lesser Spotted Eagle	LC	Ann-II	Ann-II	Ann-I	G, Y
Accipitridae	*Haliaeetus albicilla*	Ak Kuyruklu Kartal	White-tailed eagle	LC	Ann-III	Ann-I	Ann-I	Y
Accipitridae	*Hieraaetus pennatus*	Küçük Kartal	Booted Eagle	LC	Ann-II	Ann-II	Ann-I	Y
Accipitridae	*Milvus migrans*	Kara Çaylak	Black Kite	LC	Ann-II	Ann-II	Ann-I	Y
Accipitridae	*Neophron percnopterus*	Küçük Akbaba	Egyptian Vulture	EN	Ann-II	Ann-II	Ann-I	Y
Accipitridae	*Pernis apivorus*	Arı Şahini	European Honey-buzzard	LC	Ann-II	Ann-II	Ann-I	Y
Apodiformes								
Apodidae	*Apus apus*	Ebabil	Common swift	LC	Ann-III	-	-	Y
Apodidae	*Tachymarptis melba*	Ak Karınlı Ebabil	Alpine swift	LC	Ann-II	-	-	G
Falconiformes								
Falconidae	*Falco tinnunculus*	Kerkenez	Lesser Kestrel	LC	Ann-II	Ann-II	-	Y
Falconidae	*Falco subbuteo*	Delice Doğan	Eurasian Hobby	LC	Ann-II	Ann-II	-	Y
Galliformes								
Phasianidae	*Alectoris chukar*	Kınalı Keklik	Chukar	LC	Ann-III	-	Ann-II-B	Y
Coraciiformes								
Meropidae	*Merops apiaster*	Arıkuşu	European Bee-eater	LC	Ann-II	-	Ann-II-A	G
Passeriformes								
Alaudidae	*Lullula arborea*	Orman Toygarı	Woodlark	LC	Ann-III	Ann-III	Ann-I	K
Turdidae	*Oenanthe hispanica*	Kara Kulaklı Kuyrukkakan	Western black-eared wheatear	LC	Ann-II	-	-	K
Turdidae	*Oenanthe isabellina*	Kuyrukkakan	Northern Wheatear	LC	Ann-II	-	-	Y
Turdidae	*Monticola saxatilis*	Taşkızılı	Common rock thrush	LC	Ann-II	Ann-III	-	Y
Turdidae	*Saxicola rubetra*	Çayır Taşkuşu	Whinchat	LC	Ann-II	-	-	Y
Sylviidae	*Sylvia communis*	Ak Gerdanlı Ötleğen	Common whitethroat	LC	Ann-II	-	-	Y
Corvidae	*Pyrrhocorax pyrrhocorax*	Kırmızı Gagalı Dağ Kargası	Red-billed chough	LC	Ann-II	-	Ann-I	Y-T
Emberizidae	*Miliaria calandra*	Tarla Çintesi	Corn bunting	LC	Ann-III	-	-	Y
Hirundinidae	*Hirundo rustica*	Kır Kırlangıcı	Barn swallow	LC	Ann-II	-	-	Y
Motacillidae	*Anthus spinoletta*	Dağ İncirkuşu	Water Pipit	LC	Ann-II	-	-	Y
Motacillidae	*Anthus trivialis*	Ağaç İncir Kuşu	Tree pipit	LC	Ann-II	-	-	Y

Ordo/Familia	Taxon	Turkish Name	English Name	IUCN	BERN	CITES	EU Habitat/ Bird Directive	RDB/Status
Paridae	*Parus caeruleus*	Mavi Baştankara	Eurasian blue tit	LC	Ann-II	-	-	G-Y
Fringillidae	*Carduelis carduelis*	Saka	European goldfinch	LC	Ann-II	Ann-III	-	Y
Fringillidae	*Linaria cannabina*	Keten Kuşu	Common Linnet	LC	Ann-III	-	-	Y
Suliformes								
Phalacrocoracidae	*Phalacrocorax carbo*	Karabatak	Great cormorant	LC	Ann-III	-	-	Y
MAMMALIA								
ERINACEOMORHPA								
Erinacedia	*Erinaceus concolor*	Kirpi	Southern White-breasted Hedgehog	LC	-	-	-	nt
SORICOMORPHA								
Soricidae	*Crocidura leucodon*	Çiftrenkli Böcekçil	Bicolored Shrew	LC	Ann-III	-	-	nt
CHIROPTERA								
Vespertilionidae	*Rhinolophus hipposideros*	Küçük Nalburunlu Yarasa		LC		-	-	-
Vespertilionidae	*Rhinolophus euryale*	Akdeniz Nalburunlu Yarasası	Mediterranean horseshoe bat	NT	Ann-II	-	-	-
Vespertilionidae	*Myotis emerginatus*	Kirpikli Yarasa		LC		-	-	-
Vespertilionidae	*Myotis myotis*	Farekulaklı Büyük Yarasa	Greater Mouse-eared Myotis	LC	Ann-II	-	Ann-II	V
Vespertilionidae	*Myotis blythii*	Farekulaklı Küçük Yarasa	Lesser Mouse-eared Myotis	LC	Ann-II	-	Ann-II	V
Vespertilionidae	*Myotis capaccinii*	Uzunparmaklı yarasa	Long-fingered bat	VU	Ann-II	-	-	-
Vespertilionidae	*Pipistrellus pipistrellus*	Adi Yarasa	Common Pipistrelle	LC	Ann-III	-	-	V
Vespertilionidae	*Pipistrellus nathusii*	Sertderili Yarasa	Nathusius' Pipistrelle	LC	Ann-II	-	-	V
Vespertilionidae	*Pipistrellus kuhlii*	Beyazşeritli Yarasa	Kuhl's Pipistrelle	LC	Ann-II	-	-	V
Vespertilionidae	*Hypsugo savii*	Savi'nin Cüce Yarasası	Savi's Pipistrelle	LC	Ann-II	-	-	V
Vespertilionidae	*Eptesicus serotinus*	Genişkanatlı Yarasa	Serotine Bat	LC	Ann-II	-	-	V
Vespertilionidae	*Barbastella barbastellus*	Basıkburunlu Yarasa	Western barbastelle	NT	Ann-II	-	-	
Vespertilionidae	*Plecotus kolombatovici*	Balkan Uzunkulaklı Yarasası	Mediterranean long-eared bat	LC	-	-	-	-
Vespertilionidae	*Plecotus macrobullaris*	Uzunkulaklı Kafkas Yarasası	Alpine long-eared bat	LC	-	-	-	-
Vespertilionidae	*Plecotus auritus*	Kahrengi Uzunkulaklı Yarasa	Brown long-eared bat	LC	Ann-II	-	-	-
Vespertilionidae	*Vespertilio murinus*	Çiftrenkli Yarasa	Parti-coloured Bat	LC	Ann-II	-	-	-
Miniopteridae	*Miniopterus schreibersii*	Uzunkanatlı Yarasa	Uzunkanatlı Yarasa	VU	Ann-II	-	Ann-II	V
Molossidae	*Tadarida teniotis*	Kuyruklu Yarasa	European Free-tailed Bat	LC	Ann-II	-	-	-
LAGOMORPHA								
Leporidae	*Lepus europaeus*	Yaban Tavşanı	European Hare	LC	Ann-III	-	-	nt
RODENTIA								
Sciuridae	*Sciurus anomalus*	Anadolu Sincabı	Caucasian Squirrel	LC	Ann-II	-	Ann-IV	R/I

Ordo/Familia	Taxon	Turkish Name	English Name	IUCN	BERN	CITES	EU Habitat/ Bird Directive	RDB/Status
Cricetidae	*Cricetulus migratorius*	Cüce Hamster	Grey dwarf hamster	LC	-	-	-	-
Cricetidae	*Microtus socialis*	Küçük Tarlafaresi	Social vole	LC	-	-	-	-
Cricetidae	*Nannospalax xanthodon*	Anadolu Körfaresi	Nehring's Blind Mole Rat	DD	-	-	-	-
Cricetidae	*Apodemus mystacinus*	Kaya Faresi	Eastern broad-toothed field mouse	LC	-	-	-	-
Muridae	*Apodemus flavicollis*	Sarı Boyunlu Ormanfaresi	Yellow-necked Field Mouse	LC	-	-	-	nt
Muridae	*Mus macedonicus*	Sarı Evfaresi	Macedonian Mouse	LC	-	-	-	-
Muridae	*Allactaga williamsi*	Araptavşanı	Williams's jerboa	LC	-	-	-	-
CARNIVORA								
Canidae	*Canis lupus*	Kurt	Gray Wolf	LC	Ann-II	Ann-2	Ann-IV	R (V)
Canidae	*Canis aureus*	Çakal	Golden jackal	LC	-	Ann-3	-	-
Canidae	*Vulpes vulpes*	Kızıl Tilki	Red Fox	LC	-	Ann-3	-	nt
Canidae	*Ursus arctos*	Bozayı	Brown bear	LC	Ann-II	Ann-2	-	-
Mustelidae	*Mustela nivalis*	Gelincik	Least Weasel	LC	Ann-III	-	-	nt
Mustelidae	*Martes foina*	Kaya Sansarı	Stone Marten	LC	Ann-III	-	-	nt
Mustelidae	*Meles meles*	Porsuk	Eurasian Badger	LC	Ann-III	-	-	R
Felidae	*Lynx lynx*	Vaşak	Eurasian Lynx	LC	Ann-III	Ann-2	Ann-II	E
ARTIODACTYLA								
Suidae	*Sus scrofa*	Yaban Domuzu	Wild Boar	LC	Ann-3	-	-	nt

RELATIVE ABUNDANCE
(based on observation)

1 Very Rare

2 Rare

3 Moderate

4 Abundant

5 Very Abundant

ENDEMISM
(for flora species)

R: Regional Endemic

W: Widespread Endemic

HABİTAT

1 **(E1.2)**

2 **(H3.6)**

IV.2.5 Critical Habitat Assessment

Methodology

Critical habitats are areas with high biodiversity value, including (i) habitats of significant importance to Critically Endangered and/or Endangered species; (ii) habitats of significant importance to endemic and/or restricted-range species; (iii) habitats 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. Critical habitat criteria are defined in IFC PS6, 2012:

- Criterion 1: Critically Endangered (CR) and/or Endangered (EN) species
- Criterion 2: Endemic and/or restricted-range species
- Criterion 3: Migratory and/or congregation species
- Criterion 4: Highly threatened and/or unique ecosystems
- Criterion 5: Key evolutionary processes

Projects located in internationally and/or nationally recognized areas of high biodiversity value may require a critical habitat assessment:

- IUCN Protected Area Categories Ia, Ib and II.
- Key Biodiversity Areas (KBAs), which include Important Bird and Biodiversity Areas (IBAs).

Numerical thresholds have been defined for the first four critical habitat criteria (i.e., CR/EN species, endemic/restricted-range species; migratory/congregatory species, threatened and unique ecosystems) to facilitate decision-making. The thresholds were obtained from globally standardized numerical thresholds published in the IUCN's A Global Standard for Identifying Key Biodiversity Areas and Red List Categories and Criteria. The thresholds are indicative and serve as a guideline for decision-making only. There is not universally accepted or automatic formula for determining critical habitat. The involvement of external experts and project-specific assessments is of utmost importance, mainly when data are limited (as will often be the case). The thresholds defined for each criterion in the following items are explained according to IFC, 2019 GN6. Critical habitat assessment for the species identified in the Project Area was made according to these articles.

Criterion 1: Critically Endangered and Endangered Species

- Areas that support globally important concentrations of an IUCN Red-listed EN or CR species (≥ 0.5% of the global population and ≥ 5 reproductive units of a CR or EN species).
- Areas that support globally important concentrations of an IUCN Red-listed Vulnerable (VU) species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds.
- As appropriate, areas containing important concentrations of a nationally or regionally listed EN or CR species.

Criterion 2: Endemic and Restricted-range Species

- Areas that regularly hold ≥10% of the global population size and ≥10 reproductive units of a species.

Criterion 3: Migratory and Congregator Species

- Areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregator species at any point of the species' lifecycle.
- Areas that predictably support ≥10 percent of the global population of a species during periods of environmental stress.

Criterion 4: Highly Threatened or Unique Ecosystems

- Areas representing ≥5% of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN.
- Other areas not yet assessed by IUCN but determined to be highly prioritized for conservation by regional or national systematic conservation planning.

Criterion 5: Key Evolutionary Processes

For Criterion 5, there are no numerical thresholds. Best available scientific information and expert opinion will be used to guide decision-making with respect to the relative "criticality" of a habitat in these cases. For illustrative purposes, some potential examples of spatial features associated with evolutionary processes are as follows:

- Landscapes with high spatial heterogeneity are a driving force in speciation, as species are naturally selected based on their ability to adapt and diversify.
- Environmental gradients, also known as ecotones, produce transitional habitat, which has been associated with the process of speciation and high species and genetic diversity.
- Edaphic interfaces are specific juxtapositions of soil types (for example, serpentine outcrops, limestone, and gypsum deposits), which have led to the formation of unique plant communities characterized by both rarity and endemism.
- Connectivity between habitats (for example, biological corridors) ensures species migration and gene flow, which is especially important in fragmented habitats and for the conservation of metapopulations. This also includes biological corridors across altitudinal and climatic gradients and from "crest to coast."

To meet the requirements of IFC PS6 and primarily for critical habitat assessment, an ecologically reasonable unit of analysis specific to the biodiversity component in question has been defined. Unless otherwise stated, the unit of analysis is defined as turbine points and a 500-meter radius for flora species and habitat units within the BSA for fauna species.

Since international or European biodiversity assessments do not always include Turkish habitats and species, expert judgments have often been used to conclude the status of biodiversity components. Officially established or widely accepted local, regional, or national assessments regarding the threat and protection status of habitats and species were consulted, and in cases where such assessments were unavailable, local expert opinion was sought.

CHA of species in BSA

C1: Critically endangered and/or endangered species

Rhabdosciadium microcalycinum and *Sideritis vulcanica*, regional endemic flora species, are in the VU category according to Red Data Book, 2000.

Neophron percnopterus is in the EN category according to IUCN. No nests or nestlings of these species were detected within the project area. However, due to its habitat suitability, it has been included in the target species list and its monitoring will continue.

Testudo graecae, a reptile, *Myotis capaccinii and Miniopterus schreibersii*, bat species are in the VU category according to IUCN. *Myotis capaccinii and Miniopterus schreibersii* species were not detected in the project area during the studies that were carried out. Still, it has been evaluated that it could be in the region based on literature data and included in the lists. Monitoring studies on the species will continue.

The presence of all species that can meet Criterion-1 in the Project Area and the possibility of their presence in the study area are explained in Table IV.32.

Table IV.32 CHA According to Criterion-1

FLORA					
Species	**RDB**	**Global Distribution (individuals)**	**Distribution in study area (individuals)**	**%**	**Assessment**
Rhabdosciadium microcalycinum	VU	?	200	<1	It has been evaluated that if the species' populations in the area are destroyed, it will not undergo a critical change in its threat category. It does not trigger C1.
Sideritis vulcanica	VU	?	50	<1	
FAUNA					
Species	**RDB/ IUCN**	**Global Distribution**	**Distribution in BSA (km^2)/ (individuals)**	**%**	**Assessment**
Neophron percnopterus	EN	12400-36000 individuals	?	?	More data is needed for assessment; monitoring will continue.
Testudo graeca	VU	250 000 km^2	19 km^2	0,007	It does not trigger C1.
Miniopterus schreibersii	VU	?	?	?	More data is needed for assessment; monitoring will continue.
Myotis capaccinii	VU	?	?	?	

C2: Endemic and/or restricted-range species

No endemic fauna species are detected in the BSA. a total of 179 species and subspecific taxa belonging to 36 families were identified. Twelve of these identified species are endemic to Türkiye. Two endemic taxa are regional and ten are relatively widespread endemic.

Under this criterion, the population sizes of regional endemic species in the area are detailed (see Table IV.33.

Table IV.33 CHA According to Criterion-2

Species	RDB	Global Distribution (individuals)	Distribution in study area (individuals)	%	Assessment
Rhabdosciadium microcalycinum	VU	?	200	<1	Not trigger C2

Sideritis vulcanica	VU	?	50	<1	Not trigger C2

C3: Concentrations of migratory and congregator species

The project area is located in the middle of the primary and secondary migration routes used by migratory birds soaring in the Eastern Anatolia Region and close to the main migration route. (Trakus, 2023) (see Figure IV.22). Considering the flight heights of migratory birds and the altitude of the project area, there is no high level of risk for migratory birds.



Figure IV.22 Bird Migration Routes and Location of the Project Area

According to the autumn monitoring results, 259 flights belonging to 12 bird species were detected. 207 of these were identified as migratory and 52 as native birds. The most common species were *Buteo buteo* and *Merops apiaster*. The migration rate for the autumn migration season was 2.94 birds/hour. For the evaluation, the numbers of migratory species determined in the autumn observations (75.00 hours) were multiplied by the total autumn migration hours (920 hours) and the estimated annual number of migratory species was calculated.

It was reported that out of 395 bird flights observed from observation points, 207 migratory and 52 native bird flights flew within the risk area (maximum 500 m away from the turbines) and under the risk height. The species that most frequently entered the risk zone were *Buteo buteo* and *Merops apiaster*.

Migratory bird species identified in the project area and their evaluations are given in Table IV.34. According to the calculation, individuals of the *Clanga pomarina* species are present in more than 1% of the area and trigger Criterion-3. These calculations are made on a proportional basis and will be supported by annual monitoring.

Table IV.34 CHA According to Criterion-3

Species	IUCN	Global Distribution (individuals)	Number of individuals observed	Estimated number of individuals	%	Assessment
Pernis apivorus	LC	290000 - 430000	8	196	0,07- 0,05	Not trigger C3
Merops apiaster	LC	14000000-25999999	82	2012	0,01	Not trigger C3

Species	IUCN	Global Distribution (individuals)	Number of individuals observed	Estimated number of individuals	%	Assessment
Hieraaetus pennatus	LC	150000-195000	1	25	0,02-0,01	Not trigger C3
Clanga pomarina	LC	40000-60000	24	589	1,47-0,98	**Trigger C3**
Buteo buteo	LC	2000000-3500000	37	908	0,05-0,03	Not trigger C3
Haliaeetus albicilla	LC	20000-60000	3	74	0,37-0,12	Not trigger C3
Circus macrourus	NT	18000-30000	1	25	0,14-0,08	Not trigger C3
Falco subbuteo	LC	900000-1500000	11	270	0,03-0,02	Not trigger C3
Milvus migrans	LC	4000000- 5700000	36	883	0,02	Not trigger C3
Falco tinnunculus	LC	4300000-6700000	4	98	0,00	Not trigger C3

C4: Highly threatened and unique ecosystems

The habitats determined in the BSA are not listed as priority habitats within the scope of Habitat Directive Annex-1. None of these habitats are protected according to the "European Red List of Habitats" prepared by the European Union. Since the ecosystems in Turkey are not evaluated according to the IUCN Red Ecosystems List, an evaluation in this context could not be made.

South Keban Dam KBA/IBA is located 14.8 km north of the Project Area. Table IV.35 evaluates the bird species that trigger IBA around the Project area and the possibility of these species being present in the Project Area.

Criterion-4 is not triggered in the project area.

Table IV.35 Bird Species Triggering IBAs around the Project Area[16]

Species	Project Area
Larus armenicus	-
Hydroprogne caspia	-
Species group - waterbirds	-

C5: Key evolutionary processes

Landscapes with high spatial heterogeneity, edaphic interfaces, and areas with proven importance for adaptation to climate change have not been identified in the BSA. Therefore, it does not trigger Criterion-5.

Critical Habitat Assessment Conclusions

Individuals of the *Clanga pomarina* species had been seen in more than 1% of the area and trigger Criterion-3. These calculations are made proportionally and will be supported by annual monitoring. Also, monitoring studies are recommended during the construction and operation phases for species not detected in the studies carried out in the area but whose habitat suitability has been determined.

[16] *http://datazone.birdlife.org/*

As a result, based on the autumn observations, the data obtained has been proportionally calculated, and the area where the *Clanga marina* species triggering Criterion-3 occurs has been identified as the potential critical habitat for the project. It was determined that ten individuals showed migration behavior within the risk area. "The Flight Route Map of Bird Species Triggering Criterion-3" created as a result of autumn observations is shown in Figure IV.23. Monitoring of the species will continue, and the extent of its impact from the project will be determined.

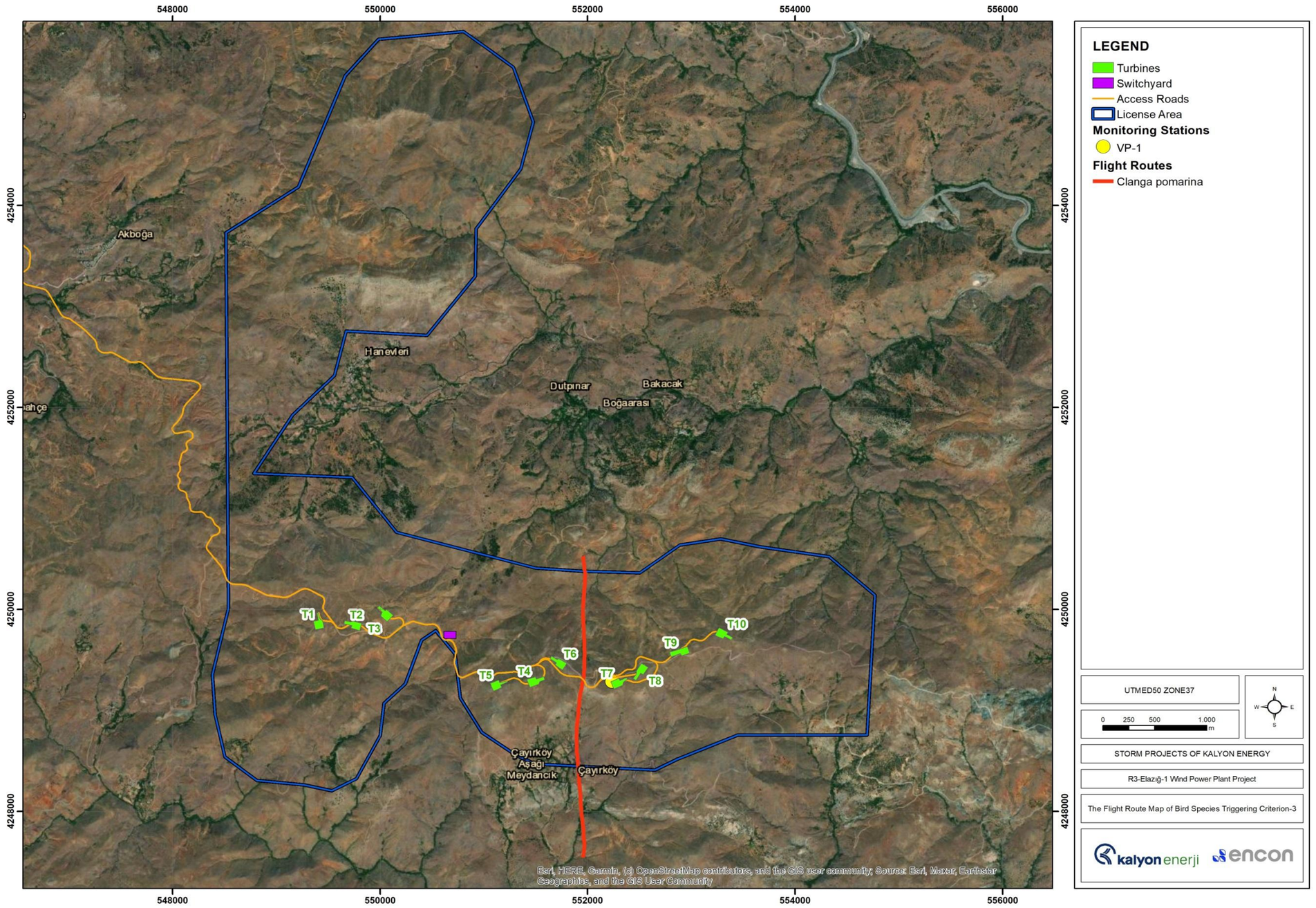


Figure IV.23 The Flight Route Map of Bird Species Triggering Criterion-3

IV.3 Cultural Heritage

IV.3.1 Methodology

The ESIA cultural heritage assessment studies for the identification, assessment and management of the potential "R3-ELAZIĞ-1 WPP Project impacts on the cultural heritage assets have been performed by REGIO Cultural Heritage Management Consultancy ("REGIO") within the cultural heritage study area, which encompasses the following (Table IV.36 and Figure IV.24):

Table IV.36: CHIA Borders[17]

	Tangible Cultural Heritage	Intangible Cultural Heritage
Impact Assessment Boundaries	All Project Area (Project Area, Switchyard, Energy Transmission Line, Access Roadand Turbine Locations)	Elazığ/ Maden – Akboğa Village
		Elazığ/ Maden – Hanevleri Village
		Elazığ/ Maden – Çayırköy Village
		Elazığ/ Maden – Dutpınar Village

[17] The impact area for tangible cultural heritage was limited by the area where Project activities to be conducted. However, other observed findings within the project licence area and its' surroundings were also included in the scope of this report. The boundaries for intangible cultural heritage were determined by taking into consideration settlements where cultural elements can be found around the Project area.

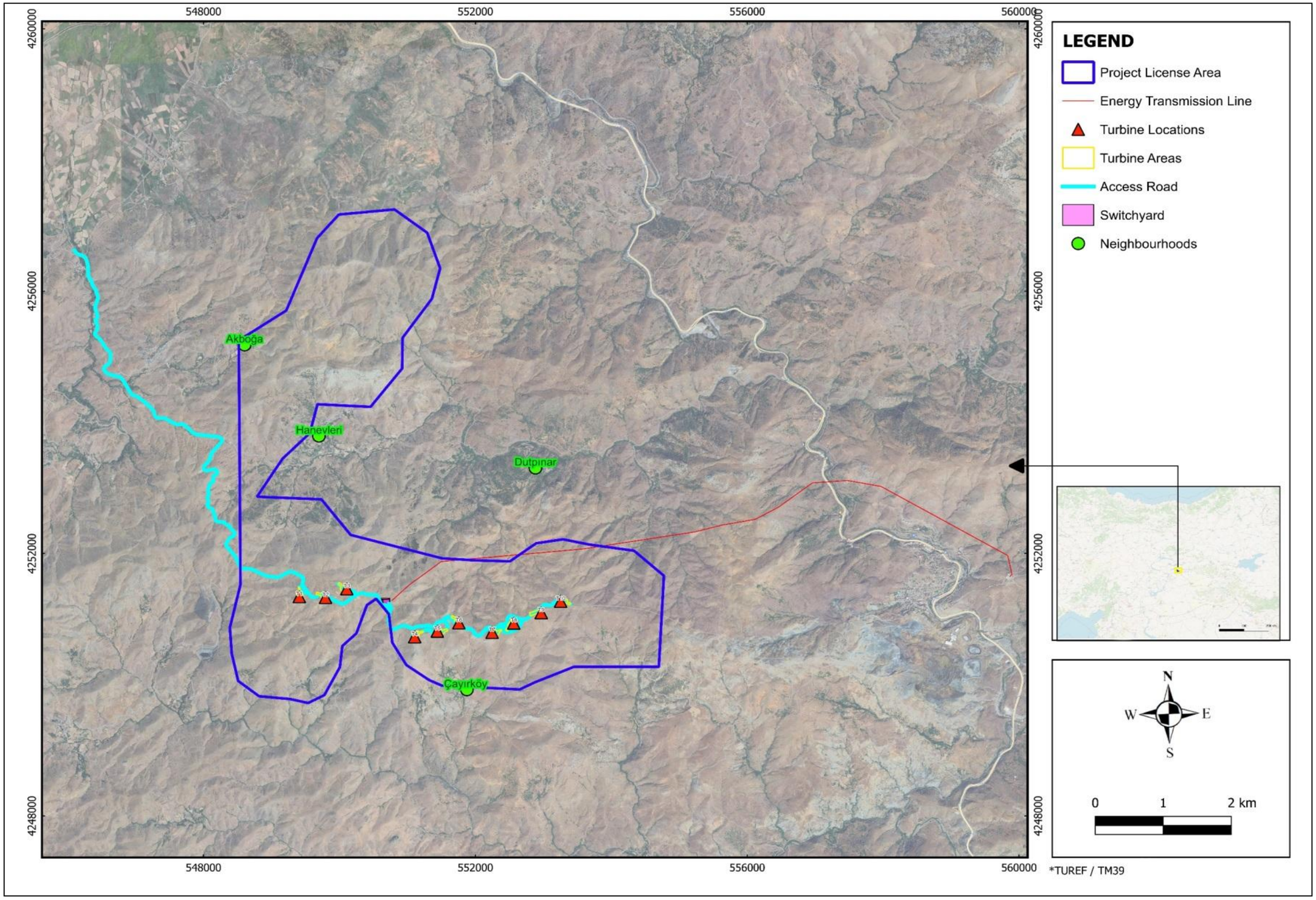


Figure IV.24: Study Area

The cultural heritage study comprised a desk study of the data available for the study area and field surveys of the Project locations conducted by the senior archaeologists. The main objectives of the study are summarized below:

- Identifying the exact location and properties of registered and unregistered cultural heritage sites and assets located within the cultural heritage study area of the ESIA based on desk study and field surveys. (Unregistered sites may include (i) sites in the process of registration by the related cultural heritage authorities; sites with archaeological potential as identified/discovered by the cultural heritage team as part of the ESIA field surveys; or (ii) other sites including the remains of a historic bridge, a grave/ graveyard, fountain, civilian architecture samples etc.)
- Defining the adverse effects on the tangible and intangible cultural heritage assets which may occur as the result of project related activities (including all Project phases).
- Developing mitigation measures for the management of registered and unregistered cultural heritage within the study area, consistent with the requirements and procedures set by the Law on the Conservation of Cultural and Natural Property (No. 2863, 1983) and related secondary legislation as well as decisions of the related Regional Councils for the Conservation of Cultural Property for the registered sites or sites that are in the process of registration by the Ministry of Culture and Tourism (MoCT).
- Providing upfront information on the cultural heritage sites and assets located within Project's impact area to the related cultural heritage authorities to ensure timely evaluation of the sites by the authorities within the framework of the Law on the Conservation of Cultural and Natural Property (No. 2863, 1983) and identify the management measures to be required by the authorities for those sites (e.g. measures to be taken by the Contractor prior to site entry).
- Providing upfront information on the cultural heritage sites and assets located within Project's impact area to relevant Project departments to ensure timely planning and progress of the activities, in alignment with the evaluation and decision processes of the cultural heritage authorities.
- Contributing to the archaeological and cultural inventory of Türkiye by sharing the information on the cultural heritage sites and assets located within the ESIA study area (collected through scientific methods) with related Regional Councils for the Conservation of Cultural Property.

In consideration of the scope of work (design and construction responsibility) of the Contractor as defined in the Construction Contract, the scoping of the tangible and intangible cultural heritage studies, including the baseline, impact assessment and management, has been done as summarised in Table IV.36.

IV.3.1.1 *Desktop Study*

Publications on archaeological and historical cultural heritage related to the field of study and its immediate surroundings have been compiled in order to determine the cultural heritage potential of the project construction and the impact areas. Existence of archaeological or cultural heritage has been recorded in the project construction areas and the project impact areas have been researched. Resources used during desk study were as follows:

- Inventory records of Regional Council for the Conservation of Cultural Property in Diyarbakır,
- Academic publications,
- Historic/ topographic and digital maps,
- Previous reports on the cultural heritage studies conducted in the area (published by other parties/academia, studies conducted by the cultural heritage team, etc.).

IV.3.1.2 *Walkover Surveys*

The cultural heritage team has conducted walkover survey following locations in order to gather field data on the location and features of the tangible cultural heritage elements within the study area:

- All Project Area (Project License Area, Switchyard, Energy Transmission Line, Access Road and Turbine Locations)

During the archaeological walkover surveys, the archaeological findings that could be observed on the surface were recorded on field survey forms by taking Geographical Positioning System (GPS) coordinates (WGS 1984, 6 degree) together with detailed photographs of the findings from various angles to form a Project archive. Based on the field survey findings, daily reports were prepared by the cultural heritage team throughout the entire field survey program.

As part of the study, as the primary research method, walkover survey was conducted by a team composed of three (3) senior archaeologists on all areas indicated in Table IV.36.

During the walkover survey, the field survey team leader walked along the main axis of the Project Area, using a GPS device, while two other specialists walked at both edges of the Project Area. The instant communication between the members of the field team, who move forward in parallel was provided by walkie-talkies. During the field walkover surveys, all archaeological traces (ceramic shards spread on the surface, architectural elements or traces, graves or traces of graves, cisterns, workshops etc.) observed on the surface of the study area were recorded on the Field Surveys Forms (kept in ESIA database) and relevant findings were incorporated to the Project Archaeological Baseline.

IV.3.1.2.1 Intensive Surveys

When archaeological traces were encountered during the walkover surveys, the method of Intensive Survey was employed to determine the width of the archaeological site, identify its association with the Project Area, reveal the area of distribution of archaeological surface findings and complete entire documentation, which would contribute to interpreting the history of the site on the basis of archaeological artefacts on the surface.

During the intensive surveys, by taking sufficient number of GPS coordinates (at least four different points) at each site, surface area of the site in current geography, and its location were determined. Moreover, detailed photographs of each site were taken from different angles and archived for documentation purposes.

The area was divided into 10x10 m wide squares in the north-south direction and the samples of archaeological material such as pottery, stone tool shards etc. on the surface were systematically documented (photographing, etc). Data collected on each site through intensive surveys were incorporate to the kept in ESIA database and Project Archaeological Baseline Table **(**Table IV.41).

By processing the field GPS coordinates in the QGIS software, the locations of the sites with respect to Project Area were recorded digitally for further consideration in impact assessment studies.

IV.3.1.2.2 Intangible Cultural Heritage

For the purposes of IFC Performance Standard 8, “intangible cultural heritage refers to cultural resources, knowledge, innovations and/or practices of local communities embodying traditional lifestyles”. Türkiye has completed the process of becoming a party to the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage on 27 March 2006.

ESIA study, besides the academic publications and study reports on intangible cultural heritage, the publicly available databases of the following sources have been reviewed to identify the baseline conditions to set the basis for the identification and assessment of potential impacts, if any:

- Turkish National Commission for UNESCO,

- Provincial Directorates of the Ministry of Culture and Tourism,
- Research Centre for Turkish Folklore (THBMER),
- Regional Development Agencies.

For intangible cultural heritage, the following topics about the traditional knowledge and practices of the local community were studied during desk study:

- Oral traditions and expressions,
- Traditional food,
- Performing arts,
- Skills to produce traditional handcrafts,
- Traditional clothing,
- Traditional knowledge in health and medicine (for human and animals),
- Traditional agricultural and husbandry practices,
- Traditional production techniques and other practices,
- Cultural places, cemeteries, historical artefacts, etc. used by the locals in the forest, grasslands, public lands, etc.

IV.3.2 Baseline Conditions

The area where the project site is located is located in the Upper Fırat region in geographical sense. The area has a hilly structure in general which has been host of many cultures from the beginning of time. This geographical structure has made people settle around the level areas next to Fırat River and Hazar Lake.

The first systematic archaeological surveys in the upper Fırat Part started with the Keban Project in 1968. Settlement areas which have been identified during the surface surveys have contributed a lot in contributing the enlightenment of the historical period there. Especially in the scope of Keban Project, the surface surveys conducted in 1967 have given evidence that the area was occupied during Neolithic, Chalcolithic, Bronze and Iron Ages. Körtepe, Altıntepe, Boytepe[18], Dizbirantepe Hoyuk[19], Kalecik Tepesi[20] and Dırdırkale[21] are among places where these archaeological remains have been found.

According to Hittite written documents, the region was dominated by Mitanni Kingdom around 1450 BC. Elazığ and surrounding area was dominated by Urartians which were based in Van (Tuşpa) between 12-7 centuries BC. The region was dominated by the Assyrians and Scythians in the 7th century BC later to be dominated by Persian government in the 6th century. After Alexandar defeated Persians in 334 BC, there was a local kingdom established in Harput and its vicinity which was living Hellenistic Period.

The region which stayed under the domination of Rome between 66 BC and 395 AD remained under the domination of Byzantine Empire after the split of Rome in 395. Elazığ and its surroundings have become a scene for Byzantine and Arabian wars starting from the middle of the 7th century AD and Arabians have dominated Harput and its vicinity at this time. Dizbirantepe Hoyuk[22], Bahçelievler Bridge, Kalecik Tepesi[23], Devedüzü Bridge, Gavurkale Tepesi, Değirmenönü, Tumulus, Körtepe, Siyahdut Mevkii Culvert, Camiikebir Grave, Dırdırkale[24], Kilise Island and Değirmenönü Castle[25] show signs of tangible data regarding this period.

Turkish domination has started in the region after the Battle of Manzikert in 1071. The region became dominated by Artuqids in 1085, by Anatolian Seljuks in 1234, by Ilkhanate in 1243, by Beylik of Dulkadir in

18 Abdulkadir ÖZDEMİR, M. Taner ŞENGÜN Elazığ İli Merkez İlçesi Prehistorik Dönem Arkeolojik Yüzey Araştırması (Epas): 2020 Yılı Uluova ve Çevresi, 2019-2020 Yılı Yüzey Araştırmaları, Cilt 1, Ankara 2022
19 http://www.tayproject.org/TAYmaster.fm$Retrieve?YerlesmeNo=7843&html=masterdetail.html&layout=web (10.08.2023 tarihinde ulaşılmıştır.)
20 http://www.tayproject.org/TAYages.fm$Retrieve?CagNo=12190&html=ages_detail_t.html&layout=web(10.08.2023 tarihinde ulaşılmıştır.)
21 http://www.tayproject.org/TAYmaster.fm$Retrieve?YerlesmeNo=6939&html=masterdetail.html&layout=web(10.08.2023 tarihinde ulaşılmıştır.)
22 http://www.tayproject.org/TAYmaster.fm$Retrieve?YerlesmeNo=7843&html=masterdetail.html&layout=web(10.08.2023 tarihinde ulaşılmıştır.)
23 http://www.tayproject.org/TAYages.fm$Retrieve?CagNo=12190&html=ages_detail_t.html&layout=web(10.08.2023 tarihinde ulaşılmıştır.)
24 http://www.tayproject.org/TAYmaster.fm$Retrieve?YerlesmeNo=6939&html=masterdetail.html&layout=web(10.08.2023 tarihinde ulaşılmıştır.)
25 Abdulkadir ÖZDEMİR, M. Taner ŞENGÜN Elazığ İli Merkez İlçesi Prehistorik Dönem Arkeolojik Yüzey Araştırması (Epas): 2020 Yılı Uluova ve Çevresi, 2019-2020 Yılı Yüzey Araştırmaları, Cilt 1, Ankara 2022

1363, and by Aq Qoyunlus (Akkoyunlular) in 1465. The region where the project site is located has been added to Ottoman lands with the Battle of Chaldiran in 1516.

Elazığ and its vicinity showed a rapid development based on the changing social and economic structure during the first half of the 20th century beginning from the last quarter of the 19th century. With the handover of Ergani Copper Operations to Eti Bank in 1936, important employment opportunities were created in Maden district and in the vicinity. Kavasbaşı House, Etibank Lodging and Etibank Directorate Building are among the important historical heritage areas located near the project site and belonging to Late Ottoman Period and Early Republic Period with its mining and economy.

Known settlements having archaeological importance on the Project Area and its vicinity are presented in Table IV.37 and Figure IV.25.

Table IV.37: Archaeological and Immovable Cultural Heritage Sites within and in the Vicinity of the Project Area

No	Name of Tangible Cultural Heritage Asset	Province	District	Village	Distance to Project Area (km)	Periods							
						Neolithic	Chalcolithic	Early Bronze	Middle Bronze	Late Bronze	Iron	Roman	Medieval / Ottoman
1	Dizbirantepe Hoyuk	Elazığ	Maden	Gezin	10								
2	Siyahdut Mevkii Culvert			Aslantaşı	7								
3	Bahçelievler Bridge			Bahçelievler	4								
4	Etibank Lodging				4								
5	Etibank Directorate Building				4								
6	Kaleciktepesi			Kavak	9,5								
7	Devedüzü Bridge			Aslantaşı	8,1								
8	Camiikebir Grave			Camiikebir	3,6								
9	Kavasbaşı House				3,6								
10	Gavurkaletepesi			Kartaldere	13								
11	Çitli (Hilindir) Fortress			Çitliköy	2								
12	Dutpınar Bridge			Dutpınar	1,6								
13	Kilise Island		Sivrice	Sürek	17								
14	Değirmenönü Tumulus		Merkez	Değirmenönü	17								
15	Değirmenönü Castle				18								
16	Körtepe				19,7								
17	Boytepe				18,4								
18	Altıntepe				19,3								

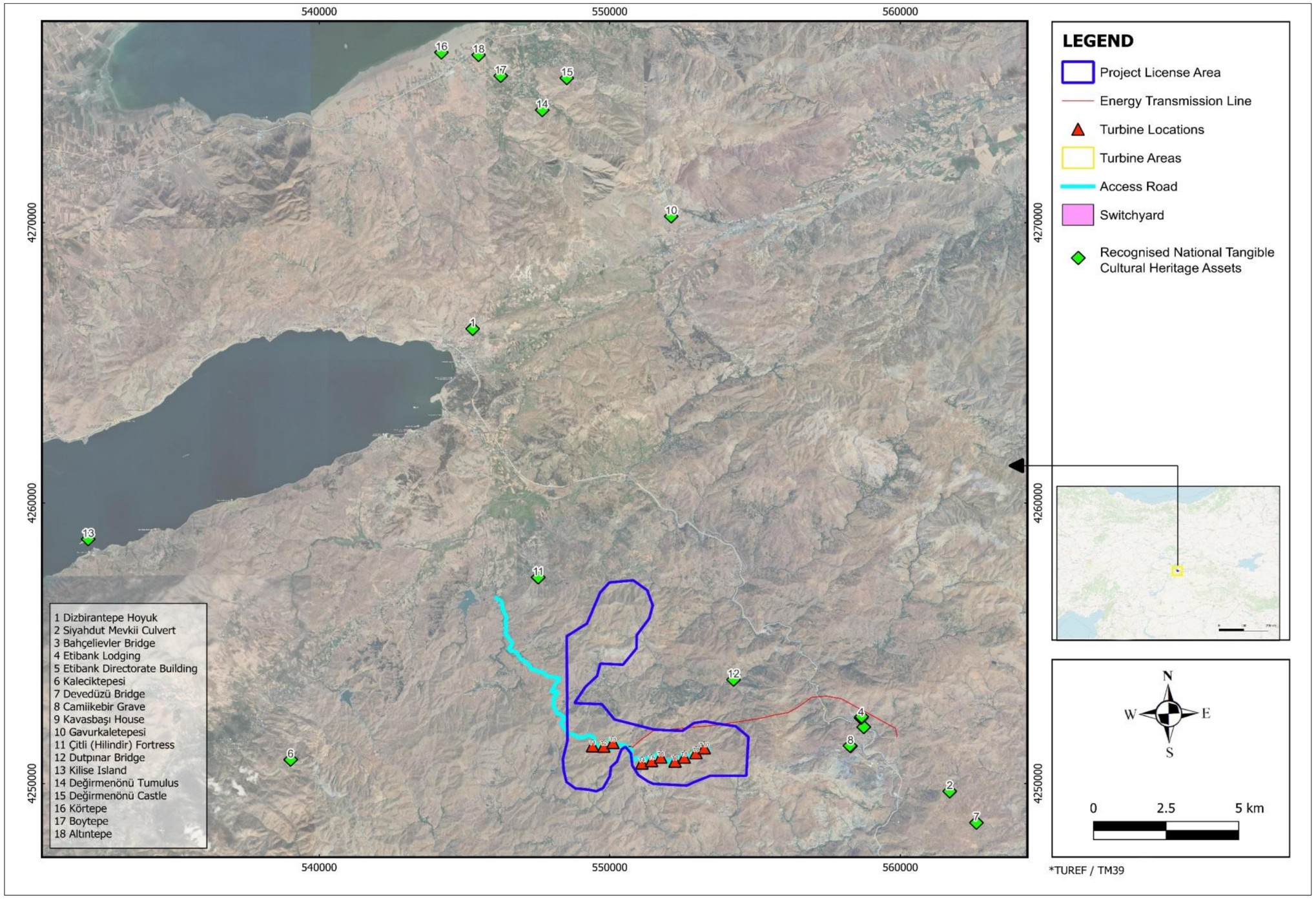

540000
550000
560000
4270000
4260000
4250000
LEGEND
Project License Area
Energy Transmission Line
Turbine Locations
Turbine Areas
Access Road
Switchyard
Recognised National Tangible Cultural Heritage Assets
1 Dizbirantepe Hoyuk
2 Siyahdut Mevkii Culvert
3 Bahçelievler Bridge
4 Etibank Lodging
5 Etibank Directorate Building
6 Kaleciktepesi
7 Devedüzü Bridge
8 Camiikebir Grave
9 Kavasbaşı House
10 Gavurkaletepesi
11 Çitli (Hilindir) Fortress
12 Dutpınar Bridge
13 Kilise Island
14 Değirmenönü Tumulus
15 Değirmenönü Castle
16 Körtepe
17 Boytepe
18 Altıntepe
N
W
E
S
0
2.5
5 km
*TUREF / TM39

Figure IV.25 Tangible Cultural Heritage Sites within and in the Vicinity of the Project Area

Registered and unregistered tangible cultural heritage sites located within the study area have been identified by the cultural heritage team through ESIA surveys. The sites identified to be located within the study area have been classified based on the criteria presented in Table IV.38.

Table IV.38: Site Classification Criteria

Site Classification	Type of the Surface Material	Size of the Site Taken into Consideration	Intensity Rate of the Surface Material
Registered Sites			
	Sites that are registered and protected by the Law No. 2863.		
Unregistered Sites			
Archaeological Site	**Ceramic, roof tile, architectural stone block, glass object shards, stone object shards, metal object shards, bone etc.**	**10mx10m**	**Between 10-100 pieces (High Intensity)**
	Architectural remains, etc.		**1 tower, 1 wall, 1 cistern etc.**
Other Cultural Heritage Sites	**Sites including the remains of historical structures such as bridge, civil architecture example, fountain, grave/cemetery etc.**		

Provincial distribution of the sites identified within the study area is presented in Table IV.39.

Table IV.39: Cultural Heritage Sites Identified within the Study Area

Province	District	Neighbourhood	Registered Sites	Unregistered Sites		Total
				Archaeological Site	Other Cultural Heritage Sites (Modern/ Old Cemetery Civilian Architecture etc.)	
Elazığ	Maden	Çitli	1[26]	-	-	**1**
		Dutpınar	1[27]	-	-	**1**
Total			**2**	**0**	**0**	**2**

Distribution of the sites identified with respect to their location/position within the study area is provided in Table IV.40**.**

Table IV.40: Distribution of Registered and Unregistered Sites

Legal Registration Status	Location/ Position of the Site/ Asset	
	Within the Project Area	Outside the Project Area
Registered	-	2
Unregistered	-	-
Total	0	2

List of registered and unregistered sites, together with information on their registration status, classification, features and position, is provided in Table IV.41 and shown on Figure IV.26.

[26] *Çitli (Hilindir) Fortress.*
[27] *Dutpınar Bridge.*

Table IV.41: Cultural Heritage Sites within the Study Area

No	Site Name	Province	District	Neighbourhood / Village	Registration Status		Location to the Project		Classification of Areas		Approximate Distance to the Project Area (km)	Site Descriptions
					Yes	No	Within the Project Area	Outside the Project Area	Archaeological Site	Other Cultural Heritage Site		
1	Çitli (Hilindir) Fortress	Elazığ	Maden	Çitli	x			x	x		2	It is a fortress dating back to the Iron, Roman and Byzantine ages.
2	Dutpınar Bridge			Dutpınar	x			x		x	1,6	It is a registered bridge dating back to the late ottoman periods.

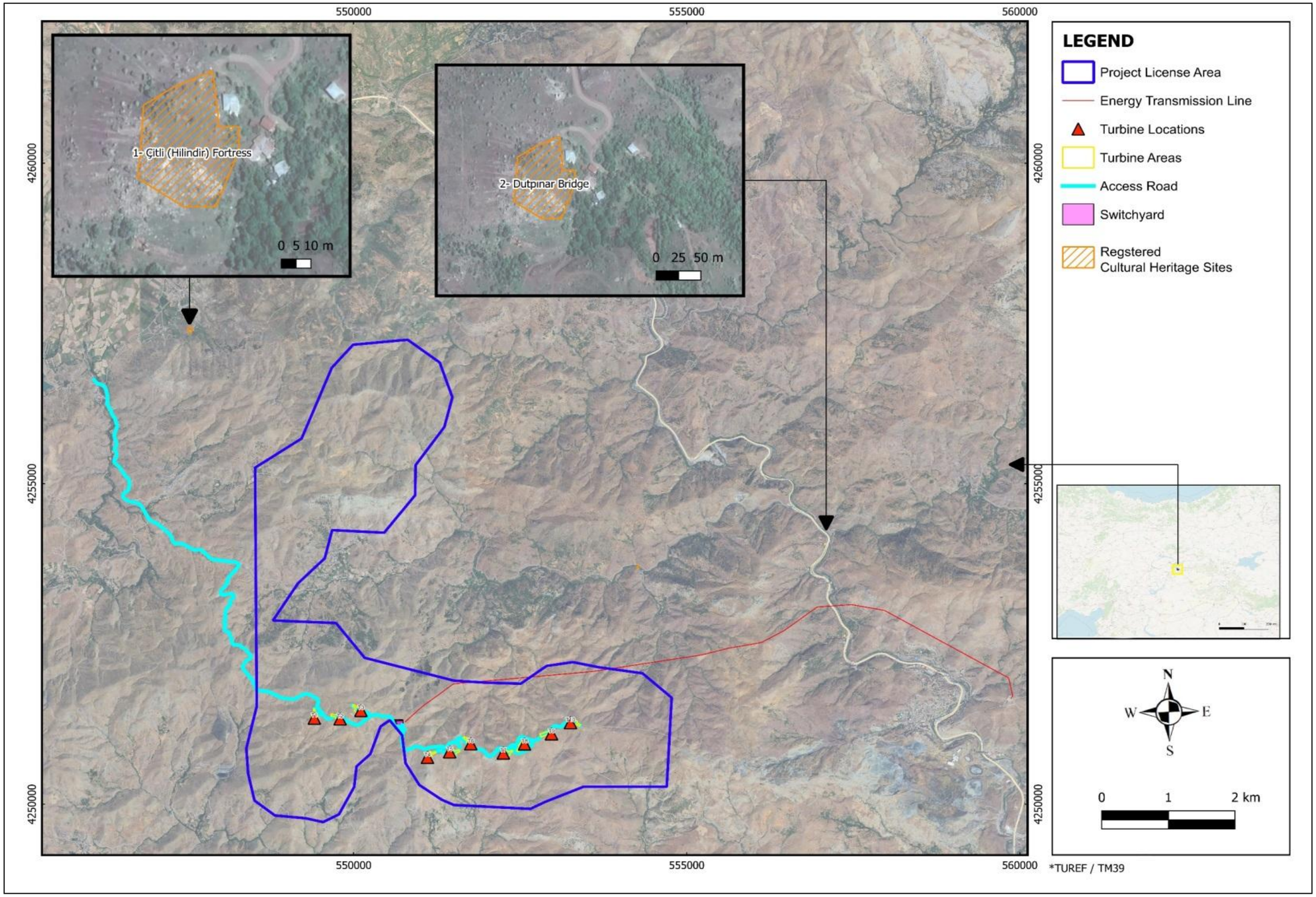
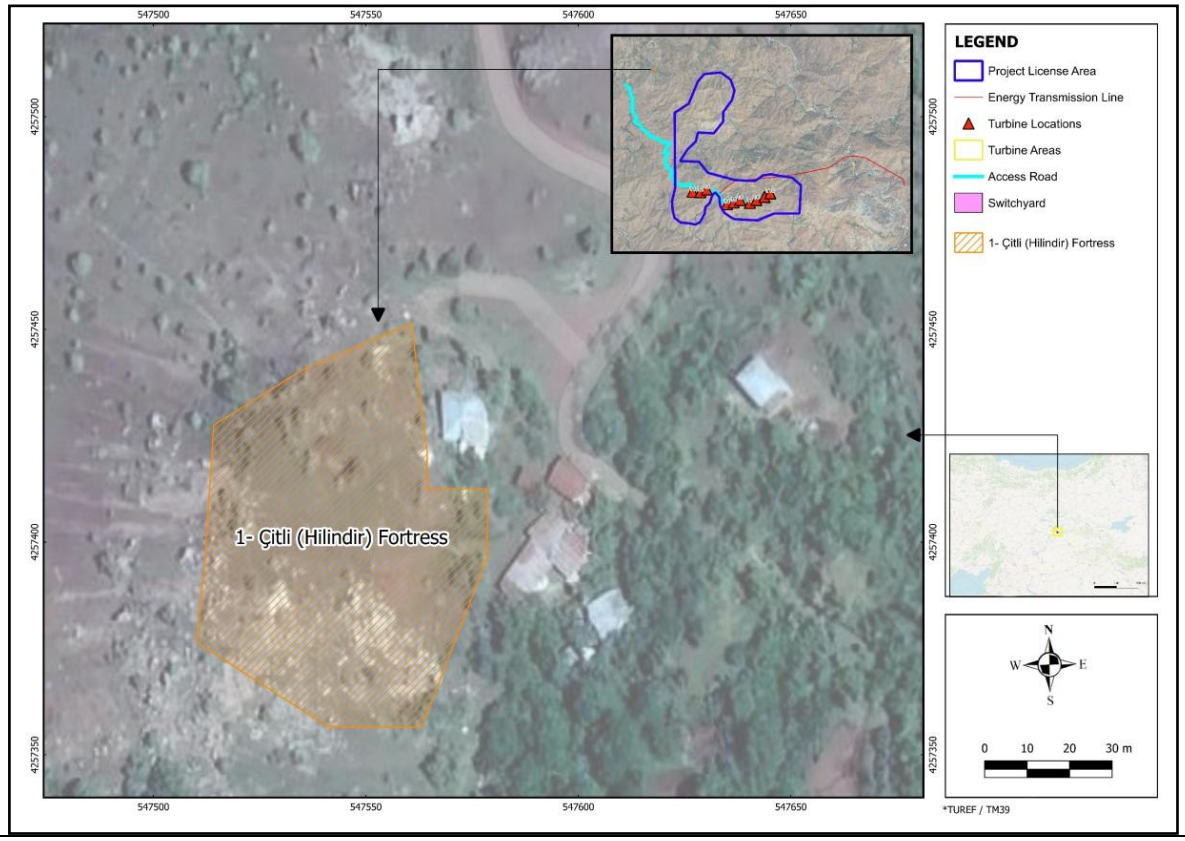


Figure IV.26: Locations of the Cultural Heritage Sites within the Study Area

The layouts and photographs pertaining to the registered and unregistered cultural heritage sites are presented below Figure IV.27 and Figure IV.28.

Çitli (Hilindir) Fortress



General View

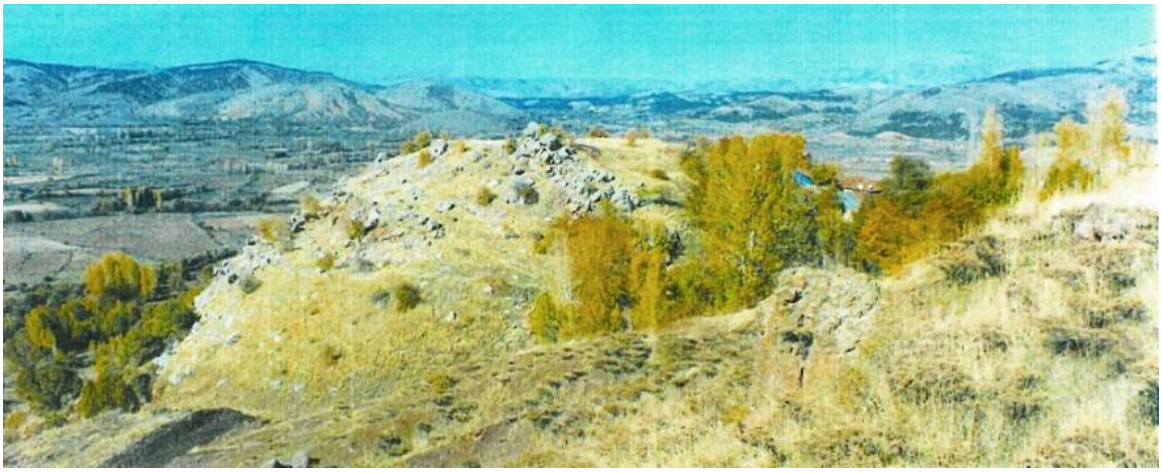


Figure IV.27: (1) Çitli (Hilindir) Fortress (registered) outside the Project Area

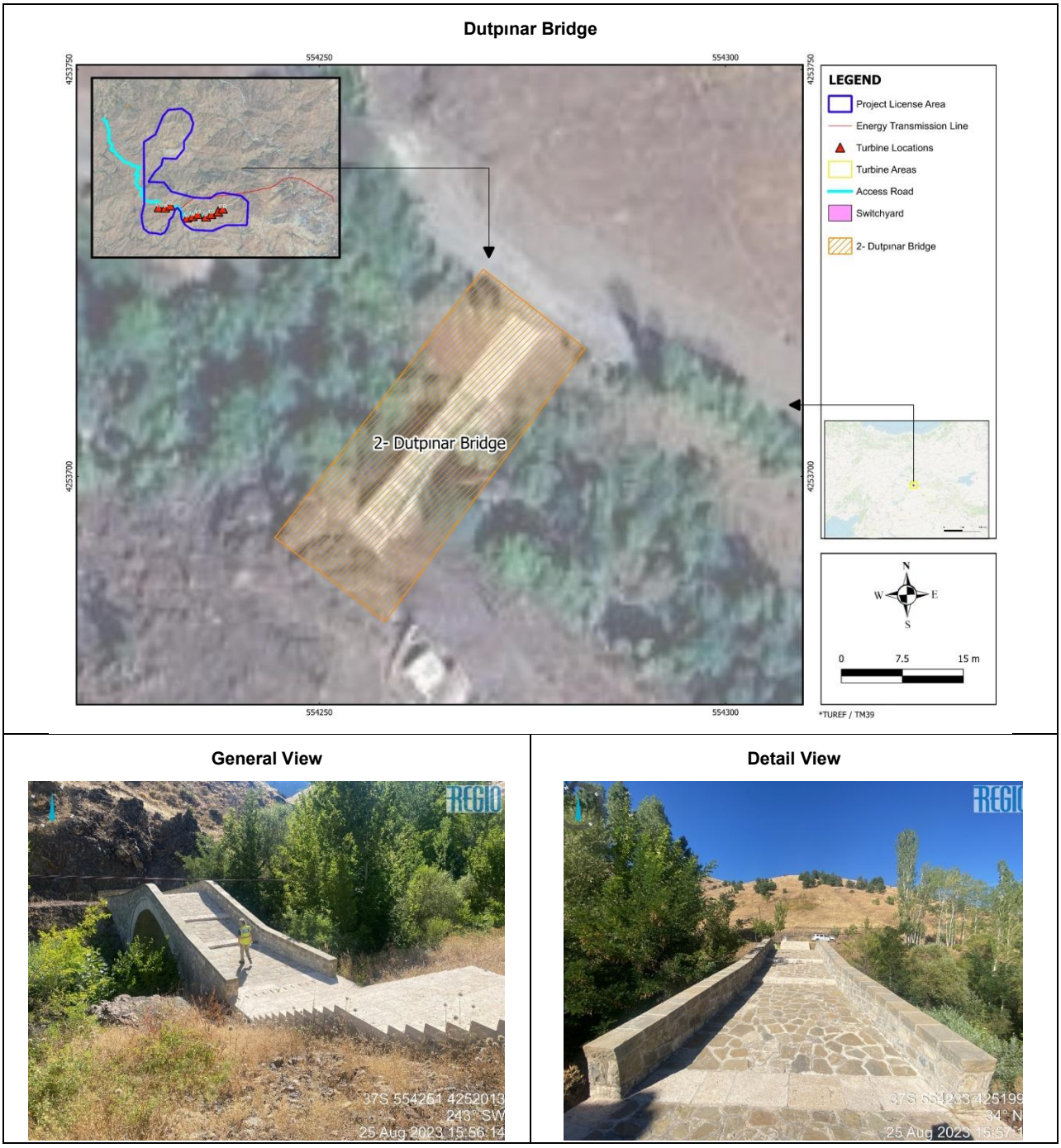


Figure IV.28: (2) Dutpınar Bridge (registered) outside the Project Area

Intangible Cultural Heritage based on Desk Studies

The region which is at an important location from a geographical perspective was preferred by people as a settlement location since the early periods of history due to its arable fields and natural riches such as water resources. The region witnessed occasional migration movements in time. Migration movements have greatly contributed to the intangible cultural heritage values in the region.

The region which is at an important location from a geographical perspective was preferred by people as a settlement location since the early periods of history due to its arable fields and natural riches such as water resources. The region witnessed occasional migration movements in time. Migration movements have greatly contributed to the intangible cultural heritage values in the region.

The region which has natural resources such as mining and water resources has always been selected by people as a settlement place since the beginning of history. The region has also seen migration movements in the historical process. It is known that Armenian, Catholic Suryani and Rum population was concentrated here until 1071 when Turkish people started to settle down. Elazığ and its vicinity which was inhabited by people since neolithic period have contributed a lot in the intangible cultural values of these areas with the lifestyle, cultural properties of Turkish people coming from Central Asia (tradition, rituals, ceremonies, Turkish music and poetry, folk medicine reflecting the experience of the folk, traditional handcraft and folk dance, cuisine, etc.)[28]

Nationally and internationally known intangible cultural heritage assets in the close vicinity of the Project Area are presented in Table IV.42 and Table IV.43.

As of 2023, there are 25 elements of Türkiye inscribed on the UNESCO Representative List of Intangible Cultural Heritage. Among these elements, there are 8 elements registered in Elazığ province where the Project Area took place, as shown in Table IV.42.

Table IV.42: Intangible Cultural Heritage Items Registered in UNESCO Representative List of Intangible Cultural Heritage of Project Area Vicinity[29]

No	Intangible Cultural Heritage Element	Year of Admission
1	Traditional Sohbet meetings	2010
2	Semah, Alevi-Bektaşi Ritual	2010
3	Turkish Coffee Culture and Tradition	2013
4	Flatbread Making and Sharing Culture: Lavash, Katyrma, Jupka, Yufka Katrıma, Jupka, Yufka	2016
5	Nawrouz, Novruz, Nowrouz, Nowrouz, Nawrouz, Nauryz, Nooruz, Nowruz, Navruz, Nevruz, Nowruz, Navruz	2016
6	Spring Celebration– Hıdrellez	2017
7	Hüsn-i Hat, traditional calligraphy in Islamic art in Türkiye	2021
8	Culture of Çay (Tea), a Symbol of Identity, Hospitality and Social Interaction	2022

The ICH elements registered in the national inventory in Elazığ province is presented in Table IV.43.

[28] *Adem SOLAK, Elazığ İli Sosyal Analiz Çalışması, Ankara 2017.*
[29] *Please check the following link; obtained on 22.09.2023 from https://ich.unesco.org/en/state/trkiye-TR*

Table IV.43: Intangible Cultural Heritage Items Registered in the National Inventory of Project Area Vicinity[30]

No	Element Group Titles	Inventory / Local Applications
1	Traditional Turkish Handicrafts	Art of Calligraphy
2		İllumination Tezhip
3	Traditional craftsmanship (Traditional craftsmanship)	Coppersmithing
4		Uslu Pottery Making
5		Saddlery
6		Tannery (Debağlık)
7		Hand Block Textile (Çit) Printing
8	Weaving Art Traditions	Rug / Cicim Weaving
9	Traditional Clothing Production and Use	Hat Making
10	Oya/Embroidery Processing, Sewing and Knitting Traditions	Needle Embroidery
11		Five Skewer Socks
12		Coin Pouch
13	Traditional Meetings and Organizations	Sohbet Meetings (Kürsübaşı)
14	Otherworldly, companionship and relative traditions	The Circumcision Ceremony (Kirve Culture)
15	Farewell and welcome ceremonies	Soldier farewell
16		Pilgrim farewell
17	Before birth / after birth and childhood traditions	Tooth Wheat
18	Marriage traditions	Veç Tradition
19		Supha/ Face-opening - seeing the bride
20		Haleat/ Gift
21		Bridal Bath
22	Traditions and Practices Based on Beliefs	Molla Potik
23	Faith, celebration and traditions linked to the calendar	Beliefs Hızır
24		Nevruz
25	Traditional Festivals	Piri Davut Festival
26	Telling tradition and traditional oral arts	Elazığ Jokes
27		“Mani” Singing Tradition
28	Folk Music and The Tradition of Singing Song	Ninni
29		Hoyrat
30	Traditional Folk Dance	Çayda çıra
31		Village and city girl Lelişo
32	Traditional Theatrical Arts and Games	Pisik Game
33	Traditional craftsmanship (Traditional craftsmanship)	Çedene Coffee

[30] *Please check the following link; obtained on 22.09.2023 from https://aregem.ktb.gov.tr/TR-344757/somut-olmayan-kulturel-miras-turkiye-ulusal-envanteri.html*

No	Element Group Titles	Inventory / Local Applications
34		Ashura
35		Orcik

Intangible Cultural Heritage based on Field Surveys

Findings of the ICH studies conducted within the project are presented below;

- The Project Area and its surroundings are Sunni Muslim (Zaza) settlements.
- Elazığ / Maden - Akboğa, Hanevleri, Çayırköy and Dutpınar villages where the Project Area is located, cultural elements such as birth, circumcision, military drafting, marriage, pilgrimage and death are among the main transition periods of life. It can be stated that these transition periods are beliefs and practices that have been maintained for centuries from the past to the present. Many beliefs and practices followed during the transition periods of life are mostly practiced in rural or villages located in the close vicinity of the Project Area.
- In addition to the traditions of the turning points of life mentioned above, it was determined that some customs were also kept alive in the celebration of religious feasts in the region. Preparations for religious feasts begin on the day of Arefe when cemetery visits are made, and refreshments are prepared for the guests coming during the feast. Generally, "kibbeh" fort the feats is made, and holiday clothes are purchased for everyone, especially children. After the feast prayer, neighbors, relatives and friends pay visits to see each other.
- The Project Area and its surroundings are Sunni Muslim settlements. Therefore, in some settlements covered with the study, there are places of worship and places of visit such as shrines built following to the beliefs of Sunni Muslims. According to the obtained information from the conducted interviews with locals in Hanevleri, Dutpınar and Akboğa villages, some places are believed to be sacred by the local people near the project licence area. These places are not the graves/tombs of people who are the subject of spiritual power, blessing or legends. However, these assets are "stone/rock", "tree", and "water spring", which are believed to be sacred and related to the intangible cultural heritage of the region.
- Agriculture in rural areas is conducted following modern methods. The public economy based on local production and consumption, which is followed by local people to maintain their lives, in animal husbandry and agriculture performed traditionally based on the knowledge obtained from ancestors. As an agricultural product, wheat, berry, corn, tomato, watermelon are produced in most of the farms.
- Traditional medicine and healing practices continue under the titles of bonesetters and healers in a large part of the settlements. It has been observed that traditional healing methods are also used for treatment of animal diseases.
- It has been determined that in certain periods of the year (at least 1 and at most 2 times) the peasant "Rain Prayer" is performed to increase agricultural productivity.
- As a result of the conducted studies on the intengible cultural heritage, it was understood that there is a "sheepherding" and "pasture" culture that continues with traditional methods in Çayırköy and Hanevleri neighbourhoods within the Project Area.
- During the conducted interviews with the locals in Çayırköy neighbourhood, it was understood that hunting culture, which is accepted as an ancestral tradition on "Mihrap Dağı Tepesi" (near Turbine 10) still continues (with a licence) **(**Figure IV.29).



Figure IV.29: Stone Hunting Blind Located Near Turbine 10

- Traditional culinary culture consists of kibbeh, bread, orcik, pastry, roasted meat (kavurma), salty hedik, stuffed eggplant (karnıyarık), kebab, guvec and tirit; tomato paste, pepper, jam and butter are made for the winter.
- It is observed that that traditional children's games such as çelik çomak, saklambaç (hide ans seek), aşık, misket, pisik and beştaş are still played by the locals.

Critical Cultural Heritage

Critical cultural heritage is defined as 'one or both of the following types of cultural heritage:

i. The internationally recognised heritage of communities who use, or have used within living memory the cultural heritage for long-standing cultural purposes; or
ii. Legally protected cultural heritage areas, including those proposed by host governments for such designation'.

Examples of legally protected areas which would be considered as cultural heritage 'include world heritage sites and nationally protected areas' (IFC, 2012a, 3, fn6).

Under IFC Performance Standard 8 critical cultural heritage should not be removed, significantly altered, or damaged. In exceptional circumstances when impacts on critical cultural heritage are unavoidable, a process of informed consultation and participation of the Affected Communities should be applied as described in IFC Performance Standard 1 and which uses a good faith negotiation process that results in a documented outcome. External experts should be retained to assist in the assessment and protection of critical cultural heritage.

Internationally Recognised Cultural Heritage Sites

World Heritage List[31] and World Heritage Tentative[32] List of UNESCO are considered under the internationally recognised cultural heritage sites.

Türkiye has 21 sites inscribed on the World Heritage List of UNESCO (as of 20 September 2023). Those located in the wider region of the Project are listed in Table IV.44 and shown in Figure IV.30. The closest site to the Project is the "Diyarbakır Fortress and Hevsel Gardens Cultural Landscape" in Diyarbakır, which is located at a distance of 75 km to the southeast of the project Area.

[31] https://whc.unesco.org/en/list/
[32] http://whc.unesco.org/en/tentativelists/

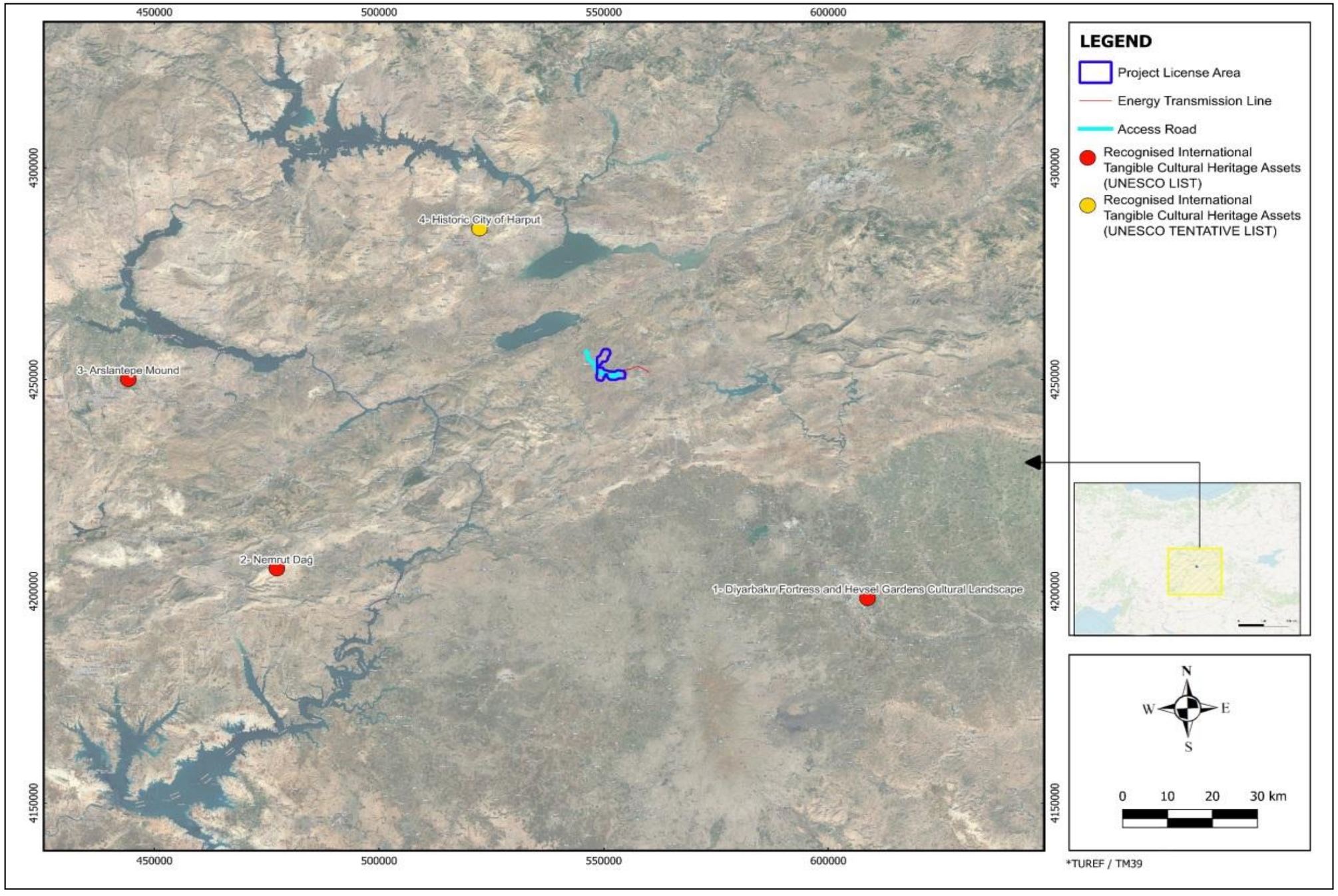


Figure IV.30: Internationally Recognised Cultural Heritage Sites

Among the sites included in the World Heritage Tentative List of UNESCO, 1 site is located in the wider region of the Project. The closest site to the Project are the “Historic City of Harput” in Elazığ, which is located at a distance of 39 km to the northwest of the Project Area which is located at a distance of 85 km in the south of the Project Area.

None of the internationally recognised cultural heritage sites is overlapping with the study area. Therefore, project activities do not have any impact on the areas listed neither in the World Heritage List or the World Heritage Tentative list. In case alternative areas need to be identified during the construction or operation phase of the project, such as quarries or dump sites, the areas listed in Table IV.44 below should be avoided.

Table IV.44: Internationally Recognised Cultural Heritage Areas (World Heritage List and World Heritage Tentative List of UNESCO)

No	Site Name	Province	District	Distance to Project (km)
World Heritage List of UNESCO				
1	Diyarbakır Fortress and Hevsel Gardens Cultural Landscape	Diyarbakır	Sur	75
2	Nemrut Dağ	Adıyaman	Kahta	94
3	Arslantepe Mound	Malatya	Battalgazi	103
World Heritage Tentative List of UNESCO				
4	Historic City of Harput	Elazığ	Centre	39

Legally Protected (Registered) Cultural Heritage Sites

Among the cultural heritage sites identified by the ESIA team vicinity of the Project Area, the sites listed in Table IV.45 are registered, legally protected cultural heritage areas.

Under Turkish Law, legally protected cultural heritage assets are classified and protected in accordance with Principal Decision No. 658 (issued 5 November 1999) which states that all archaeological sites need to be classified and protected according to their significant features. Detailed information on the features of each site has been previously provided in Table IV.41.

Table IV.45: Legally Protected (Registered) Cultural Heritage Site Within the Study Area

No	Site Name	Province	District	Neighbourhood / Village
1	Çitli (Hilindir) Fortress	Elazığ	Maden	Çitli
2	Dutpınar Bridge			Dutpınar

IV.4 Socio-Economic Baseline

This chapter presents baseline information on the socio-economic conditions of the settlements in the social study area of the R3-Elazığ-1 Wind Power Plant (WPP) Project and assesses the present and potential social impacts of the Project. The social study area of the Elazığ WPP ESIA studies has been identified considering the physical boundary of the Project's activities as the core area, and a wider buffer zone covering access to the Project and any natural or community receptors which may be affected by the Project. The social baseline, assessment and reporting studies have been conducted by the team of qualified experts ("social team") of the StraSpace Planning and Consultancy Limited Company ("StraSpace").

The chapter is structured to include the following main topics:

- Description of the methodology for social baseline definition,
- Baseline information on population and demography, income sources (including livestock, agriculture, beekeeping, etc.), education level, education services, health services, quality of life and infrastructure, vulnerable groups and social components of settlement.

IV.4.1 Methodology

The methodology used to assess the socioeconomic baseline as part of the ESIA process follows the Equator Principles IV (EP) and International Finance Corporation's (IFC) Performance Standards (PSs). Describing the baseline includes identifying and defining the importance and sensitivity of the various environmental and social resources and receptors likely to be impacted. Understanding the value or sensitivity of the resources and receptors to impacts and changes is significant to determine the significance of effects and allows for better identification of the most appropriate measures that will be employed to avoid impacts, and to mitigate any adverse impacts.

This baseline study was performed to:

- Understand the characteristics of the social context that may be subject to change point.
- Understand what resources are available at the household level in terms of livelihood strategies and coping/resilience mechanisms through profiling households' economic, social, and cultural activities.
- Identifying particular groups deemed vulnerable in the local context and potentially less able to cope with the changes brought about by the Project, or less able to benefit from its positive effects.

The methodology for the assessment of the socioeconomic conditions of the R3-Elazığ-1 Wind Power Plant Project is based on a combination of secondary research (desktop study) and primary research (field study). Following the preliminary desk-based research, a scoping (reconnaissance) site visit was conducted by the social team on August 9, 2023. Based on the outcomes of the preliminary desk-based research and the scoping site visit, the potential area of influence (social study area) for the Project has been delineated.

Following the identification of the potential area of influence (AoI) further desk-based research has been conducted and a comprehensive field study program comprising key informant meetings, interviews with the Project Affect Persons (PAPs) and focus group meetings have been undertaken as described in the below sections.

Potential Area of Influence

The overall Study Area for the social impact assessment represents the potential Area of Influence (AoI) of the Project. This is 'the area over which significant effects of the Project could reasonably occur, either on their own or in combination with those of other developments and projects'.

Potential AoI would include the physical boundary of the Project's activities as the core area, and a wider buffer zone covering access to the Project and any natural or community receptors which may be affected by the Project. The Direct Area of Influence (DAoI) for the social impact assessment is identified to cover the construction and operation phase of the Project facilities in the following areas:

- Lands to be acquired for project components (physical boundary of the Project's activities) including:
  - installation of the turbine platforms,
  - installation of the switchyard,
  - construction and/or widening of roads,
  - electricity transmission line connecting the Project area to the substation,
- Settlements where lands to be leased or acquired for the Project,

The Indirect Area of Influence (IAoI) for the social impact assessment is identified to cover the construction and operation phase of the Project facilities in the following areas:

- Settlements 2 km from the Project area that may be using pastureland.

In identifying these thematic study areas, the type and degree of the potential direct and indirect effects were taken into consideration. The core area where direct effects are likely to occur was determined, as well as the wider area of influence where indirect, combined, and cumulative effects are likely to occur in the surrounding areas and communities.

Direct AOI and indirect AOI are shown in Figure IV.31. The Direct Area of Influence (DAoI) is considered to include the following;

- Lands to be acquired for project components including installation of the turbine platforms, installation of the switchyard, construction and/or widening of access roads. The Project-related land acquisition will affect the parcels registered in Akboğa, Çayırköy, Çitli, Dutpınar, Hanevleri and Işıktepe villages. The expropriation data show that some project components are located in privately owned agricultural lands registered in Akboğa, Çitli and Işıktepe villages and public areas registered in Akboğa, Çayırköy, Dutpınar, Hanevleri and Işıktepe villages.
  - The total number of privately-owned parcels to be affected by the Project-related land acquisition is 28 and the total number of shareholders is 102.
  - The total number of parcels owned by Işıktepe village legal entity to be affected by the Project-related land acquisition is 3.
  - The total number of parcels registered to the treasury and public common property to be affected by the Project-related land acquisition is 21.
- Settlements from Maden districts where lands to be acquired for the Project are;
  - Akboğa
  - Çayırköy
  - Dutpınar
  - Hanevleri

- Işıktepe[33]
- There is no settlement 2 km from the Project area that may be using pastureland.

Land requirements by ownership type and by settlements within Project AoI are given in Table IV.46. and Table IV.47. While 68.1% of the required parcels are registered in Çayırköy, 13.2% is from Hanevleri, 10.2% is from Dutpınar, 4.4% is from Akboğa, 3.3% is from Işıktepe and 0.8 is from Çitli settlements. The share of privately owned parcels is 26.9% in Akboğa, 17.3% in Işıktepe and 9.6% in Çitli. The share of privately owned lands in total required areas is 0.5% for Akboğa, 1.4% for Işıktepe and 0.8% for Çitli. Therefore it can be concluded that the share of affected private parcels is very low.

Table IV.46. Land Requirement by Ownership Type

Row Labels	Number of Affected Parcels	Percent (%)	Total Area of the Affected Parcel (m^2)	Area to be Expropriated (m^2)	Area to be Easement Right Established (m^2)	Total Area to be Acquired (m^2)	Percent of Area to be Acquired (%)
Akboğa	**25**	**48.1**	**1,095,052.05**	**16,241.04**	**0**	**16,241.04**	**4.4**
Treasury	11	21.2	1,038,362.32	14,435.27	0	14,435.27	3.9
Private	14	26.9	56,689.73	1,805.77	0	1,805.77	0.5
Çayırköy	**2**	**3.8**	**7,606,778.57**	**249,036.46**	**2,671.86**	**251,708.32**	**68.1**
Treasury	1	1.9	5,177,192.14	112,426.71	1,427.45	113,854.16	30.8
Public Common Property	1	1.9	2,429,586.43	136,609.75	1,244.40	137,854.16	37.3
Dutpınar	**1**	**1.9**	**3,862,645.92**	**35,975.36**	**1,730.68**	**37,706.04**	**10.2**
Public Common Property	1	1.9	3,862,645.92	35,975.36	1,730.68	37,706.04	10.2
Hanevleri	**1**	**1.9**	**929,564.45**	**48,551.80**	**0**	**48,551.80**	**13.2**
Public Common Property	1	1.9	929,564.45	48,551.80	0	48,551.80	13.2
Işıktepe	**18**	**34.7**	**1,456,478.08**	**12,024.08**	**0**	**12,024.08**	**3.3**
Treasury	5	9.6	6,571.00	4,750.17	0	4,750.17	1.3
Village Legal Entity	3	5.9	6,331.58	331.60	0	331.60	0.1
Public Common Property	1	1.9	1,409,071.25	1,807.58	0	1,807.58	0.5
Private	9	17.3	34,504.25	5,134.73	0	5,134.73	1.4
Çitli	**5**	**9.6**	**605,404.23**	**2,892.72**	**0**	**2,892.72**	**0.8**
Private	5	9.6	605,404.23	2,892.72	0	2,892.72	0.8
Grand Total	**52**	**100.0**					**100.0**

[33] According to the cadastral records, 5 privately owned parcels affected by the project are registered in Çitli village, but it was learned that the parcels are within the vicinity of Işıktepe village and owners/users are residing in Işıktepe village. Thid information was confirmed by headmen of both vilages. Therefore, Çitli village was removed from the AoI.

Table IV.47. Affected Number of Parcels by Ownership and by Settlements

District	Village	Privately-Owned	Legal Entity	Treasury/Public	Total
Maden	Akboğa	14	-	11	25
Maden	Çayırköy	-	-	2	2
Maden	Dutpınar	-	-	1	1
Maden	Hanevleri	-	-	1	1
Maden	Işıktepe	9	3	6	18
Maden	Çitli	5	-	-	5
Total		28	3	21	52

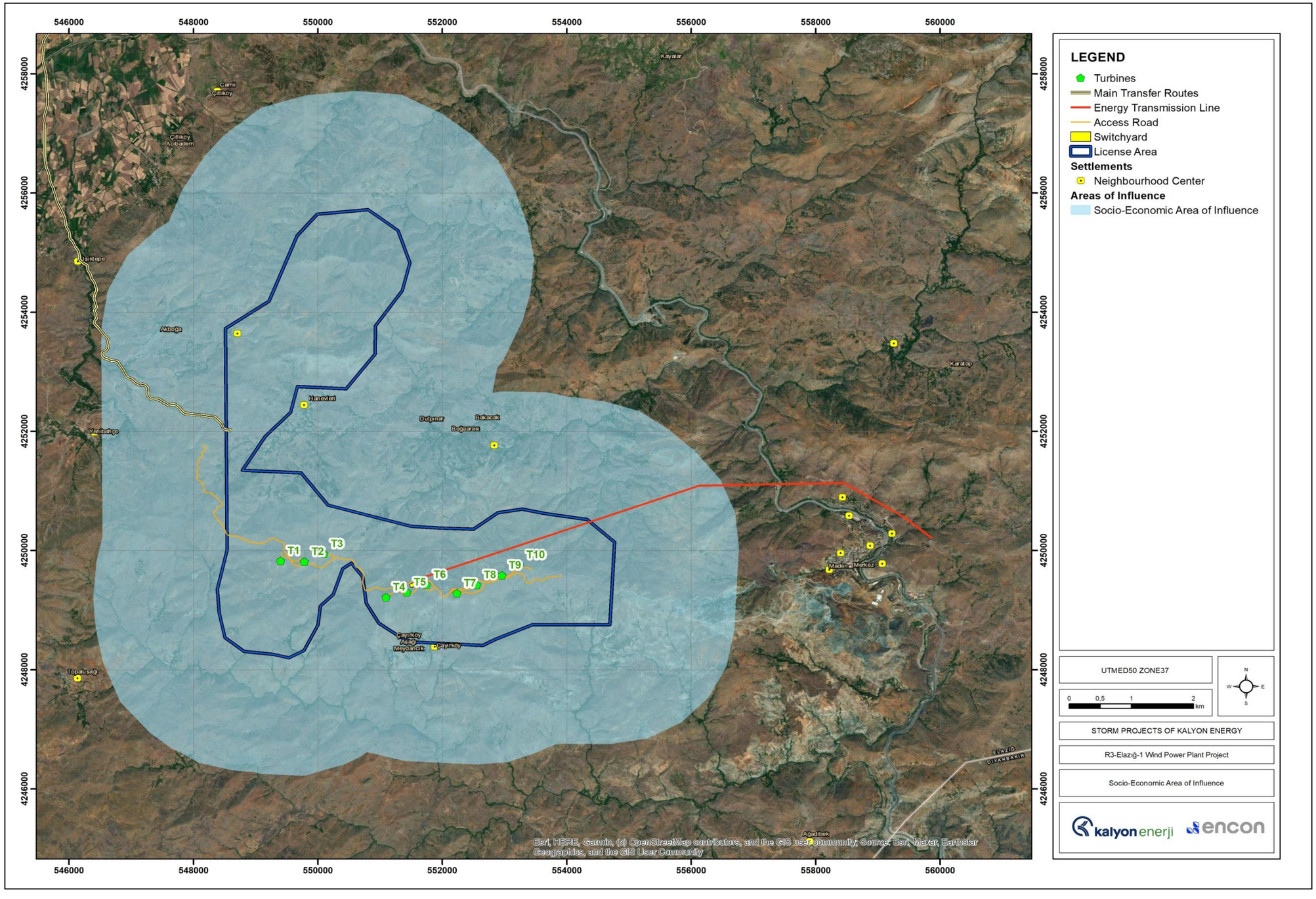


Figure IV.31. Socio-Economic Area of Influence

Desktop Study

During the desktop study for the R3-ELAZIĞ-1 WPP ESIA, existing secondary socio-economic data published from reliable sources at the national, provincial and district levels were collected, reviewed, and analyzed. The collected, reviewed and analyzed secondary socio-economic data are summarized below:

- Current and historical demographic data on the population of each settlement in the AoI (TurkStat, 2023a),
- Regional and local demographic indicators: size, structure and migration patterns (TurkStat, 2023b),
- Socio-economic development indicators at provincial and district levels: education level, unemployment, employment (TurkStat, 2023c; Acar, et al., 2019 and Acar, et al., 2022),
- Data on economic structure and livelihoods at provincial and district level: main economic activities, labour market, income levels (TurkStat, 2023c; Acar, et al., 2019 and Acar, et al., 2022),
- Infrastructure and public services: water, electricity supply, waste management, education and health services,
- Publicly available information about livelihoods and economic activities of Project Affected Settlements (PASs)
- Publicly available information about the education and health services in the AoI.

In addition to compiling available secondary data, data on land acquisition was obtained from the Project Company to analyse existing land use and ownership status and incorporate this into field survey planning.

Finally, questionnaire forms (household survey questionnaire, headman interview form and focus group interview form) were prepared to be applied to the people in the affected settlements. As the last step of the desktop study, fieldwork dates were set in coordination with headmen, and visits were organized.

In summary, the desktop study included the following steps:

- Collection of demographic, agricultural and livestock data of PAPs,
- Obtaining up-to-date information on settlements, and parcels,
- Preparation of questionnaires to be used during the fieldwork,
- Finalization of the field program (dates, sites, consultations, surveys, etc.),

Field Study

The field survey aims to collect primary data to determine the socio-economic baseline of settlements through focus group discussion with the participation of household representatives; survey with key informants; survey with representatives of households and field observation to validate the data and information collected via these interviews.

Key-Informant Interviews

Key informants are individuals who possess special knowledge or status, who are willing to share their knowledge and skills with the researcher and who have access to perspectives or observations denied to the researcher. Key-informant interviews were applied to the settlement headmen.

During the interviews, specifically designed Key Informant Questionnaires were used in addition to identification questions, other questions to explore and understand issues regarding the demographical, cultural and religious structure of settlements, social integration and adaptation, socio-economic infrastructure and economic characteristics of the project AoI were asked to the participants. The main topics of the key informant questionnaires are as follows:

- General information and historical profile,
- Demography/ general profile,
- Management/leadership,
- Local economy/ livelihoods (information on agriculture, animal husbandry, beekeeping, etc.),
- Social harmony and integration,
- Socio-economic infrastructure,
- Identification of sensitive groups,
- Possible impacts of the project,
- Basic social problems and development problems.

Household Survey

A household survey of households in the project area was conducted. The face-to-face interview method was used for the survey. The survey involves a formal visit to families and individual interviews with the adult member of the family (preferably the head of household or the head of household's spouse) by using a standard questionnaire. During the fieldwork, household questionnaires were implemented for the households in Çayırköy and Dutpınar settlements directly affected by the project. As the project company informed at the beginning of the project Işıktepe village would not be affected, household survey was not performed in Işıktepe village.

The survey topics are given below;

- Household characteristics (number of people living in the household and demographic characteristics),
- Household income, expenditure and savings,
- Land use, agriculture and livestock,
- Housing and infrastructure,
- Education opportunities,
- Health facilities,
- Perceptions and expectations regarding the project,
- Social integration and cohesion.

According to the Address Based Population Registration System 2022 results, the total population within these settlements is 409. By using district-based average household size it is estimated that there are 173 households in the project AoI. (Table IV.48.)

The sample size is determined with a 0,90 confidence level and plus or minus 0,09 margin of error. Based on this, it is aimed that 39 households will be interviewed. ITreating the settlements as tabulation groups (rather than taking them as separate domains) the target sample size was divided proportionally according to the household numbers at each settlement.

Table IV.48 Sample Size for Household Survey and Performed Social Surveys

District	Village	Population (2022)	Average Household Size by Province (Person)	Number of Household	Sample Size	Performed Household Survey
Maden	**Akboğa**	54	2,37	23	0	0
Maden	**Çayırköy**	102	2,37	43	18	13
Maden	**Dutpınar**	61	2,37	26	11	4
Maden	**Hanevleri**	97	2,37	41	0	0
Maden	**Işıktepe**	95	2,37	40	-	-
TOTAL		409		173	39	17

The household surveys were planned for 39, but 17 people were reached and responded. The reasons why actual performance is lower than intended are explained below:

- Since some of the population in the affected settlements prefer settlements as a secondary living area, the population is not always at the ABPRS level and is generally less than the ABPRS population.
- Some PAPs would not agree to participate in the survey.
- PAPs who are engaged in agriculture did not choose to participate in the survey because they were working in the fields.

Focus Group Discussions

Focus group discussion provides information directly from individuals who are invested in the issue or hold expert knowledge about a topic of which little is known among researchers and also provides information from people who can provide insights about actual conditions and situations (Rabiee, 2004).

Focus group discussions are applied to residents and during the meeting, separate groups were covered where possible. Some sources give the minimum number of participants as 3, however, it is known that focus group discussions with less than 6 participants are inefficient. The population of some settlements is too small for such a form of qualitative research. Therefore, it is planned to hold the focus group discussions within one affected settlement where the total population is more than 100. The focus group discussions were held in the Çayırköy settlement with the participation of three people each.

The focus group interview topics are given below.

- General information about the region (problems, life experiences, conflicts, etc.),
- Information about the project and positive/ negative opinions,
- Possible impacts of the project, and mitigation measures,
- Suggestions for the project.

The outcomes of the focus group discussions and in-depth interviews were used to understand the concerns/perceptions of the local communities about the Project.

Two separate field visits were held by the social team as part of the ESIA study, as summarised in Table IV.49. The first one was a reconnaissance study carried out with the attendance of a senior social expert from StraSpace on August 9, 2023. The aim reconnaissance study was to assess the Project's impact

area. During the scoping site visit, locations of the new turbines and structures in the vicinity were visited to assess the potential land acquisition impact of the Project.

The second field visit, which was conducted between September 10-11-12, 2023, focused on key stakeholder meetings, focus group discussions, key-informant interviews and household surveys. Meetings were held at the settlement level. Key stakeholder meetings revealed key social aspects of the Project; and identified stakeholders that may be impacted by the Project, in addition to acquiring information on Project perception, expectations and potential impacts.

Table IV.49 Summary of the Social Field Studies Conducted as part of the ESIA

Tasks	Date of the Field Study	Scope of the Field Study
Scoping (reconnaissance) site visit	9 August 2023	-Visiting the Project Area, turbine locations, parcels to be affected by Project-related land acquisition, nearby structures and the main access road route -Meeting with the available headmen to inform them about the study and field studies to be performed.
In-depth interviews and focus group meetings	10-11-12 September 2023	-In-depth interviews with the headmen (headman surveys with Akboğa, Çayırköy, Dutpınar, Hanevleri and Işıktepe village headmen) -Household surveys (Çayırköy and Dutpınar settlements) -Focus group discussions (Çayırköy settlement)

IV.4.2 Project Standards

The majority of the Project Area, including the footprint of the WPP Project units, corresponds to state-owned pastureland, field, sheepfold and fountain. The acquisition of the land required for the wind power plant projects will be undertaken by EMRA (EPDK in Turkish) in accordance with Law No. 2942 “Expropriation Law”. Besides, the requirements of the Pasture Law (Law No: 4342) will be applicable to the Project.

In addition to complying with the requirements of the national legislation, the Project Company aims to fulfil the requirements of the following international standards to the extent possible to fulfil the management of the Project’s potential social impacts:

IFC’s Performance Standards on Environmental and Social Sustainability:

- IFC PS 1: Assessment and Management of Environmental and Social Risks and Impacts
- IFC PS 4: Community Health, Safety and Security
- IFC PS 5: Land Acquisition and Involuntary Resettlement

The Equator Principles:

- 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
- Principle 10: Reporting and Transparency

IV.4.3 Baseline Conditions

The social scoping study conducted as part of the ESIA has identified Akboğa, Çayırköy, Dutpınar, Hanevleri and Işıktepe villages of the Maden district of Elazığ as the project-affected settlements for the R3-Elazığ-1 WPP Project. The socio-economic baseline conditions of the PAPs are described in the following sections based on the findings of the desk-based and field studies.

IV.4.3.1 *General Socio-Economic Structure*

In this section, while presenting the social current situation, first the provincial and district level information is presented according to the data obtained from the secondary sources, and then the data of the settlements within the Project AoI are presented according to the data obtained from the field study.

Socio-Economic Development Index studies allow for determining the development index and trends of districts, provinces and regions as well as benchmarking. According to the Socio-Economic Development List of Provinces and Regions Study (2017), Elazığ is listed as the fourth-level developed province and ranked in 42nd place out of 81 provinces (Acar, et al., 2019).

According to the Socio-Economic Development Index of Districts Study (2022), Maden district is listed as the 5th developed district of Elazığ (708 out of 973 districts of Türkiye) and located within the 5th-degree development level (Acar, et al., 2022).

According to the Urban and Rural Settlement Systems (YER-SİS) study in Türkiye, Elazığ is categorized as 4-A which is the sixth level service center. In the YER-SİS study, Maden district of Elazığ has been categorized as 1-A service center. 1-B is the lowest category for urban centers.

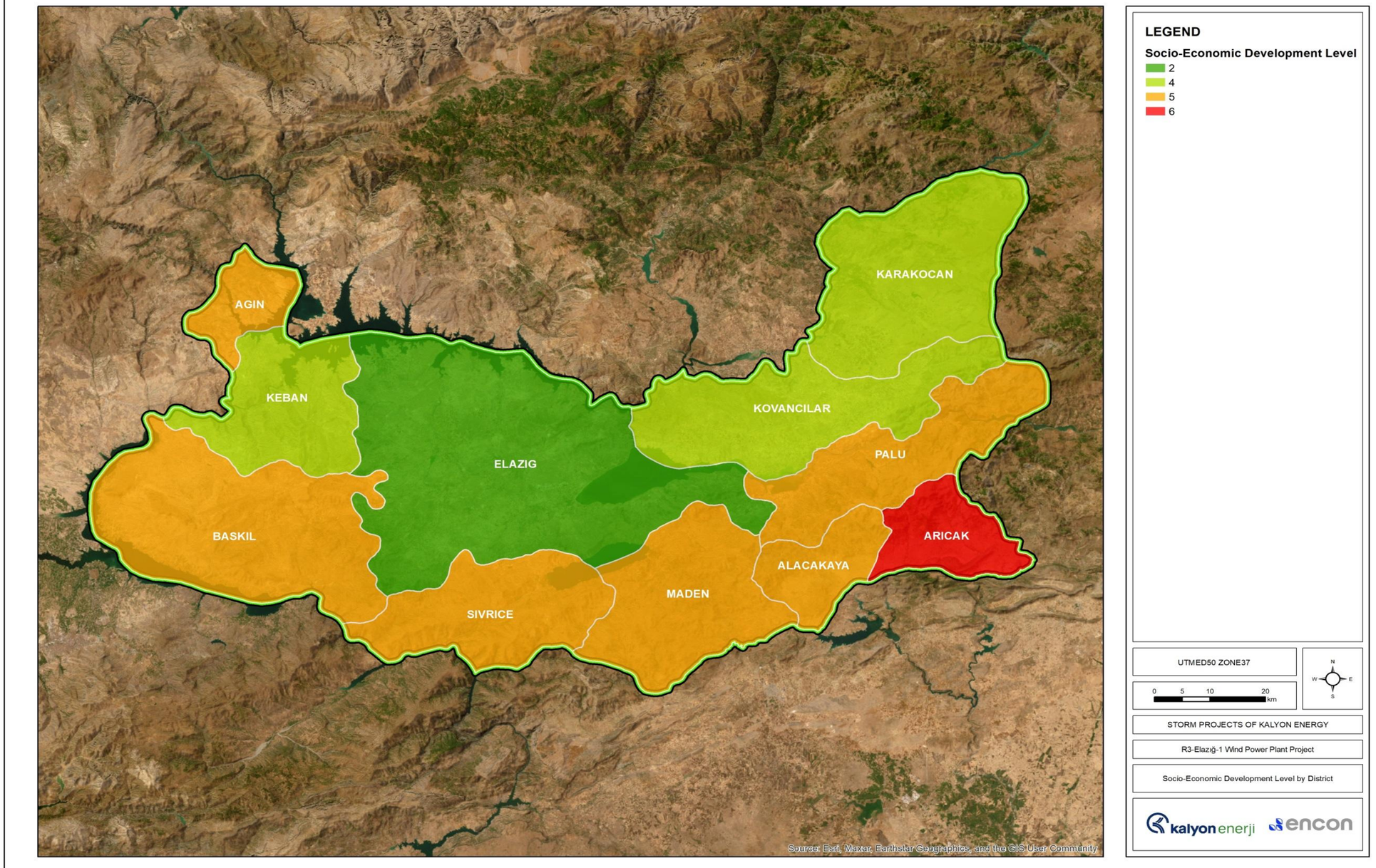


Figure IV.32. Socio-Economic Development Level by District (2022)
Source: Acar, et al., (2022)

IV.4.3.2 *Population and Demographics*

Settlements in the AoI are located in Maden district of Elazığ. According to the Address Based Population Registration System 2022 results, the total population of Maden district is 8,929.

Maden district, whose share in Elazığ's population was 2.9% in 2007, lost population in this period and its share decreased to 1.5% in 2022. The downward trend of the population persists.

During the 2007-2002 period, the population of Elazığ increased by 0,6% on average annually, while the population of Maden decreased by 3.8% on average annually.

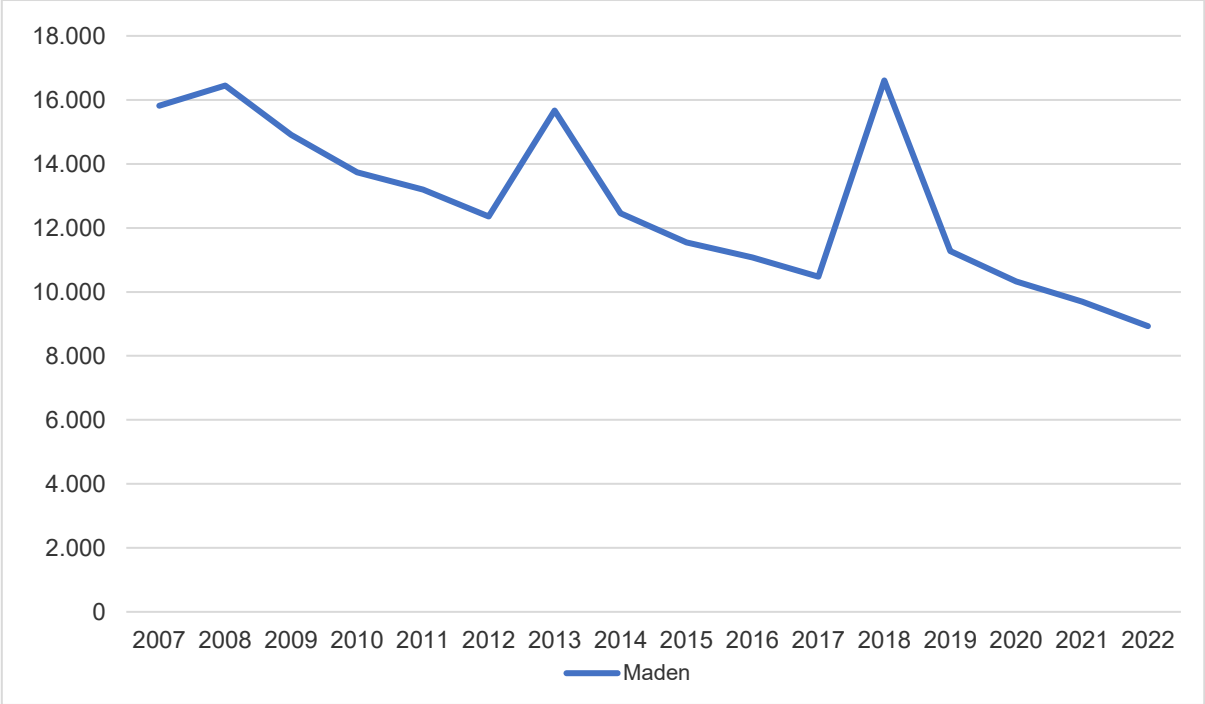


Figure IV.33. Population of Maden District (2007-2022)
Source: TurkStat, 2023

The total populations of the affected settlements are given in Table IV.50 based on Address Based Population Registration System Results (ABPRS) 2018 and 2022 results. The total population of the affected settlements is 409 in 2022 and this number was 1,140 in 2018. All settlements in the AoI are small-scale settlements with population from 54 to 102. Çayırköy village has the largest population, with 102 inhabitants while Akboğa village has the lowest population, with only 54 inhabitants in 2022.

The population of all settlements in the AoI is on a decreasing trend. This situation can be explained by the decreasing trend of the rural population that has been going on for many years. While cities that have the potential to attract or retain population are growing, settlements that lack these potential and inadequate urban functions, especially rural areas, are losing population. The population decline trend has been slowing down recently, as rural areas are preferred after the COVID-19 pandemic and retirees turn to rural areas.

Table IV.50 Population Change, 2018-2022

Districts	Village	Population		
		2018	2022	Annual Population Growth Rate (%)
Maden	**Akboğa**	194	54	-32.0
Maden	**Çayırköy**	237	102	-21.1
Maden	**Dutpınar**	150	61	-22.5
Maden	**Hanevleri**	280	97	-26.5
Maden	**Işıktepe**	279	95	-26.9
Total		1140	409	-25.6

Source: TurkStat, 2023.

Although the population of the settlements in the AoI appears to be decreasing according to the results of the Address Based Population Registration System (ABPRS), during the headman interviews; headmen of Akboğa and Cayırköy mentioned that the population increased in their settlements. The table below shows the population change and reasons for this situation.

Table IV.51 Population Change and Reason of Change by Settlements

District	Village	Population Change	Reason of Change
Maden	**Akboğa**	Increased	The number of people who prefer to live in the summer months increased
Maden	**Çayırköy**	Increased	Retirees immigrated.
Maden	**Dutpınar**	Decreased	Unemployment
Maden	**Hanevleri**	Decreased	Unemployment
Maden	**Işıktepe**	Decreased	Unemployment

Source: StraSpace Field Study, 2023.

According to the headman interviews, the population of all settlements, increases in summer because agricultural landowners return in the summer months to cultivate crops and retirees choose these settlements to live in the summer months.

According to household interviews, the average household size of settlements in the AoI is 3.53 which is above the Elazığ (3.13) and the Türkiye (3.17) averages. This situation can be explained by the high share of crowded families.

Table IV.52 Population Data of the Settlements

Settlements	Population	Winter Population	Summer Population	Average HH Size
Elazığ	591.497	N/A	N/A	3.13
Maden	8.929	N/A	N/A	2.37
Akboğa	54	30	300	3.00
Çayırköy	102	40	400	2.93
Dutpınar	61	30	250	5.50
Hanevleri	97	100	500	5.00
Işıktepe	95	50	400	3.33
Village in the AoI	409	450	2.550	3.53

Source: Turkstat, 2023 and StraSpace Field Study, 2023.

While the male and female populations are approximately equal in the Türkiye and Elazığ, women are more abundant in the settlements in the AoI (Table IV.53).

Table IV.53 Percentage of Population by Gender

Province/ District	Share of Males (%)	Share of Females (%)	Total
Elazığ	49.4	50.6	100.0
Maden	50.9	49.1	100.0
Villages in the AoI	41.7	58.3	100.0

Source: TurkStat, 2023

The age structure of affected settlements differs from the age structure of Türkiye. Migration from rural areas to cities has been a phenomenon that increases ageing in rural areas. With the migration of the young population from rural to urban areas and the decrease in fertility rates, the rural population has entered a rapid ageing process. In Türkiye, 22.0% of the total population is aged 0-14, 68.1% is aged 15-64 and 9.9% consists of individuals aged 65 and over. It is seen that the settlements are mainly inhabited by people between the ages of 15-64 (53.4%) however their share is low compared to Türkiye and Elazığ. Also, while the share of the 0-14 age group (20.7%) in the AoI is similar to Türkiye and Elazığ, the share of the age 65 and over group (25.9%) in the AoI is high compared to Türkiye and Elazığ. The high share of 65 and over is effective in making pensions gain importance as a source of income.

Table IV.54 Percentage of Population by Age Groups

Age Groups	Affected Settlements (2023)	Elazığ (2022)	Türkiye (2022)
0-14	20.7	21.2	22.0
15-64	53.4	67.9	68.1
65+	25.9	10.9	9.9
Total	100.0	100.0	100.0

Source: StraSpace Field Study, 2023 and TurkStat, 2023

IV.4.3.3 *Income Sources*

According to Provincial Gross Domestic Product (2021) data (TurkStat, 2021), the industry sector has the largest share in Elazığ (48.1%). The industry sector is followed by service (29.4%) and agriculture (22.5%). In terms of sectoral shares of Gross Domestic Product Elazığ is not similar to Türkiye where the share of the service sector is the highest. Economic activities and income sources of Maden district are the same in Elazığ.

Although agriculture and service seem low in Elazığ, there is significant agricultural production. The total agriculture area is 157.760 hectares in Elazığ which is 17% of Elazığ's total area (Elazığ Valiliiği, 2015). The most produced agricultural products in Elazığ are wheat, barley and clover.

Primary, secondary and tertiary income sources in the settlements are given in Table IV.55. According to the information obtained from settlements' headmen, the main sources of income are beekeeping, pension and animal husbandry within the social study area. The headmen of one settlement (Hanevleri) mentioned animal husbandry as their primary source of income. Also, in two settlements (Çayırköy and Akboğa), the primary source of income is pension. On the other hand, it can be stated that those who have retired, may continue their agricultural or animal husbandry activities. Additionally, it has been mentioned that beekeeping is the primary source of income in Akboğa village.

Table IV.55 Income Sources

Settlements	Income Source		
	Primary	**Secondary**	**Tertiary**
Akboğa	Beekeeping	Agriculture	Animal Husbandry
Çayırköy	Pension	Agriculture	Animal Husbandry
Dutpınar	Pension	Beekeeping	Animal Husbandry
Hanevleri	Animal Husbandry	Beekeeping	Agriculture
Işıktepe	Agriculture	Pension	Animal Husbandry

Source: StraSpace Field Study, 2023.

In the surveys conducted with 17 households, only 13 households shared their monthly/annual income. According to data from these household surveys, the average annual income of households is 186.000 TL. This income level is slightly higher than the net minimum wage determined as of July 2023 (annual minimum wage for 2023 136,824 TL). 37% of the households' average annual income is less than the net minimum wage determined as of July 2023.

Table IV.56 The Average Annual Income of Households

Annual Income	Frequency	Percent (%)
60.000	3	24
66.000	5	39
102.000	2	15
300.000	2	15
360.000	1	7
Total	13	100

In addition, while the majority of households consider themselves to be in the poor income group (63%), 25% consider themselves to be in the middle-income group. The rate of those who consider themselves lower-middle is 12%.

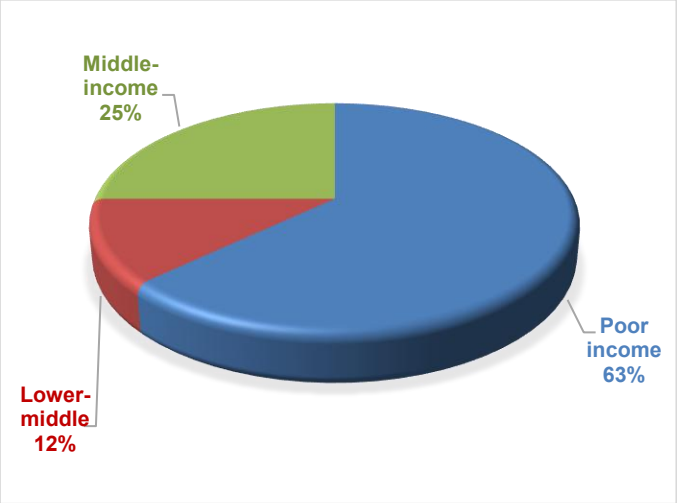


Figure IV.34. Distribution of Households Income Group
Source: StraSpace Field Study, 2023.

IV.4.3.3.1 Agricultural Activities

Data on the number of farmers registered in the settlements and the average agricultural land size were requested from the Farmer Registration System to officially find out. However, no official information could be reached. Therefore, the evaluations were made in line with the interviews with the headmen and household surveys.

Although agriculture is an important economic activity in all settlements in AoI, it is the primary income source for only Işıktepe village (Table IV.55). It is the secondary income source in Akboğa and Çayırköy and the tertiary income source in Hanevleri villages. Throughout the settlements, wheat and vegetables are predominantly cultivated.

The average amount of agricultural land per household varies by settlement. Generally, the average agricultural land per household varies between 10 and 350 decares. As the population increases, the per capita agricultural land decreases. According to the information obtained from headman interviews, households generally carry out agricultural production on their lands.

Table IV.57 Agricultural Activities

Settlements	Average Agriculture Areas per Household (decare)	Cultivated Crops
Akboğa	20	Vegetable and wheat
Çayırköy	20	Vegetable, wheat and sweetcorn
Dutpınar	10-15	Vegetable
Hanevleri	30	Clover, wheat and strawberry
Işıktepe	250-350	Legume, wheat and barley

Source: StraSpace Field Study, 2023.

Problems related to agriculture were raised during the headman meetings. Akboğa's headman stated that water and the Hanevleri headman stated that land was insufficient.

IV.4.3.3.2 Animal Husbandry and Pasture Activities

Information was requested from the Animal Information System in order to officially access data on the number of cattle/ovine animals and total pasture areas in the settlements. However, no official information was reached. Therefore, the evaluations were made in line with the interviews with the headmen and household surveys.

Animal husbandry is the first source of income in the Hanevleri, and the third source of income in the Akobga, Cayirköy and Dutpınar settlements. Approximately 41% of households in the AoI are engaged in animal husbandry. When the settlements are compared according to the number of households, Hanevleri has the highest proportion of households engaged in animal husbandry (100% of households). Işıktepe village ranks second in terms of the share of households engaged in animal husbandry (66.6%). Approximately 42% of bovine animals in AoI are in Çayırköy and 65% of ovine animals are in the Dutpınar settlement. The table below shows the number of households engaged in animal husbandry and the number of cattle and ovine animals in all settlements.

Table IV.58 The Number of Cattle and Ovine Animals

Settlements	Total number of Households	The Number of Households Engaged in Animal Husbandry	Share of Households Engaged in Animal Husbandry (%)	The number of Bovine Animals	The number of Ovine Animals
Akboğa	10	3	30	6	0
Çayırköy	90	20	22	150	0
Dutpınar	10	6	60	100	600
Hanevleri	20	20	100	70	300
Işıktepe	15	10	66.6	30	20
Total	145	59	41	356	920

Source: StraSpace Field Study, 2023.

During the field studies, it was observed that local people are using the project area to graze animals. Only the headmen of the Hanevleri raised problems related to animal husbandry during the headman meetings. The headmen of the Hanevleri emphasized that the feed prices are expensive, the project may damage pasture areas and those who engaged in livestock may be negatively affected.

IV.4.3.3.3 Beekeeping

Information was requested from the Beekeeping Registration System in order to officially access data such as the number of bees or the number of beehives in the settlements. However, no official information could be reached. Therefore, the evaluations were made in line with the interviews with the headmen and household surveys.

Beekeeping is practised in all settlements, and it is the primary source of income only in Akboğa. Akboğa village has the highest number of households engaged in beekeeping, with 30 households.

Beekeeping is practised as a secondary source of income in Dutpınar and Hanevleri. The total number of beekeeping households in these settlements is 74. According to the information obtained from the headmen, the number of households whose primary source of income is beekeeping is 31 in the AoI (Table IV.59).

Table IV.59 Beekeeping Activities

Settlements	The Number of Households Engaged in Beekeeping	The Number of Households Engaged in Beekeeping as a Primary Source of Income
Akboğa	30	30
Çayırköy	10	Additional income source
Dutpınar	20	Additional income source
Hanevleri	10	Additional income source
Işıktepe	4	1
Total	74	31

Source: StraSpace Field Study, 2023.

During the field studies, it was observed that local people are using the project area for beekeeping activities and there were many beehives at the project area. Problems related to beekeeping were raised during the headman meetings. The headman of Akboğa has serious concerns about this issue, other village headmen also think that beekeeping may be negatively affected due to the Project. They mentioned their concerns as follows:

- Pasture damage may occur,
- WPP dries the herbs and the camel flower.
- WPP changes the bees' directions.
- WPP affects water resources.

IV.4.3.3.4 Mushroom and Herb Gathering

According to the information obtained from the headmen and household interviews, people at the AoI are not using the project area for mushroom or herb collection activity.

IV.4.3.3.5 Tourism

Despite the high touristic potential of Elazığ, the settlements in the AoI are not close to touristic areas and they are not on tourist routes. Therefore, there is no household involved in tourism.

IV.4.3.4 Education Level

The literacy rates in the districts of AoI of the Elazığ province are given in the tables below. The share of illiterate in the province and districts of AoI namely Elazığ and Maden is lower than Türkiye's averages. As in all of Türkiye, the female literacy rate is lower than that of men in the provinces and districts within the project's impact area. However, the female illiteracy rate in Elazığ and Maden is lower than in Türkiye.

Table IV.60 Literacy Rate in the Districts of AoI

Gender	Literacy Status	Türkiye	Elazığ	Maden
Male	Unknown (%)	1.0	1.1	0.3
	Literate (%)	98.3	97.8	97.6
	Illiterate (%)	0.7	1.1	2.1
Female	Unknown (%)	1.1	5.1	0.6
	Literate (%)	94.9	93.9	90.0
	Illiterate (%)	4.0	1.0	9.4
Total	Unknown (%)	1.0	3.1	0.4
	Literate (%)	96.6	95.9	93.9
	Illiterate (%)	2.4	1.0	5.7

Source: TurkStat, 2023

In the household survey conducted in the Cayirköy and Dutpınar, interviews were conducted with a total of 17 households, and it was observed that 12 people in both Çayırköy and Dutpınar village were illiterate. Approximately 82% (10 people) of the illiterate people in these villages are women.

According to the information obtained in the household survey, the education level of the settlements in AoI is lower than both in Türkiye and Elazığ. In addition, the education level of women is significantly lower than that of men. The educational status of the household members is given inTable IV.61.

Table IV.61 Education Status Türkiye, Elazığ and Settlements at the AoI by Gender (%)

	Gender	Illiterate	Literate without a Diploma	Primary School	Primary Education	Secondary School	High School	Universities and Other Higher Educational Institutions	Unknown	Total
Türkiye	M	0.7	8.4	18.8	7.4	19	25.7	19	1.0	100
	F	4.0	11.1	25	5.7	15.9	19.8	17.4	1.1	100
Elazığ	M	1.1	8.4	15.4	6.8	19.8	27.8	19.6	1.1	100
	F	5.1	14.9	22.5	5.4	17.2	18.9	15.0	1.0	100
Total of Settlements in the AoI	M	8.0		28.0		24.0	36.0	4.0		100
	F	31.5		34.2		11.4	22.9			100

M: Male, F: Female
Source: TurkStat, 2023 and StraSpace Field Study, 2023.

During the headmen interview, it was learned that the girls were sent to school at the settlements in AoI and there is no child out of school.

IV.4.3.5 Education and Health Services

Education

There are no high schools or secondary schools in the settlements within the project AoI. Only there is one primary school in Işıktepe. According to the field study, residents go to Elazığ for education. Elazığ is equipped with an educational infrastructure comprising 38 preschools, 187 primary schools, 130 middle schools, 50 high schools, and 24 vocational high schools. Maden district offers an education infrastructure consisting of 2 high schools, 5 secondary schools, 4 primary schools and 1 preschool. (Ministry of Education, 2023).

Health

During the field study, the availability and quality of healthcare services were questioned at the local level. There are no health facilities in all settlements, except Işıktepe. There is a first-level health service located in Işıktepe. In the field research conducted in Çayırköy, and Dutpınarı villages, it was mentioned that Elazığ and Maden State Hospitals are used by the residents. While there are 13 hospitals with a capacity of 3.164 beds in Elazığ. (Ministry of Health, 2023; Health Statistics Yearbook, 2021). Elazığ State Hospital has a capacity of 1,038 beds, 198 intensive care units, and approximately 2,000 staff. There is 1 hospital which is Maden State Hospital in Maden with a capacity of 24 patient beds.

IV.4.3.6 Vulnerable Groups

One of the vulnerable groups is the poor. The exact number of beneficiaries of Social Assistance and Solidarity Foundation (SASF) support in settlements directly and indirectly affected by the project could not be reached. During the headman interviews, it was asked whether any households in the settlement were poor or living with the help of others. Accordingly, it was determined that there is one household in Akboğa, and 10 households in each Çayırköy and Hanevleri. Also, the headman of the Hanevleri stated that there is a financial difficulty in general. It was determined that there were no poor households in Dutpınar and Işıktepe.

It was also asked whether there were any households where the head of the household is a woman. Accordingly, it was found that there are 2 households in Çayırköy, 3 in Dutpınar and 2 in Işıktepe. The female heads of households in all villages received pensions from their husbands.

It was found that there is 1 household in Akboğa, 2 households each in Çayırköy, Işıktepe and Hanevleri and 8 households in Dutpınar with disabled people.

The number of vulnerable households is given in Table IV.62.

Table IV.62 Vulnerable Groups in Settlements

Settlements	Poor Households	Female-headed Households	Child -headed Households	Households with Disabled People	Total Vulnerable Households
Akboğa	1	-	-	1	2
Çayırköy	10	2	-	2	14
Dutpınar	-	3	-	8	11
Hanevleri	10	-	-	2	12
Işıktepe	-	2	-	1	3
Total	21	7	-	14	42

Source: StraSpace Field Study, 2023.

IV.4.3.7 Social Integration and Cohesion

There are no indigenous people as defined by IFC PSs in Türkiye. R3-Elazığ-1 WPP social AoI includes people from different ethnic and religions. Zaza and Kurds live in all settlements. There are no minorities in the social AoI. No tension or conflict was observed in and between settlements due to ethnic and religious reasons, land disputes, natural resources, cultural differences, and employment patterns. There is only tension between Dutpınar and Hanevleri villages due to water.

The headmen of all settlements stated that there are no settlement associations. However, there is an Irrigation Cooperative in Işıktepe village.

IV.4.3.8 *Quality of Life and Infrastructure*

While the access roads of Akboğa and Işıktepe are asphalt, other villages' are stabilized. The roads in the villages are stabilized in Akboğa and Çayırköy, and dirt roads in Hanevleri, Dutpınar and Işıktepe. Also, there is no public transportation in Akboğa, Çayırköy, Dutpınar and Hanevleri. There is one bus in the evening and morning only in Işıktepe villages during the summer.

Spring water is used as a water source in Dutpınar and Çayirkoy. Additionally, all headmen, except Dutpınar, stated that water was insufficient.

According to the interviews with the headmen, the sewerage system is available in Akbaoga. On the other hand, a septic tank is used in other villages.

Complaints were received in Hanevleri that electricity is sometimes cut off from time to time in the winter.

Solid waste is not collected in Akboğa, Çayirkoy, Dutpiinar and Hanevleri. Headmen stated that it was thrown into wells or burned. On the other hand, the Headman of Işıktepe stated that Solid waste is collected by Special Administrative in Işıktepe.

In all settlements, stoves are used as domestic heating systems and wood is used as fuel. There are no settlements or households with central heating systems. In addition, Hanevleri and Çayirkoy headmen stated that some households in their villages received coal support through social aid.

Lastly, there is no zoning plan in any settlements.

Table IV.63. Some Information on Settlements

Village	Access Roads	Inner Roads	Zoning Plan	Electricity	Drinking Water Supply	Sewerage System	Heating System	Solid waste	Public transport
Akboğa	Asphalt	Stabilised	None	They are satisfied.	Not enough.	There is a sewage system.	Stove, wood	It is not collected.	None
Çayırköy	Stabilised	Stabilised	None	They are satisfied.	Spring water source is used, but not enough.	Septic tank is used.	Stove, wood	It is not collected.	None
Dutpınar	Stabilised	Dirt road	None	They are satisfied.	Spring water source is used.	Septic tank is used	Stove, wood	It is not collected.	None
Hanevleri	Stabilised	Dirt road	None	It sometimes interruptions in the winter.	Not enough.	Septic tank is used	Stove, wood	It is not collected.	None
Işıktepe	Asphalt	Dirt road	None	They are satisfied.	Spring water source is used, and they are satisfied.	Septic tank is used	Stove, wood	Special administration collects.	Once in the morning and evening in summer.

IV.4.4 Summary of Baseline Findings and Vulnerable Receptors

General Socio-Economic Structure

According to the Socio-Economic Development List of Provinces and Regions Study (2017), Elazığ is listed as the fourth-level developed province and ranked in 42nd place out of 81 provinces. Also, according to the Socio-Economic Development Index of Districts Study (2022), Maden district is listed as the 5th developed district of Elazığ (708 out of 973 districts of Türkiye) and located within the 5th-degree development level.

Population: The total population of the affected settlements is 409 in 2022 and this number was 1,140 in 2018. All settlements in the AoI lost population between 2018 and 2022. All settlements in the AoI are small-scale settlements with a population from 54 to 102. Çayırköy village has the largest population, with 102 inhabitants while Akboğa village has the lowest population, with only 54 inhabitants in 2022.

Although the population of the settlements in the AoI appears to be decreasing according to the results of the Address Based Population Registration System (ABPRS), during the headman interviews; headmen of Akboğa and Çayırköy mentioned that the population increased in their settlements.

Population by Age: It is seen that the settlements are mainly inhabited by people between the ages of 15-64 (53.4%) however their share is low compared to Türkiye and Elazığ. Also, while the share of the 0-14 age group in the AoI (20.7%) is similar to Türkiye and Elazığ, the share of the age 65 and over group in the AoI (25.9%) is high compared to Türkiye and Elazığ. The increasing importance of retirement income as a source of income is effective in the high share of people aged 65 and over.

Gender Distribution: While the male and female populations are approximately equal in the Türkiye and Elazığ, women are more abundant in the settlements in the AoI.

Household Size: According to 17 household interviews, the average household size of settlements in the AoI is 3,53 which is above the Elazığ (3,13) and the Türkiye (3,17) averages.

Vulnerable Groups: During the headman interviews, it was asked whether any households in the settlement were poor, female-headed, child-headed or disabled people. It was determined that there is one household in Akboğa, and 10 households in each Çayırköy and Hanevleri. Also, the headman of the Hanevleri stated that there is a financial difficulty in general. Also, it was found that there were 2 female-headed households in Çayırköy, 3 in Dutpınar and 2 in Işıktepe. Lastly, it was found that there were 1 household in Akboğa, 2 households each in Çayırköy, Hanevleri and Işıktepe and 8 households in Dutpınar with disabled people. In short, there are 42 vulnerable people in total and this is 10.3% of the total population.

Social Cohesion: No tension or conflict was observed in and between settlements due to ethnic and religious reasons, land disputes, natural resources, cultural differences, and employment patterns. There is only tension between Dutpınar and Hanevleri villages due to water.

Income Sources and Income Levels: According to the information obtained from settlements' headmen, the main sources of income are beekeeping, pension and animal husbandry within the social study area. The headmen of one settlement (Hanevleri) mentioned animal husbandry as their primary source of income. Also, in two settlements (Akboğa and Çayırköy), the primary source of income is pension. On the other hand, it can be stated that those who have retired income continue their agricultural or animal husbandry activities. Additionally, it has been mentioned that beekeeping is the primary source of income in Akboğa village.

In the surveys conducted with 17 households, only 13 households shared their monthly/annual income. According to data from these household surveys, the average annual income of households is 186.000 TL. This income level is slightly higher than the net minimum wage determined as of July 2023 (annual minimum wage for 2023 136,824 TL). 37% of the households' average annual income is less than the net minimum wage determined as of July 2023. In addition, while the majority of households consider themselves to be in the poor income group (63%), 25% consider themselves to be in the middle-income group. The rate of those who consider themselves lower-middle is 12%.

Education Level: The share of illiterate in the province and districts of AoI namely Elazığ and Maden is lower than Türkiye's averages. As in all of Türkiye, the female literacy rate is lower than that of men in the provinces and districts within the project's impact area. However, the female illiteracy rate in Elazığ and Maden is lower than in Türkiye.

In the household survey conducted in the Cayirköy and Dutpınar, interviews were conducted with a total of 17 households, and it was observed that 12 people in both Çayırköy and Dutpınar village were illiterate. Approximately 82% (10 people) of the illiterate people in these villages are women. Also, according to the information obtained in the household survey, the education level of the settlements in AoI is lower than both in Türkiye and Elazığ. In addition, the education level of women is significantly lower than that of men. During the headmen interview, it was learned that the girls were sent to school at the settlements in AoI and there is no child out of school.

Education infrastructure: There are no high schools, secondary schools or primary schools in the settlements within the AoI, except Işıktepe. There is one primary school in Işıktepe. Those of school age use the educational facilities in Maden.

Health infrastructure: There are no health facilities in the survey settlements except Işıktepe. There is one first-level health service located in Işıktepe. Most people in the survey settlements prefer to use health centres in the Maden and Elazığ, having to travel to access them.

Infrastructure and Public Services

Roads and Transportation: While the access roads of Akboğa and Işıktepe are asphalt, other villages' are stabilized. The roads in the villages are stabilized in Akboğa and Çayırköy, and dirt roads in Hanevleri, Dutpınar and Işıktepe. Also, there is no public transportation in Akboğa, Çayırköy, Dutpınar and Hanevleri. There is one bus in the evening and morning only in Işıktepe villages during the summer.

Potable Water Supply: Spring water is used as a water source in Dutpınar and Çayirkoy. Additionally, all headmen, except Dutpınar, stated that water is insufficient.

Electricity supply: Complaints were received in only Hanevleri that electricity is sometimes cut off from time to time in the winter.

Sewerage System: According to the interviews with the headmen, the sewerage system is available in Akbaoga. On the other hand, septic tank is used in other villages.

Solid Waste: Solid waste is not collected in Akboğa, Çayirkoy, Dutpınar and Hanevleri. Headmen stated that it was thrown into wells or burned. On the other hand, it is collected by Special Administrative Işıktepe.

***Stakeholder Feedback and Concerns during Interviews**:* Headman interviews revealed that residents of the settlement have certain expectations regarding the project. The first of these expectations is local employment during both construction and operation. Also, especially the headman of Akboğa and other headmen think that those who engage in beekeeping and animal husbandry will be negatively affected. In addition, there are demands such as the construction of asphalt or keystone roads in the Çayırköy village.

V. ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

The main purpose of an environmental and social impact assessment is to identify and assess the potential positive and adverse impacts/risks that may be caused by the Project activities on the natural environment and on the socio-economic wellbeing and conditions of the population (community and workforce) at local and regional level. The following assessment is based on the Project characteristics and pre-construction, construction and operation activities and the baseline conditions in the Project Area.

As a result of this assessment, relevant mitigation measures were developed to avoid, minimize, mitigate and off-set significant adverse impacts and enhance beneficial impacts. Furthermore, the significance of Project-induced residual adverse effects on the environment and community after implementation of the mitigation measures are assessed. And finally, planned monitoring activities for checking effectiveness of the proposed mitigation measures are identified. These mitigation measures and monitoring activities are included in Chapter VII.

V.1 Scoping of Environmental and Social Risks and Impacts

The first step in the ESIA is the scoping process of the planned Project activities and the environmental and social aspects they would interact with in order to identify the issues to be focused on in the ESIA study. This approach provided the means to identify the potential interactions may have on a range of resources/receptors within the Project Area of Influence (AoI).

According to IFC PS1 Assessment and Management of Environmental and Social Risks and Impacts;

- The environmental and social assessment will be conducted in accordance with PS 1, and will consider, in an integrated way, all relevant direct, indirect and cumulative environmental and social risks and impacts of the project, including those specifically identified in PS1–8. The breadth, depth, and type of analysis undertaken as part of the environmental and social assessment will depend on the nature and scale of the project, and the potential environmental and social risks and impacts that could result,
- The environmental and social assessment will also identify and assess, to the extent appropriate, the potential environmental and social risks and impacts of Associated Facilities. The Borrower will address the risks and impacts of Associated Facilities in a manner proportionate to its control or influence over the Associated Facilities. To the extent that the Borrower cannot control or influence the Associated Activities to meet the requirements of the PSs, the environmental and social assessment will also identify the risks and impacts the Associated Facilities may present to the project.

Considering the potential interactions between project activities and environmental receptors, project impacts need to be evaluated on the following issues:

- Physical Environmental Risks and Impacts
  - Air Quality
  - Climate Change
  - Soil and Soil Quality
  - Natural Hazards and Seismicity
  - Geology, Hydrogeology and Hydrology
  - Water Resources and Water Quality
  - Noise and Vibration
  - Use of Resources and Waste Management
- Biological Environment
  - Critical Habitat Assessment
  - Impact Assessment
  - Ecosystem Services
- Cultural Heritage
  - Impact Assessment and Management

  - Conclusion of Impact Assessment
  - General Assessment and Results
- Social Impacts of the Project
  - Population/Demography
  - Land Acquisition
  - Economy/Employment and Livelihood
  - Education and Health Services
  - Vulnerable/Disadvantaged Groups
  - Infrastructure Services
  - Working Conditions and Labor Management
  - Community Health and Safety
  - Landscape and Visual
- Cumulative Impact Assessment

The Project has been prepared according to IFC PS requirements that are listed in the **Table V.1**.

Table V.1 PS List Concerning the Project

Physical Environment	**Relevant PS**
Geographical Location and Topography	
Land Use and Property	PS4, PS5
Climate Conditions, Meteorology and Climate Change	PS1, PS3
Natural Hazards and Seismicity	
Hydrology, Water Resources and Water Quality	PS1, PS2, PS3, PS4
Geology and Hydrogeology	PS1, PS3
Soil and Soil Quality	PS1, PS3
Use of Resources and Waste Management	PS3, PS4,
Air Quality	PS1, PS3
Noise and Vibration	PS1, PS3
Biological Environment	**Relevant PS**
Ecology and Biodiversity	PS1, PS6
Socio-Economic Environment	**Relevant PS**
Population/Demography	PS1
Cultural Heritage	PS1, PS8
Economy/Employment	PS 1
Vulnerable/Disadvantaged Groups	PS 1
Land Acquisition	PS 1, PS 5
Working Conditions and Labor Management	PS 1, PS 2
Community Health and Safety	PS 1, PS 4
Occupational Health and Safety	PS 1, PS 2
Traffic and Transportation	PS 1
Protected Areas, Landscape and Visual Environment	PS6

The assessment will be generated to the project's potential risks and impacts, taking into account all relevant environmental and social risks and impacts that may arise over the entire duration (pre-construction, construction and operation activities) of the project. This comprehensive assessment will encompass direct, indirect, and cumulative factors, including those that have been specifically identified in all PSs. In other words, cumulative impact assessment will be carried out as part of ESIA after all risks and impacts arising from the project have been evaluated.

V.2 Scope-in/Scope-out Process

The ESIA scoping process for the Project considered relevant project activities and the environmental and social aspects they would interact with in order to identify the issues to be focused on in the ESIA studies. The analysis of these potential interactions has been done using a color code (see Table V.2) in a modified Leopold matrix (see Table V.3 and Table V.4). This approach provided the means to identify the potential interactions each Project activity may have on a range of resources/receptors within the Project Area of Influence (AoI).

The Turkish EIA Regulation defines the area of influence as "the area affected by a planned project before operation, during operation and after operation". The Area of Influence (AoI) may be different for different types of impacts and different environmental components (physical, biological, social).

The AoI of the Project is defined to encompass the following as appropriate:

- The area likely to be affected by: (i) the Project (e.g. Project sites, immediate air shed and watershed, or transport corridors) and the Project Sponsors' activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project (e.g. tunnels, access roads, borrow and disposal areas construction camps); (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent.
- Associated facilities, which are facilities or activities that are not funded as part of the project and, in the judgment of the Bank, are: (a) directly and significantly related to the project; (b) carried out, or planned to be carried out, contemporaneously with the project; and (c) necessary for the project to be viable and would not have been constructed, expanded or conducted if the project did not exist.
- Cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.

In this respect, the Project together with all of its components has been considered in the ESIA to the extent the level of information allowed. In the further sections of this chapter, the environmental and social impacts of the Project are evaluated on the Project components basis since the possible Engineering, Procurement and Construction (EPC) contractors of the components might be different.

Table V.2 Color Code Used in the Scope-in/Scope-out Process

(White)	An interaction is not reasonably expected.	Aspect "scoped out"
(Grey)	An interaction is reasonably possible, but none of the resulting impacts are likely to lead to significant effects, and/or interaction is addressed through embedded mitigation measures.	Aspect "scoped out", but rationale is provided in relevant section of current report
(Red)	An interaction is reasonably possible and at least one of the resulting impacts is likely to lead to a negative effect (low, medium or significant).	"Scoped in" – subject to impact assessment.
(Green)	Impacts that are considered likely to be positive.	"Scoped in" – subject to impact assessment.

Those interactions that are colored white are scoped out of further consideration in the impact assessment process and no discussion is warranted in the ESIA report. Those interactions that are colored grey are also scoped out, but during the impact assessment process these potential interactions have been reviewed to confirm that resulted impacts are not significant and/or are appropriately addressed through one or more embedded controls. Those interactions marked with red and green are scoped in and subject to impact assessment as part of the ESIA process. These impacts would be assessed for their significance and additional mitigation measures, beyond the already planned embedded controls, would be proposed as necessary.

Table V.3 and Table V.4 summarize the potential interactions between the Project and environmental resources (air, water, noise, etc.) and socioeconomic receptors.

Table V.3 Potential Interactions between Project Activities and Environmental Parameters

Project Stage/Activity	Environmental Parameters								
	Air Quality	Climate Change	Soil and Soil Quality	Natural Hazards and Seismicity	Geology and Hydrogeology	Water Resources and Water Quality (Groundwater, Surface Water)	Noise and Vibration	Use of Resources and Wastes	Terrestrial and Aquatic Biodiversity
Pre-Construction Phase									
Construction Phase									
Operation Phase									

Table V.4 Potential Interactions between the Project Activities and Social/Socio-economic Receptors

Project Stage/Activity	Social / Socio-economic Receptors													
	Local Economics	Macro Economics	Workers Influx	Infrastructure and Services	Health Standards	Access to Reliable Water Service	Land Use	Livelihoods	Occupational Health and Safety	Community Health, Safety and Security	Archaeological and Cultural heritage	Traffic	Job Opportunities	Landscape and Visual (Aesthetics)
Pre-Construction Phase														
Construction Phase														
Operation Phase														

V.3 Impact Assessment Approach and Methodology

The purpose of impact assessment and mitigation is to identify and evaluate the significance of potential impacts (positive or negative) and risks on identified receptors and resources according to defined assessment criteria; to develop and describe the measures that will be taken to avoid or minimize any potential adverse effects and enhance potential benefits; and to report the significance of the residual impacts that remain the following mitigation.

While making the impact assessment, collected data from desk study and outcomes of site visits were taken into consideration. The assessment of environmental and social impacts/risks has been done based on the criteria provided below using mainly expert judgement, relevant standards and guidelines:

- **Nature of the impact:** Positive (+), Negative (-)
- **Type of Impact:** Direct, Indirect, Cumulative
- **Extent/area of Impact:** On-site/project footprint, Local, Regional, National
- **Duration of Impact:** Short term, Mid-term, Long term, Permanent
- **Likelihood of Impact Occurrence:** Very likely/certain, Likely, Unlikely

The magnitude and severity of the adverse impacts have been assessed based on the criteria given above and significance of the impacts has been determined based on this assessment and sensitivity of the receiver/source exposed to the impact, as much as possible. The matrix given in Table V.5 combines the sensitivity information with the magnitude of impacts. The significance of the impact is first designated without mitigation measures and then evaluated with proposed mitigation measures. This evaluation serves to determine the significance of the residual impacts (impact left after employing mitigation measures).

Table V.5 Impact Significance Matrix*

Sensitivity of Receptor	Magnitude of Impact			
	High	**Medium**	**Low**	**Negligible/None**
High	High	High	Medium	Negligible/None
Medium	High	Medium	Low	Negligible/None
Low	Medium	Low	Low	Negligible/None

** Adapted from Scottish Natural Heritage – A handbook on environmental impact assessment, 2013*

V.4 Area of Influence

The scope of the Project's potential impact area is outlined in the Environmental Impact Assessment Regulation, which defines it as the area influenced by the project before, during, and after its operation. This impact area varies depending on the type of impact and environmental factors (such as physical, biological, and social).

In the context of IFC Performance Standard 1, the impact area is described as encompassing identified physical elements, aspects, and facilities within the Project that are expected to create impacts. Environmental and social risks and impacts are assessed within the Project's area of influence.

To assess environmental and social risks/impacts caused by the Project on vicinity of the Project Area, firstly the area of influence (AoI) is determined. The AoI of the Project is defined to encompass the following as appropriate:

- The area likely to be affected by: (i) the Project (e.g. Project sites, immediate air shed and watershed, or transport corridors) and the Project Sponsors' activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project (e.g. tunnels, access roads, borrow and disposal areas construction camps); (ii) impacts

from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent.
- Associated facilities, which are facilities or activities that are not funded as part of the project and, in the judgment of the Bank, are: (a) directly and significantly related to the project; (b) carried out, or planned to be carried out, contemporaneously with the project; and (c) necessary for the project to be viable and would not have been constructed, expanded or conducted if the project did not exist.
- Cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.

According to IFC PS 1, it is important to identify potential risks and impacts early in the project cycle. Within the scope of the ESIA studies carried out for the Project, the ESIA work area defining the Project Impact Area has been defined in order to ensure the analysis and management of impacts. The assessed elements are presented in the relevant sections of this ESIA. The tangible impacts of pre-construction and construction activities are predominantly confined to the Project area but certain environmental effects, notably dust and air pollution emissions, extend beyond the licensed boundaries. Therefore, the Area of Influence (AoI) of the Project is delineated as a 5-kilometer buffer zone surrounding the licensed area to encompass all potentially affected areas. The Social Area of Influence (SAoI), on the other hand, is defined by comprehensively evaluating key factors such as the socio-economic environment, social impacts (including population, demography, economy, employment, land acquisition, land use as well as vulnerabilities), labor influx, community health and safety, and cultural heritage. Thus, the Social Area of Influence (SAoI) of the Project is delineated as a 2-kilometer buffer zone surrounding the Project area to encompass all potentially socially affected areas. The Community Health and Safety Area of Influence describes the geographical and social scope within which a construction project may influence the well-being and safety of the surrounding community. The Community Health and Safety AoI of the Project is defined by evaluating potential impacts of accidents and disasters, emergency response preparedness, air and water quality standards, noise mitigation measures, and the overall infrastructure resilience of the community and the Project components. Accordingly, the Community Health and Safety Area of Influence are evaluated as the most severe impact/hazard/risk as wind turbine blade throw/fall with potential maximum effect reach of 248 meters, and the furthest impact/hazard/risk as shadow flicker with its potential maximum effect reach of 1380 meters.

In addition, a cumulative impact assessment was conducted within the scope of ESIA and is presented in Section 10 of this Chapter.

- A study area of 10 km x 10 km was selected for air quality modeling and emission calculations were made for construction phase. Air emissions disappear after 5 km. To stay on the safe side, more extensive modeling work has been done. The modeling report is available in Annex 8 of this report.
- Noise modelling was performed in a calculation area was created up to approximately 3 km away from the boundary of the operation site and virtual receivers were defined for the points where noise measurements were made. The noise modeling report is included in Annex-9 of this report.
- The Cumulative Impact Assessment (CIA) area is designated as significantly larger than the Project area and larger or equal to the study areas designated for assessing Project-level impacts for each environmental and social element. CIA assessment is included in Section 10 of this Chapter.
- Terrestrial plant and animal experts carried out field studies within the study area they determined within the borders of the Project Area.
- In the Project area, archaeological field research was carried out by experts.
- The determined AoI of the Project includes but not limited to the area of turbines, switchyard, access roads, and Switchyard Center.
- The defined SAoI of the Project covers nearby settlements of Ağadibek, Akboğa, Çayırköy, Dutpınar and Hanevleri villages and Camikebir Neighborhoods. More information on nearby settlement is given in Table V.6 and Table V.7.

Table V.6 Information of Nearby Settlements Covered in SAoI

Settlement Name	District	City	Closest Turbine	Distance to Turbine (km)
Ağadibek Village	Maden	Elazığ	T10	6.5
Akboğa Village	Maden	Elazığ	T1	3.6
Camikebir Neighborhood	Maden	Elazığ	T10	3.73
Çayırköy Village	Maden	Elazığ	T7	0.92
Dutpınar Village	Maden	Elazığ	T7	2.37
Hanevleri Village	Maden	Elazığ	T1	2.30

Table V.7 Population Changes of Project Districts

Districts	Village/ Neighborhood	Population		
		2018	2022	Annual Population Growth Rate (%)
Maden	Ağadibek	140	115	-4.5
Maden	Akboğa	194	54	-18.0
Maden	Camikebir	2,974	2,090	-7.4
Maden	Çayırköy	237	102	-14.2
Maden	Dutpınar	150	61	-14.8
Maden	Hanevleri	280	97	-16.3
Total		3,975	2,519	-9.2

Maps showing AoI, Socio-Economic AoI and Community Health and Safety AoI prepared within the scope of ESIA are presented in Figure V.1, **Figure V.2**, and **Figure V.3**, respectively.

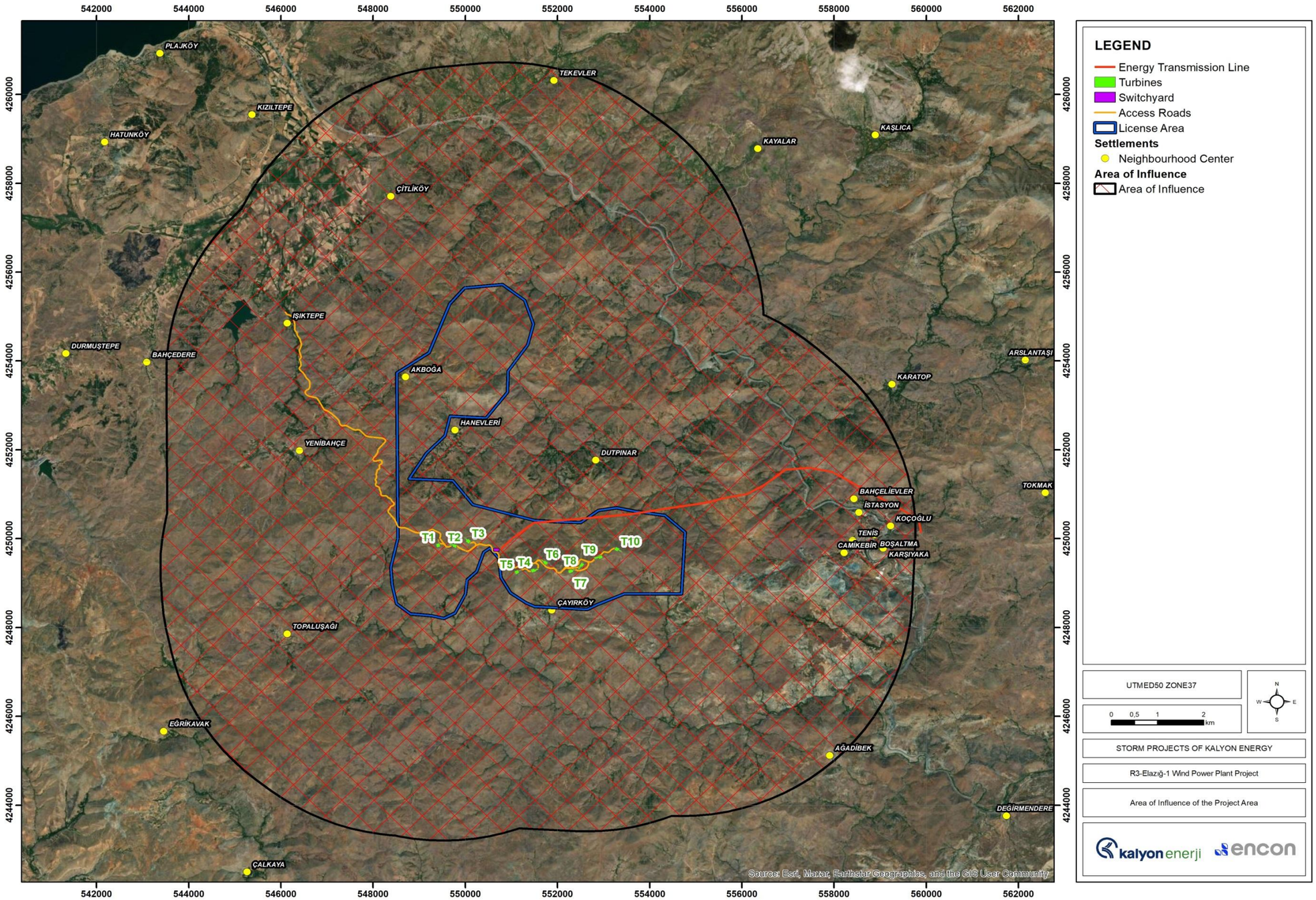


Figure V.1 Area of Influence (AoI) Map

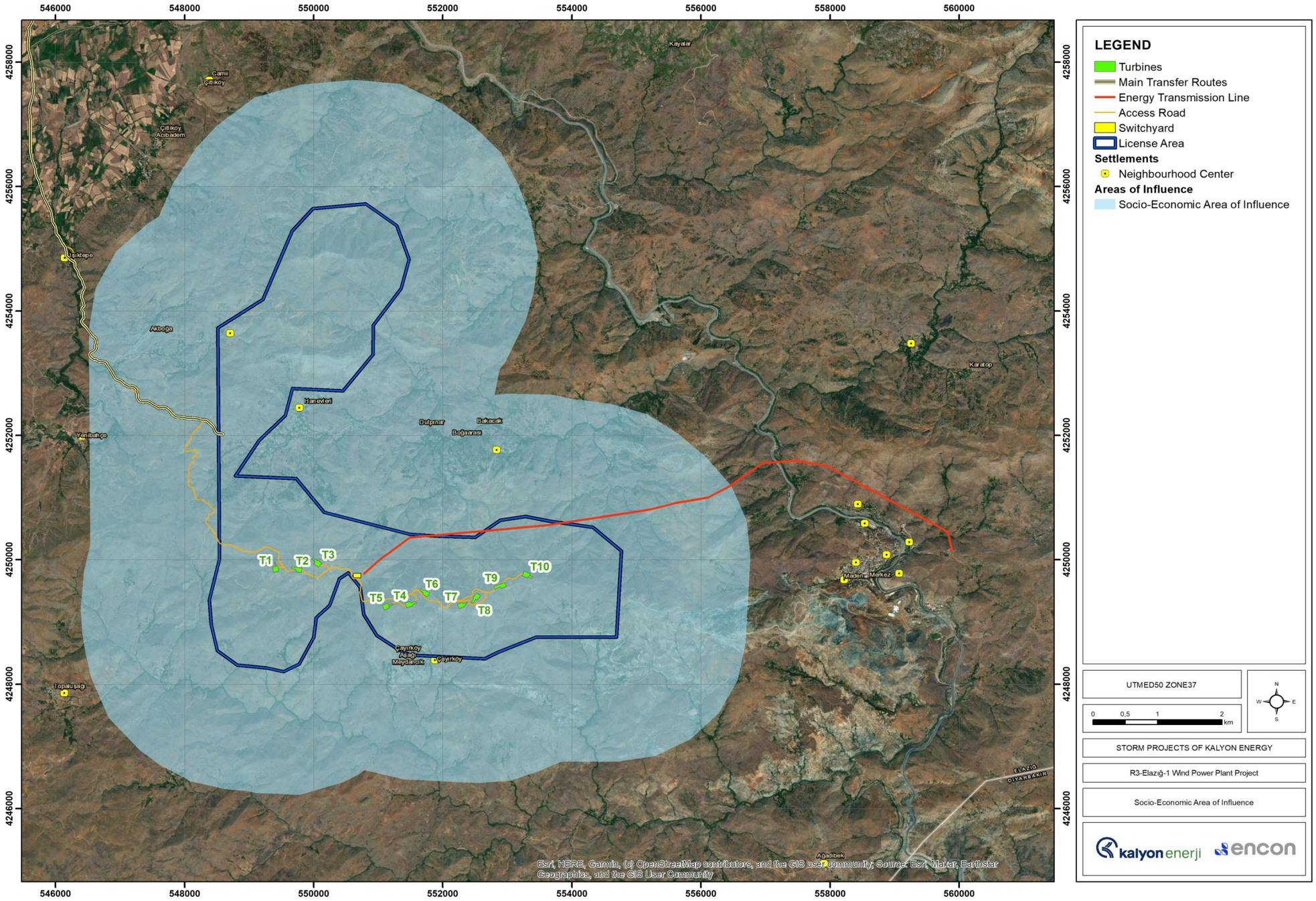


Figure V.2 Socio-Economic Area of Influence Map

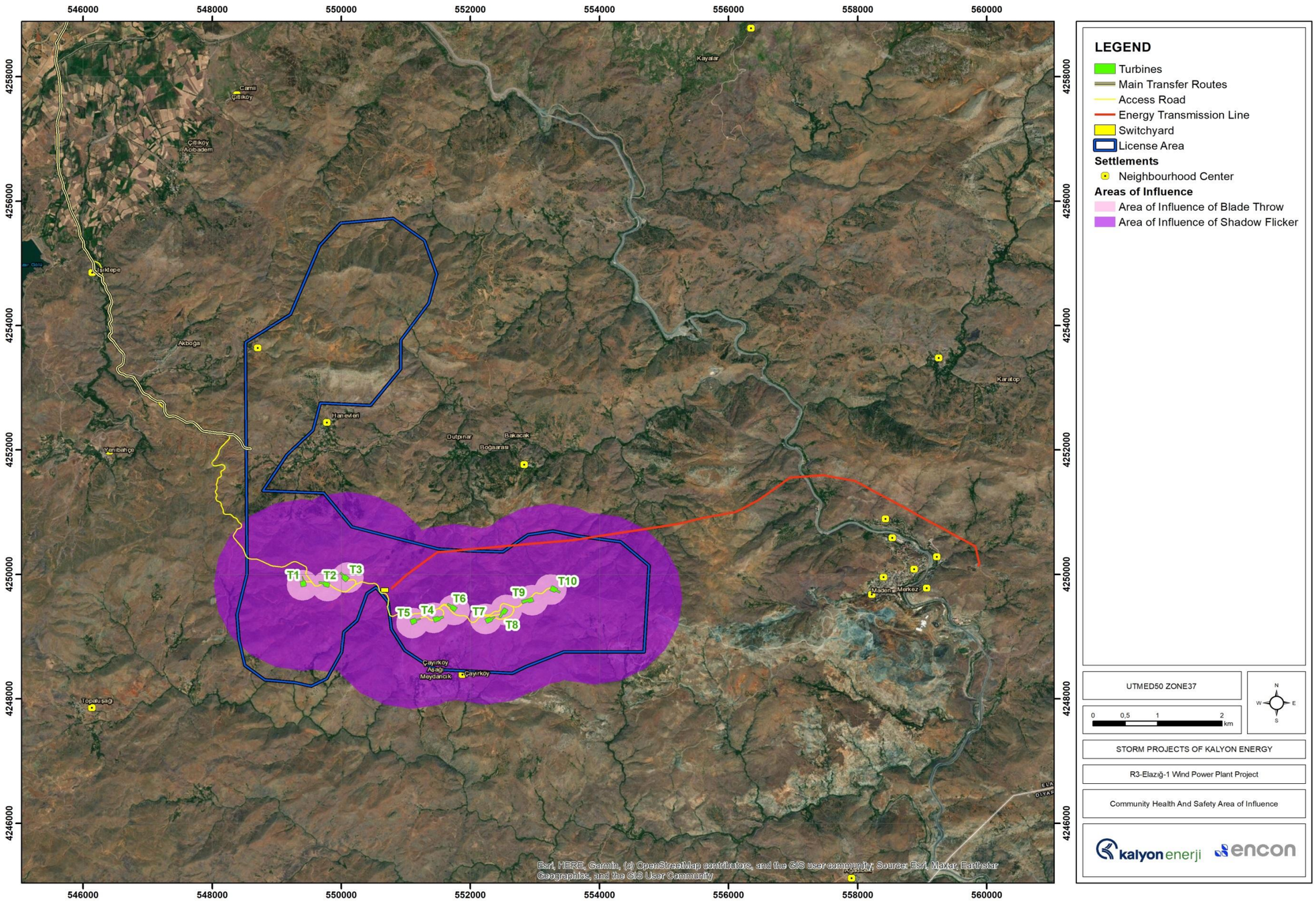


Figure V.3 Community Health and Safety Area of Influence Map

V.5 Determination of Environmental and Social Impact Level and Significance

The potential impacts of the Project on the physical and biological environment are presented in this Section and a detailed overview of these identified impacts and their assessment for the pre-construction, construction and operation phases are provided in Table V.8 together with the potential impacts on the socioeconomic environment.

Table V.8 Matrix Table with Identification of Impact Level in Terms of Environmental and Social Attributes

No	Environmental and Social Attributes	Impact																		
		Nature		Type			Extent/area				Duration				Likelihood of Occurrence			Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance Before Mitigations	Impact Significance After Mitigations
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/ Project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely	High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
A. PRE-CONSTRUCTION PHASE																					
1. Air Quality																					
1	Increase in dust concentration (PM, Settled Dust)		□	□				□			□				□			Medium	Low	Low	Negligible/ None
2	Exhaust emissions (CO, SO_2, VOC and NO_x)		□	□				□			□				□			Medium	Low	Low	Negligible/ None
3	Impact on human health		□		□			□			□					□		Low	Low	Low	Negligible/ None
2. Climate Change																					
1	Contribution to climate change through Greenhouse Gas (GHG) emissions		□			□			□		□				□			Low	Low	Low	Negligible/ None
3.Soil and Soil Quality																					
1	Erosion potential		□	□			□						□		□			Low	Low	Low	Negligible/ None
2	Contamination of soil		□	□			□						□			□		Low	Low	Low	Negligible/ None
4. Water Resources and Water Quality																					
1	Change in surface water quality		□	□				□			□						□	Low	Low	Low	Negligible/ None
2	Change in groundwater quality		□	□				□			□						□	Low	Low	Low	Negligible/ None
3	Increase in water usage		□	□				□			□				□			Low	Low	Low	Negligible/ None
5. Noise and Vibration																					
1	Increase in noise level		□	□				□			□				□			Medium	Low	Low	Low
2	Blasting		□	□				□			□				□			Medium	Low	Low	Low
6. Use of Resources and Waste Management																					
1	Resources used during works		□	□				□			□				□			Low	Low	Low	Negligible/ None
2	Improper waste management		□	□				□			□					□		Medium	Low	Low	Low
3	Storage and Transportation of Explosives		□	□			□				□					□		Medium	Low	Low	Low
7. Socioeconomic Environment																					
1	Infrastructure damage		□	□				□			□						□	Low	Low	Low	Negligible/ None
8. Community Health and Safety and Security																					
1	Trespassing and community encroachment		□	□			□				□						□	Low	Medium	Low	Negligible/ None
2	Gender Based Violence (GBV), Sexual Exploitation Abuse / Sexual Harassment (SEA/SH)		□	□				□					□			□		High	Medium	Medium	Low
9. Labor Force and Working Conditions																					
1	Working conditions and protecting the workforce		□	□			□				□				□			Medium	Low	Low	Low
2	Workers' exposure to work-related occupational health and safety (OHS) risks		□	□			□				□				□			High	High	High	Low
3	Workers Engaged by Third Parties and the Supply Chain		□	□			□				□				□			Medium	Low	Low	Low
10. Landscape and Visual																					

No	Environmental and Social Attributes	Impact																		
		Nature		Type			Extent/area				Duration				Likelihood of Occurrence			Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance Before Mitigations	Impact Significance After Mitigations
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/ Project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely	High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
1	Impairment of quality of life due to the overall presence of annoying construction works and activities and altered landscape		□	□				□			□				□			Low	Medium	Low	Low
B. CONSTRUCTION PHASE																					
1. Air Quality																					
1	Increase in dust concentration (PM, Settled Dust)		□	□				□				□			□			Medium	Low	Low	Low
2	Exhaust emissions (CO, SO_2, VOC and NO_x)		□	□				□				□			□			Medium	Low	Low	Low
3	Impact on human health		□		□			□				□				□		Medium	Low	Low	Negligible/ None
2. Climate Change																					
1	Contribution to climate change through Greenhouse Gas (GHG) emissions		□			□			□			□			□			Low	Low	Low	Low
3. Soil and Soil Quality																					
1	Erosion potential		□	□			□						□		□			Medium	Low	Low	Low
2	Contamination of soil		□	□			□						□			□		Medium	Low	Low	Low
4. Water Resources and Water Quality																					
1	Change in surface water quality		□	□				□				□					□	Medium	Low	Low	Low
2	Change in groundwater quality		□	□				□				□					□	Medium	Low	Low	Low
3	Increase in water usage		□	□				□				□			□			Low	Low	Low	Negligible/ None
5. Noise and Vibration																					
1	Increase in noise level		□	□				□				□			□			Low	Low	Low	Low
6. Use of Resources and Waste Management																					
1	Resources used during works		□	□				□				□			□			Low	Low	Low	Negligible/ None
2	Improper waste management		□	□				□				□				□		Medium	Low	Low	Low
7. Socioeconomic Environment																					
2	Infrastructure damage		□	□				□				□				□		Low	Low	Low	Negligible/ None
8. Community Health and Safety and Security																					
1	Trespassing and community encroachment		□	□			□					□					□	Low	Medium	Low	Negligible/ None
2	Gender Based Violence (GBV), Sexual Exploitation Abuse / Sexual Harassment (SEA/SH)		□	□				□					□			□		High	Medium	Medium	Low
9. Labor Force and Working Conditions																					
1	Working conditions and protecting the workforce		□	□			□					□			□			Medium	Low	Low	Low
2	Workers' exposure to work-related occupational health and safety (OHS) risks		□	□			□					□			□			High	High	High	Low
3	Workers Engaged by Third Parties and the Supply Chain		□	□			□					□			□			Medium	Low	Low	Low
10. Landscape and Visual																					
1	Impairment of quality of life due to the overall presence of annoying construction works and activities and altered landscape		□	□				□				□			□			Low	Medium	Low	Low

No	Environmental and Social Attributes	Impact																		
		Nature		Type			Extent/area				Duration				Likelihood of Occurrence			Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance Before Mitigations	Impact Significance After Mitigations
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/ Project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely	High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
B. OPERATION PHASE																					
1. Air Quality																					
1	Exhaust emissions (CO, SO_2, VOC and NOx)		□	□				□					□		□			Medium	Low	Low	Negligible/ None
2	Impact on human health		□		□			□					□				□	Medium	Low	Low	Negligible/ None
2. Climate Change																					
1	Contribution to climate change through Greenhouse Gas (GHG) emissions	□				□			□				□		□			Positive			
3. Soil and Soil Quality																					
1	Contamination of Soil		□	□			□						□				□	Medium	Low	Low	Negligible/ None
4. Water Resources and Water Quality																					
1	Change in surface water quality		□	□				□					□				□	Medium	Low	Low	Low
2	Change in groundwater quality		□	□				□					□				□	Medium	Low	Low	Low
3	Increase in water usage		□		□			□					□				□	Low	Low	Low	Negligible/ None
5. Noise and Vibration																					
1	Increase in Noise Levels		□	□				□					□			□		Medium	Low	Low	Low
6. Use of Resources and Waste Management																					
1	Resources used for operation		□	□				□					□		□			Low	Low	Low	Negligible/ None
2	Improper waste management		□	□				□					□			□		Medium	Low	Low	Low
7. Socioeconomic Environment																					
1	Infrastructure damage		□	□				□					□			□		Low	Low	Low	Negligible/ None
8. Community Health and Safety and Security																					
1	Trespassing and community encroachment		□	□			□						□				□	Low	Medium	Low	Negligible/ None
2	Community's exposure to disease due to improper handling of wastes		□	□				□					□				□	Low	Medium	Low	Negligible/ None
9. Labor Force and Working Conditions																					
1	Working conditions and protecting the workforce		□	□			□						□		□			Medium	Low	Low	Low
2	Gender Based Violence (GBV), Sexual Exploitation Abuse / Sexual Harassment (SEA/SH)		□	□				□					□			□		High	Low	Medium	Low
3	Workers' exposure to work-related occupational health and safety (OHS) risks		□	□			□						□		□			High	High	High	Low
4	Workers Engaged by Third Parties and the Supply Chain		□	□			□						□		□			Medium	Low	Low	Low
10. Landscape and Visual																					
1	The existence of the WPP		□	□				□						□	□			Low	Low	Low	Low

V.6 Physical Environmental Risks and Impacts

V.6.1 Air Quality

Pre-Construction and Construction Phases

During the construction activities, there will be emissions due to the fuel used for operation of construction machinery which is given in Table V.9. Accordingly, pollutant estimation values expected to be caused by construction machinery are given in Table V.10. Detailed calculations are conducted using AERMOD View - Gaussian Plume Air Dispersion Model software for exhaust emissions are given in Annex 8 Air Quality Modelling.

Table V.9 Pre-Construction and Construction Phase Machinery-Equipment List

Machine/Vehicle Type	Number
Excavator	9
Bulldozer	2
Grader	1
Loader	1
Truck	11
Roller	2
4x4 All-Terrain Vehicle	3
Staff Service Vehicle	1
Total	30

Table V.10 Maximum Exhaust Emissions from Construction Vehicles/Machinery

Pollutant	Exhaust Emissions (g/s)
Carbon Monoxide (CO)	1.512
Nitrogen Oxides (NO_x)	3.650
Sulfur Dioxide (SO_2)	0.002
Volatile Organic Carbons (VOCs)	0.244

The model study was carried out to calculate the maximum exhaust emission by determining the time interval when the maximum exhaust emission will occur during the construction phase.

Dust emissions are expected to occur during the Project works. These dust emissions due to the Project activities are calculated as controlled and uncontrolled and are presented in the Table V.11. As shown in Table V.11, estimated uncontrolled dust emissions from excavation works may exceed the 1 kg/hour limit value defined in the Regulation on Control of Industrial Air Pollution. The Regulation recommends Air Quality Modeling; therefore a modeling study has been conducted. Detailed calculations and modelling report are given in the Annex-8. An air quality modeling study was conducted using AERMOD View - Gaussian Plume Air Dispersion Model software for dust emissions during the construction phase of the project. A 10 km x 10 km impact area was selected for the modeling study.

Table V.11 Controlled and Uncontrolled Dust Emissions

Activity	Operation	Controlled Emission Flow Rate (kg/h)	Uncontrolled Emission Flow Rate (kg/h)
Excavation Works	Removal	10.33	20.65
	Loading	4.31	8.63
	Unloading	4.31	8.63
	Total	**18.95**	**37.91**

Blasting activities can release particulate matter, gases, and other pollutants into the air and this pollution can have detrimental effects on air quality. There will be control measures such as wet drilling, water sprinkling on transportation routes, etc. Afforestation is also proposed to prevent the dispersion of airborne dust.

Therefore the Project's contribution to the air quality is assessed as a negative and direct impact. The impact's extent will be local and duration will be short-term for pre-construction phase and mid-term for construction phase. Since the Project will have local and time limited adverse impacts on air quality, the significance of the impact is considered as low. Mitigation measures proposed in Chapter VII in order to prevent and/or minimize likely impacts will be implemented to further reduce the effects of the impacts on the environment.

Operation Phase

During the operation phase of the Project, there will be no air emissions, except for potential emissions from the diesel generator (one) that will be available in case of power outage and personnel shuttles/vehicles.

Therefore the Project's contribution to the air quality is assessed as a negative and direct impact. The impact's extent will be local and duration will be long-term. Since the Project will have very low adverse impacts on local air quality, the significance of the impact is considered as low. Mitigation measures proposed in Chapter VII in order to prevent and/or minimize likely impacts will be implemented to further reduce the effects of the impacts on the environment.

V.6.2 Climate Change

Pre-Construction and Construction Phases

The Project's contribution to the climate change during the pre-construction and construction phases will be due to the emission of GHGs. The majority of GHGs will be due to construction machinery/ equipment usage. The major greenhouse gas emission will be CO_2 emissions resulting from the combustion of petroleum-based products such as diesel engines of construction vehicles and electric generators. Relatively small amounts of methane and nitrous oxide will also be emitted during fuel combustion. Therefore, these emissions will contribute to the climate change.

According to the GHG Protocol, there are three different emission scopes. These are:

- Scope 1 Emissions: Covers direct emissions from sources owned or controlled by a company.
- Scope 2 Emissions: These are the emissions that are indirectly caused by a company while producing the energy it imports or purchases and uses.
- Scope 3 Emissions: Includes all other indirect emissions occurring in the value chain that are not produced by the company itself and are not the result of activities arising from assets it owns or controls.

Emissions stemming from construction activities on the site and transportation of construction materials and personnel for the Project are categorized as Scope 1. The ultimate source of CO_2 emissions involves three primary contributors: fuel combustion, material combustion, and the introduction of carbon-containing substances from combustion engine to atmosphere (EMEP/EEA Air Pollutant Emission Inventory Guide 2016). The CO_2 emission coefficient of diesel fuel is 3.169 kg CO_2 per kg of fuel consumed. The average consumption rate for lubricants in diesel powered heavy-duty vehicles (of all ages) is 1.56 kg per 10,000 km. Consequently, CO_2 emissions are computed as 4.87 kg per 10,000 km (EMEP/EEA Air Pollutant Emission Inventory Guide 2016). Global warming potential factors are used to convert GHG emissions to CO_2 emissions in order to assess the global warming potential of a GHG. Emission coefficients and global warming potentials are given in Table V.12. The pre-construction works of the project will last 1 month while construction works of the Project will last 11 months. Scope 1 greenhouse gas emissions were calculated assuming 1 workday is 10 hours. GHG emission calculation details such as diesel powered machinery number, assumed distance per travel, for pre-construction phase and construction phase are given in Table V.13.

Table V.12 Pollutant Emission Coefficients for Moving Sources and Machines Used Off-Road (Diesel Fuel)

Pollutant	Emission Coefficient	Global Warming Potentials
CO_2	3.160 kg/ton of fuel	1
CH_4	83 g/ton of fuel	28
N_2O	135 g/ton of fuel	265

Source: EMEP/EEA Air Pollutant Emission Inventory Guide 2016 – May 2017 Update

Table V.13 Details Used for Emission Calculations for the Pre-construction and Construction Phases of the Project

Item	Pre-Construction Phase	Construction Phase
Construction Period	1 month	11 months
Daily construction work	10 hours per day	10 hours per day
Number of Heavy Duty Vehicles	9	26
Number of Turbines	-	10
Typical Diesel Fuel Consumption for Heavy Duty Vehicles	240 g/km	240 g/km
Daily mileage per HDV for on-site construction works	15 km	15 km
Diesel oil (net calorific value)	43 TJ per Gg	43 TJ per Gg
Fuel consumption by non-road mobile sources	1 tons	10 tons

GHG emissions and CO_2 equivalent (CO_2-eq) emissions calculated for pre-construction and construction phases are presented in Table V.14 and Table V.15, respectively.

Table V.14 Scope 1 GHG Emission Calculations for Pre-construction Phase

	Scope 1 Emissions	Emission Factor	GHG (kg)	CO_2-eq (kg)
Emissions due to Road Transport	CO_2 emissions due to fuel consumption	3.169 kg CO_2/kg diesel	3,080.27	3,080.27
	CO_2 emissions due to lube oil	4.87 kg CO_2/10,000 km	1.97	1.97
	CH_4 emissions (fuel type: gas/diesel oil)	3.9 kg CH_4 per TJ	0.16	4.56
	N_2O emissions (fuel type: gas/diesel oil)	3.9 kg N_2O per TJ	0.16	43.20
Emissions due to Non-road Mobile Sources/Machinery	CO_2 emissions due to fuel consumption	3.160 kg CO_2/kg fuel	3,160.0	3,160.0
	CH_4 emissions	83 g CH_4/ton fuel	0.08	2.32
	N_2O emissions	135 g N_2O/ton fuel	0.14	35.78
TOTAL				**6,328.10**

Reference: EMEP/EEA Air Pollutant Emission Inventory Guide 2016 – Updated July 2018 – Equation 16

Table V.15 Scope 1 GHG Emission Calculations for Construction Phase

	Scope 1 Emissions	Emission Factor	GHG (kg)	CO_2-eq (kg)
Emissions due to Road Transport	CO_2 emissions due to fuel consumption	3.169 kg CO_2/kg diesel	97,884.07	97,884.07
	CO_2 emissions due to lube oil	4.87 kg CO_2/10,000 km	62.68	62.68
	CH_4 emissions (fuel type: gas/diesel oil)	3.9 kg CH_4 per TJ	5.18	145.04
	N_2O emissions (fuel type: gas/diesel oil)	3.9 kg N_2O per TJ	5.18	1,372.68
Emissions due to Non-road Mobile Sources/Machinery	CO_2 emissions due to fuel consumption	3.160 kg CO_2/kg fuel	31,600.0	31,600.0
	CH_4 emissions	83 g CH_4/ton fuel	0.83	23.24
	N_2O emissions	135 g N_2O/ton fuel	1.35	357.75
TOTAL				**131,445.45**

Reference: EMEP/EEA Air Pollutant Emission Inventory Guide 2016 – Updated July 2018 – Equation 16

In the tables above, GHG emissions are calculated by taking into account the direct emissions of the Project's construction activities during pre-construction and construction phases. The CO_2 emission released during the pre-construction phase is 6.3 tons and during construction phase is 131.4 tons, for a total of 137.7 tons. However, this emission will be compensated approximately in less than two years (see Operation Phase section below) by the Project after it is commissioned since the Project will deliver a reduction in CO_2 by producing clean energy.

Therefore the Project's contribution to the climate change is assessed as a negative and cumulative impact. The impact's extent will be regional and duration will be short-term for pre-construction phase, mid-term for construction phase. The sensitivity of the receptor is considered as low and due to the usage of small number of construction machinery/equipment, the significance of the impact is considered as low. Mitigation measures proposed in Chapter VII in order to prevent and/or minimize likely impacts will be implemented to further reduce the effects of the impacts on the environment.

Operation Phase

The renewable electricity generated by the Project will be used for the energy demand of the operations. Therefore, the GHG emissions associated with the Project will be limited to maintenance/repair works, personnel and goods transportation during the operation phase, thus the Project will positively impact climate change. The Project activity will reduce GHG emissions by avoiding CO_2 emissions that would be

otherwise be generated from by fossil fuel power plants connected to the Turkish National Grid. Due to the nature of the Project activities, they are not included among the activities listed in Annex-1 of the "Regulation on the Monitoring of Greenhouse Gas Emissions," published in the Official Gazette on May 17, 2014. Since the Project is not among the activities included in the Annex-1 list of the "Regulation on the Monitoring of Greenhouse Gas Emissions", there is no need to monitor, verify and report greenhouse gas emissions.

The maximum annual generated energy is expected to be 127,578.9 MWh. The reduction in emissions that Project will be able to deliver is 82,773.2 tCO_2e/year. This calculation was based on the combined margin emission factor provided by the MoENR, which is 0.6488 tCO_2/MWh. Annual energy generation of the Project was multiplied by the combined margin emission factor. The emission factor of 0.6488 tCO_2/MWh signifies that producing 1 MWh of electricity from a new solar or wind power facility will prevent the release of 0.6488 tons of CO_2 emissions. Other significant positive impacts of the Project on the climate change are given below:

- WPP's require relatively small land areas for electricity generation compared to traditional power plants. This low land requirement advantage enables wind turbines to be installed on land that may not be suitable for other purposes, such as infertile lands or remote areas. While conventional power plants that utilize fossil fuels such as coal and natural gas require significant land for mining/pipelines, fuel storage, and infrastructure, wind turbines can be placed relatively closer together in specifically allocated areas (wind farms), allowing for more efficient land use. This land use efficiency helps preserve natural ecosystems, reducing the impact of land-use changes and deforestation.
- WPP's generally have lower water usage, compared to other conventional power plants that rely on significant water consumption for cooling systems. This helps alleviate stress on water resources, particularly important in the context of changing climate patterns that predicts water scarcity in the future years.
- WPP's contribute to a significant reduction in the carbon footprint associated with electricity generation considering the entire lifecycle, including manufacturing, transportation, installation, and decommissioning processes. WPP's generally have lower carbon footprints compared to fossil fuel-based power generation.

Therefore the Project's contribution to the climate change is assessed as a positive and cumulative impact. The impact's extent will be regional and duration will be long-term.

Project's Climate Vulnerability Assessment

The climate change impacts that the Project will be exposed to during the operation phase have been evaluated in the Chapter IV of this report. In the evaluations presented in the Chapter IV, higher average temperatures, less average precipitation, an increase in extremely hot days and flash flood/heavy rain days are foreseen in both scenarios. As a result, it is predicted that there will be an increase in erosion, fire, strong wind, water scarcity and flood events in the future. Assessing the Project in this context, the following actions to be considered where applicable:

- The Project Area should be planted with native plants/vegetation that do not require regular irrigation to ensure sustainable vegetation,
- Bare soil on the Project Area should be planted with native species to ensure increased protection from erosion (both wind and water sourced) and heavy rains,
- The natural flow paths of the water should not be physically blocked by buildings, embankments, trees, etc. to ensure flow of rainwater,
- Emergency Action and Response Plans should be updated (if necessary) to include disasters such as high winds and storms to ensure fast response and recovery during such events,
- Emergency drills should be conducted regularly also to ensure fast response and recovery during such events,
- Water drainage and/or water recovery systems should be evaluated for increased flash floods/heavy rains and decreased average rainfall,

V.6.3 Soil and Soil Quality

Pre-Construction and Construction Phases

The impacts that could occur on the soil environment during pre-construction and construction phases are listed below. These impacts are localized and restricted to the construction site.

- Disturbance of the natural soil and land structure as a result of soil stripping, levelling, excavation and filling activities, work of construction machinery,
- Mixing of soil layers as a result of excavation activities;
- Soil contamination risk due to leakage and spill of fuels, paints and oils that will be used for the construction machinery and equipment;
- The risk of vegetation loss,
- Soil pollution, which may occur in case of uncontrolled storage or disposal of solid and/or liquid wastes to be generated within the scope of the Project
- Improper replacement of soil to its original position; and
- Erosion risk due to excavation activities.

The total area of the power plant site is 1993.42 hectares. When the power plant area of the Project is evaluated, it is observed that it consists of pasture, forest, agriculture, bare land and settlement areas, and turbine areas consist of pasture, woodland, bare land, stony and rocky areas.

Excavation Works

Soil corresponding to the footprint of the Project components (access roads, excavation and stockpile sites, temporary campsite structures, turbine foundations etc.) will excavated to a sufficient depth (5 m for foundations, 0.5 m for switchyard works and 1 m for access roads for excavation works) prior and during the construction activities. Table V.16 presents the amount of soil to be excavated from the Project sites.

If not properly managed, soil within the Project Area may be affected throughout the pre-construction and construction phases due to erosion or mixing with coarse or contaminated soils. Thus, soil management measures have to be applied in the scope of the Project and a Soil Management and Erosion Control Plan is prepared.

Table V.16 R3-ELAZIĞ-1 WPP Access Roads and Pad Areas Soil Budget Table

R3-ELAZIĞ-1 WPP			
Access Roads	**Road Name**	**Excavation (m^3)**	**Filling (m^3)**
	Mainroad-1	138,955.190	108,320.920
	T1 Access Road	5,021.720	497.890
	T3 Access Road	278.160	11,624.310
	T5 Access Road	10,015.850	583.870
	T6 Access Road	2,806.830	63.370
	T7 Access Road	20,533.120	2,405.000
	T8 Access Road	8,800.510	15,432.310
	Switchyard Access Road	237.200	834.370
	Total	**186,648.580**	**139,762.040**
Pad Zones	**Pad Zone Name**	**Excavation (m^3)**	**Filling (m^3)**
	T1 Pad Zone	32,495.100	4,911.658
	T2 Pad Zone	17,481.810	49,207.648
	T3 Pad Zone	9,600.260	40,525.578
	T4 Pad Zone	27,044.780	43,003.798
	T5 Pad Zone	19,779.080	35,264.118
	T6 Pad Zone	23,207.090	49,500.398
	T7 Pad Zone	24,178.920	32,846.048
	T8 Pad Zone	27,618.490	41,816.578
	T9 Pad Zone	34,571.600	31,895.458
	T10 Pad Zone	59,542.720	39,830.248
	Switchyard	34,330.270	3,935.130
	Total	**309,850.120**	**372,736.660**
Turbine Foundations	**Foundation Name**	**Excavation (m^3)**	**Filling (m^3)**
	T1 Pad Zone	1,600.000	0.000
	T2 Pad Zone	1,600.000	0.000
	T3 Pad Zone	1,600.000	0.000
	T4 Pad Zone	1,600.000	0.000
	T5 Pad Zone	1,600.000	0.000
	T6 Pad Zone	1,600.000	0.000
	T7 Pad Zone	1,600.000	0.000
	T8 Pad Zone	1,600.000	0.000
	T9 Pad Zone	1,600.000	0.000
	T10 Pad Zone	1,600.000	0.000
	Total	**16,000.000**	**0.000**
Overall Total		**Excavation (m^3)**	**Filling (m^3)**
		512,498.700	**512,498.700**

YEKA RES 3 will ensure that the contractor will implement the Soil Management and Erosion Control Plan and Reinstatement Management Plan that are in line with the IFC PSs and Equator Principles (IV).

Therefore the Project's contribution to the soil and soil quality is assessed as a negative and direct impact. The impact's extent will be limited to on-site and duration will be long-term. After assessing the sensitivity of the receptor and the magnitude of the impact, the significance of the impact is considered as low. Mitigation measures proposed in Chapter VII in order to prevent and/or minimize likely impacts will be implemented to further reduce the effects of the impacts on the environment.

For the blasting operations, the Contractor will use explosives which are defined as hazardous materials. The amount and type of explosives as well as the storage locations will be defined by the Contractor, prior to the execution of the works, and get the consent of the Employer. Necessary mitigation measures should be implemented regarding storage of explosive materials. Blasting often results in changes to the topography and land use patterns. This alteration can affect the availability of land for agriculture, urban development, or conservation, influencing regional resource planning.

Blasting, sub-excavation, and drilling activities will have an impact on the stability of natural rock walls. The inspection will be conducted in conjunction with qualified experts. Blasting site will be marked with flag indicating clearance zone, cone or easily visible markers before filling the holes with blasting material. Risk Assessment for the blasting activities will be prepared. Overly confined charges such as those having too much burden or too much sub drilling will be avoided. The primer will not be placed in the sub drilling. Where it appears that a later row of blast holes will have inadequate relief, a delay period will be skipped between rows. All blasting will be covered to avoid rock flying, unless it is ensured that a sufficient safety zone is established. The safety zone will be guarded at strategic entrances.

Operation Phase

In the operation phase of the Project, the activities will have a limited physical interaction with the environment. In the operation phase of the Project, no additional significant direct impacts on topography, soil and land use are anticipated under the normal operating conditions. Impacts of the operation phase of the Project are related to the risks that arise during repair and maintenance works, such as spillage/leakage of oil and chemicals to soil. In addition, in accordance with the "*Reinstatement Management Plan*" specially prepared for the Project, the protective layer consisting of plants and trees, which was started to be formed after the construction phase of the Project, will be maintained to ensure the continuity of the positive effects in combating erosion and protecting the soil.

Therefore the Project's contribution to the soil and soil quality is assessed as a negative and direct impact. The impact's extent will be limited to on-site and duration will be long-term. After assessing the sensitivity of the receptor and the magnitude of the impact, the significance of the impact is considered as low. Mitigation measures proposed in Chapter VII in order to prevent and/or minimize likely impacts will be implemented to further reduce the effects of the impacts on the environment.

V.6.4 Natural Hazards and Seismicity

The Project is not expected to have any impact on flood risk, landslide risk during both pre-construction, construction and operation phases. Elazığ province is located in an area of high earthquake risk. However, construction of the structures will be in accordance with the Building Earthquake Regulation.

V.6.5 Geology, Hydrogeology

The Project is not expected to have any impact on geology. Pre-construction – construction and operational activities may create the potential for accidental release/leak of petroleum-based products such as lubricants, hydraulic fluids or fuels during storage, transportation or use in equipment. All chemical storage containers, including diesel fuel, solid waste, wastewater and hazardous liquid waste drums/containers, should be located to minimize the risk of soil, surface water, and groundwater contamination during pre-construction phase. On the other hand, there are no discharges into groundwater resources.

V.6.6 Water Resources and Water Quality

Pre-Construction and Construction Phases

During the pre-construction and construction phases, employees' needs will create water supply requirement. The utility water to be used will be supplied from Elazığ Special Provincial Administration network points via tankers. The total amount of daily water requirement is calculated based on the multiplication of the number of employees that will be working at the peak time of the phase and the daily water requirement for a person, which is 228 L/cap/day (TurkStat, 2022). The number of personnel required is determined as 10 for pre-construction phase and 80 for construction phase. Therefore, the daily water requirement of employees during the pre-construction and construction phases will be:

- 10 employees x 0.228 m^3/cap/day= 2.28 m^3/day (Pre-construction phase)
- 80 employees x 0.228 m^3/cap/day= 18.24 m^3/day (Construction phase)

During the pre-construction and construction phases, there will be dust due to excavation/backfilling activities and the operation of equipment in the field. The amount of water required to suppress this dust and irrigate green areas is taken as 8 m^3/day. Accordingly, it is anticipated that a total of 10.28 m^3 of water will be used during pre-construction phase and a total of 26.24 m^3 of water will be used per day during construction phase.

Since ready-mixed concrete will be used in construction, no additional water is needed for concrete preparation.

Bottled water will be used for the drinking water needs of the personnel. The quality of drinking water that will be supplied to the Project shall be in compliance with the Regulation Concerning the Water Intended for Human Consumption together with the internationally accepted standards, such as WHO and IFC's General EHS Guidelines.

The Project involves various construction activities during pre-construction and construction phases that have the potential to interact with water resources, necessitating careful management of the Project's impacts. The release of sediment to water bodies from incorrect material/excavate stockpiling, pumping of silt water from the tanks, spills/leakages of municipal wastewater, chemicals, petroleum-based products (lubricants, hydraulic fluids, or fuels) can lead to water quality concerns during their storage, transfer, or usage. All chemicals, including diesel fuel and hazardous liquid waste drums/containers should be stored on impermeable areas to minimize the risk of surface water and groundwater contamination during the pre-construction and construction phases.

Municipal wastewater and solid wastes should only be transferred by licensed companies on a timely manner to minimize the risk of surface water and groundwater contamination during the pre-construction and construction phases.

As part of the Project, there is no planned groundwater extraction, and as such, no adverse effects on the groundwater table are anticipated. Furthermore, there are no intentions to utilize groundwater or discharge into groundwater resources. By implementing adequate measures for preventing spills and chemical leaks, it will be ensured that groundwater quality remains unaffected.

Therefore the Project's contribution to the water resources and water quality is assessed as a negative and direct impact. The impact's extent will be local and duration will be short-term for pre-construction phase and mid-term for construction phase. The sensitivity of the receptor is considered as low, due to the fact that there is no discharge to any water bodies, the significance of the impact is considered as low. Mitigation measures proposed in Chapter VII in order to prevent and/or minimize likely impacts will be implemented to further reduce the effects of the impacts on the environment.

Operation Phase

During the operation phase of the Project, water supply requirement will arise due to employee needs. The total amount of daily water requirement is calculated based on the multiplication of the number of employees that will be working and the daily water requirement for a person, which is 228 L/cap/day (TurkStat, 2022) Daily water requirement will be supplied from Elazığ Special Provincial Administration. The number of personnel required is determined as 10. Therefore, the daily water requirement of employees during the operation phase will be;

- 10 employees x 0.228 m^3/cap/day = 2.28 m^3/day

Hazardous materials use and waste generation, along with the possibility of accidental spills/leakages of chemicals, hazardous wastes, oils and/or fuel during operation phase, pose a threat to water resources. Additionally, water use, domestic wastewater generation, uncontrolled discharge of wastewater, maintenance works, and activities like washing vehicles or equipment are the other potential risks. Lastly, the operation of service areas also introduces potential interactions with water resources.

Operation phase activities may pose the potential for accidental spills/leakages of chemicals, petroleum-based products (lubricants, hydraulic fluids, or fuels) during their storage, transfer, or usage. The practice of storing all chemicals, petroleum-based products (lubricants, hydraulic fluids, or fuels), and hazardous liquid wastes on impermeable areas and transferring solid wastes by licensed companies on a timely manner to minimize the risk of surface water and groundwater contamination that is utilized during the pre-construction and construction phases should be continued on the operation phase as well. In addition if a demand of a new storage area for the mentioned chemicals and wastes arises, the new storage areas should also be built as impermeable surfaces with containments to minimize the risk of contamination.

Therefore the Project's contribution to the water resources and water quality is assessed as a negative and direct impact. The impact's extent will be local and duration will be long-term. Although the sensitivity of the receptor is considered as medium, due to the fact that there is no discharge to any water bodies, the significance of the impact is considered as low. Mitigation measures proposed in Chapter VII in order to prevent and/or minimize likely impacts will be implemented to further reduce the effects of the impacts on the environment.

V.6.7 Noise and Vibration

The development of the WPP involves multiple phases, including land preparation, construction and operation. The operation of the WPP is anticipated to bring about an increase in baseline noise levels along the access route, particularly during construction activities and the transportation of construction materials. Moreover, the ongoing construction will temporarily amplify noise and vibration levels at specific locations due to blasting activities. The traffic generated by trucks transporting excavated materials is also identified as a contributor to this noise increase.

Pre-Construction and Construction Phases

Transportation of materials, turbine components and other construction phase transportation requirements; construction machinery and equipment to be used for the construction of access roads and crane pads, preparation of turbine foundations and other civil works will result in noise generation during the pre-construction and construction phases of the Project, which may impact the receptors. Construction-related

noise impacts will be localized within the Project's area of influence, and vehicle-related disturbances will be temporary during site preparation. The equipment and noise levels to be used during the construction phase are presented in the Table V.17.

Table V.17 Construction Equipment and Sound Power of Each Equipment

Machine/Vehicle Type	Number	dBA/pc
Excavator	9	110
Bulldozer	2	119
Grader	1	105
Truck	11	104
Loader	1	110
Steamroller	2	101
4x4 All-Terrain Vehicle	3	90
Staff Service Vehicle	1	90
Total	30	-

Source: Bearbeitung: RWTÜV Anlagentechnik GmbH, Essen im Auftrag des Landesumweltamtes NRW, Essen 2000, R3-ELAZIĞ-1 Wind Power Plant Project Noise Model and Assesment Report prepared by Hidrotek Mimarlık Mühendislik Tic. Ltd. Şti, 2024

Noise Modeling Report has been prepared by Hidrotek Mimarlık ve Mühendislik A.Ş and is presented in Annex-9 of this report. Noise calculations were made at four different receivers for the construction phase. The Project Standards are aligned to the more stringent limit values which are defined in the national legislation. The details about the noise level are summarized in Table V.18.

Table V.18 Noise During Construction Phase

Receptor	Calculated Values		Project Standards		
	L_{den} dB(A)	L_d dB(A)	L_d dB(A)	L_e dB(A)	L_n dB(A)
A-N-1	35.9	38.9	65	60	55
A-N-2	29.2	32.2	65	60	55
A-N-3	37.3	40.3	65	60	55
A-N-4	25.8	28.8	65	60	55
A-N-5	-*	-*	65	60	55

Source: R3-ELAZIĞ-1 Wind Power Plant Project Noise Model and Assessment Report prepared by Hidrotek Mimarlık Mühendislik Tic. Ltd. Şti, 2024
** Noise calculation in A-N-5 yielded a non-positive integer, therefore not included in the table.*

As stated in the table, the activities to be performed during the construction phase of the Project meet the Project Standards. Although the results for the noise levels indicate that limits will not be exceeded, mitigation measures are proposed in Chapter VII in order to avoid exceeding any noise limit and monitor potential noise impacts on the receptors. A *Pollution Prevention Plan* has been developed and will be implemented. After taking all necessary mitigation measures, the residual impact will be negligible.

Prior to the blasting operations, sensitivity of nearby settlements/buildings against noise and vibration will be assessed. Aboveground blasting operations will not be conducted in close vicinity (within a 100 meter radius area) of the residential areas/neighborhoods if construction with other methods is feasible at that location. Vibration will be minimized by applying modern blasting techniques. Blasting will be carried out at dedicated times in order to prevent nuisance and there will be a warning system at all audible distances during

blasting activities. Number of holes to be blasted at one shot and total charge amounts per shot will be optimized to ensure compliance with the regulatory limit values and minimize fly rock incidents. All blast vibrations will be monitored by using vibrometers to be placed at suitable locations and records on charge amounts, delays provided, distance to blasting locations and relevant vibration levels will be kept. Under the supervision of the Project Sponsor, the Contractor or its subcontractor will perform seismic measurements of the intensity of blasting-induced vibrations at various distances from the blasting spots if required by the Project Sponsor based on documented issues relating to blasting intensity.

Additionally, limit values described in the Regulation on Environmental Noise Control for ground vibrations will be complied with. Records on air shock and vibration measurements will be kept and compliance with regulatory limit values will be checked to minimize impacts on local people. Grievance mechanism will be active for any complaints related to vibration impacts. If any complaints related to vibration are received through Project's Grievance Mechanism, the complaint will be evaluated and where necessary, corrective actions will be planned and implemented.

Operation Phase

During operation phase, noise sources are very limited. Noise will mainly be generated from the operation of the wind turbines. Wind turbines in operation produce noise that varies with wind speed. Mechanical noise and aerodynamic noise are the sources of noise emitted by wind turbines. For mechanical noise, it is caused by the rotation of mechanical and electrical equipment. The aerodynamic sound is caused by the flow of air around the blades. Transformers and inverters will be enclosed and there will be minimal noise emissions from traffic due to transportation of workers. Hence noise emissions will be minimal compared to the construction phase.

Noise Modeling Report has been prepared by Hidrotek Mimarlık ve Mühendislik A.Ş and is presented in Annex-9 of this report. Noise calculations were made at four different receivers for the operation phase. The Project Standards are aligned to the more stringent limit values which are defined in the national legislation. The details about the noise level are summarized in Table V.19.

Table V.19 Noise During Operation Phase

Receptor	Calculated Values				Project Standards		
	L_{den} dB(A)	L_d dB(A)	L_e dB(A)	L_n dB(A)	L_d dB(A)	L_e dB(A)	L_n dB(A)
A-N-1	45.1	38.7	38.7	38.7	65	60	55
A-N-2	31.8	25.4	25.4	25.4	65	60	55
A-N-3	32.9	26.5	26.5	26.5	65	60	55
A-N-4	33.8	27.4	27.4	27.4	65	60	55
A-N-5	-*	-*	-*	-*	65	60	55

Source: R3-ELAZIĞ-1 Wind Power Plant Project Noise Model and Assessment Report prepared by Hidrotek Mimarlık Mühendislik Tic. Ltd. Şti, 2024
** Noise calculation in A-N-5 yielded a non-positive integer, therefore not included in the table.*

As calculated in Table V.19, there is no noise generation exceeding the Project Standards during the operation phase of the Project. According to the turbine specifications, maximum sound power level for one turbine is 106 dB(A). However, at the receptors this noise impact will be significantly low and vibration is not expected to occur during the operation phase.

During the operation phase, mitigation and monitoring activities which are presented in Chapter VII will be implemented to prevent the generation of disturbing noise and monitor potential noise impacts on receptors. A grievance mechanism will be implemented and noise monitoring will be carried out where any comments regarding noise are received from receptors to verify compliance with Project Standards and corrective measures will be taken where necessary. Plant components such as inverters, transformers and

other equipment and vehicles used for transportation will be periodically maintained to ensure good working conditions.

V.6.8 Use of Resources and Waste Management

As a result of the use of resources, construction and operation/maintenance activities as well as domestic requirements of the personnel, different types of waste will be generated throughout the lifetime of the Project.

All the waste to be generated during the pre-construction, construction and operation phases of the Project are required to be properly managed in line with the requirements of national Waste Management Regulation and international good practice in order to avoid impacts on soils, nearby water resources and flora and fauna elements. This section identifies the waste to be generated in this context and assesses the impacts associated with waste generation.

The possible sources that will generate various types of waste are listed below:

Municipal solid waste,
Packaging waste such as wood, paper, cardboard and plastic, etc.,
Hazardous and special waste that may be generated within the scope of the land preparation, construction and operation phases of the Project can be listed as contaminated vessels, cloths and overheads, waste batteries and accumulators, waste oils, etc.,
Excavation and construction waste,

Waste to be generated in the scope of the Project activities will be managed in accordance with the waste management hierarchy as given in Figure V.4. In this respect, waste generation will be avoided/prevented at the source. In cases where prevention is not possible at the source, respectively; minimization of waste generation, reuse of generated waste at the site as much as possible, assessment of alternatives such as recycling and energy recovery for waste (where reuse is not possible) will be considered. The final step in the hierarchy of waste management involves the final disposal of waste in accordance with relevant regulations, where reuse, recycling and energy recovery options are not possible.

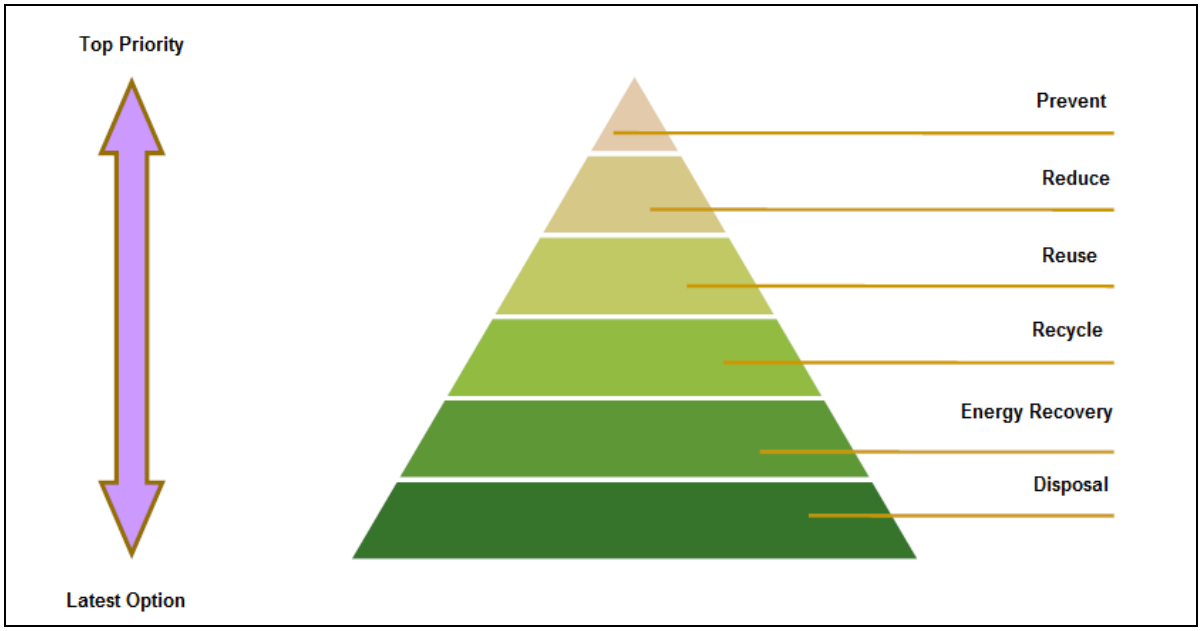


Figure V.4. Waste Management Hierarchy

Pre-construction and Construction Phase

There will be no cement/concrete unit in the Project Area for the concrete that will be used in the construction phase of the project. Cement/Concrete will be supplied from the nearby concrete plant. There is one concrete batching plant within approximately 38 km of the Project Area. Within the scope of the project, electricity, water for personnel use, and fuel for both vehicles and heating will be needed. During the pre-construction and construction phases, employees' needs will create water supply requirement. Transmission towers or poles, conductors, transformers, power lines and cables, grounding equipment will be used for the electricity transmission line.

During the pre-construction and construction phases of the Project, activities such as levelling works, construction and installation of the main operation and auxiliary units, procurement of ready mixed concrete and other materials, transportation and assembly of units and equipment will be carried out. Solid waste types expected to be generated within the scope of these activities are; municipal wastes, packaging wastes of system equipment (e.g., wood, cardboard, plastic), hazardous waste, special waste, excavation and construction waste (e.g., scrap metal, wood, concrete waste) and waste system equipment (panels, cables, electronic components). Hazardous and special waste might contain chemical substances (e.g., paint, solvent) or packaging materials and cloths contaminated with oils, waste oils resulting from operation and maintenance of machinery and vehicles, solvents, accumulators, batteries, filters, machine parts.

Waste to be generated during the pre-construction and construction phases of the Project will be managed in accordance with the waste management hierarchy (avoidance, reduce, re-use, recycling, energy recovery and disposal). Contractors will take mitigation measures described in Chapter VII.

Hazardous waste will be stored in special compartments in the Temporary Storage Area allocated for this purpose, in containers, separated from the non-hazardous waste as indicated in Waste Management Regulation. This area will have an impermeable base/ground and will be protected from the surface flows and rain. Additionally, necessary drainage for the area will be provided. Hazardous waste will be collected and disposed of by companies selected by YEKA RES 3 among companies licensed by the MoEUCC.

Table V.20 lists the types of waste that can be generated during the pre-construction and construction phases of the Project and their waste codes according to the waste lists given in the annexes of the Waste Management Regulation.

Table V.20. List of Possible Waste Types to be Generated during Pre-construction and Construction Phase of the Project

Waste Code	Definition of Waste Code
13	**Oil Wastes and Liquid Fuel Waste (Excluding Edible Oils, 05 and 12)**
13 02	Waste Engine, Transmission and Lubrication Oils
15	**Waste Packages, Unspecified Absorbents, Wipes, Filter Materials and Protective Clothing**
15 01	Packaging Waste (Including Packaging Waste Separately Collected by the Elazığ Special Provincial Administration)
15 02	Absorbents, Filter Materials, Cleaning Cloths and Protective Clothing
16	**Waste Not Specified Otherwise in the List**
16 06	Batteries and Accumulators
17	**Construction and Demolition Waste (Including Excavations from Contaminated Sites)**
17 01	Concrete, Brick, Tile and Ceramic
17 02	Wood, Glass and Plastic
17 04	Metals (Including Alloys)
17 05	Soil (Including Excavations from Contaminated Sites), Stones and Dredging Sludge
17 09	Other Construction and Demolition Waste

Waste Code	Definition of Waste Code
20	**Municipal Waste Including Separately Collected Fractions (Domestic and Similar Commercial, Industrial and Institutional Waste)**
20 01	Separately Collected Fractions (Except 15 01)
20 03	Other Municipal Waste

Municipal waste within the scope of the Waste Management Regulation are referred to as domestic waste or commercial, industrial and institutional waste similar to domestic waste in terms of its content or structure, which are defined with waste code of 20, in the Waste List given in Annex-4 of the Regulation and of whose management responsibility belongs to the Elazığ Special Provincial Administration. Therefore, these types of waste will be stored separately from hazardous waste and recyclable waste and will be collected regularly by the Elazığ Special Provincial Administration. In Maden district where R3-ELAZIĞ-1 WPP is located, domestic solid waste is currently disposed of at a dump site.

In order to determine the amount of municipal waste to be generated at site, the average daily municipal waste per person is taken as 1.13 kg according to the municipal waste statistics of TurkStat in year 2020 (TurkStat, 2024). The estimated amount of municipal waste to be generated during the pre-construction phase and construction phase of the Project, based on the number of people working, is given below. This amount includes also separately collected fractions such as paper, cardboard, glass, metal, plastic, etc. together with biodegradable wastes.

For pre-construction phase:

- 10 people x 1.13 kg/person/day=11.3 kg/day.

For construction phase:

- 80 people x 1.13 kg/person/day=90.4 kg/day

The food will be supplied through catering services. Thus, there will be no food preparation related waste (such as vegetable waste oil etc.) generation within the context of the Project.

The general composition of the municipal waste in Türkiye is as demonstrated in Figure V.5 according to the results of the solid waste composition determination study made within the scope of the Solid Waste Master Plan Project. 34% of municipal waste consists of kitchen waste. Separately collectable and recyclable fractions such as paper, cardboard, bulk cardboard, plastic, glass and metal constitute 25% of municipal waste.

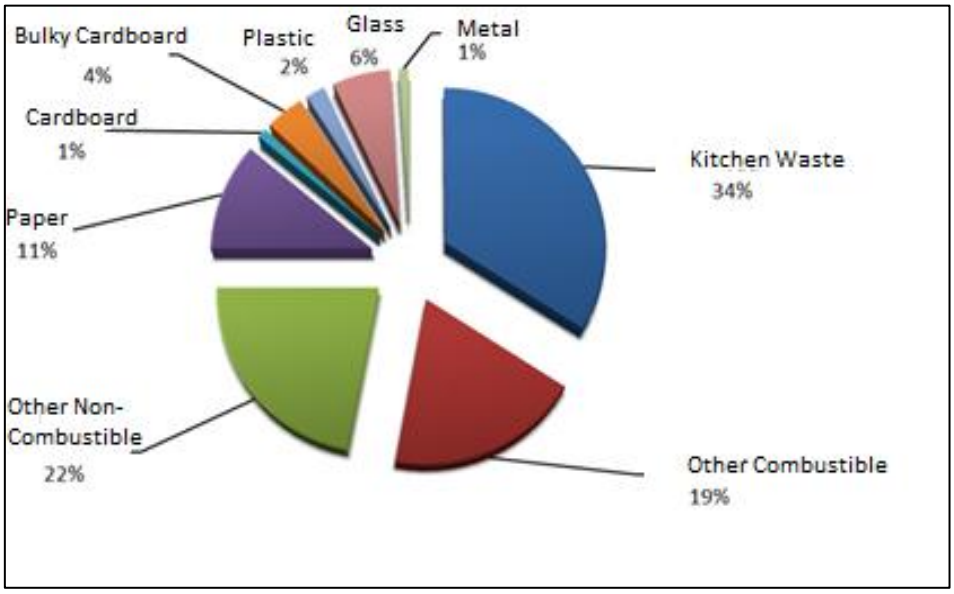


Figure V.5. Composition of Municipal Waste (*former Ministry of Science, Industry and Technology, 2014)*

Considering the information provided in Figure V.5, it is also valid for the municipal waste to be generated within the scope of the Project. The only difference will be the kitchen waste percentages since there will be no kitchen/cafeteria in the Project. By reflecting this and the assumption of only 5% food waste, the composition of the municipal waste will be as follows:

- Food Waste : 5%
- Other Combustible : 27%
- Other Non-combustible : 31%
- Paper : 16%
- Cardboard : 2%
- Bulky Cardboard : 6%
- Plastic : 3%
- Glass : 8%
- Metal : 2%

From these percentages it is estimated that 0.57 kg of food waste and 4.18 kg of separately collectable and recyclable waste will be generated daily during pre-construction phase, and 4.52 kg of food waste and 33.45 kg of separately collectable and recyclable waste will be generated daily during construction phase of the Project. The remaining 6.55 kg (for pre-construction phase) and 52.43 kg (for construction phase) of daily produced waste are in the category of other combustible and non-combustible waste.

Waste vegetable oil will not be generated at the site during the construction activities as meals for the staff will be provided by catering companies. End-of-life tire generation and storage will not take place due to the fact that the tire changes of the construction machines and other vehicles to be used at this stage will be carried out at the facilities in the region providing service for this purpose.

For the personnel who will work during the land preparation and construction phases of the Project, medical equipment will be available to provide first aid in case of any accident; since medical interventions such as injections and stitches will not be performed, cutting and piercing medical wastes will not be generated. In case of more serious injuries and accidents, the personnel will be immediately referred to health institutions in the nearest settlements.

The construction machinery will require oil changes during the pre-construction and construction phase of the Project, at least once in every two-month period of the phase. Oil changes of the construction

machinery will be carried out at services licensed for the maintenance of the machinery. Thus, there will be no waste oil generation is expected in the pre-construction and construction phase of the Project. In the event that maintenance of construction vehicles is unavoidable on site, a small amount of waste oil will be generated on site.

The annual amount of waste battery per person in Türkiye is six and this value corresponds to 140 grams (*abrogated Ministry of Environment and Forestry, General Directorate of Environmental Management, 2009*). The waste battery production of 10 people to be employed during the pre-construction phase of the Project is calculated as 0.12 kg. According to this, the waste battery production of 80 people to be employed during the construction phase of the Project is calculated as 11 kg.

No excavation waste is expected during any phase of the Project and the excavations that will occur during the construction of the WPP will be used for landscaping and backfilling. Excavation wastes that cannot be used will be disposed of in areas determined by both the Metropolitan Municipality and the District Municipality, as specified in the "Regulation on the Control of Excavation Soil, Construction and Demolition Wastes".

For the blasting operations, the Contractor will use explosives which are defined as hazardous materials. Blasting activities also generate waste materials such as rock fragments, dust, and debris. Effective waste management becomes crucial to prevent soil erosion, water contamination, and the alteration of local landscapes.

Accurate and current records must be kept of the explosive material inventory to ensure that the oldest stocks are utilized first, satisfy regulatory requirements, and facilitate immediate notification of any loss or theft. Storage area records will reflect the quantity of explosions removed, the amount returned, and the net quantity used at the blasting site. Explosives will be stored in designated areas in storage facilities and delivered to work sites in only the quantity required for immediate use and they will not be stored near heat sources or in direct sunlight. Buildings used to store large quantities of hazardous substances are isolated from other buildings to avoid the spreading of fire (i.e. a minimum distance has been foreseen for blasting storage area - 200 m). The location of storage for the explosive materials will be at a safe distance from community dwellings and workers camps. Sufficient number of fire extinguishers will be provided in storage area. There will be no smoking, matches, open lights, or other fire or flame inside or within 10 meters of storage areas or explosive materials. Admittance will be restricted to the storage area responsible person, blasting supervisor, or licensed blaster. Storage will be locked and guarded at all times. Vehicles carrying explosive materials must be well-maintained, properly marked with placards, and have a non-sparking floor. Entrances, exits, and emergency equipment access will all be kept open at all times.

Prior to loading a vehicle with explosives, the vehicle must be fully fueled and inspected to ensure its safe operation. Materials in contact with the explosives will be non-sparking and the load will be covered with a fire and water-resistant tarpaulin. Vehicles will be equipped with fire extinguishers. No person shall smoke or carry matches or any other flame-producing device, nor shall firearms or loaded cartridges be carried while in or near a motor vehicle or conveyance transporting explosives. Motor vehicles or conveyances carrying explosives, blasting agents, or blasting supplies, shall not be taken inside a garage or shop for repairs or servicing.

In addition to waste generation, domestic wastewater resulting from workers will be generated during the pre-construction and construction phases. This type of wastewater will originate from facilities where the needs of employees are met, such as eating areas, toilets, and shower. According to TurkStat (2022), the average daily amount of wastewater per person is 197 L/day. Using this data, total wastewater generation for pre-construction and construction phases is calculated below:

- For pre-construction phase: 10 people x 197 L/person.day = 1970 L/day = 1.970 m^3/day
- For construction phase: 80 people x 197 L/person.day = 15760 L/day = 15.760 m^3/day

Since the Project area is located in a rural area and there is no municipal sewage system around the project area, wastewater will be collected in a sealed septic tank to be constructed at the Project site. Domestic wastewater will be collected by Elazığ Special Provincial Administration with vacuum trucks at

regular intervals when the septic tank capacity reaches 80%. The volume of the septic tank will be 50 m^3. It will be emptied by vacuum trucks every 10 days for pre-construction phase and every 2 days for construction phase.

Water to be used in dust suppression during the pre-construction and construction phases of the Project will be absorbed by soil or lost by evaporation. Therefore, there will not be any surface runoff formation or wastewater generation due to watering for dust suppression.

No significant impact resulting from waste generation is expected due to the nature and scale of the Project, as explained above. Therefore, the impact is assessed as direct and negative with short term duration for pre-construction and mid-term duration for construction, local and low significance. Mitigation measures are proposed in Chapter VII in order to prevent and/or minimize likely impacts will be implemented to further reduce the effects of the impacts on the environment.

Operation Phase

In the operation phase, there might be waste generation resulting from damaged, malfunctioned or end-of-life equipment and material that could be replaced or controlled during maintenance and repair activities to be performed periodically or in case of a breakdown. Also, procurement of new equipment, pieces and others will also result in the generation of packaging waste. Besides, personal protective equipment, clothes and rags used during maintenance and repair activities might result in a limited amount of waste generation. Generated municipal wastes during operation phase will be collected by the Municipality as in former phases.

10 workers are expected to be employed in the Project's operation phase. Therefore, municipal waste generation will be 11.3 kg/day and using the same approach as in pre-construction, the recyclable portion of the municipal waste and the amount of food waste will be 4.18 kg/day and 0.57 kg/day, respectively. After recyclable wastes are collected separately, they will be sent to licensed facilities according to the type of waste and will be managed in accordance with the waste management hierarchy.

In the operation phase of the Project, waste vegetable oil generation is not expected from meals/kitchen since staff meals will be provided by a catering service provider. However some limited machinery oil/lubricant waste is expected during maintenance/repair periods of the turbines, work equipment/vehicles and staff vehicles/shuttles. The maintenance/repair will be carried out by services licensed for the maintenance of the equipment/machinery/vehicle. Thus, there will be minor waste oil generation in the operation phase of the Project.

Table V.21 lists the waste types and waste codes that may occur during the operation phase of the Project, according to the waste lists given in the Waste Management Regulation's Annex. The wastes generated during the operation phase will be stored in a temporary waste storage area.

Table V.21 List of Possible Waste Types to be Generated during Operation Phase

Waste Code	Definition of Waste Code
13	**Oil Wastes and Liquid Fuel Waste (Excluding Edible Oils, 05 and 12)**
13 02	Waste Engine, Transmission and Lubrication Oils
13 03	Waste Insulation and Heat Conduction Oils
15	**Waste Packages, Unspecified Absorbents, Wipes, Filter Materials and Protective Clothing**
15 01	Packaging Wastes (Including Packaging Waste Separately Collected by the Elazığ Special Provincial Administration)
15 02	Absorbents, Filter Materials, Cleaning Cloths and Protective Clothing
16	**Waste Not Specified Otherwise in the List**
16 02	Electrical and Electronic Equipment Waste
16 06	Batteries and Accumulators
20	**Municipal Waste Including Separately Collected Fractions (Domestic and Similar Commercial, Industrial and Institutional Wastes)**
20 01	Separately Collected Fractions (Except 15 01)
20 03	Other Municipal Wastes

The impact is assessed as direct and negative with long term duration, local and low in significance. However, mitigation measures proposed in Chapter VII in order to prevent and/or minimize likely impacts will be implemented to further reduce the effects of the impacts on the environment.

V.7 Biological Environment

In this section, a critical habitat assessment is first made with the species identified in the BSA. If a threatened/endemic species is encountered as a result of monitoring in the later phases of the project, this assessment will be updated. The sensitivity of biodiversity components is then evaluated, and the magnitude of impact on these components is assessed.

V.7.1 Impact Assessment

The identification and assessment of the project's potential effects on biodiversity throughout the construction and operation phases are detailed in this section. The project's impacts have been assessed for each receptor species and project phase. Table V.32 provides a summary of mitigation measures and the overall assessment.

Biodiversity Receptors

The sensitivity of biodiversity receptors identified and potentially inhabiting the BSA has been evaluated according to the “Significance Criteria” provided in Table V.22 and given in Table V.23.

Significance Criteria

The significance criteria for the impacts on ecology and biodiversity were determined as high, moderate, or low based on evaluating the magnitude of impact and sensitivity/value of the receptors/resources. The sensitivity/value criteria used in the ecological impact assessment are summarized in Table V.22.

For the evaluation of the significance of the impacts on biodiversity of construction and operation phases of the project, the categorization matrix (3 x 3) given in Chapter V is used. EUNIS Habitat Types of the Project Area is given in the Figure V.6.

Table V.22 Criteria for Sensitivity/Value of Resource/Receptor (Ecology and Biodiversity)

Ecosystem Component	Sensitivity/Value Level			
	High (3)	Medium (2)	Low (1)	Negligible
Habitats	Areas that meet the criteria of the IUCN’s Protected Area Categories Ia, Ib and II. Internationally recognized and nationally protected areas. Annex I priority habitats designated in the EU Habitats Directive. Habitats that trigger critical habitat under the following IFC PS6 Criterion 4-5. Habitats that support species of High sensitivity	Areas of habitat that represent >1% distribution within Türkiye or are threatened at a national level. Annex I habitats (non-priority) designated in the EU Habitats Directive. Natural habitats that do not meet the Critical Habitat. Habitats that support species of medium sensitivity.	Modified habitats that do not meet the criteria for either medium or high sensitivity.	Hard surfaces like buildings, transportation networks, artificial water bodies, and waste deposits etc.
Species	Species populations that trigger critical habitat under the following IFC PS6 Criterion 1-2-3. Annex IV species designated in the EU Habitats Directive.	Nationally/ regionally important concentrations of VU species or locally important concentrations of CR and/or EN species. VU species by IUCN or national status. Important populations of endemic / range restricted species. Migratory species that do	NT or LC species by IUCN. Species of no national protection status.	

		not trigger Criterion-3. Annex II species designated in the EU Habitats Directive.		

Table V.23 Sensitivity of Biodiversity Receptors

Biodiversity Receptor		Sensitivity	Rationale
Habitats	E1.2 H3.6	Medium	Natural habitats that do not meet the Critical Habitat.
	X.10	Low	Modified habitats that do not meet the criteria for either medium or high sensitivity.
	J4.1	Negligible	Hard surfaces like buildings, transportation etc.
Flora Species	*Rhabdosciadium microcalycinum*	Medium	Regional Endemic and VU category in the RDB
	Sideritis vulcanica	Medium	Regional Endemic and VU category in the RDB
	Achillea magnifica	Low	NT category in the RDB
	Other flora species detected in the BSA	Low	LC species by IUCN and species of no national protection status
Herpetofauna	*Testudo graeca*	Medium	VU category in the IUCN Lists
	Other herpetofauna species dete”cted in the BSA	Low	LC species by IUCN and species of no national protection status
Birds	*Neophron percnopterus*	High	EN category in the IUCN Lists
	Merops apiaster	Medium	VU category in the IUCN Lists
	Haliaeetus albicilla	Medium	Migratory species that do not trigger Criterion-3
	Pernis apivorus	Medium	Migratory species that do not trigger Criterion-3
	Circus macrourus	Medium	Migratory species that do not trigger Criterion-3
	Falco subbuteo	Medium	Migratory species that do not trigger Criterion-3
	Milvus migrans	Medium	Migratory species that do not trigger Criterion-3
	Falco tinnunculus	Medium	Migratory species that do not trigger Criterion-3
	Hieraaetus pennatus	Medium	Migratory species that do not trigger Criterion-3
	Clanga pomarina	High	Migratory species trigger Criterion-3
	Buteo buteo	Medium	Migratory species that do not trigger Criterion-3
	Other bird species detected in the BSA	Low	NT or LC species by IUCN and species of no national protection status.
Mammals	Mammal species detected in the BSA except bats	Low	NT or LC species by IUCN and species of no national protection status
Bats	*Miniopterus schreibersii*	Medium	VU category in the IUCN Lists
	Myotis capaccinii	Medium	VU category in the IUCN Lists
	Other bat species detected in the BSA	Low	NT or LC species by IUCN and species of no national protection status

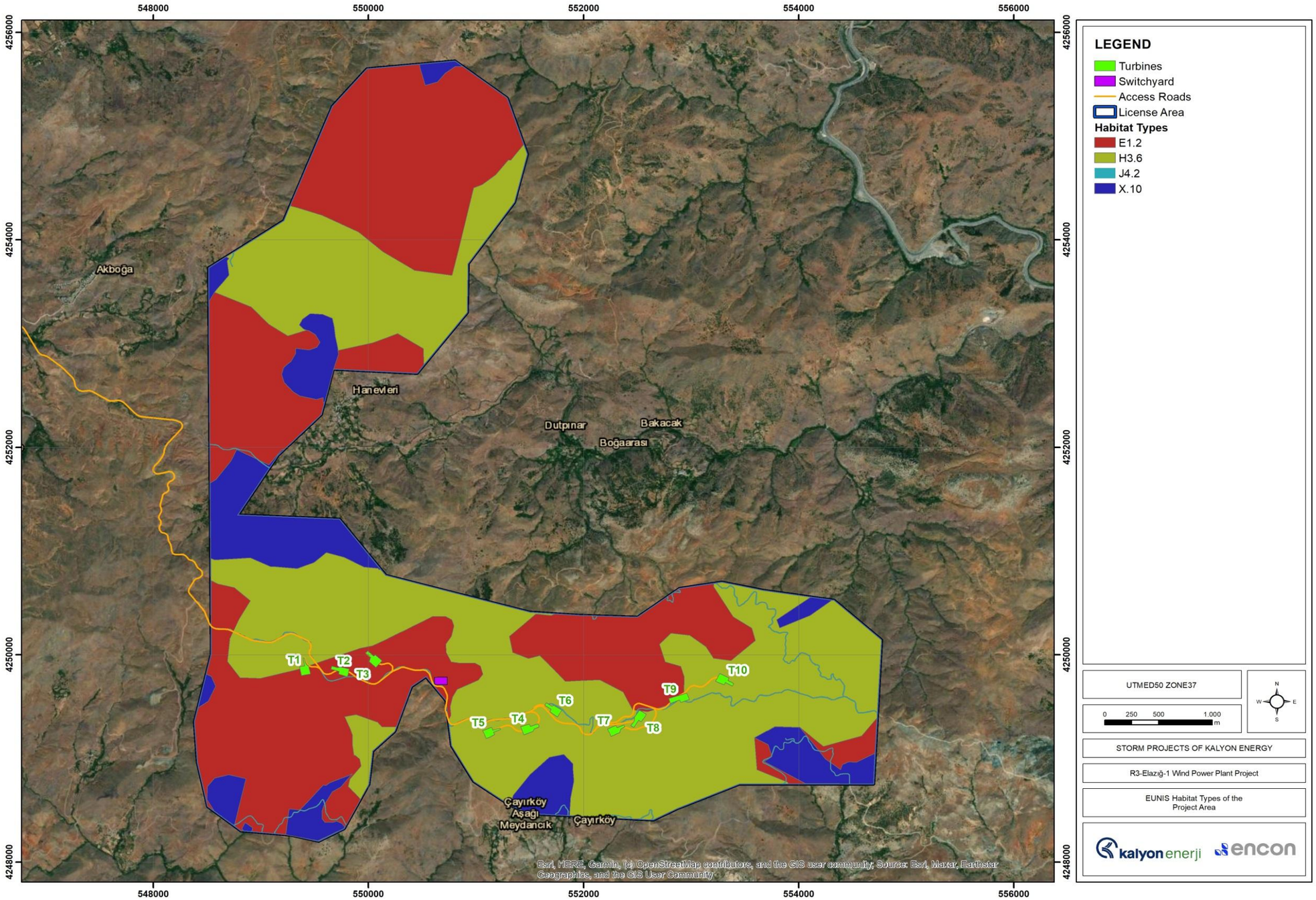


Figure V.6 EUNIS Habitat Types of the Project Area

Construction Phase Impacts on Biodiversity Components

The impacts of construction activities on biodiversity components are explained in the following items as a summary:

Table V.24. Project Actions and Related Impact Factors during Construction Phase

Project Actions	Impact Factors
General engineering/construction works	Habitat fragmentation and temporary or permanent loss of habitats resulting from the construction of turbines and access roads. Loss of flora species due to vegetation clearance. Destruction/disruption of nesting and foraging/feeding areas. Noise, vibration, light, and dust emissions resulting from construction activities and vehicles. Injuries/deaths of fauna due to traffic generated by vehicles. Introduction of invasive species into the construction area.
Material transportation	Noise, vibration, light, and dust emissions resulting from construction activities and vehicles. Injuries/deaths of fauna due to traffic generated by vehicles.

The probable magnitude of the impacts of the project's construction phase on biodiversity components is assessed under the following subheadings and summarized in Table V.25.

Habitat types and Flora Species

During the project's construction phase, with the vegetation clearing activities to be carried out for the construction of turbine areas and access roads, habitats and flora species in these areas will be cleaned.

The significant impact on biodiversity during the project's construction phase will result from habitat loss. The habitats that will be lost and their amount in hectares are given in Table V.27.

Since habitat loss will be low, the magnitude impact of the construction phase on habitat types is evaluated as "low".

Widespread flora species are also expected to be "low" affected by these losses. Regional endemic species are also present around the project area, but since they are regionally limited, the magnitude of impact has been evaluated as "medium".

Fauna Species

The most significant impact of the project on fauna species during the construction phase is habitat destruction and fragmentation, the discomfort caused by emissions such as noise, light and vibration from vehicles and works, injuries or deaths of fauna individuals because of traffic-driven by vehicles, and pollution from construction and domestic waste.

Vegetation clearing, and excavation works will negatively affect the vertebrates that use the soil as a nest.

Mobile fauna species affected by sound, noise and vibration will move to alternative habitats. *Testudo greaca* or juvenile vertebrates, such as those with movement restrictions, may be more affected by construction work.

No permanent roosts for bats were identified in the field studies carried out in BSA and especially at the turbine points. For this reason, the magnitude of impact on bats during the construction phase has been evaluated as "low".

Table V.25 The Magnitude of Construction Impacts on Terrestrial Flora-Fauna Species and Habitat Types

Component	Magnitude
Terrestrial Habitat Types	Low
Regional flora species	Medium
Other Flora Species	Low
Testudo graeca	Medium
Other herpetofauna and mammal species	Low
Songbirds	Medium
Other bird species	Low

Operation Phase Impacts on Biodiversity Components

The main impact on biodiversity during the operation phase of the project will be the impact of the turbines on birds and bats. The impacts of the operation phase on biodiversity are given in general in the following articles.

Table V.26. Project Actions and Related Impact Factors during Operation Phase

Project Actions	Impact Factors
General operation works	Permanent habitat loss due to turbine areas and habitat fragmentation due to access roads. Birds and bats hitting turbine blades/electric shock. Turbines' barrier effect on birds. Disturbance to wildlife due to noise, vibration, and light. Fauna injuries/deaths due to increased traffic. Spread of invasive species into the area.
Traffic	Fauna injuries/deaths due to increased traffic.

The probable magnitude of the impacts of the project's operation phase on biodiversity components is assessed under the following subheadings and summarized in Table V.32.

Habitat types and Flora Species

The significant impact on habitat during the operation phase of the project will be permanent habitat loss and fragmentation. Access roads, turbine settlements will cause permanent habitat loss. Permanent habitat loss has been calculated and given in Table V.27. As seen in Table V.27, permanent habitat loss is relatively small. The magnitude of project's impact on these habitats has been evaluated as "low". Flora species are also expected to be "low" affected by these losses.

Table V.27 EUNIS Habitat Types and Habitat Loss Calculation

EUNIS Code	EUNIS Habitat Type	Status	Area (ha)	Habitat Loss (ha)
E1.2	Perennial Limestone Grassland and Steppe	Natural	322.10	0.00
H3.6	Dry Rock Habitats	Natural	846.64	4.81
X10	Mosaic landscapes with a woodland element (bocages)	Modified	919.79	8.66
J4.2	Road networks	Modified	9.50	1.00

Fauna Species

As a result of permanent habitat loss and fragmentation, mobile fauna species will settle in alternative habitats in the immediate vicinity. The noise and vibration of the turbines will also cause disturbed species to leave the areas. Adaptable species will continue to make the area and its surroundings their habitat.

The magnitude of the impact during the operation phase for herpetofauna and mammal species, excluding bats, has been evaluated as "low".

Birds

WPP presents three main potential risks to birds:

- Death through collision or interaction with turbine blades.
- Direct habitat loss through WPP construction.
- Displacement through indirect habitat loss if disturbance causes birds to avoid the wind farm and its surroundings. Displacement can include barrier effects in which birds are deterred from using their regular routes to feeding or roosting grounds.

Collision Risk Modeling has been carried out with the data obtained from studies carried out in the autumn period for local and migratory bird species.

Accordingly, since the mortality rate of migratory and native bird species is low (<1.0), the mortality rate was not calculated separately for each species that fly in the risky area (SNH, 2010). Although the collision analysis results were low, since these studies were conducted only with autumn data, the collision risk of native and migratory species has been evaluated as "medium". The collision risk of songbirds has been assessed as "negligible" (see Table V.28).

Table V.28 The Magnitude of Operation Impacts on Bird Species

Component	Magnitude
Merops apiaster	Medium
Haliaeetus albicilla	Medium
Pernis apivorus	Medium
Accipiter nisus	Medium
Circus macrourus	Medium
Falco subbuteo	Medium
Milvus migrans	Medium
Falco tinnunculus	Medium
Hieraaetus pennatus	Medium
Clanga pomarina	Medium
Buteo buteo	Medium
Buteo rufinus	Medium
Other songbirds	Negligible

Bats

The significant impacts of WPPs on bats during the operation phase are loss or shifting of flight corridors and fatalities from collision to turbines and electrical shocks.

As a result of the studies, detected bats' level of collision with the turbines has been calculated (Eurobats, 2014). Accordingly, the magnitude of the impact on bats during the operation phase of the project is given in Table V.29.

Table V.29 The Magnitude of Operation Impacts on Bat Species

Component	Magnitude
Eptesicus serotinus	Medium
Myotis myotis	Low
Pipistrellus kuhlii	High
Pipistrellus nathusii	High
Pipistrellus pipistrellus	High

Mitigation Measures

Construction-Pre Construction Phase

Flora species

Under ex-situ conservation, the seeds of these species will be collected in October-November and delivered to the Türkiye Seed Gene Bank. Additionally, under in-situ conservation, some of the collected seeds will be planted in the road verges opened within the scope of the Project, helping to restore the steppe habitats damaged by road construction and offsetting population loss caused by the activity.

In-situ and ex-situ conservation measures for these species can be implemented during the ongoing project activities. This is because the critically distributed species also exist in similar habitats outside the project area. However, at least for three years, annual monitoring (May/June) will be conducted to assess the success of the in-situ conservation measures.

Monitoring studies will be carried out by the biodiversity assistant specialist. External flora expert consultancy will be obtained based on monitoring data if necessary.

Preventing dust formation from construction activities is crucial to ensure that natural habitats outside the activity areas are not affected. Dust prevention measures will be taken, and regular irrigation activities will be conducted according to seasonal conditions to prevent the closure of plant stomata due to dust emissions and population loss.

Fauna Species

Herpetofauna and Mammalia

- All stones in the area will be removed, and the vertebrate species underneath will be allowed to move away. People who will perform this application will wear gloves.
- Vegetation clearing outside March-June, daylight hours, to avoid disturbance to vertebrate species during breeding.
- To prevent damage to insectivorous species nested under leaves or in humus deposits in the area during excavation work for construction, they will be removed by hitting the surface before starting the excavation.

- If any vertebrate species is encountered during any area use, the species will be allowed to move away from the area without intervention.
- Especially when *Testudo graeca* is seen, time will be given to it to move away from the area.
- The project area will be clearly defined and marked in a way that everyone working in the area can perceive.
- Vegetation cleaning will be carried out only in necessary areas, existing roads on the site will be used as much as possible, and the area will be minimized.
- The roads to be used will be marked and limited in a way everyone can perceive.
- Before vegetation cleaning, trained personnel will remove vertebrate species and their nests or eggs from the area, and expert help will be obtained if necessary.
- Waste, dust, noise, vibration, and light will be minimized, and the measures in the Pollution Prevention Plan will be implemented.
- In the operational phase, the sound and noise generated by the turbines may disturb mammal and reptile species. Within this scope, adherence to the measures provided in the Pollution Prevention Plan will mitigate the impact and minimize the effect.
- Vehicle drivers will be trained on vertebrate species, allowing them to recognize the species they may frequently encounter in the area. They will be informed about what to do when they encounter these species. Especially when driving at night, vehicles will always use low-beam headlights. The measures specified in the Traffic Management Plan will be followed to ensure that the traffic within the project's scope does not harm vertebrate species.
- No boxes, parcels or crates will be left in the project area.
- Any activity that will endanger vertebrate species by creating odor and food sources in the project area and attracting them to the project area will be controlled.
- Monitoring will be carried out in the Project Area and alternative habitats. The presence of species that escape human influence in alternative habitats will be monitored. Detailed monitoring will be carried out when any impacts are identified. This monitoring will be carried out by Biodiversity Assistant Specialist.

Birds

- During the observations made at the BSA, it was determined that the region has steppe vegetation, and there are rocky areas and shrub-form trees around the points where the turbines will be installed. Nests, especially of passerine species, have been identified in these areas. Since the study was conducted in the autumn, it could not be determined whether the nests were active or not. If tree cutting is necessary, will not be done during the nesting season, and trained personnel will carry out nest control before cutting.
- Domestic waste generated during temporary and permanent accommodation during construction activities will not be kept within the site to prevent the project area from becoming attractive for wild animals.
- Monitoring of target bird species during the construction period will continue in the fall and spring. Monitoring will be carried out by the external ornithologist.

Bats

- If tree cut is necessary, nest screening for bats will be carried out before tree felling. Only non-nest trees can be cut down.
- Permanent roads and buildings to be constructed within the project's scope will be constructed to minimize the impact.
    - The structures will be as small as possible, and the roof edges will be closed to prevent bat entry.
    - Lighting systems that produce minimum heat and light will be used.
    - During periods bats are active, open doors and windows in buildings in the area will be closed with fly screen-like structures to prevent bats from entering the building and rooms.
    - The structures will not contain any insect collecting or sheltering features.

- Noise, vibration, lighting, and other disturbing effects during construction works will be minimized (see Pollution Prevention Plan).
- To minimize the risk during the construction phase, a distance at least equal to the length of the turbine blade will be maintained between the outermost point of the wind turbine and the nearest vegetation, such as shrubs or trees.
- The base of the area where the turbines are installed will be completely cleared of vegetation to form a circle of the same diameter as the width of the circle formed by the outermost points of the blades.
- The lighting in buildings will be planned to prevent insect orientation.
- After completing all construction works, no transplant vegetation will be used for the areas where vegetation has been disturbed during the construction activities. These areas, excluding a circle with a radius of at least 50 meters from the tower's center beneath the turbines, will be left to regenerate naturally. This is because the area, based on its ecological characteristics, is expected to undergo this process in a short period.
- Monitoring of target bat species during the construction period will continue in the fall and spring. Monitoring will be carried out by the external bat specialist.

Operation Phase

Flora species

- Monitoring of regional endemic flora populations will be carried out by external flora expert first year of operation and by the biodiversity specialist assistant in the following years. External flora expert consultancy will be obtained based on monitoring data if necessary.
- All habitat losses within the project area are permanent. Therefore, there is no area designated for rehabilitation. Disturbed vegetation during construction will be left to regenerate naturally, and where possible, seeds from the surrounding area will be scattered to facilitate natural succession. Non-native species will not be planted in the area. This approach will contribute to the recovery of damaged habitats. If the spreading of invasive species is observed, an appropriate eradication program will be developed and implemented. The monitoring will be carried out by the external flora expert in the first year of operation and by the biodiversity specialist assistant in the following years. External flora expert consultancy will be obtained based on monitoring data if necessary.

Fauna Species

Herpetofauna and Mammalia

- Monitoring studies will be conducted in project area and alternative habitats during operation. The monitoring will be carried out by the external fauna expert in the first year of operation and by the biodiversity specialist assistant in the following years.
- Traffic Management Plan measures will be followed to prevent harm to vertebrate species within project scope.
- During operation, driving only on-site roads allowed.
- Off-road driving/parking banned except for designated areas (e.g., maintenance).
- Site speed limit will conduct 20kph to prevent harm to fauna.
- In the operational phase, the sound and noise generated by the turbines may disturb mammal and reptile species. Within this scope, adherence to the measures provided in the Pollution Prevention Plan will mitigate the impact and minimize the effect.

Birds

- The turbines are planned to be installed in an east-west oriented area with an average altitude of 1600-1700 meters, and this area may create a barrier effect to north-south/south-north migration flights. Therefore, monitoring will be done during the spring and autumn migration periods in operation period.

- Bird monitoring will be conducted during migration periods. Monitoring frequency will adjust as needed; a shutdown policy is possible during monitoring.
- Bird mortality in vegetation-cleared areas around turbine bases will be monitored and carcass counts reported. An ornithologist will be consulted if bird deaths are observed.
- Bird monitoring will be conducted during migration periods. Monitoring frequency will adjust as needed; a shutdown policy is possible during monitoring.
- Bird mortality in vegetation-cleared areas around turbine bases will be monitored and carcass counts reported. An ornithologist will be consulted if bird deaths are observed.

Following the monitoring that meets the monitoring requirements of 'Post-construction Bird and Bat Fatality Monitoring for Onshore Wind Energy Facilities in Emerging Market Countries, Good Practice Handbook and Decision Support Tool, IFC 2023' in the first year of operation, the following measures will be implemented if deemed necessary and appropriate by the investor[34]:

- Turbine shutdown and restriction methods are used in coordination with surveillance systems such as bird detection radars and infrared and thermal imaging cameras. It assumes that whenever a dangerous situation occurs, for example if birds flying in a high collision risk area or within a safety perimeter, the wind turbine presenting the greatest risk stop spinning.
- Some measures for minimizing the collisions are based on sensory cues, such as auditory, visual and acoustic deterrents like long range acoustic device (LRAD), activated to scare or frighten birds and prevent them from coming closer to the wind turbines. Laser deterrents have also been suggested as relevant tools to deter birds during night-time and have been considered a mitigation option. Deterrents can also be activated by automated real-time surveillance systems as an initial mitigation step and prior to blade curtailment.
- Turbine operation can be restricted to certain times of the day, seasons or specific weather conditions. Curtailment and temporary shutdown of wind turbines are minimization measures for birds flying at the rotor swept height. Shutdown or curtailment can be performed whenever a bird is detected in a high collision risk area or within a perimeter of the wind farm, which can be referred as "informed curtailment". Additionally, temporary shutdown can be done during migration seasons or certain weather conditions.

Bats

- Monitoring will be conducted during the operation phase by bat expert.
- During the operation phase, the area cleared of vegetation at the base of the turbines will be checked, and a count will be made to see if there are any dead bats. If the number of deaths increases, an opinion from a bat expert will be sought.
- Detailed monitoring will be carried out when any impacts are identified.
- If a high risk for bats is determined during operation monitoring, the turbine will be stopped, and the source of the risk will be determined.
- During construction, the area cleared of vegetation at the base of the turbine will be constantly checked to prevent vegetation from forming. No chemicals will be used during this process.
- All kinds of waste generated in the facility will be left at least 5 km from the turbines.
- Heat dissipation of turbine rotors will be controlled and kept to a minimum.
- No substances (odor, color, etc.) will attract insects in any way within the turbine and its 100-meter surroundings.
- Collaborating with the administrations of the settlements near the project area, structures such as animal remains, and animal shelters that attract many insects and mosquitoes in the village and its surroundings will be organized. By reducing the number of insects and mosquitoes that constitute the food source for bats in the area, the population density will decrease.

[34] *1. Marques, Ana Teresa, et al., 2014 "Understanding bird collisions at wind farms: An updated review on the causes and possible mitigation strategies." Biological Conservation, Volume 179.*
2. Paula B. Garcia-Rosa and John Olav G. Tande. 2023 Mitigation measures for preventing collision of birds with wind turbines. J. Phys.: Conf. Ser. 2626.
3. Nygård, Torgeir, et al., 2020 "Paint it black: Efficacy of increased wind turbine rotor blade visibility to reduce avian fatalities." Ecology and Evolution, Volume 10, Issue 16.

- The settlements' irregular and scattered general lighting system will be rearranged and no longer be a fly and insect-attracting structure.

No flight belonging to the *Myotis capaccinii* and *Miniopterus schreibersii* species was detected in the studies that were carried out. However, the bat expert stated that the species is likely to be found in the region. All specified measures will be taken, considering the possibility that the species, whose population is risky and needs to be protected, may be active in and around the project area. In addition, monitoring will continue during the operation period. The possibility of the species being present in the area will be researched, and additional measures will be taken if necessary.

Monitoring

The most critical issue in monitoring studies is bird and bat monitoring during the operation phase. As a result of the studies, the probability of birds in the area hitting the turbines was calculated. However, these values are estimated since no active turbines are in the project area. Bird and bat collisions and deaths will be monitored in the operation phase, and additional measures will be taken if necessary.

The impacts associated with WPPs are highly unpredictable, even when robust pre-construction baseline survey results are available (Ferrer et al. 2012; Hein, Gruver, and Arnett 2013; Solick et al. 2020). Although rigorous pre-construction baseline studies are necessary to characterize risks, post-construction fatality monitoring is the only way to understand the actual collision impacts of WPPs on birds and bats. Implementing a robust monitoring program during the operational phase of a WPP is, therefore, critical for the effective management and mitigation of biodiversity impacts (IFC, 2023).

In this regard, ornithological monitoring will be carried out, especially during the operation phase. Monitoring will be carried out by an ornithologist, covering migration periods. Monitoring frequency will be changed if necessary, and a shut-down policy may be applied during monitoring.

During the first year of operation, monitoring will be established to adequately characterize bird and bat collision analyses at WPP and obtain accurate information on mortality rates. Based on these results, additional measures can be taken, and monitoring programs for the coming years will be determined.

The aim is to characterise wildlife collision adequately impacts for the first year and identify target species so that optimized monitoring can progress in subsequent years (IFC, 2023).

Bird and bat monitoring will continue for at least 3 years and will include breeding and migration seasons by ornithologist and bat expert.

During the construction period, bird, and bat species' use of BSA will continue to be monitored. Monitoring studies will continue during migration and breeding periods until construction is completed. The presence of *Neophron percnopterus, Myotis capaccinii*, *Miniopterus schreibersii and* other target species in the BSA will also be monitored within the scope of bird and bat monitoring studies.

The search pilot will be determined for each turbine, and bird and bat fatality and carcass scanning will be carried out in the migration and breeding period of the first year with the transect method.

Bat carcass scanning:

- March-May: once a week.
- June-September: every three days.
- October-November: once a week.

Bird carcass scanning:

- March - May: every three days.

- June-July: once a week.
- August-November: every three days.
- December-February: once a week.

According to these inspection results, mitigation measures can be changed, and the frequency of inspections in the following years will be determined.

Fauna deaths/injuries that may occur due to vehicles will be inspected and recorded weekly.

In this context, Table V.30, the monitoring table, is recommended by considering common approaches and implementations.

Table V.30 Biodiversity Monitoring Table of Construction Phase

Monitoring Parameter	Monitoring Frequency	Monitoring Method	EXPERT
Population persistence of *Rhabdosciadium microcalycinum and Sideritis vulcanica* species around BSA. Growth of *Rhabdosciadium microcalycinum and Sideritis vulcanica* seeds planted on roadsides with in-situ conservation.	Annually (May-June)	Observation and sampling	YEKA RES 3 Biodiversity Assistant Specialist with consultation of external flora expertt
The continuity of populations of fauna species that have fled or been relocated to alternative habitats	Twice a year (May and October)	Observation	YEKA RES 3 Biodiversity Assistant Specialist with consultation of external flora expert
Target Bird Species	Twice a year (March-June and August-November)	Observation	External Ornithologistt
Target Bat Species	Twice a year (May and October)	Observation	External Bat Expert
Presence of invasive flora species	Annually (May-June)	Observation and sampling	YEKA RES 3 Biodiversity Assistant Specialist with consultation of external flora expert

Table V.31 Biodiversity Monitoring Table of Operation Phase

Monitoring Parameter	Monitoring Frequency	Monitoring Method	EXPERT
Population persistence of *Rhabdosciadium microcalycinum and Sideritis vulcanica* species around BSA. Growth of *Rhabdosciadium microcalycinum and Sideritis vulcanica* seeds planted on roadsides with in-situ conservation.	First 3 years of Operation Annually (May-June)	Observation and sampling	YEKA RES 3 Biodiversity Assistant Specialist with consultation of external flora expert
The continuity of populations of fauna species that have fled or been relocated to alternative habitats	First three years of operation Twice a year (May and October)	Observation	YEKA RES 3 Biodiversity Assistant Specialist with consultation of external flora expert
Target Bird Species	First year of operation (March-June and August-November)	Observation	External Ornithologist
Bird collisions with turbines (carcass scanning)	First year of operation March - May: every three days. June-July: once a week. August-November: every three days. December-February: once a week.	Observation	YEKA RES 3 Biodiversity Assistant Specialist

Monitoring Parameter	Monitoring Frequency	Monitoring Method	EXPERT
Target Bat Species	First year of operation Twice a year (May and October)	Observation	External Bat Expert
Bat collisions with turbines (carcass scanning)	First year of operation March-May: once a week. June-September: every three days. October-November: once a week.	Observation	YEKA RES 3 Biodiversity Assistant Specialist
The return of fauna species to the area during the operational phase	First 3 years of Operation Twice a year (May and October)	Observation	YEKA RES 3 Biodiversity Assistant Specialist
Presence and spread of invasive species	First 3 years of Operation Twice a year (May and October)	Observation and sampling	YEKA RES 3 Biodiversity Assistant Specialist with consultation of external flora expert
Growing of degraded areas left to regenerate naturally	First 3 years of Operation Twice a year (May and October)	Observation and sampling	YEKA RES 3 Biodiversity Assistant Specialist

Summary of Assessment and Residual Impacts

Table V.32 provides a summary of the ecology and biodiversity assessments. The significance of the identified impacts before and after mitigation measures are summarized in this table.

Table V.32 Summary of the Biodiversity Assessments of Construction Phase

Biodiversity Component		Project Phase	Definition of Potential Impact	Impact			Magnitude	Sensitivity/ Value of Resource /Receptor	Impact Significance (Before Mitigation)	Significance of Residual Impacts
				Type	Extent	Duration				
Habitat Types	E1.2	Pre-construction Construction	• Temporary or permanent loss habitats	Adverse	Onsite	Permanent	Low	Medium	Low	Low
	H3.6			Adverse	Onsite	Permanent	Low	Medium	Low	Low
	X.10			Adverse	Onsite	Permanent	Low	Low	Low	Low
	J4.1			Adverse	Onsite	-	Negligible	Negligible	Negligible	Negligible
Flora Species	*Rhabdosciadium microcalycinum*		• Loss of flora species • Introduction of invasive species	Adverse	Onsite	Permanent	Medium	Medium	Medium	Low
	Sideritis vulcanica			Adverse	Onsite	Permanent	Medium	Medium	Medium	Low
	Achillea magnifica			Adverse	Onsite	Permanent	Low	Low	Low	Low
	Other flora species detected in the BSA			Adverse	Onsite	Permanent	Low	Low	Low	Low
Herpetofauna	*Testudo graeca*		• Habitat fragmentation • Temporary or permanent loss habitats • Destruction/disruption of nesting and foraging/feeding areas. • Noise, vibration, light, and dust emissions • Injuries/deaths of fauna due to traffic	Adverse	Local	Short-term	Medium	Medium	Medium	Low
	Other herpetofauna species detected in the BSA			Adverse	Local	Short-term	Low	Low	Low	Low
Birds	*Neophron percnopterus*			Adverse	Local	Short-term	Low	High	Medium	Medium
	Merops apiaster			Adverse	Local	Short-term	Low	Medium	Low	Low
	Haliaeetus albicilla			Adverse	Local	Short-term	Low	Medium	Low	Low
	Pernis apivorus			Adverse	Local	Short-term	Low	Medium	Low	Low
	Accipiter nisus			Adverse	Local	Short-term	Low	Low	Low	Low
	Circus macrourus			Adverse	Local	Short-term	Low	Medium	Low	Low
	Falco subbuteo			Adverse	Local	Short-term	Low	Medium	Low	Low
	Milvus migrans			Adverse	Local	Short-term	Low	Medium	Low	Low
	Falco tinnunculus			Adverse	Local	Short-term	Low	Medium	Low	Low
	Hieraaetus pennatus			Adverse	Local	Short-term	Low	Medium	Low	Low
	Clanga pomarina			Adverse	Local	Short-term	Low	Medium	Low	Low
	Buteo buteo			Adverse	Local	Short-term	Low	Medium	Low	Low
	Buteo rufinus			Adverse	Local	Short-term	Low	Low	Low	Low
	Other songbirds			Adverse	Local	Short-term	Medium	Low	Low	Low
	Other bird species detected in the BSA			Adverse	Local	Short-term	Low	Low	Low	Low
Mammalia	Mammal species detected in the BSA except bats			Adverse	Local	Short-term	Low	Low	Low	Low
Bats	*Eptesicus serotinus*			Adverse	Local	Short-term	Low	Low	Low	Low
	Myotis myotis			Adverse	Local	Short-term	Low	Low	Low	Low
	Pipistrellus kuhlii			Adverse	Local	Short-term	Low	Low	Low	Low
	Pipistrellus nathusii			Adverse	Local	Short-term	Low	Low	Low	Low
	Pipistrellus pipistrellus			Adverse	Local	Short-term	Low	Low	Low	Low
	Miniopterus schreibersii			Adverse	Local	Short-term	Negligible	Medium	Negligible	Negligible
	Myotis capaccinii			Adverse	Local	Short-term	Negligible	Medium	Negligible	Negligible

Table V.33 Summary of the Biodiversity Assessments of Operation Phase

Biodiversity Component		Project Phase	Definition of Potential Impact	Impact			Magnitude	Sensitivity/ Value of Resource /Receptor	Impact Significance (Before Mitigation)	Significance of Residual Impacts
				Type	Extent	Duration				
Habitat Types	E1.2	Operation	• Permanent habitat loss	Adverse	Onsite	Permanent	Low	Medium	Low	Low
	H3.6			Adverse	Onsite	Permanent	Low	Medium	Low	Low
	X.10			Adverse	Onsite	Permanent	Low	Low	Low	Low
	J4.1			Adverse	Onsite	Permanent	Negligible	Negligible	Negligible	Negligible
Flora Species	*Rhabdosciadium microcalycinum*		• Permanent flora loss • Spread of invasive species	Adverse	Onsite	-	Low	Medium	Low	Low
	Sideritis vulcanica			Adverse	Onsite	Permanent	Low	Medium	Low	Low
	Achillea magnifica			Adverse	Onsite	Permanent	Low	Low	Low	Low
	Other flora species detected in the BSA			Adverse	Onsite	Permanent	Low	Low	Low	Low
Herpetofauna	*Testudo graeca*		• Permanent habitat loss • Habitat fragmentation • Disturbance to wildlife due to noise, vibration, and light • Injuries/deaths due to increased traffic	Adverse	Onsite	Permanent	Low	Medium	Low	Low
	Other herpetofauna species detected in the BSA			Adverse	Onsite	Permanent	Low	Low	Low	Low
Birds	*Neophron percnopterus*		• Permanent habitat loss • Disturbance to wildlife due to noise, vibration, and light • Death/injuries through collision or interaction with turbine blades • Displacement through indirect habitat loss • Electrical shocks	Adverse	Onsite	Permanent	Medium	High	High	Medium
	Merops apiaster			Adverse	Local	Permanent	Medium	Medium	Medium	Low
	Haliaeetus albicilla			Adverse	Local	Permanent	Medium	Medium	Medium	Low
	Pernis apivorus			Adverse	Local	Permanent	Medium	Medium	Medium	Low
	Accipiter nisus			Adverse	Local	Permanent	Medium	Low	Low	Low
	Circus macrourus			Adverse	Local	Permanent	Medium	Medium	Medium	Low
	Falco subbuteo			Adverse	Local	Permanent	Medium	Medium	Medium	Low
	Milvus migrans			Adverse	Local	Permanent	Medium	Medium	Medium	Low
	Falco tinnunculus			Adverse	Local	Permanent	Medium	Medium	Medium	Low
	Hieraaetus pennatus			Adverse	Local	Permanent	Medium	Medium	Medium	Low
	Clanga pomarina			Adverse	Local	Permanent	Medium	Medium	Medium	Low
	Buteo buteo			Adverse	Local	Permanent	Medium	Medium	Medium	Low
	Buteo rufinus			Adverse	Local	Permanent	Medium	Low	Low	Low
	Other songbirds			Adverse	Local	Permanent	Negligible	Low	Low	Negligible
	Other bird species detected in the BSA			Adverse	Local	Permanent	Low	Low	Low	Low
Mammalia	Mammal species detected in the BSA except bats		• Permanent habitat loss • Habitat fragmentation • Disturbance to wildlife due to noise, vibration, and light • Injuries/deaths due to increased traffic	Adverse	Local	Permanent	Low	Low	Low	Low
Bats	*Eptesicus serotinus*		• Permanent habitat loss • Disturbance to wildlife due to noise, vibration, and light • Loss or shifting of flight corridors • Fatalities from collision to turbines • Electrical shocks	Adverse	Local	Permanent	Medium	Low	Low	Low
	Myotis myotis			Adverse	Local	Permanent	Low	Low	Low	Low
	Pipistrellus kuhlii			Adverse	Local	Permanent	High	Low	Medium	Low
	Pipistrellus nathusii			Adverse	Local	Permanent	High	Low	Medium	Low
	Pipistrellus pipistrellus			Adverse	Local	Permanent	High	Low	Medium	Low
	Miniopterus schreibersii			Adverse	Local	Permanent	Negligible	Medium	Negligible	Negligible
	Myotis capaccinii			Adverse	Local	Permanent	Negligible	Medium	Negligible	Negligible

V.7.2 Ecosystem Services

IFC PS 6, 2012 defines ecosystem services as “the benefits that people, including businesses, obtain from ecosystems”. Ecosystem services are organized into four major categories:

Provisioning ecosystem services include, among others:

1. Agricultural products, seafood and game, wild foods, and ethnobotanical plants.
2. Water for drinking, irrigation, and industrial purposes.
3. Forest areas provide the basis for many biopharmaceuticals, construction materials, and biomass for renewable energy.

Regulating ecosystem services includes, among others:

1. Climate regulation and carbon storage and sequestration
2. Waste decomposition and detoxification
3. Purification of water and air
4. Control of pests, disease, and pollination
5. Natural hazard mitigation

Cultural services include, among others:

IV. Spiritual and sacred sites
V. Recreational purposes such as sport, hunting, fishing, and ecotourism
VI. Scientific exploration and education

Supporting services are the natural processes that maintain the other services, such as (i) nutrient capture and recycling, (ii) primary production, and (iii) pathways for genetic exchange.

The ecosystem services impact assessment identified in R3-ELAZIĞ-1 WPP is given in Table V.35. Criteria used to define the value of ecosystem services are shown in Table V.34.

Detailed information about Agricultural products, wild foods, ethnobotanical plants, and Recreational purposes such as sport, hunting, and ecotourism and the measures to be taken are given in Chapters VII.

Table V.34 Criteria to Define the Value of Ecosystem Services

		Replicability of the service		
		High (lots of Geographic locations possible)	**Moderate (a few geographic locations possible)**	**Low (a few to no other possible geographic location)**
Importance to beneficiaries of the ecosystem service	**Minor**	Low	Low	Medium
	Moderate	Low	Medium	High
	High	Medium	High	Critical
	Essential	High	Critical	Critical

Table V.35 Summary of the Ecosystem Services

Provisioning Services	Project Related Services	Importance to Beneficiaries	Replicability	Value	Significance of residual impact
Agricultural products, seafood and game, wild foods, and ethnobotanical plants.	Animal grazing, bee keeping, herb gathering	High	High	Medium	Low
Water for drinking, irrigation, and industrial purposes.	NA	-	-	-	-
Forest areas provide the basis for many biopharmaceuticals, construction materials, and biomass for renewable energy.	NA	-	-	-	-
Regulating Services					
Climate regulation and carbon storage and sequestration	NA	-	-	-	-
Waste decomposition and detoxification	NA	-	-	-	-
Purification of water and air	NA	-	-	-	-
Control of pests, disease, and pollination	NA	-	-	-	-
Natural hazard mitigation	NA	-	-	-	-
Cultural Spiritual, and Recreational Services					
Spiritual and sacred sites	NA	-	-	-	-
Recreational purposes such as sport, hunting, fishing, and ecotourism	Hunting	Minor	High	Low	Negligible
Scientific exploration and education	NA	-	-	-	-
Supporting services					
Nutrient capture and recycling	NA	-	-	-	-
Primary production	NA	-	-	-	-
Pathways for genetic exchange	NA	-	-	-	-

V.8 Social Impacts of the Project

V.8.1 Population/ Demography

Pre-Construction and Construction Phases

For the Project, the pre-construction works will start and last for one month. The continuation of this process is the construction phase of the project, which will last 12 months.

It is anticipated that there will be 80 personnel working on site at the peak period of construction activities, some of which are anticipated to be unskilled. Contractors will be contractually required to maximize the use of the local workforce, especially by utilizing the experienced and qualified workforce available in Maden. Thus, the impact of the Project related employment on the population movements in the region is considered to be limited during the construction phase. On the other hand, Labour and Influx Management Plan was prepared for the project to manage possible labour influx issues.

There will be a camp area (7-8 containers) within the YEKA area where the staff can meet their basic requirements such as offices, dining hall (food will be transported from outside), tea house (kitchen), sinks, but there will be no on-site accommodation for the construction workforce. Therefore, local settlements are not expected to be negatively affected in this regard.

Workers will be accommodated in apart, hotels, etc. in Elazığ and/or Maden. Construction personnel will be transported to the Project area by service buses. Considering the current population size of the settlements, they are not expected to be negatively affected in this regard.

Operation Phase

The operation team will consist of 10 personnel, and they will work 8 hours a day in one shift. Thus, the Project is not likely to bring any significant positive or adverse impact on the population during the operation phase. However, local procurement and local employment will reduce as a result of the end of the construction phase.

No additional impacts are anticipated during the closure phase of the project, apart from those already outlined during the construction and operation phases.

V.8.2 Land Acquisition

Pre-Construction and Construction Phases

Land and other assets are related to the planned land acquisition during the construction period. The land acquisition to be carried out should be in accordance with IFC performance standard 5 Land Acquisition.

Impact on Public Land

The Project requires acquisition of public lands. 97.3% of the areas affected by project-related expropriation are public land registered as treasury, village legal entity and public common property. Data about the total size of the pasture area at the AoI could not be reached. However, the pasture area to be acquired is only 7.6% of the affected pasture parcels. Thus, the Project's impact on pasture resources is very limited. The land to be acquired for the Project will not impede or restrict PAPs' access to common resources as the License Area or the Project units except the substation site will not be fenced. However, a Community Development Plan was prepared for the settlements at AoI. The improvement of the remaining part of the pasture parcel would have positive economic impacts on the PAPs using the area for grazing or beekeeping purposes. Thus, the Project Company will collaborate with the Provincial Directorate of Agriculture and Forestry in order to identify and implement potential feasible pasture improvement measures, which will be subject to the final approval of the Pasture Commission established under the Provincial Directorate.

There is no informal housing/ user on public lands.

Impact on Private Land

The project does have an impact on private lands. 2.7% of the areas affected by project-related expropriation are private land. As it is known that the project will affect 28 private parcels. A total of 102 shareholders are expected to be affected. There is no house in the expropriation area so expropriation will not cause physical resettlement.

The number of parcels, more than 15% of which will be expropriated, is 7. The total number of shareholders of these 7 parcels is 24. Among these parcels, there are parcels with critical expropriation rates of 28,8%, 38,5%, 46,4%, 52,8% and 100% which may cause a decrease in income. The parcels to be expropriated at 28,8%, 38,5%, 46,4% and 52,8% are owned by 1 shareholder each and the expropriated area of these parcels are 673.78 m^2, 1.285,67 m^2, 862,08 m^2 and 113,07 m^2. During the interviews with the headmen, it was learned that owners of these parcels come to the settlement only during the summer months and they plant vegetables for their use.

The total area of the parcel to be expropriated at 100% is 265,96 m^2 and owned by 18 shareholders each. The headmen stated that the owners of this parcel come to the settlement only during the summer months, they plant vegetables for their use and also use trees such as willow and oak around the garden as firewood.

As a result, there will be no physical resettlement, but the income level or quality of life of some owners/ shareholders will be negatively affected. Community Development Plan is prepared for income restoration. Providing different supports (such as seedling, feed, seed, or fertilizer) would have positive economic impacts on the PAPs.

Operation Phase

It is anticipated that the operational activities of the project will not cause an additional impact on land acquisition.

No additional impacts are anticipated during the closure phase of the project, apart from those already outlined during the construction and operation phases.

V.8.3 Economy/ Employment and Livelihoods

Pre-Construction and Construction Phases

The impacts of WPP on the local economy during construction periods were evaluated according to the aspects of local employment, local procurement, residence in the districts, contribution to the training of qualified labour force and agriculture and animal husbandry.

The project will contribute to the local economy by creating short-term jobs during the construction phase. As mentioned above, it is anticipated that there will be 80 personnel working on site at the peak period of construction activities, of which 35% is anticipated to be unskilled. Contractors will be contractually required to maximize the use of the local workforce, especially by utilizing the experienced and qualified workforce available in Maden.

The construction of the Project will result in temporary positive economic impacts because of the procurement of goods and services required during the construction phase. In addition to the local procurement of construction materials, procurement of goods and services (such as transport, catering, laundry, food supply, etc.) is planned to be supplied locally and regionally to the extent possible. Thus, the Project is anticipated to contribute to the local economy. So, it can contribute to the economy of settlements near the project area and Maden district.

Residence in Maden district will contribute to the economy of the district. Local employment will also contribute to the development of the economy of the settlements at the AoI. Employment of non-locals, as well as the increase in incomes of local employees, is also expected to bring in some benefits for local communities, associated with increased spending in the Project area, which would bring positive economic impacts for the small-scale settlements located in the vicinity of the Project Area.

It is also expected to contribute to the training of qualified personnel as a result of improving the knowledge and skills of workers during the WPP construction period.

Land acquisition related to the project will affect registered parcels in a total of 6 settlements of Maden, namely:

- Akboğa
- Çayırköy
- Dutpınar
- Hanevleri
- Işıktepe
- Çitli[35]

The project does have an impact on private lands; also, they have an impact on lands owned by the treasury, public common property and legal entity.

Agriculture

As the project does have an impact on private lands, a negative impact on agriculture is expected. There are 28 privately owned parcels, while the amount of expropriation will be very low in some parcels, it will be high in others. The number of parcels, more than 15% of which will be expropriated, is 7. The total number of shareholders of these 7 parcels is 24. Among these parcels, there are parcels with critical expropriation rates of 28,8%, 38,5%, 46,4%, 52,8% and 100% which may cause a decrease in income.

The parcels to be expropriated at 28,8%, 38,5%, 46,4% and 52,8% each are owned by 1 shareholder and the expropriated area of these parcels are 673.78 m^2, 1.285,67 m^2, 862,08 m^2 and 113,07 m^2 respectively. During the interviews with the headmen, it was learned that owners of these parcels come to the settlement only during the summer months and they plant vegetables for household consumption.

The total area of the parcel to be expropriated at 100% is very low (265,96 m^2) and owned by 18 shareholders. The headmen stated that the owners of this parcel come to the settlement only during the summer months, they plant vegetables for household consumption and also use trees such as willow and oak around the garden as firewood.

The expropriated area of privately owned lands is very limited. The owners of these parcels come to the settlement only during the summer months, which means their economy is not based on agriculture but they plant vegetables for their use. Therefore, loss of land will negatively affect production of agricultural products for household consumption. Community Development Plan is prepared for income generation/ restoration.

[35] *According to the cadastral records, 5 private parcels affected by the project are seen in Citli village, but it was learned that their owner/user were within the borders of Isıktepe village. Therefore, Citli was removed from the AoI.*

Table V.36 Land Requirement by Expropriated Rates

Settlements	Number of Affected Private Parcels	More than 15% of which will be expropriated	State of Expropriated Rates (%)	Number of Affected Shareholders	Total Area of the Affected Parcel (m^2)	Area to be Expropriated (m^2)	Notes
Akboğa	14	0	N/A	N/A	N/A	N/A	N/A
Işıktepe	9	6	16.4	3	9,352.26	1,533.42	They only come to the village in the summer months and are planting vegetables in the garden.
			17.8	1	2,025.97	360.98	They only come to the village in the summer months and are planting vegetables in the garden.
			38.5	1	3,337.00	1,285.67	They only come to the village in the summer months and are planting vegetables in the garden.
			46.4	1	1,857.94	862.08	They only come to the village in the summer months and are planting vegetables in the garden.
			52.8	1	214.11	113.07	They only come to the village in the summer months and are planting vegetables in the garden.
			100.0	18	265.96	265.96	They only come to the village in the summer months and are planting vegetables in the garden.
Çitli	5	1	28.8	1	2,336.39	673.78	They only come to the village in the summer months and are planting vegetables in the garden.
Grand Total	**28**	**7**	**-**	26	19,389.63	5,094.96	-

Grazing Area and Animal Husbandry

Animal husbandry is the first source of income in the Hanevleri village of Maden, and the third source of income in Akboğa, Çayırköy, Dutpınar and Işıktepe. Approximately 41% of households at the AoI are engaged in animal husbandry. Data about the total size of the pasture area at the AoI could not be reached. However, the pasture area to be acquired is only 7.6% of the affected pasture parcels.

The Project will not restrict access to grazing areas within the pastureland at the YEKA area. As the affected pasture area will be limited and there will be no fencing around the License Area of the Project units except the substation site. Thus, Project-related impact is not anticipated on animal husbandry. However, Community Development Plan was prepared for the settlements at AoI. The improvement of the remaining part of the pasture parcel would have positive economic impacts on the PAPs using the area for grazing or beekeeping purposes. Thus, the Project Company will collaborate with the Provincial Directorate of Agriculture and Forestry in order to identify and implement potential feasible pasture improvement measures, which will be subject to final approval of the Pasture Commission established under the Provincial Directorate.

Beekeeping

Official information about the number of bees and the number of beehives, requested from the Beekeeping Registration System, could not be accessed, according to interviews beekeeping is practiced in all settlements as an additional income source at the AoI. However, there are 30 households in Akboğa and 1 household in Işıktepe whose main source of income is beekeeping. The total number of beekeeping households in these settlements is 74.

During the field studies, it was observed that local people are using the project area for beekeeping activities and there were many beehives at the project area. Problems related to beekeeping were raised during the headman meetings. The headman of Akboğa has serious concerns about this issue, other village headmen also think that beekeeping may be negatively affected due to the Project. They mentioned their concerns as follows:

- Pasture damage may occur,
- WPP dries the herbs and the camel flower.
- WPP changes the bees' directions.
- WPP affects water resources.

Since the pasture area to be acquired is only 7.6% of the affected pasture parcels, it is not anticipated that the Project will have an impact on beekeeping. According to the literature, there is no evidence that WPP dries the herbs and the camel flower or changes the bees' directions. Bees/ beehives may be impacted by dust and noise during construction. The air quality modelling results presented in Chapter V.6.9 (“Air Quality”) show that the Project’s construction activities will cause significant dust effects on beehives in the YEKA area. The noise modelling results presented in Chapter V.6.10 (“Noise and Vibration”) also show that the noise and vibration effect caused by construction activities will have a significant impact at these locations. Although, during the field studies conducted as part of the ESIA process, it has been identified that there are active beehives and beekeeping activities within the YEKA area, It was learned that beekeepers place their beehives seasonally.

Mitigating dust and noise or relocating the beehives should be considered to mitigate the negative impact on livelihoods sourced from beekeeping. it is important to keep the beekeepers in the AoI informed about the construction sites and schedule so as to ensure that the beekeepers are well informed about the upcoming activities and potential future beehives placed outside the impact area of the construction activities throughout the temporary construction duration.

Mushroom and Herb Gathering

According to the information obtained from the headmen and household interviews, people at the AoI are not using the project area for mushroom or herb collection activity.

Operation Phase

The operation team will consist of 10 personnel and they will work 8 hours a day in one shift. Thus, the Project is not likely to bring any significant positive or adverse impact on the local economy or employment levels in the operation phase. However, local procurement and employment are expected to decrease with the end of the construction period.

According to the literature, there is no evidence that noise generated by WPP during operation has a negative effect on beehives. However, noise level and impact on bees/ beehives should be monitored.

No additional impacts are anticipated during the closure phase of the project, apart from those already outlined during the construction and operation phases.

V.8.4 Education and Health Services

Pre-Construction and Construction Phases

There are no high schools or secondary schools in the settlements within the project AoI. Only there is one primary school in Işıktepe. There are no health facilities in all settlements, except Işıktepe. There is a first-level health service located in Işıktepe. The Project facilities will be located outside of the settlements. Therefore, educational or health services will not be affected by the WPP.

The Project construction works will not cause a worker influx. Also, the construction workers to be employed during the temporary construction period will use the medical facility to be provided on-site for issues that can be treated on-site (e.g. minor injuries, sickness) and will only be transferred to the external healthcare facilities for potential major incidents. Thus, the Project is not anticipated to increase the existing patient load of the healthcare services at Elazığ and Maden. On the other hand, Labour and Influx Management Plan was prepared for the project to manage possible labour influx issues.

Operation Phase

It is anticipated that the operational activities of the project will not cause an additional impact on education and health services.

No additional impacts are anticipated during the closure phase of the project, apart from those already outlined during the construction and operation phases.

V.8.5 Vulnerable/Disadvantaged Groups

Pre-Construction and Construction Phases

Poor households, female-headed households, child-headed households, and households with disabled people are considered vulnerable groups.

The construction-related effects including dust emissions and noise generation might temporarily affect this receptor during the period of construction activities. According to Air Quality Modeling, dust emissions will be limited to localized impacts and will not cause long-term or diffuse changes in local air quality. Particulate matter deposition, however, will cause short-term impacts on settlements and agricultural areas close to the project area.

According to the noise modelling study, the noise generated during pre-construction and construction is above the Project standard up to a distance of 200 meters, while after a distance of 200 meters the results are below the Project standard. There is no settlement area 200 m from the tribune locations. Vulnerable persons will be closely monitored and consulted throughout the construction activities in order to avoid and/or mitigate potential impacts.

Operation Phase

During the operation phase, noise sources are very limited. Noise will mainly be generated from the operation of the wind turbines. Wind turbines in operation produce noise that varies with wind speed. According to the noise modelling study, there is no noise generation exceeding the Project standards during the operation phase of the Project.

During the operation phase of the Project, impacts on dust would be almost insignificant.

No additional impacts are anticipated during the closure phase of the project, apart from those already outlined during the construction and operation phases.

V.8.6 Infrastructure Services

Pre-Construction and Construction Phases

WPP construction activities are not expected to have an impact on the infrastructure facilities of the settlements such as drinking water supply and sewerage system, electricity, solid waste collection and public transport. On the other hand, Labour and Influx Management Plan was prepared for the project to manage

possible labour influx issues. Besides, a Community Development Plan was prepared for the settlements at AoI. The improvement of the roads would have positive economic impacts on the PAPs.

Operation Phase

It is anticipated that the operational activities of the project will not cause an additional impact on infrastructure services.

No additional impacts are anticipated during the closure phase of the project, apart from those already outlined during the construction and operation phases.

V.8.7 Working Conditions and Labour Management

Labour relations are governed by the provisions of the Turkish Labor Law (4857 numbered). The Law of Turkish on Occupational Health and Safety (numbered 6331) provides for provisions on occupational health and safety and applies to direct and contracted workers, including foreign workers. Social Security and General Health Insurance Law (Law No: 5510) regulates social insurance and general health insurance. Turkish labour law and related regulations cover the basic principles of international labour standards and the IFC PS 2 in the issues of equal treatment of employees, restrictions on the working age and employment of children, avoidance of forced labour and ensuring occupational health and safety at the workplaces. Türkiye is a party to a multitude of ILO conventions, including but not limited to the conventions on equal treatment of employees, gender equality, child labour, forced labour, OHS, right of association and minimum wage.

On the other hand, as is the case with many countries transitioning to international standards, labour-related problems, especially on employment rate, women's presence in the workforce, freedom of association and child labour exist in Türkiye. In addition to these, another issue that has become prominent recently is the informal employment (unregistered /uninsured employment) of refugees and other foreign seasonal workers.

Unregistered/Uninsured Employment

According to the data of the General Directorate of Immigration Authority dated September 14, 2023, there are 4 million 638 thousand 461 refugees in Türkiye, most of which consist of Syrian refugees. The number of Syrians in Türkiye under temporary protection is 3,381,429. According to the data published by the Ministry of Labor and Social Security, the number of foreigners granted work permits in 2021 is 168,103. However, the numbers of the Ministry of Labor and Social Security are of course not sufficient to make a definitive judgment about the foreign workforce. Because many Syrian refugees, especially, work in unregistered jobs. This resulted in the illegal employment of refugees with significantly lower wages and no insurance and thus the displacement of Turkish workers, consequently leading to an increase in conflict.

As per the 2024 Türkiye Migration Report issued by the Ministry of Interior Affairs – General Directorate of Immigration Authority, Istanbul, Gaziantep and Şanlıurfa provinces have the highest numbers of registered Syrian refugees with 530,243, 427,782 and 289,240 refugees, respectively. The number of registered Syrian refugees in Elazığ province is 11,686 which is 1.90% of the total province population.

Gender Equality/ Women Participation in the Labour Force

According to Turkstat 2021 Labour Force Statistics, the labour force participation rate was estimated at 70.3% for men and 32.8% for women in Türkiye. The youth unemployment rate for the 15-24 age group was realized as 22.6% with a 2.3 percentage point decrease in 2021. The unemployment rate in this age group was estimated as 19.4% for men and 28.7% for women.

Child Labour

According to ILO, the term child labour is defined as work that deprives children of their childhood, their potential and their dignity and that is harmful to physical and mental development. Article 1 of the UN Convention on the Rights of the Child, which Türkiye is a party to, defines “child” as a person under the age of 18.

Türkiye has ratified all key international conventions concerning child labour including ILO C. 138, Minimum Age, ILO C. 182, Worst Forms of Child Labor; UN CRC; UN CRC Optional Protocol on Armed Conflict; UN CRC Optional Protocol on the Sale of Children, Child Prostitution and Child Pornography; Palermo Protocol on Trafficking in Persons.

In Türkiye, the definition of child labour was made in Article 4 of the Regulation on the Procedures and Principles of Employing Children and Young Workers, which was issued based on Article 71 of the Labour Law No. 4857. According to this article; a “child worker” is defined as a person who completed the age of 14, has not completed the age of 15 and completed primary education, and a “young worker” is defined as a person who has completed the age of 15 but has not completed the age of 18. In addition, a light duty definition has been made in the same article and it has been ensured that children and young workers may be employed in light work that will not prevent their success at school and the preparations to be made for the choice of profession, or the participation in vocational training, whose qualifications are accepted by the competent authorities. With the amendment made in 2015 in Article 71 of the Labour Law, under the condition of a written contract and getting permission for each of the activities, children under the age of 14 may be employed in arts, culture and advertising activities that do not impede their physical, mental, social and moral development and their attendance to school has been ensured.

In Occupational Health and Safety Law No. 6331, those who have completed the age of 15 but have not completed the age of 18 are defined as young employees.

In 2018, Türkiye made a moderate advancement in efforts to eliminate the worst forms of child labour. The government signed a Joint Declaration on the Elimination of Child Labor, declaring 2018 as the Year of Elimination of Child Labor.

According to Findings on the Worst Forms of Child Labor of International Child Labor and Forced Labor Reports (U.S. Department of Labor, 2022) the Integrated Model for the Elimination of the Worst Forms of Child Labor in Seasonal Agriculture in Hazelnut Harvesting prevented 1,022 children from working in hazelnut harvesting and was extended to 2020. However, children in Türkiye age in the worst forms of child labour, including commercial sexual exploitation and recruitment by non-state armed groups. Children also perform dangerous tasks in seasonal agriculture and small and medium manufacturing enterprises.

Forced Labour

International Labour Organisation (ILO) Convention No. 29 on Forced Labour was adopted by Türkiye on 30 October 1998. According to Trafficking in Persons Report: Türkiye Country Narrative (United States Department of State, 2022) 133 victims of forced labour were identified in Türkiye in 2021. Forced labour has been reported in several sectors, including agriculture, domestic service, garments, textiles, and construction, with migrant workers and refugees, particularly at risk.

Occupational Health and Safety

There is no comprehensive database on occupational health and safety in the wind energy industry. The fact that the only accessible source of OHS data is maintained by an independent alliance campaigning for the reform of the Scottish Government’s wind energy policy, Scotland Against Spin (SAS).

According to SAS, the data on Turbine Accident Statistics is by no means fully comprehensive. On 11 December 2011, the Daily Telegraph reported that Renewable UK confirmed that there had been 1500 wind turbine accidents and incidents in the UK alone in the previous 5 years. In July 2019 Energy Voice and the

Press and Journal reported a total of 81 cases where workers had been injured on the UK's windfarms since 2014. But the data provided by Scotland Against has only 15 of these (<19%).

According to SAS data, until 2023, 3,493 accidents 168 of which resulted in 232 fatalities. Of the 232 fatalities, 138 were wind industry and direct support workers (divers, construction, maintenance, engineers, etc), or small turbine owners/operators. 94 were public fatalities, including workers not directly dependent on the wind industry (e.g. transport workers, and ecologists).

355 accidents regarding human injury are documented. During the accidents, 388 wind industry or construction/maintenance workers were injured, and a further 84 members of the public or workers not directly dependent on the wind industry (e.g. firefighters, transport workers, fishermen) were also injured.

Working at heights, sometimes in tight areas similar to confined spaces, isolation, lack of nearby emergency response capabilities, the physical demands of climbing towers, working in very cold temperatures, and the risks of electric shock or electrocution are the issues in wind turbine occupational health and safety.

Health Services

There are no health services at the settlements at AoI. Only, it was informed that healthcare units providing first-level health services are located in Isiktepe village in the AoI. The health services capacity of the region is developed. The state hospital is located in the district center.

Pre-Construction and Construction Phases

Working Conditions and Labour Management

It is anticipated that there will be 80 personnel working on-site at the peak period of construction activities, some of which are anticipated to be unskilled. The construction workforce will be required for the earthworks, construction of foundations, turbine erection and electricity work. Among these jobs, both skilled and unskilled workers are required. YEKA RES 3 will request the Contractors to give priority to employment from the local workforce available in settlements at AoI and also Maden. The Turkish Labour Law already provides for the basic principles of international labour standards and the IFC PS2 and compliance of the Project with the national legislation will ensure equal treatment of employees, compliance with the restrictions on the working age and employment of children and avoidance of forced labour. All contractors/subcontractors will be responsible for implementing Project Standards for the management of their workforce.

Workers will be accommodated in aparts, hotels, etc. in Elazığ and/or Maden. Construction personnel will be transported to the Project area by service buses. Considering the current population size of the settlements, they are not expected to be negatively affected in this regard.

As the number of construction workers is limited and the total period for construction is foreseen to be 12 months (the peak construction period when all the 80 workers will work at the same time will be a much shorter duration), the adverse impacts on the nearby district centers, such as increased demands on infrastructure, services and utilities, development of illicit trade activities and inflation in local rent and other subsistence items, are anticipated to be minor. Similarly, the benefits of off-site housing on the economies of the nearby district centers are also anticipated to be limited and temporary.

The following measures will be taken in order to minimise potential impacts that be caused due to off-site accommodation of Project personnel:

- The labour management process will be implemented by YEKA RES 3 in alignment with national and international requirements. It will include the following principles, which are also applicable to all contractors-subcontractors in creating better working conditions:
- YEKA RES 3 will analyze the accommodation options preferred/selected by non-local workers in collaboration with the Contractors' management and ensure that service buses are provided for the non-local workers accommodating in the nearby district and town centers in order to ensure

the safe travel of the Project workers to the Project site and minimize Project-related traffic in the region.
- YEKA RES 3 will ensure that the relevant aspects of the EBRD/IFC Guidance Note on Workers' Accommodation (2009) will apply to Project-related off-site accommodation.

At the construction site, potable and sanitary water will be supplied in line with the requirements of the national legislation. On-site facilities such as sanitary facilities and medical/first aid facilities will ensure compliance with the Project Standards.

Occupational Health and Safety

The major OHS hazards for the pre-construction and construction phase of wind energy facilities are related to earthworks required for internal site access road construction and preparation of turbine foundations, lifting operations and working at height.

Working at height occurs frequently throughout all phases of operation at any wind energy facility and is especially relevant for maintenance purposes. The main focus when managing working at height should be the prevention of a fall. However, additional hazards that may also need to be considered include falling objects and adverse weather conditions (wind speed, extreme temperatures, humidity, and wetness). Managing working at height activities requires suitable planning and the allocation of sufficient resources. Preferred mitigation methods will include, in this order:

- Eliminate or reduce the requirement to work at height. During the planning and design phases of an installation, specific tasks should be assessed with the aim of removing the need to work at height, if practicable.
- If working at height cannot be eliminated, use work equipment or other methods to prevent a fall from occurring. Collective protection systems, such as edge protection or guardrails, should be implemented before resorting to individual fall arrest equipment. In addition, safety nets or airbags can be used to minimize the consequences of a fall should it occur.

Lifting operations are an integral component of the construction of any wind energy facility. During the construction phase, components are typically assembled and transported to the site where assembly will take place. This involves using large, complex pieces of lifting equipment to lift loads of varying dimensions and weights numerous times. The management of lifting operations requires the use of competent personnel, thorough planning, effective communication, and a high level of supervision when carrying out a lift.

Systematic and well-laid-out traffic management practices are required to ensure safety since construction vehicle operators and truck drivers have limited fields of view around their equipment, especially considering the transportation of turbine components.

Slips and falls are one of the most frequent types of accidents that occur at construction sites generally caused by slips on excavation material debris and/or work equipment left unattended on site, as well as due to lack of attention to objects such as cables and ropes on the ground.

Direct exposure of personnel to dust generated by construction works due to vehicle and equipment movements can result in respiratory problems.

Exposure to excessive levels of noise generated by construction equipment and activities and use of vibrating equipment such as ground drillers or hand-held drillers and whole-body vibration caused by contact with large vibrating surfaces are amongst OHS risks for the construction phase of the Project.

Operation Phase

The operation team will consist of 10 personnel, and they will work 10 hours a day in one shift. In the operation phase, maintenance personnel, and workers who work at height may be subject to occupational

health and safety risks if not properly mitigated. Similarly, workers working in confined spaces may be subject to occupational health and safety risks. Another risk is related to electric shock or electrocution. Structural failure, blade failure, ice fall/throw and fire are also amongst incidents that might potentially impact workers during the operation phase.

No additional impacts are anticipated during the closure phase of the project, apart from those already outlined during the construction and operation phases.

V.8.8 Community Health and Safety

Pre-Construction and Construction Phases

There are no health institutions and services that are expected to be adversely affected by construction activities within the scope of WPP. The potential impacts of the WPP construction process on public health and safety overlap with quality of life and infrastructure issues. Issues concerning public health and safety are as follows:

Dust
Noise (the most frequently mentioned complaint in both headman and household interviews)
Drinking water quality and access to water
Traffic safety
Prevention of the occurrence and spread of diseases.

Dust

According to Air Quality Modeling, dust emissions will be limited to localized impacts and will not cause long-term or diffuse changes in local air quality. Particulate matter deposition, however, will cause short-term impacts on settlements and agricultural areas close to the project area.

Noise

According to the noise modelling study, the noise generated during pre-construction and construction is above the Project standard up to a distance of 200 meters, while after a distance of 200 meters, the results are below the Project standard. There is no settlement area 200 m from the tribune locations.

Drinking water quality and access to water

WPP construction activities are not expected to have an impact on the drinking water supply infrastructure.

Abnormal Load Transportation and Traffic Load

Abnormal load transportation and traffic load cover the following impacts on the communities;

Transportation of heavy and oversized equipment, other plant equipment,
Transportation of ready-made concrete,
Transportation of construction machinery and equipment, water and excavated material trucks,
Transportation of steel, diesel fuel, transformer oil and other necessary equipment and goods,
Transportation of the construction workforce to the construction camp site and construction sites,
Transportation during the operations

Within the scope of the project, blades, towers and turbines will be transported to the project area from the factory and warehouse area in İzmir and Iskenderun Port by road. Since the turbines will be

transported by vertical transportation method, transportation is provided on shorter and narrower roads compared to other methods.

The YEKA site has several accesses by the public road network, however direct and main access will be from Citli and Isiktepe local roads. The access road passes through rural areas with limited dwellings and agricultural / fields. It will be used as a main entrance point during the construction and operation.

The project has 3 construction work items:

- Road Works
  - Land leveling
  - Excavation
  - Filling
  - Stabilized coating
  - Infrastructure
- Turbine Works
  - Construction of cable channels (opening channels and laying cables)
  - Construction of turbine foundation (Reinforced concrete, steel)
  - Turbine installation
- Substation Works
  - Carrying out rough works of the substation (reinforced concrete/iron)
  - Placement of transformers
  - Making cabling

Construction will occur 6 days per week over the 12-month construction period.

For the construction period, a workforce of about 80 people is anticipated. This will be the peak number. Employees will be transported to the site from Maden.

Workers will generally travel to the site via light vehicles (LV) (i.e. car or small van) assuming, to and from the site.

The construction phase for the project will result in additional traffic on the roads in the vicinity of the development. The heavy vehicles (HVs) will typically be rigid vehicles (i.e. concrete trucks, dump trucks, delivery vehicles) or maximum legal articulated vehicles within normal vehicle loading.

This additional construction traffic will include the following:

- Construction worker vehicles, e.g. cars or vans (light vehicles).
- HVs carry conventional earthworks equipment such as excavators, rollers, stone crushers, forklifts, etc.
- Mobile Cranes.
- Delivery vehicles carrying:
  - conventional construction materials for the site, e.g. aggregate, concrete, rebar, etc.
  - conventional construction materials for the substation, e.g. electrical components, bricks, concrete, rebar, fencing, etc.
  - drainage infrastructure i.e. culverts, clear-span bridges, tanks, etc.
  - met mast, electric cabling, inverter stations and electrical equipment for the on-site substation.

The transformer and the wind turbine components will be abnormal indivisible loads (AILs). An assessment of the AIL loads has been made based on the proposed project details.

The maximum blade length to be used will be 68.62 m. The contractor will be responsible for obtaining all associated licenses from the General Directorate of Highways or related municipalities during construction for the abnormal load.

The YEKA site has several accesses by the public road network, however direct and main access will be from Citli and Isiktepe local roads. The access road passes through rural areas with limited dwellings and agricultural fields. It will be used as a main entrance point during the construction and operation. Since the road width is not sufficient in the area where Işıktepe village settlement is located, a bypass road will be opened. For this purpose, privately owned lands will be expropriated. Abnormal load transportation and traffic load will be mitigated by using the Traffic Management Plan which was prepared for the project.

Worker's Interaction with Local Communities (Labor Influx)

It is anticipated that there will be 80 personnel working on-site at the peak period of construction activities, some of which are anticipated to be local. Workers will be accommodated in apart, hotel, etc. in Elazığ and/ or Maden. Construction personnel will be transported to the Project area by service buses. Thus, the impact of the Project-related employment on the population movements in the region is considered to be limited during the construction phase. On the other hand, Labour and Influx Management Plan was prepared for the project to manage possible labour influx issues.

Operation Phase

Shadow Flicker

Shadow flicker is the effect of the sun (low on the horizon) shining through the rotating blades of a wind turbine, casting a moving shadow. Shadow flicker occurs when the sun passes behind the wind turbine and casts a shadow. Shadow flicker is a phenomenon when the same location is repeatedly passed over by a shadow while the rotor blades revolve. When potentially sensitive receptors (e.g., residential properties, workplaces, learning and/or health care spaces/facilities) are close by or have a particular orientation to the wind energy installation, shadow flicker may become an issue.

Shadow flicker is limited in time and location. As per the IFC EHS Guideline on Wind Energy (2015), 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.

The seasonal duration of the shadow flicker can be calculated from the geometry of the turbine and the latitude and topography of the potential site.

The evaluation of potential shadow flicker from turbines was conducted using WindPRO, a widely recognized software tool utilized for wind power plant design and assessment within the industry. It's important to note that WindPRO doesn't incorporate any barriers between houses and turbines in its calculations and assumes ideal weather conditions, which may amplify the worst case scenario that shadow flicker effects. Additionally, WindPRO does not adjust for daylight savings time, so any timing data provided in this report should be adjusted accordingly.

As standard industry practice dictates, it has been assumed that each house within the study area has a window of 1 m x 1 m, located at the nearest point of the house to the turbine and positioned at a height-to-center of 2 m above ground level directly facing the proposed wind turbine. Google Earth software has been used to identify residential addresses and the location of the properties. This will have the effect of creating a worst-case scenario.

Shadow strength decreases with distance from the source and is generally accepted that shadow flicker becomes insignificant at distances greater than 10 times the turbine rotor diameter. The candidate turbine selected for this study has a 96 m hub height and a rotor diameter of 138.25 m. The shadow flicker effects beyond the distance of 1,385 m, can be considered insignificant.

There are 1 village (Çayırköy) closer than 1.385 meters to planned turbines. 2 closest houses from Çayırköy and 1 house near Çayırköy are chosen as receptors to assets for the worst case scenario calculations. The locations of houses for the analysis are given in Figure V.7 below.

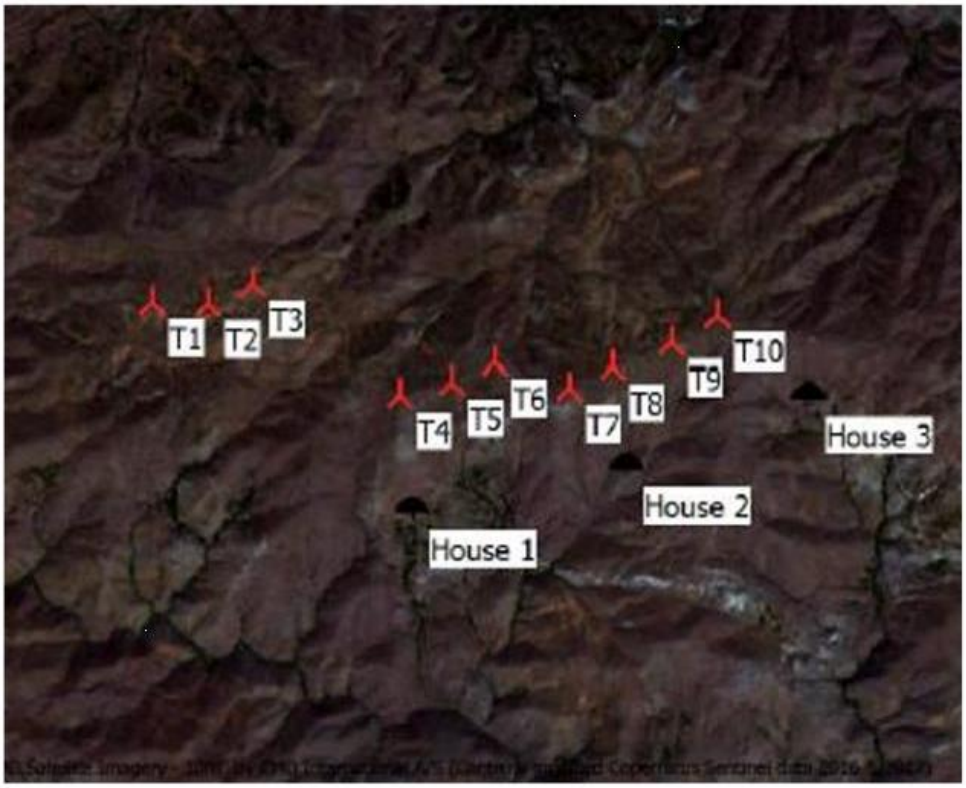


Figure V.7 Map of Turbines and Houses Locations

Shadow flicker modelling of the houses within 1,385 m of the wind turbines has shown that under perfect weather conditions with sunshine all year round. Without considering any screening effects between the houses and turbine, none of the properties may experience shadow flicker more than the widely recognized 30-hour annual limit.

Therefore, an analysis of potential shadow flicker impacts from the R3-ELAZIĞ-1 Wind Power Plant on nearby receptors indicates there are no effects that do not present concerns for nuisance.

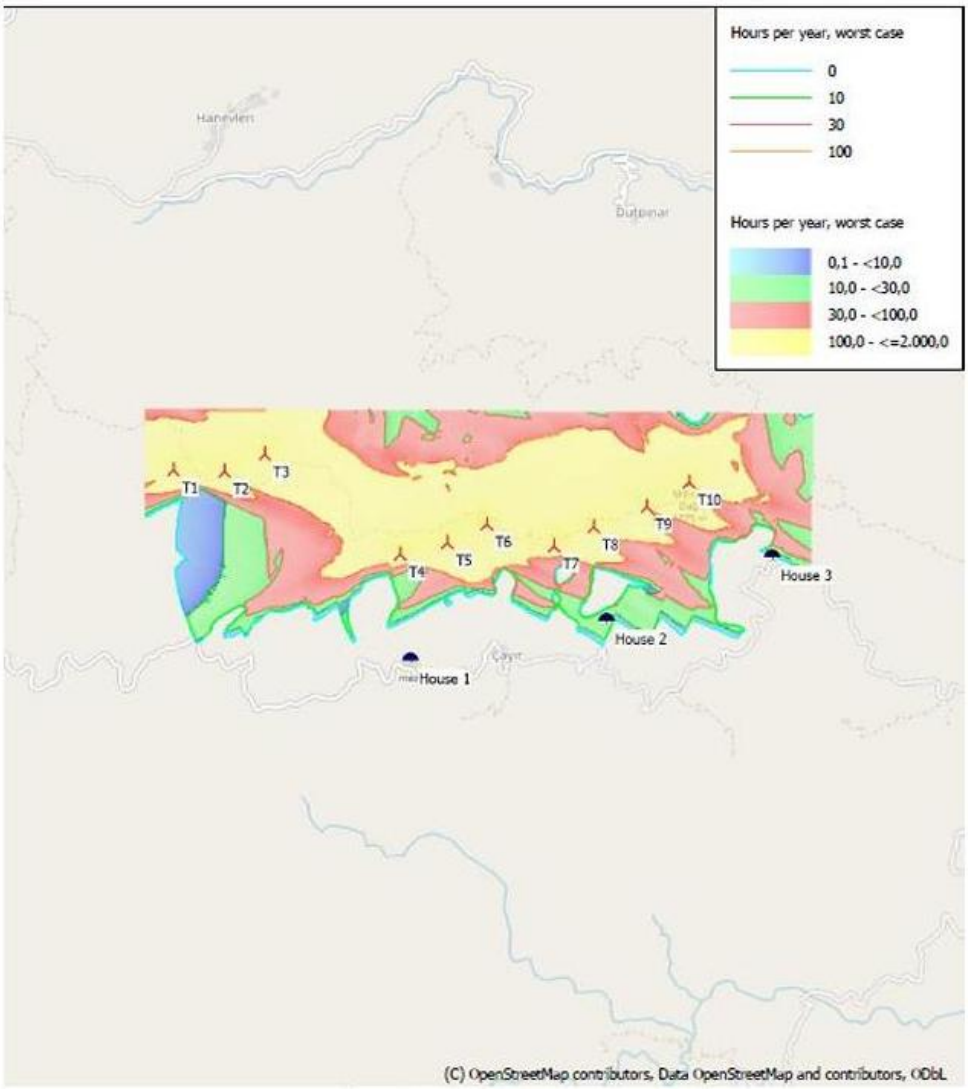


Figure V.8 Map of Worst-Case Scenario Showing Shadow

Blade/Ice Throw

Blade throw events have reportedly occurred in the past on wind farms as a result of the failure of the rotor blade, which results in the ejection or throwing of the rotor blade. Blade throw can endanger people living or working close to the wind farm. Assessment of reports and case studies available to the public have revealed an increasing trend to locate wind farms in proximity to build-up areas, which can endanger people living or working close by. Therefore, it has become strictly necessary to define setback distances and/or buffer zones to minimise the risk of damage or injury from rotor blade failure.

According to the IFC EHS Guideline on Wind Energy (2015), if ice accretion occurs on blades, which can happen in certain weather conditions in cold climates, then pieces of ice can be thrown from the rotor during operation or dropped from it if the turbine is idling.

For blade/ ice throw risk management, the IFC EHS Guideline on Wind Energy (2015) recommends establishing setback distances between turbines and populated locations. The minimum setback distance is 1,5 x turbine height (tower + rotor radius). The Project AoI of blade throw is determined as 1,5 times turbine height (hub height and rotor radius) which is about 247,5 m. The nearest settlement to wind turbines is Çayırköy and its distance to the turbine is about 832 m therefore there is no Blade/Ice Throw risk for communities.

Security Management

The land to be acquired for the Project will not impede or restrict public access (i.e. pasture lands) to common resources during the operation phase as the License Area or the Project units except the switchyard will not be fenced. Therefore, safety issues may arise with public access to wind turbines (e.g., unauthorized climbing of the turbine) or to the wind energy facility substation. Mitigation measures i.e. involvement of security personnel to control unauthorized access will be developed.

V.8.9 Landscape and Visual

Pre-Construction and Construction Phase

The visual impact of a wind power plant during the pre-construction and construction phases can vary depending on factors such as project size, location, and landscape characteristics. While WPP is generally considered a clean and sustainable source of energy, the visual impact can be a concern for some individuals and communities.

Preparing the land for construction by clearing vegetation can temporarily change the visual appearance of the landscape. Survey markings or signs may be noticeable during the planning of access roads, substations, and other infrastructure. The transportation of large turbine components to the site, particularly on local roads, can have a visual impact. The presence of construction equipment, cranes, and machinery during the installation of turbines may also modify the visual character of the area. Signs conveying information about the project, safety regulations, and construction activities might be present. Large cranes and construction crews are typically temporarily on-site during this phase. For safety and operational reasons, construction sites might need temporary lighting during night work, potentially altering the visual landscape at night. However, night work will only be conducted if it is deemed necessary within the project's scope.

YEKA RES 3 will generally take mitigation measures to address concerns, implement landscaping plans, and reduce the temporary visual impact of wind farm construction. Additionally, once construction is completed, the visual impact is often reduced and wind turbines become part of the landscape, contributing to clean energy production.

Operation Phase

During the operation phase of a wind power plant, the visual and landscape effects are generally less pronounced compared to the construction phase. Periodic maintenance activities, such as inspections and repairs, may require temporary visual alterations, such as the presence of maintenance vehicles or personnel.

In certain conditions, the rotating blades of wind turbines can cast moving shadows on the ground, a phenomenon known as shadow flicker. Hidrotek Mim. Müh. Tic. Ltd. Şti. (“Hidrotek”) presents the findings of the shadow flicker analysis conducted for Project R3-ELAZIĞ-1 Wind Power, located in Elazığ, Türkiye.

A shadow model was made within the scope of ESIA studies and is available in Annex-10 of this report. According to this model, under certain geographic orientations and different times of the day, the path of the sun might intersect with the spinning blades of the planned wind turbine. This interaction could lead to periodic shadows cast on adjacent properties. This occurrence, known as the 'shadow flicker' effect, has the capacity to occur even within structures. In such cases, the flickering light may enter indoor spaces through small openings like windows or apertures. The assessment of potential shadow flicker caused by turbines was carried out using WindPRO, a widely acknowledged software tool employed in the industry for designing and evaluating wind power plants.

As standard industry practice requires, each house within the study area was assumed to have a 1 m x 1 m window located at the point of the house closest to the turbine and positioned 2 m above ground from the center. This will have the effect of creating a worst-case scenario. The shadow force decreases with distance from the source, and it is generally accepted that shadow flicker becomes negligible at distances

greater than 10 times the turbine rotor diameter. The hub height of the candidate turbine selected for this study is 96 m and the rotor diameter is 138.25 m. Beyond a distance of 1,385 m, shadow flicker effects may be negligible. There is 1 village located less than 1,385 meters from the planned turbines. 2 closest houses from Çayırköy and 1 house near Çayırköy are chosen, as receptors to assess for the worst case scenario calculations. Locations of houses and the solar power plant are presented in Table V.37.

Table V.37 Locations of Houses

House ID	Longitude	Latitude
House 1	39,585846	38,380826
House 2	39,593876	38,381600
House 3	39,616814	38,387747

Source: R3-ELAZIĞ-1 Wind Power Plant Project Shadow Flicker Report prepared by Hidrotek Mim. Müh. Tic. Ltd. Şti.

Table V.38 Shadow Hours According to the Worst Case Scenario

House ID	Shadow Hours Per year (h/year)	Shadow Days Per year (days/year)	Max shadow hours per day (h/day)
House 1	0:00	0	0:00
House 2	0:00	0	0:00
House 3	0:00	0	0:00

Source: R3-ELAZIĞ-1 Wind Power Plant Project Shadow Flicker Report prepared by Hidrotek Mim. Müh. Tic. Ltd. Şti.

According to the model report, shadow flicker modelling of the houses within 1,385 m of the wind turbines has shown that under perfect weather conditions with sunshine all year round and worst case scenario results are given in Table V.38. Without considering any screening effects between the houses and turbine, none of the properties may experience any shadow flicker.

Therefore, an analysis of potential shadow flicker impacts from the R3-ELAZIĞ-1 Wind Power Plant on nearby receptors indicates there are no effects that do not present concerns for nuisance.

V.9 Cultural Heritage

V.9.1 Impact Assessment and Management

V.9.1.1 *Tangible Cultural Heritage*

The activities to be conducted during all Project phases may cause direct potential impacts on the cultural heritage receptors, if not properly managed. The key Project activities that may result in impact (direct or indirect) upon archaeology and cultural heritage receptors during all Project phases are summarized in Table V.39.

Table V.39 Sources of Impacts on Cultural Heritage Receptors during All Project Phases

Phase	Description of Activity	Potential Receptors that may be Affected by the Activities
Design Phase	• Area selection (turbine locations, selection of camp sites, storage and access road)	• Tangible Cultural Heritage o Registered Sites o Archaeological Sites o Other Cultural Heritage Sites • Intangible Cultural Heritage
Land preparation phase	• Removal of vegetation and/or trees • Installation of fencing • Traffic movements (vehicles and staff)	
Construction phase (For all Project Sites)	• Topsoil stripping • Excavation and Filling • Blasting • Construction traffic movement • Siting of construction sites and other Project/associated facilities • Piling • Landscaping/ earth-mounding • Waste disposal including excess excavated materials • Structures, installation features (fencing, cables etc.) • Presence of workforce • Leaks and spills	
Operation Phase	• Vibrations caused by heavy traffic • Visual Impacts on Cultural Heritage • Noise • Access difficulties	

Potential impacts are direct damage or disturbance to cultural heritage resources. This can include:

- Physical damage of construction activities including from topsoil stripping, excavation, filling, blasting
- Physical damage of sites, including from noise, vibration and dust due to plant, equipment and heavy vehicles, and from spills and leaks
- Noise and visual intrusion on people's appreciation of cultural heritage
- Disruption of access to cultural heritage sites
- Enhanced access to cultural heritage sites allowing increased opportunity to outside parties for collection of artefacts or damage to resources
- Loss or change of identity or significance of the intangible cultural heritage
- Effects of noise and visual intrusion on the ability of communities to appreciate and use their intangible cultural heritage
- Disruption or diminution of cultural ecosystem services including customary ways of understanding the wider world and for maintaining social relations and group identity.

In addition to direct impacts, damage due to looting and interference may occur. Sites may suffer inadvertent damage or interference. There may be piecemeal illicit removal of portable antiquities from archaeological sites within the Project Area.

Baseline information on the internationally recognized cultural heritage areas has been provided in Chapter IV.3. Given the distances of the sites under the World Heritage List, it is assessed that the Project will not have an adverse physical or setting impact on them nor will it induce any significant changes to visitor numbers, site access and conservation.

The closest site under the World Heritage Tentative List of UNESCO is located at a distance of 39 km in the northwest of the Project Area (Historic City of Harput, Elazığ). It is assessed that the Project will not have an impact on this site.

Significance of Project's impacts on the cultural heritage elements have been identified based on the sensitivity of the receptors and overall magnitude of the impact on that specific receptor. Sensitivity of the receptors for cultural heritage has been determined in line with the criteria defined in Table V.40 as per the Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (ICOMOS 2011).

Table V.40 Criteria for the Value of Cultural Heritage Receptors

Value	Criteria According to ICOMOS (2011)	Criteria According to Turkish Law	Value According to IFC PS8
Very High	Sites of acknowledged international importance inscribed as WH property.	Tangible cultural heritage: 1st Degree Archaeological Sites (registered) Tangible cultural heritage: 2nd Degree Archaeological Sites (registered) or other sites depending on their value	Complex palaeontological and archaeological remains (if present) Critical Cultural Heritage (cemeteries and burial grounds)
	Individual attributes that convey outstanding universal value (OUV) of the WH property.		
	Assets that can contribute significantly to acknowledged international research objectives.		
	Sites or structures of acknowledged international importance inscribed as of universal importance as WH property.		
	Individual attributes that convey OUV of the WH property.		
	Other buildings or urban landscapes of recognized International importance.		
High	Nationally- designated Archaeological Monuments protected by the State Party's laws		
	Undesignated sites of the quality and importance to be designated.		
	Assets that can contribute significantly to acknowledged national research objectives.		
	Nationally- designated structures with standing remains.		
	Other buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the listing grade.		
	Conservation Areas containing very Important buildings.		
	Undesignated structures of clear national importance.		
Medium	Designated or undesignated assets that can contribute significantly to regional research objectives.	Tangible cultural heritage: 3rd Degree Archaeological Sites (registered) and Archaeological sites presently unknown or unregistered archaeological sites or other sites (Unregistered Bridge, Cistern etc.) depending on their value (if present)	Isolated palaeontological and archaeological sites and findspots (if present)
	Designated buildings. Historic (unlisted) buildings that can be shown to have exceptional qualities or historical associations.		
	Conservation Areas containing buildings that contribute significantly to its historic character.		
	Historic townscapes or built-up areas with important historic integrity in their buildings, or built settings.		
Low	Designated or undesignated assets of local importance.		
	Assets compromised by poor preservation and/or poor survival of contextual associations.		
	Assets of limited value, but with potential to contribute to local research objectives.		
	"Locally Listed" buildings.		

Value	Criteria According to ICOMOS (2011)	Criteria According to Turkish Law	Value According to IFC PS8
	Historic (unlisted) buildings of modest quality in their fabric or historical associations.		
	Historic Townscape or built-up areas of limited historic integrity in their buildings or built settings.		
Negligible	Assets with little or no surviving archaeological interest.	Unregistered potential archaeological sites	
	Buildings or urban landscapes of no architectural or historical merit; buildings of an intrusive character.		
Unknown	The importance of the resource cannot be ascertained. Buildings with some hidden (i.e. inaccessible) potential for historic significance.		

Based on the sensitivity criteria given in Table V.40, the sensitivity of the cultural heritage sites identified within the study area has been determined in accordance with the Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (ICOMOS 2011) as presented in Table V.41.

Table V.41 Value of the Registered and Unregistered Tangible Cultural Heritage Sites Identified within Study Area

High		Medium	Low	Negligible
1	Çitli (Hilindir) Fortress	N/A	N/A	N/A
2	Dutpınar Bridge	N/A	N/A	N/A

Assessment of the magnitude of impact is based on an understanding of how, and to what extent, the Project would impact on archaeology and cultural heritage receptors. Table V.42 presents a description of the impact magnitude for archaeology and cultural heritage receptors based on ICOMOS (2011).

Table V.42 Criteria for Magnitude of Change for Tangible Cultural Heritage (ICOMOS 2011)

Impact Grading	Archaeological Attributes	Built Heritage or Historic Urban Landscape attributes	Historic landscape attributes
Major Change	Changes to attributes that convey OUV of WH properties.	Change to key historic building elements that contribute to OUV, such that the resource is totally altered.	Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit and loss of OUV.
	Most or all key archaeological materials, including those that contribute to OUV such that the resource is totally altered.	Comprehensive changes to the setting.	
	Comprehensive changes to setting.		Change to many key historic landscape elements, parcels or components; visual change to many key aspects of the historic landscape; noticeable differences in noise or sound quality; considerable changes to use or access; resulting in moderate changes to historic landscape character.
Moderate Change	Changes to many key archaeological materials, such that the resource is clearly modified.	Changes to many key historic building elements, such that the resource is significantly modified.	
	Considerable changes to setting that affect the character of the asset.	Changes to the setting of an historic building, such that it is significantly modified.	
Minor Change	Changes to key archaeological materials, such that the resource is slightly altered.	Change to key historic building elements, such that the asset is slightly different.	Change to few key historic landscape elements, parcels or components; slight visual changes to few key aspects of historic landscape; limited changes to noise levels or sound quality; slight changes to use or access; resulting in limited change to historic landscape character.
	Slight changes to setting.	Change to setting of an historic building, such that it is noticeably changed.	
Negligible Change	Very minor changes to key archaeological materials or setting.	Slight changes to historic building elements or setting that hardly affect it.	Very minor changes to key historic landscape elements, parcels or components; virtually unchanged visual effects; very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character.

Impact Grading	Archaeological Attributes	Built Heritage or Historic Urban Landscape attributes	Historic landscape attributes
No Change	No change.	No change to fabric or setting.	No change to elements, parcels or components; no visual or audible changes; no changes in amenity or community factors.

Once the sensitivity of the receptor/resource and the overall magnitude of the impact on that specific receptor/resource have been identified, the significance of the impact has been determined based on the matrix provided in Table V.43.

Table V.43 Cultural Heritage Impact Significance Assessment Matrix (ICOMOS 2011)

Value of Heritage Asset	Scale & Severity of Change/Impact				
	No Change	Negligible Change	Minor Change	Moderate Change	Major Change
For Word Heritage List Properties VERY HIGH – Attributes Which Convey Outstanding Universal Value	Significance of Effect or Overall Impact (Either Adverse or Beneficial)				
	Neutral	Slight	Moderate/ Large	Large/ Very Large	Very Large
For Other Cultural Heritage Assets	Significance of Impact (Either Adverse or Beneficial)				
Very High	Neutral	Slight	Moderate/ Large	Large/ Very Large	Very Large
High	Neutral	Slight	Moderate/ Slight	Moderate/ Large	Large/ Very Large
Medium	Neutral	Neutral/ Slight	Slight	Moderate	Moderate/ Large
Low	Neutral	Neutral/ Slight	Neutral/ Slight	Slight	Slight/ Moderate
Negligible	Neutral	Neutral	Neutral/ Slight	Neutral/ Slight	Slight

The Project will adopt a proactive management of the potential Project impacts, prioritizing avoidance where this is possible. In case avoidance is not possible, relevant archaeology and cultural heritage management/mitigation measures will be taken in accordance with the national legislation, IFC PS 8, EBRD PR 8 and other applicable standards.

The Project does not propose to use the cultural heritage, including knowledge, innovations, or practices of local communities for commercial purposes (examples include, but are not limited to, commercialization of traditional medicinal knowledge or other sacred or traditional technique for processing plants, fibers, or metals).

Management of Potential Impacts

In line with Article 4 of the Law on Conservation of Cultural and Natural Properties (No. 2863), the main contractor will notify the responsible Museum Directorates or Regional Councils for the Conservation of Cultural Property about the archaeological sites and immovable cultural heritage assets, including registered and unregistered sites, identified within the study area, as given in this ESIA Report. To this end, the information collected through the field surveys (such as site-specific photos, site survey forms, site coordinates, digital data, expert notes, etc.) will be delivered to these institutions in order to initiate official decision processes relevant to these sites. The cultural heritage authorities to be notified in each province are listed in Table V.44 (contact details of the authorities are provided in the Cultural Heritage Management Plan).

Table V.44 Cultural Heritage Authorities Responsible

Project Related Museum Directorate	Duty Area
Elazığ Museum	All Project Area
Project Related Regional Council for the Conservation of Cultural Property	**Duty Area**
Diyarbakır Regional Council for the Conservation of Cultural Property	All Project Area

General management measures applicable to different types of sites are listed below. Specific measures and actions stipulated by the relevant cultural heritage authorities in their official decisions (e.g. trial pits, geophysics surveys, salvage excavations, technical drawings, relocation, construction under supervision of the related museum, etc.) will be implemented for the management of potential cultural heritage impacts as part of the Project Table V.45.

Table V.45 General Management Measures Applicable to Different Classification of Sites

Site Classification	Framework Management Measures
Registered Site	• Avoiding physical intervention • Archaeological monitoring for potential disturbance of the project activities. • Following the decisions of the relevant Regional Council
Archaeological Site	• Avoiding physical intervention • Notify the cultural heritage authorities • Mark as archaeological sensitive area in the Project/construction drawings and plans • Avoiding physical intervention/construction until the final decision of the Regional Council is Issued • Following/implementing the decisions of the Regional Council (e.g. test or salvage excavation, if required) • Archaeological monitoring for implementation of Regional Council decision.
Other Cultural Heritage Site	• Avoiding physical intervention • Notify the cultural heritage authorities • Relocation of moveable cultural heritage asset where applicable • Consideration of Project alternatives in case of immovable cultural heritage assets where applicable • Avoiding physical intervention/construction until the final decision of the Regional Council is Issued • Following/implementing the decisions of the Regional Council (e.g. Technical documentation, measured drawing, etc., if required) • Archaeological monitoring for implementation of Regional Council decision.

Even though the Project does not propose to use the cultural heritage, including knowledge, innovations, or practices of local communities for commercial purposes (examples include, but are not limited to, commercialization of traditional medicinal knowledge or other sacred or traditional technique for processing plants, fibers, or metals), any intangible cultural heritage that may be encountered/identified to be affected by Project's construction works will be considered and managed in line with the applicable principles of IFC PS8 and UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (see Chapter V.10.1.2. below).

V.9.1.2 Intangible Cultural Heritage

Assessment of the impact of the project on intangible cultural heritage has been conducted in the Project Area and its vicinity in compliance with international standards and local legislation. Findings of the ICH studies conducted within the project are presented previous sections.

In line with the ICOMOS Guidelines, sensitivity of intangible cultural assets and the magnitude of impact of the Project on those (if present) will be identified with respect to the criteria stated below Table V.46.

Table V.46 Criteria for the Sensitivity of Intangible Cultural Heritage Receptors and Magnitude of Impact

Value Level	Criteria	Magnitude Level	Criteria
Very High	Areas associated with Intangible Cultural heritage activities as evidenced by the national register. Associations with particular innovations, technical or scientific developments or movements of global significance. Associations with particular individuals of global importance.	**Major Change**	Major changes to area that affect the ICH activities or associations or visual links and cultural appreciation.
High	Nationally designated areas or activities associated with globally important Intangible Cultural Heritage activities. Associations with particular innovations, technical or scientific developments or movements of national significance. Associations with particular individuals of national importance.		
Medium	Areas associated with Intangible Cultural heritage activities as evidenced by local registers. Associations with particular innovations or developments of regional or local significance. Associations with particular individuals of regional importance.	**Moderate Change**	Considerable changes to area that affect the ICH activities or associations or visual links and cultural appreciation.
Low	Intangible Cultural heritage activities of localsignificance. Associations with particular individuals of localimportance. Poor survival of physical areas in which activities occur or are associated.	**Minor Change**	Changes to area that affect the ICH activities or associations or visual links and cultural appreciation.
Negligible	Few associations or Intangible Cultural Heritage vestiges surviving.	**Negligible Change**	Very minor changes to area that affect the ICH activities or associations or visual links and cultural appreciation.
Unknown	Little is known or recorded about Intangible Cultural Heritage of the area.	**No change**	No change

V.9.1.3 *Cultural Heritage Management Plan*

The Cultural Heritage Management Plan developed for the Project based on the findings of the ESIA surveys and assessments is presented.

The key measures to be taken through the implementation of the Cultural Heritage Management Plan are listed below:

- Training on implementation of the Cultural Heritage Management Plan, including the Chance Find Procedure, will be provided to all relevant Contractor and subcontractor personnel as part of the induction training (to be given at the time of employment) and refreshments will be done through toolbox talks throughout the construction phase. If required, the Operator will also train the operations and maintenance personnel on the Cultural Heritage Management Plan, including the Chance Find Procedure.
- Sites located close to the Project License Area and other project sites (e.g. camp sites, dump sites, access roads and quarries etc.) will be protected, where appropriate, by providing temporary flagging/fencing and signage subject with approval from the cultural heritage authorities.
- Sufficient resources for the implementation of the Cultural Heritage Management Plan will be provided by the main contractor. Archaeological monitoring and technical elements of the Chance Find Procedure will be implemented by qualified experts during the construction works, as necessary.
- Following the notifications (for the sites identified as part of ESIA or discovered during construction) to be made to the authorities in line with Article 4 of the Law on Conservation of Cultural and Natural Properties (No. 2863), appropriate measure(s) will be taken in line with the official decisions of the cultural heritage authorities. Such measures may include documentation,

application of remote sensing (e.g. geophysical survey) at areas where chance finds are discovered to clarify the character and location of sites and inform design of targeted salvage strategies, excavation of test pits to verify the results of remote sensing at chance find areas, salvage excavation and recording, etc.

V.9.2 Conclusion of Impact Assessment

The potential Project impacts, proposed mitigation measures and residual impact significance are summarized in Table V.47.

Table V.47 Construction Impacts, Proposed Mitigation Measures and Residual Impacts (Tangible Cultural Heritage)

No	Archaeological Site/Asset Name	Impact Magnitude				Value of Heritage Asset	Significance of Impact (Either Adverse or Beneficial)	Description of Impact and Specific Mitigation Measures	Residual Impact
		Scale & Severity of Change/ Impact	Reversibility	Duration	Frequency[36]				
1	Çitli (Hilindir) Fortress (Registered Fortress) Outside the Project License Area	Negligible Change	Irreversible	Short-term	One-off	High	Slight	The archaeological site is located outside of the Project license area. Any change has not been expected on the archaeological asset by the project activities in accordance with the planned project activities. However, the following procedures about cultural assets should be conducted during the Project lifespan: • **The archaeological area border (registration borders for legal protection) should be marked on the project drawings as an archaeological site.** • **Any ground-disturbed activities should not be planned in and around the registered archaeological site.** • **The construction activities should be avoided from the registered archaeological site during the Project lifespan.**	If the determined recommendations are taken into consideration and implemented, any "residual impact" will not occur.
2	Dutpınar Bridge (Registered Bridge) Outside the Project License Area	Negligible Change	Irreversible	Short-term	One-off	High	Slight	The cultural heritage asset is located outside of the Project license area. Any change has not been expected on the cultural heritage asset by the project activities in accordance with the planned project activities. However, the following procedures about cultural assets should be conducted during the Project lifespan: • **The protection border of the cultural heritage asset (registration borders for legal protection) should be marked on the project drawings as an archaeological site.** • **Any ground-disturbed activities should not be planned in and around the registered protection borders.** • **The construction activities should be avoided from the registered protection borders during the Project lifespan.**	If the determined recommendations are taken into consideration and implemented, any "residual impact" will not occur.

[36] *This column designates the possibility of impact recurrence.*

Based on the results of impact assessment on the tangible cultural heritage;

- **"Value of Heritage Asset"** are defined as "High" in 2 areas,
- **"Scale & Severity of Change/ Impact"** is defined as "Moderate Change" in 1 area and "Negligible Change" in 2 areas,
- **"Significance of Impact (Either Adverse or Beneficial)",** which is evaluated by overlapping the parameters "Value of Heritage Asset" and "Scale & Severity of Change/ Impact", is found to be "Slight" in 2 areas (Table V.47).

As the result of desk studies and field works, any harm to intangible cultural heritage patterns because of the Project activities is not foreseen for all settlements in the study area.

V.9.3 General Assessment and Results

V.9.3.1 *Tangible Cultural Heritage*

The geographical position of tangible cultural heritage assets with respect to the Project area is the main factor to identify the extent of the impact. A cultural asset located outside the construction corridor does not mean that it will not be adversely affected by construction activities. The type, size and location of the source of the effect can have different impact on cultural assets

The number of tangible cultural heritage assets within the study area is 2. All identified cultural heritage sites are registered.

The general layout plans of the 2 cultural assets identified as the result of archaeological studies are given in Chapter IV.3. According to the results of the impact assessment, it was determined that 2 registered cultural heritage sites outside the project construction boundaries are not affected by the construction activities to be carried out within the scope of the project.

Additional Cultural Heritage Impact Assessment (CHIA) studies should be conducted for all revisions and additions (service paths, quarries, campsites) to be made in the Project.

"Cultural Heritage Management Plan" should be implemented during all activities that require soil intervention within the scope of the project. This plan and procedure should be shared with other construction subcontractors of the project, and subcontractors should prepare and implement a more detailed Cultural Heritage Management Plan and Chance Find Procedure for their activities during the project.

V.9.3.2 *Intangible Cultural Heritage*

During the Project activities, active stakeholder engagement has to continue and any sensitivity which may the Project cause must be resolved. In addition, the Project staff must be informed about the intangible cultural heritage assets in the region and their importance to the local communities.

Depending on the project's social/community investment strategy, social investment projects can be prepared for promoting rural tourism not only for intangible cultural heritage assets but for physical cultural heritage as well (e.g., local weaving traditions in Elazığ province). Financial support to these projects through local communities may contribute to the protection of intangible cultural assets as well as providing source of income for the local people.

V.10 Cumulative Impact Assessment

Project-level environmental and social impacts of the Project have been assessed in the previous chapters of this ESIA Report. This Chapter aims to assess the potential cumulative impacts that may result from the incremental impacts from other past, existing or future (reasonably foreseeable) developments/activities implemented or planned in the region. Cumulative Impact Assessment Methodology and Data Sources are given in Annex 11.

The cumulative impact assessment is carried out step by step below in accordance with the methodology described above.

Step 1: Scoping Phase I – Valued Ecosystem Components (VECs), Spatial and Temporal Boundaries

For the initial determination of VECs, environmental and social issues within the scope of the impact assessment conducted for the Project Area in the previous sections of this ESIA report will be taken into account. VECs to focus on in the Cumulative Impact Assessment (CIA) were selected as follows:

- Land use
  - Agricultural land
- Hydrology
  - Seasonal Creek
  - Creek
- Protected Areas
  - Wetland
- Socio-economy
  - Settlements (Maden District, Elazığ City)
  - Existing roads

With regard to the temporal dimension of impacts, the assessment will cover, to the maximum extent possible, the impacts of present and reasonably foreseeable future developments that will correspond to the economic life of the Project.

Step 2: Scoping Phase II – Other Activities and Environmental Drivers

Within the scope of the Project, other present and future (reasonably foreseeable) activities/developments located in the CIA area within the scope of CIA studies at the first stage will affect the status of VECs selected desk-based assessment of databases. The list covering all secondary projects in CIA area is given in Table V.48. According to desk research, there are one (1) project that can be evaluated within the scope of CIA. The last column of the table evaluates the potential of other projects/activities/developments to influence selected VECs.

Table V.48 Other Projects/Activities/Developments in AoI

Project/Activity/Development Name	Project Type	Location	Proximity (m)	Status	Potential for Affecting the Selected VECs
Ümraniye Municipality - Ümraniye Municipality Solar Energy Power Plant Project	Solar Power Plant	Maden District of Elazığ	80	Pre-license has been obtained	Yes

In the Cumulative Impact Assessment for the Project, only the projects/activities/developments that have the potential to affect selected VECs are marked as “Yes” in the last column of Table. CIA practices will be considered in accordance with the VEC-centered perspective. The planned WPP Project will be named as source project within the scope of CIA. Map showing the source and secondary projects in the CIA area is given in **Figure V.9**.

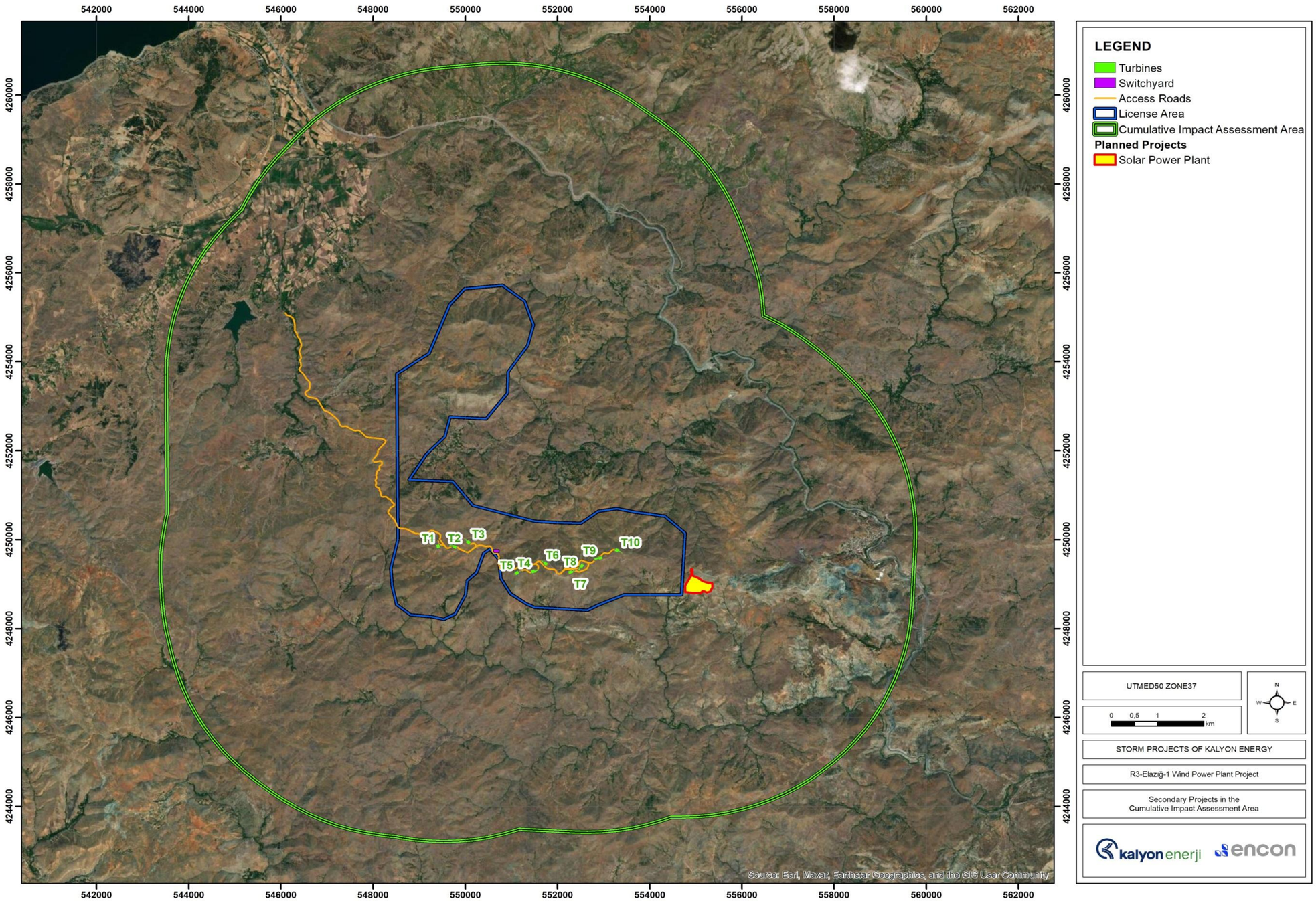


Figure V.9 Secondary Projects in the Cumulative Impact Assessment Area

Step 3: Establish Information on Baseline Status of VECs

The baseline conditions for VECs to be evaluated in this study will be based on the information gathered for each environmental and social issue under the ESIA process. Relevant information on VECs is provided in the relevant sections of this ESIA Report.

Step 4: Assess Cumulative Impacts on VECs

The results of the evaluation of the cumulative impacts of the source Project on the selected VECs along with other projects/activities/developments identified in the region are summarized in Table V.49. Evaluation is based on a qualitative approach. The interaction between the other projects and VECs covered in the Cumulative Impact Assessment is shown on the map in **Figure V.10**.

Within the scope of the assessment, the cumulative impact potential on the VECs was evaluated by considering the ***"Renewable Energy Projects"*** affecting the VECs.

In this context, the potential for cumulative impacts on each VEC has been classified as none, low, moderate or high depending on the criteria described below.

- None; If the VEC will only be affected by the source Project;
- Low; if VEC will be affected by 2 or less other projects (except the source Project);
- Moderate; if VEC will be affected by 4 or less other projects (except the source Project);
- High; if the VEC will only be affected by 6 or less projects (except the source Project).

As can be seen from the assessment, there is one project interacting with the source Project and there is a VEC that causes a "low" cumulative impact potential.

It should be noted that the assessment is limited to the level of technical knowledge currently available to practitioners of this Cumulative Impact Assessment. In addition, the assessment is based on currently known projects, so any changes to projects could change the impact status of VECs.

Table V.49 Interaction of Projects with Selected VECs

VECs	Source Project	Other Projects	Cumulative Impact Potential
	Elazığ WPP	*Solar Power Plant*	
Land Use			
Agricultural land			Low
Hydrology			
Seasonal Creek			Low
Creek			Low
Protected Areas			
Wetland			None
Socio-Economy			
Settlements			Low
Existing roads			Low

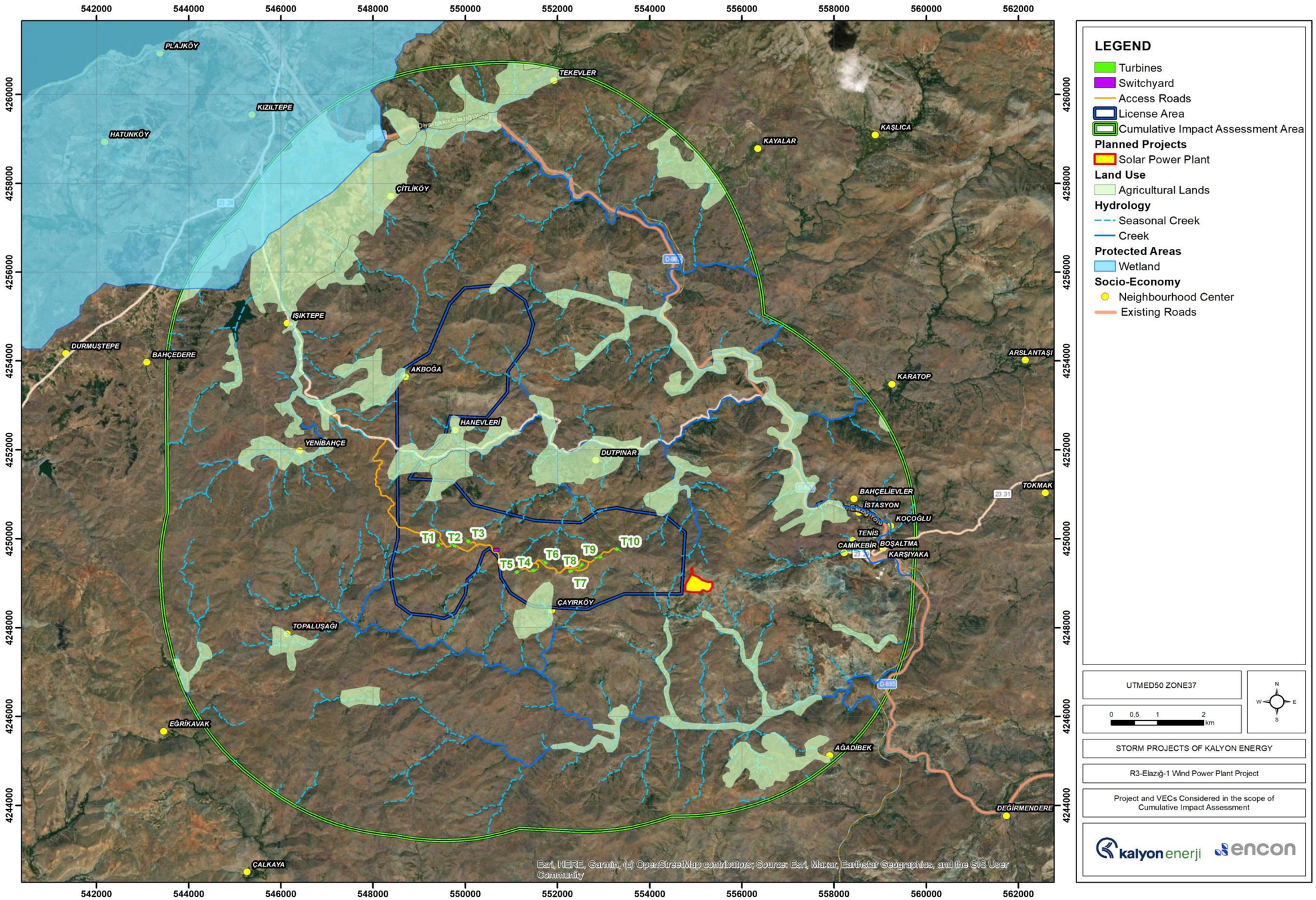


Figure V.10 Projects and VECs Considered in the Scope of Cumulative Impact Assessment

Step 5 and Step 6: Assess Significance of Predicted Cumulative Impacts and Management of Cumulative Impacts – Design and Implementation

Table V.50 lists VECs with low, moderate, or high cumulative impact potential (as assessed in Step 4). The significance of the cumulative impacts was then determined according to the criteria given section of assessment methodology.

Table V.50 Significance of Potential Cumulative Impacts

VECs	Cumulative Impact Potential	Significance of Cumulative Impact
Land Use		
Agricultural lands	Low	Minor
Hydrology		
Seasonal Creek	Low	Minor
Creek	Low	Minor
Protected Areas		
Wetlands	None	-
Socio-Economy		
Settlements	Low	Minor
Existing Roads	Low	Minor

Since cumulative impacts result from the actions of more than one stakeholder, responsibility for the management of these impacts encompasses all stakeholders. It is important that individual development requires individual actions to eliminate or minimize their contribution. The measures to be taken to minimize the impacts at the project level within the scope of the Project have been explained in the previous sections of this ESIA.

It is recommended that, the following specific actions that may be necessary to effectively manage cumulative impacts:

- Project mitigation to minimize cumulative impacts of the source Project, including adaptive management approaches to project mitigation will be applied;
- Management of risk of potential cumulative impacts associated with concurrent road use by other projects and the source Project will be provided.
- Implementation of monitoring programs to assess the effectiveness of mitigation measures will be ensured and mitigation measures will be updated when necessary.

VI. ASSESSMENT OF PROJECT ALTERNATIVES

VI.1 Energy Source Alternatives

Utilizing either renewable sources like water, wind, or solar, or nonrenewable sources such as coal, oil/gas, or nuclear energy is a viable approach to electricity generation in power plants. A wind power plant specifically harnesses the renewable energy source of wind to generate power, relying solely on the kinetic energy of air currents for electricity production. Below are several benefits associated with wind power:

- Wind power plants eliminate the necessity for extracting, processing, transporting, or combusting fossil fuels
- Due to its absence of air emissions or hazardous wastes during power generation, wind power emerges as an eco-friendly source of energy, underscoring its environmental sustainability.
- Wind farms stand out as environmentally favorable alternatives to fossil-fueled power plants, as they do not produce any greenhouse gases during electricity generation.
- Wind turbines offer a spatial advantage over conventional power stations, requiring less area for installation. The footprint of windmills is relatively compact, with only a few square meters needed for the base. In comparison, solar power plants demand considerably more space for their infrastructure
- Wind power plants do not consume surface or groundwater, and they do not release wastewater (cooling water) containing heat or chemicals.
- In isolated areas like mountainous regions and remote countryside, wind turbines serve as an excellent energy source. Their adaptability is evident in the various sizes available, designed to accommodate diverse landscapes and cater to populations with varying energy needs.
- The wind power generation industry has established a commendable safety record, with reported accidents predominantly occurring during the construction and maintenance phases.

As mentioned earlier, there are different ways to generate electricity, but it's crucial to use sustainable and renewable energy sources to tackle global warming. This Project specifically focuses on tapping into Türkiye's wind energy potential through the application of wind turbine technology for electricity generation. By harnessing this renewable energy source, the Project not only contributes to Türkiye's energy needs but also plays a crucial role in mitigating global environmental issues. The use of wind energy aids in reducing GHG emissions, therefore, leaving a positive impact on the climate change.

VI.2 Location Alternatives

R3-ELAZIĞ-1 WPP (10 Turbines - 42.6 MWm/40 MWe) Project is a YEKA project. "Renewable Energy Resource Area", YEKA in short, refers to the area(s) where at least one of the developable renewable energy resources is located in high density in public and treasury real estate and privately owned real estate, according to the definition in the regulation. In other words, it is the transformation of large-scale lands into large-scale energy fields. These areas, if deemed appropriate by the Ministry of Energy and Natural Resources of the Republic of Türkiye, are declared as YEKA and allocated to investors.

Within the scope of the Regulation on Renewable Energy Resource Areas (YEKA Regulation) published in the Official Gazette dated October 09, 2016 and numbered 29852 and the "Competition Announcement Regarding the Allocation of Renewable Energy Resource Areas and Connection Capacities Based on Wind Energy" (YEKA RES-3) published in the Official Gazette dated May 29, 2021 and numbered 31495, contracts were signed on July 20, 2022 with the companies that won the competitions held on June 14, 2022. R3-ELAZIĞ-1 WPP (10 Turbines - 42.6 MWm/40 MWe) Project is one of these projects and the Project area has been determined accordingly. For this reason, there is no other alternative for the Project area.

In addition, since WPP projects must be established in windy areas, it will not be possible to install the Project in an alternative area. For this reason, the formulation given for the R3-ELAZIĞ-1 WPP Project was determined as the most optimum formulation and no other location alternatives were considered.

When choosing a location for WPP;

- The power plant site is in an area suitable for generating electricity from wind energy,
- There are no legal obstacles or usage restrictions within the scope of current legislation in and around the power plant site,
- Factors such as the fact that the power plant site is not on important "main bird migration routes" were effective.

VI.3 Technology Alternatives

ENERCON E138 EP3 E2 model will be used in the R3-ELAZIĞ-1 WPP Project with an installed power of 42.6 MWm/40 MWe, and the maximum annual electricity production amount is planned to be 127,578.9 MWh/year with 10 turbines.

Permission was obtained for 13 turbines during the EIA phase of the project, but it is decided to build 10 turbines. However, since the necessary permits are available, these 3 turbines can be built in the future if deemed necessary and reasonable.

The following features were taken into account when selecting the turbine type and capacity of the wind power plant planned to be established.

- Wind characteristics,
- Turbine characteristics and performance,
- Economic life and guarantees of turbines,
- Tested and operational turbines and their performances,
- Connection features to the interconnected system,
- Price and performance,
- Minimum environmental impact,
- Economical life and ease of maintenance
- Technology.

For this reason, no other alternative technology was considered for electricity production.

VI.4 No Project Alternative

Any investment may have many alternatives in terms of location and technology. All of these alternatives are different investment options developed for the realization of the Project. Beyond these, no project alternative should also be considered. The main purpose of such studies, which are referred to as no project alternatives, is to assess the benefits and costs of not implementing the Project (i.e. under current conditions). Since it is generally difficult to make such quantitative assessments, these studies present the decision-maker with alternative scenarios of what the implementation or non-implementation of the Project would entail. The R3-ELAZIĞ-1 Wind Power Plant Project (10 Turbines - 42.6 MWm/40 MWe) Project is a YEKA project. In short, YEKA, "Renewable Energy Resource Area", according to its definition in the regulation, "refers to the area(s) where at least one of the renewable energy resources that can be developed on public and Treasury immovable properties and privately owned immovable properties is located with a high density. In other words, it is the transformation of large-scale lands into large-scale energy sites. YEKA areas are declared as YEKA and allocated to investors if deemed appropriate by the Ministry of Energy and Natural Resources.

Therefore, the no project alternative for the Project area is considered and the benefits of the Project outweigh the risks/impacts in preliminary assessments. Therefore, implementation of the Project was deemed logical.

VII. MITIGATION AND MONITORING PLANS

VII.1 Mitigation Plans

This section presents cost effective and feasible measures to reduce adverse environmental and social impacts to acceptable level. The mitigation measures are presented in Table VII.1 and Table VII.2 During the implementation of the mitigation plan, Project Standards as described in Chapter III.3 will be complied with.

Table VII.1 Mitigations for the Pre-Construction and Construction Phase

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Residual Impact (Impact Significance After Mitigation)	Responsible Party/Parties
Physical Environment					
Air Quality: Dust Emissions	Increase in dust concentration Reducing air quality surrounding the Project Area, Temporarily reduced line of sight on nearby roads and highways, Possible health hazards due to extended exposure to high dust emissions in the Project Area. Possibility of erosion with strong winds. Flying rock and emissions due to blasting	Low	• YEKA RES 3 will ensure that Contractor will comply with the Pollution Prevention Plan in pre-construction and construction phases of the Project. Contractor will ensure all the employees are trained on the Pollution Prevention Plan and renew the training if necessary; • Dust will be minimized from open area sources, including storage piles, by using control measures such as installing enclosures and covers and increasing the moisture content; • Speed limitations will be defined and obeyed for pre-construction and construction vehicles; • The drop height of potentially dust generating materials will be kept as low as possible; • Dust suppression methods will be applied at construction sites to mitigate Project-related dust emissions. Watering will be done for dust suppression. In this respect, the upper layers of the work sites/materials will be kept humid. Watering will be applied at any time necessary including night time, weekends or off-days by using pressurized distribution or spraying systems that would ensure even distribution of water; • If there is traffic flow on the existing roads near the work sites, dust suppression measures will be continuously applied to ensure traffic safety. If there is no traffic existing in the local roads, dust suppression measures will be applied only at local residential areas; • All vehicles to be used in transportation activities will obey the speed limits set out in the Regulation on Highway Traffic. Vehicle speeds are proposed to be limited to 30 km/h on unpaved surfaces; • Loading and unloading operations will be performed without throwing/scattering; • During transportation, excavated materials will be covered with nylon canvas or materials with grain size larger than 10 mm; • Vehicles carrying excavation materials will be covered. • Wind shields/barriers will be placed at work sites such as material storage areas to prevent dust dispersion where necessary; • Special attention will be paid to the grievances of adjacent field and/or garden owners and relevant measures will be taken immediately; • Any damage caused by insufficient or lack of dust suppression (transportation of dust to a residential area, wind borne dust deposits etc.) measures will be compensated by the Contractor. • Driving through settlements will be avoided wherever alternative roads are present. • Compliance with the air emission limit values stipulated in Project Standards will be ensured. • Dust measurements will be conducted if any grievance regarding dust generation is received and mitigation measures will be enhanced in this respect such as increasing wet suppression/watering activities, further reducing speed/traffic if deemed necessary, considering both national legislations and IFC EHS Guidelines limit values. • A project-specific Stakeholder Engagement Plan will be implemented to identify any air quality-related complaints and plan/carry out corrective actions when necessary.	Low	YEKA RES 3 Contractor
Air Quality: Exhaust Emissions	Reducing air quality surrounding the Project Area, Possible health hazards due to extended exposure to high emissions in the Project Area. Increase in CO, SO_2, VOC and NOx emissions.	Low	• YEKA RES 3 will ensure that Contractor will comply with the Pollution Prevention Plan for reduction in exhaust emissions and the Resource Efficiency Management Plan for efficient energy use and low vehicle emissions during the pre-construction and construction phases of the Project. Contractor will ensure that all employees are trained on the Pollution Prevention Plan and the Resource Efficiency Management Plan and will update the training if necessary; • Well and adequately maintained vehicles will be used. Regular maintenance of machinery and equipment will be ensured; • Transportation vehicles (not including machinery and equipment) will be subjected to regular emission control; • Pre-construction and construction vehicles will not be permitted to keep engines running while waiting to enter the site or waiting on-site; • Project Standards will be complied with to minimize air emissions sourced from pre-construction and construction machinery and trucks; • Speed restrictions will be adopted by pre-construction and construction vehicles and optimal use of equipment to optimize fuel efficiency; • Driving through settlements will be avoided wherever alternative roads are present. • Monitoring of project related emissions will be carried out and additional actions will be developed and implemented as required, during the construction works. • Training will be performed for project personnel regarding energy efficiency.	Low	YEKA RES 3 Contractor
Climate Change: GHG Emissions	Contribution to climate change through Greenhouse Gas (GHG) emissions	Low	• YEKA RES 3 will ensure that Contractor will comply with the Pollution Prevention Plan for reduction in exhaust emissions and the Resource Efficiency Management Plan for efficient energy use and low vehicle emissions during the construction phase of the Project. Contractor will ensure that all employees are trained on the Pollution Prevention Plan and the Resource Efficiency Management Plan and will update the training if necessary; • All types of fuel used during pre-construction and construction phases will be recorded. • Compliance with the air emission limit values stipulated in Project Standards will be ensured. • Well and adequately maintained vehicles will be used. Regular maintenance of machinery and equipment will be ensured; • Construction vehicles will not be permitted to keep engines running while waiting to enter the site or waiting on-site;	Low	YEKA RES 3 Contractor

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Residual Impact (Impact Significance After Mitigation)	Responsible Party/Parties
			• YEKA RES 3 and contractors will evaluate cleaner production options and select the most appropriate raw materials and resources. • Optimal utilization of the available construction equipment and materials in such a way that reduces greenhouse gas emissions; • Speed restrictions will be adopted by construction vehicles and optimal use of equipment to optimize fuel efficiency; • Monitoring of project related emissions will be carried out and additional actions will be developed and implemented as required, during the construction works. • Trainings will be performed for project personnel regarding climate change and energy efficiency to increase awareness among employees.		
Soil and Soil Quality Erosion Potential	Possibility of increased risk of erosion, Possibility of increased dust emissions caused by wind erosion.	Low	• YEKA RES 3 will ensure that Contractor will comply with the Soil Management and Erosion Control Plan in pre-construction and construction phase of Project. Contractor will ensure all the employees are trained on the Soil Management and Erosion Control Plan and renew the training if necessary; • Activities will be scheduled to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff and vehicle tracking. • Activities will be carefully planned to minimize disturbed areas and to preserve existing vegetation. • Activities will be modified or suspended during extreme rainfall and high winds to the extent practical. • A drainage system will be constructed in the turbine foundations and switchyard. • Construction activities (especially excavation works) will be undertaken in the dry weather condition as much as possible to avoid surface runoff effects on excavated soil; • Unnecessary circulation of heavy machinery in the Project Area will be prevented; • The disturbed areas and soil stock piles will be kept moist to avoid wind erosion of soil and the pile height will not be higher than 2 m; • Subsidence and soil movements that may occur during excavation and filling operations will be prevented. • Where necessary, terracing, planting in pits (living fencing) and diversion ditches (diversion channels) would be used to reduce erosion and landslides. • Topography will be restored to provide stabilization immediately after the completion of construction at each location. • All the work sites will be revegetated to the extent possible promptly following the completion of works at that site. • If the measures are insufficient, hydraulic mulch and hydro-seeding will be used to stabilize the soil as an additional measure.	Low	YEKA RES 3 Contractor
Soil and Soil Quality Soil Contamination	Contamination of soil, Possibility of contamination of underground waters close to the surface, Scatter/dispersion of contaminated soil due to improper handling, transferring and disposal of the contaminated soil, Improper reuse of contaminated soil as landscaping,	Low	• YEKA RES 3 will ensure that Contractor will comply with the Soil Management and Erosion Control Plan in pre-construction and construction phases of the Project. Contractor will ensure all the employees are trained on the Soil Management and Erosion Control Plan and renew the training if necessary; • In order to minimize the impacts on soil environment, the amount of soil that could be subject to compaction and contamination/pollution will be minimized by ensuring the use of only the designated work sites and routes for the pre-construction and construction machinery and equipment and field personnel; • The fuel required for the pre-construction and construction equipment and vehicles to be used within the site during pre-construction and construction phases will be supplied primarily from the nearest station; if deemed necessary, fuels that may possibly be stored at site will be stored in the areas where necessary impermeability precautions (including secondary containment) are taken; • In case of accidental oil or fuel leakage/spill from machinery and equipment, the spread of leakage and spillage will be prevented with absorbent materials and spill kits in accordance with Emergency Preparedness and Response Plan. • Hazardous wastes and materials will be handled in accordance with the Hazardous Materials Management Procedure to prevent soil contamination. • Machinery and equipment will be checked regularly for leaking oil and fuel; • The provisions of the Regulation on the Control of Excavation Soil, Construction and Demolition Wastes shall be complied with during pre-construction and construction phases of the Project; • Provisions of the Regulation on the Control of Soil Pollution and Sites Contaminated by Point Sources shall be complied with within the scope of the Project; • Wastes and wastewater to be generated during the pre-construction and construction phases of the Project will be stored and disposed in a controlled manner in accordance with the national legislation, IFC General EHS Guidelines and in line with the management practices described in this report; • The units of the Project that are in touch with water, wastewater and chemicals will be constructed using concrete with appropriate cement ratio and durability in order to provide basement impermeability. Thus, no leakages to soil and groundwater will occur during the pre-construction and construction phases of the Project; • Septic tanks will be leak proof and the level will be checked periodically. • According to requirements specified in the Regulation on the Control Soil Pollution and Sites Contaminated by the Point Source, in terms of a possible soil contamination in the area, YEKA RES 3 is obliged to notify the MoEUCC on possible soil pollution in the Project Area according to the procedure defined in the regulation. Based on the inspections that will be carried out by the MoEUCC, if the site will be defined as a contaminated site that needs to be cleaned up, the site will be cleaned up by firms authorized by the MoEUCC and YEKA RES 3 will be the responsible entity to ensure clean up. Within the scope of cleanup activities, the following measures will be taken for the contaminated areas during the pre-construction and construction phases: o Vehicles containing any excavated soil will be suitably covered to limit potential dust emissions and	Low	YEKA RES 3 Contractor

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Residual Impact (Impact Significance After Mitigation)	Responsible Party/Parties
			truck bodies and tailgates will be sealed to prevent any discharge during transport; ○ Only licensed waste haulers will be used to collect and transport contaminated soil to an appropriate treatment/disposal site and illegal disposal of the soil will be prohibited; ○ Speed control for the trucks carrying contaminated soil will be enforced; • The use of contaminated soil for landscaping will be prohibited. • Any substance/material that would result in soil contamination will not be allowed to be discharged onto soil environment;		
Water Resources and Water Quality: Quality Change in Water Bodies and Sedimentation Control	Possibility of leakage of generated municipal wastewater that may cause to degradation in surface water and groundwater qualities, Increased possibility of surface runoff occurrence, Deterioration of quality in nearby water bodies due to wastes carried by surface runoff, erosion, waste dispersion or improper waste storage, handling and transfer. Possibility of adversely affecting water quality due to sediment transport by runoff.	Low	• YEKA RES 3 will ensure that Contractor will comply with the Pollution Prevention Plan and the Resource Efficiency Management Plan that are prepared in line with IFC PSs and Equator Principles (IV) in pre-construction and construction phases of the Project. Contractor will ensure all the employees are trained on the Pollution Prevention Plan, the Resource Efficiency Management Plan and renew the training if necessary; • Surface runoff resulted from rain/storm water or wastewater generation due to dust suppression activities will be prevented; • The water to be used for dust suppression will be monitored and recorded in m^3; • Within the scope of the Project, wastewater will be disposed of in accordance with the Regulation on Water Pollution Control. • Discharge of wastewater, residues or other waste into groundwater or into surface water will be avoided. Portable toilets will be supplied for the workers at the construction site. The limited amount of domestic wastewater generated at the construction site will be collected into the impervious septic tanks and then will be disposed of by septic tankers by Elazığ Special Provincial Administration in case the septic tanks reach 80% fullness. • The units of the Project that are in touch with water, wastewater and chemicals will be constructed using concrete with appropriate cement ratio and durability in order to provide basement impermeability. Thus, no leakages to soil and groundwater will occur during the pre-construction and construction phases of the Project; • Solid or liquid wastes will be disposed of properly. These materials will never be dumped into the streams and a 25 m protection band will be left on both banks of the stream beds. • Fuel/filling, chemical processing activities will be restricted in the vicinity of the water bodies. • Construction activities may pose the potential for accidental release/leakages of petroleum-based products, such as lubricants, hydraulic fluids, or fuels during their storage, transfer, or use in equipment. All chemical storage containers, including diesel fuel and hazardous liquid waste drums/containers will be placed in secondary containment in temporary storage area so as to minimize the risk of soil, surface water and groundwater contamination during the pre-construction and construction; • To prevent and alleviate the vehicle-generated sediment transport, measures such as stabilization of roads, etc. should be implemented.	Low	YEKA RES 3 Contractor
Water Resources and Water Quality: Water Usage	Water used/consumed during works	Low	• YEKA RES 3 will ensure that Contractor will comply with the Resource Efficiency Management Plan in pre-construction and construction phases of the Project. Contractor will ensure all the employees are trained on the Resource Efficiency Management Plan and renew the training if necessary; • Dust suppression will be done in a controlled manner. • Awareness will be raised among employees on the importance of water conservation and proper water use practices will be encouraged.	Negligible/None	YEKA RES 3 Contractor
Noise and Vibration: Noise Management	Possible health hazards due to extended exposure to high noise in/around the Project Area. Over exposure to increased noise levels may disturb routine life of human and animal populations nearby.	Low	• YEKA RES 3 will ensure that Contractor will comply with Pollution Prevention Plan in pre-construction and construction phases of the Project and the employees will be trained on the Plan. • The machinery and equipment to be used during the pre-construction and construction phases will not be operated at the same point/location but homogeneously distributed in the site if possible; • During vehicle and equipment procuring/leasing process for the Project, item with lower noise levels than equivalent ones will be preferred, if feasible; • The maintenance of the pre-construction and construction machinery and equipment will be carried out regularly and periodically. Daily maintenance will be carried out in each shift; and the working time of each vehicle will be registered by the operator in order to follow the total working hours for periodic maintenance. • All vehicles to be used in transportation activities will obey the speed limits set out in the Regulation on Highway Traffic; • Noise measurements will be conducted by an authorized environmental laboratory in case of any grievance and mitigation measures will be enhanced in this respect such as use of noise barriers; • Construction works will be performed between 07:00 - 19:00 hours. Unless absolutely necessary, no construction activities will be done at night. In case night operations are deemed necessary and the noise levels would be high, the public will be informed 1 day in advance about the time of construction activities; • The idle running equipment will be shut off in order to reduce the noise originating from idle running equipment. • The utilization of vehicles during construction will be adjusted to limit the number of vehicles and hence the possibility for traffic noise. • Where necessary, silencers will be installed on exhausts of vehicles and other equipment. • All construction activities will be carried out in compliance with the noise limits set out in the Regulation on Environmental Noise Control (RENC) and IFC EHS Guidelines and the Contractor will take additional mitigation measures in case of a requirement revealed by the monitoring; • Noise sensitive receptors will be informed about the construction schedule and activities to be conducted via the methods provided by the Stakeholder Engagement Plan. Information on Grievance Mechanism will also be provided through appropriate mediums.	Low	YEKA RES 3 Contractor

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Residual Impact (Impact Significance After Mitigation)	Responsible Party/Parties
Noise and Vibration: Blasting Management	Blasting activities can release significant amounts of energy in the form of shock and gas pressure, which can cause concussion.	Medium	• YEKA RES 3 will ensure that Contractor will comply with the Pollution Prevention Plan in pre-construction and construction phases of Project. Contractor will ensure all the employees are trained on the Pollution Prevention Plan and renew the training if necessary; • Aboveground blasting operations will not be conducted in close vicinity (within a 100 meter radius area) of the residential areas/neighborhoods if construction with other methods is feasible at that location. • Explosive charges will be optimized. Relevant records will be kept during the blasting operations and blasting related impacts will be monitored. • Vibration due to blasting will be minimized by applying modern blasting techniques. Blasting operations will be conducted using millisecond delays with low charge weight to be determined based on the geological formation and rock density. • Vibration due to blasting operations will be monitored and grievance mechanism will be active for any complaints related to vibration impacts. If any complaints related to vibration are received through Project's Grievance Mechanism, the complaint will be evaluated and where necessary, corrective actions will be planned and implemented. • Construction works will be designed and scheduled to reduce vibration and adverse effects. • Under the supervision of YEKA RES 3, the Contractor or its subcontractor will perform seismic measurements of the intensity of blasting-induced vibrations at various distances from the blasting spots if required by YEKA RES 3 based on documented issues relating to blasting intensity. • The degree of vibration on structures and plants that could be harmed by blasting activities will be monitored. • Where possible, on-site material (e.g. soil or scrap) shall be placed where it can provide additional shielding so that it does not cause any problems. Transport of material on-site or off-site by road will take place during the day and along a route that will be away from particularly sensitive receptors. • There will be a warning system at all audible distances during blasting activities (including nearby settlements that may be affected by blasting noise).	Low	YEKA RES 3 Contractor
Use of Resources and Waste Management: Resource Management	Resources used/consumed during works	Low	• YEKA RES 3 will ensure that Contractor will comply with the Resource Efficiency Management Plan in pre-construction and construction phases of the Project. Contractor will ensure all the employees are trained on the Resource Efficiency Management Plan and renew the training if necessary; • YEKA RES 3 and contractors will evaluate cleaner production options and select the most appropriate raw materials and resources. • Energy-efficient construction equipment, machinery and office equipment will be used. • A policy will be implemented to immediately shut down equipment and machinery when not in use to avoid unnecessary energy consumption. • Routine maintenance of electrical systems will be carried out to ensure that equipment operates at peak efficiency and to avoid wasting energy due to inefficiencies. • Watering will be done in a controlled manner. • Awareness will be raised among employees on the importance of water conservation and proper water use practices will be encouraged. • Vehicles and equipment will be inspected regularly, and transport-related measures will be taken, such as setting speed limits for optimal fuel consumption of vehicles.	Negligible/None	YEKA RES 3 Contractor
Use of Resources and Waste Management: Waste Management	Inefficient management of resources and increased amount of waste due to not separating waste and/or storing, handling or transferring wastes improperly. Possibility of increased public health hazard risks, deterioration of surface water, underground water and air quality, and/or soil contamination due to improper storage, handling and transfer of hazardous wastes, Possibility of air and/or soil pollution risk due to unauthorized burial and burning of waste on the site.	Low	• YEKA RES 3 will ensure that Contractor will continue to comply with the Waste Management Plan in pre-construction and construction phases of the Project. Contractor will ensure all the employees are trained on the Waste Management Plan and renew the training if necessary; • Waste to be generated within the scope of the Project will be managed in accordance with the waste management hierarchy; • Waste will be separated (i.e., hazardous / non-hazardous, recyclable / non-recyclable) and stored in designated temporary storage areas; • All kinds of implementations that may threaten personnel or public health will be avoided in all activities involving collection, temporary storage, transport and disposal of waste throughout the Project; • Waste recycling, transport and disposal will be carried out by means of licensed companies and/or relevant municipality's vehicles; • Incineration or burying of waste by any means at site and/or dumping of waste to nearby roads or water resources will not be allowed; • Waste to be temporarily stored on site will be delivered to licensed transport vehicles appropriate to the type of waste for disposal. Information related to the operations in this context will be recorded and the records will be kept in the administrative building; • Any generated waste oils originating from machinery and vehicles will be stored in impervious tanks and containers that would be situated on impervious foundation in accordance with the "Regulation on Control of Waste Oils". Tanks and containers will be equipped with apparatus that would prevent over filling and will be filled till the designated level mark. Tanks and containers will have a red color and will be labeled as "waste oil". Disposal of waste oils will be controlled by the YEKA RES 3; • Waste batteries from construction site and accumulators from vehicles will be disposed of in compliance with the consumer responsibilities specified in Article 13 of the "Regulation on Control of Waste Batteries and Accumulators". Accordingly, used batteries will be collected separately (from municipal wastes) and transferred to the TAP battery collection center; • All other hazardous materials will be disposed of in accordance with the Waste Management Regulation; • Hazardous waste to be temporarily stored on site will be delivered to licensed transport vehicles appropriate to the type of waste for disposal. Information related to the operations in this context will be recorded and the records will be kept in the administrative building; • Hazardous or non-hazardous inscription, waste code, stored waste amount and storage date will be	Low	YEKA RES 3 Contractor

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Residual Impact (Impact Significance After Mitigation)	Responsible Party/Parties
			indicated/labelled on waste temporarily stored by classifying according to their properties. The reaction of waste with each other will be prevented by the measures taken in the Temporary Storage Area, which will have impermeable ground, proper drainage for accidental leaks/spills, top cover and designated rooms for different types of waste, etc. The permit for the temporary Waste Storage Area will be taken from the Provincial Directorate of Environment, Urbanization and Climate Change. • Spill kits will be available at the Temporary Storage Area and necessary precautions will be taken against possible fires such as provision of appropriate firefighting equipment. • Construction materials that are resistant to material degradation caused by environmental factors (e.g. rainfall, wind, temperature changes, solar radiation and extreme weather conditions) will be selected to reduce waste generation. • Adequate ventilation will be provided where volatile wastes are to be stored.		
Use of Resources and Waste Management: Storage and Transportation of Explosives	Unintentional explosion, Soil contamination.	Low	• YEKA RES 3 will ensure that Contractor will comply with the related Management Plans (such as EPRP, CHS etc.) in construction phase of Project. Contractor will ensure all the employees are trained on related subjects and renew the training if necessary; • Explosives will be stored in designated areas in storage facilities and delivered to work sites in only the quantity required for immediate use. • Explosives will not be stored near heat sources or in direct sunlight. • Admittance will be restricted to the storage area responsible person, blasting supervisor, or licensed blaster. • Additional security measures, such as lockable cabinets, will be used to secure highly dangerous and reactive products. • Storage facilities will be clearly marked and provide supplementary containment. • Entrances, exits, and emergency equipment access will all be kept open at all times. • Buildings used to store large quantities of hazardous substances are isolated from other buildings to avoid the spreading of fire (i.e. a minimum distance has been foreseen for blasting storage area - 200 m). • The location of storage for the explosive materials will be at a safe distance from community dwellings and workers camps. Storage will be locked and guarded at all times. • Explosives will be kept within permitted storage areas having isolated divisions for capsules. • Detonators will be kept separately from explosive materials. • New explosive materials are not kept in same container with old explosive materials. • Explosives containers will not be placed directly against an interior wall for ventilation reasons. They will be stored so that identifying marks are visible and easy to read. • Detonators will be kept and transported separately from explosive materials. • Vehicles carrying explosive materials must be well-maintained, properly marked with placards, and have a non-sparking floor. • Prior to loading a vehicle with explosives, the vehicle must be fully fueled and inspected to ensure its safe operation. • Materials in contact with the explosives will be non-sparking and the load will be covered with a fire and water-resistant tarpaulin. • Vehicles will be equipped with fire extinguishers. • No person shall smoke or carry matches or any other flame-producing device, nor shall firearms or loaded cartridges be carried while in or near a motor vehicle or conveyance transporting explosives. • Motor vehicles or conveyances carrying explosives, blasting agents, or blasting supplies, shall not be taken inside a garage or shop for repairs or servicing. • No motor vehicle transporting explosives shall be left unattended. • Sufficient number of fire extinguishers will be provided in storage area. • Explosives, blasting agents, or initiation devices will not be stored in wet or damp areas; near oil, gasoline, or cleaning solvents; or near sources of heat radiators, stoves, etc. No metal or metal tools will be stored in the storage area. • There will be no smoking, matches, open lights, or other fire or flame inside or within 10 meters of storage areas or explosive materials.	Low	YEKA RES 3 Contractor
Social					
Population and Population Movements	Local employment	Low	• Prioritizing local employment in settlements in AoI. • The Project SEP including the grievance mechanism will be implemented. • Providing regular information to local stakeholders	Low	YEKA RES 3 Contractor
Employment / Economy	Contribution to economy	Low	• Care will be taken to contribute to the local economy through the use of local materials and to procure various goods and services from local resources. • Priority should be given to the local labour where possible and practical. • Efforts will be exercised to allocate employment opportunities to the local parties and the settlements within the AoI. • The SEP will be implemented. • In case any issues arise with procurement and employment, the grievance mechanism will be operated. • Providing regular information to local stakeholders	Low	YEKA RES 3 Contractor
Impacts on Agriculture	Loss of income	Low	• The Project SEP including the grievance mechanism will be implemented. • Prior to the start of the construction phase, YEKA RES 3 will collaborate with the headmen, related authorities and agencies in order to inform the local farmers will be notified about the construction areas and schedule.	Negligible/None	YEKA RES 3 Contractor

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Residual Impact (Impact Significance After Mitigation)	Responsible Party/Parties
			• The Project Community Development Plan (CDP) will be implemented.		
Impacts on Grazing Area and Animal Husbandry	Loss of income	Low	• The Project SEP including the grievance mechanism will be implemented. • Prior to the start of the construction phase, YEKA RES 3 will collaborate with the headmen, related authorities and agencies in order to inform the local livestock breeders will be notified about the construction areas and schedule. • The Project CDP will be implemented. • YEKA RES 3 will implement potential feasible pasture improvement measures, which will be subject to the final approval of the Pasture Commission established under the Provincial Directorate.	Negligible/None	YEKA RES 3 Contractor
Impacts on Beekeeping	Loss of income	Low	• The Project SEP including the grievance mechanism will be implemented. • Prior to the start of the construction phase, YEKA RES 3 will collaborate with the headmen, related authorities and agencies in order to inform the local beekeepers will be notified about the construction areas and schedule. • Providing in kind or cash support for the transportation of beehives that may be affected by dust and noise during construction. • The Project CDP will be implemented.	Negligible/None	YEKA RES 3 Contractor
Impacts on Mushroom and Herb Gathering	Loss of income	Low	• The Project SEP including the grievance mechanism will be implemented. • The Project CDP will be implemented. • Prior to start of the construction phase, YEKA RES 3 will collaborate with the headmen, in order to inform about the construction areas and schedule.	Negligible/None	YEKA RES 3 Contractor
Impacts on Public Land	Loss of income	Low	• The Project SEP including the grievance mechanism will be implemented. • The Project CDP will be implemented. • YEKA RES 3 will implement potential feasible pasture improvement measures, which will be subject to the final approval of the Pasture Commission established under the Provincial Directorate.	Negligible/None	YEKA RES 3 Contractor
Impacts on Private Land	Loss of income	Low	• Compensation will be paid according to international standards The Project SEP including the grievance mechanism will be implemented. • The Project CDP will be implemented. • YEKA RES 3 will implement potential supports, such as seedlings, feed, seeds, or fertilizer.	Negligible/None	YEKA RES 3 Contractor
Social Welfare (Quality of Life and Infrastructure)	Potential impact Quality of Life and Infrastructure	Low	• Continuously monitor the effectiveness of measures to minimize negative impacts such as dust and noise and develop additional measures if necessary. • Continuously monitor the effects on infrastructure • Operation of a grievance mechanism	Low	YEKA RES 3 Contractor
Labour and Working Conditions	Improper Working Conditions, Child labour, forced labour and unregistered employment	Low	• Implementing Labor and Influx Management Plan (LIMP), • Workers will be informed about the grievance mechanism and will be required to be aware of this Mechanism. • All workers will be given training on discrimination and codes of conduct. The training given to the employees will be explanatory about the concepts of sexual harassment and abuse, sexual exploitation, gender-based violence, abuse, and intervention with harassment. • Minimum legal labour standards will be met (child/forced labour, anti-discrimination, working hours, minimum wages) as per International Labor Organization (ILO) regulations. • At the same time, national laws/ regulations and international conventions/ standards will be complied with in terms of the working conditions. • Discrimination based on language, race, gender, political thought, philosophical belief and religion will be avoided in business relations.	Low	YEKA RES 3 Contractor
Labour and Working Conditions	Work suspension due to legal noncompliance in Labor and Influx Management	Medium	• Concluding written contracts with workers upon recruitment, including terms and conditions of employment and rights in accordance with national legislation • Keeping personnel data files including contracts, training records, signed codes of conduct, health reports	Low	YEKA RES 3 Contractor
Labour and Working Conditions	Human Rights	Low	• Implementing Human Rights Management Plan ; • Legal labor standards will be met (child/forced labor, anti-discrimination, working hours, minimum wages) as per International Labor Organization (ILO) regulations. • Discrimination based on language, race, gender, political thought, philosophical belief and religion will be avoided in business relations. • Regular monitoring and control of workers' written contracts, personnel data	Low	YEKA RES 3 Contractor
Occupational Health and Safety (OHS)	Inadequate workers' health and safety conditions	High	• The Contractor will include a fulltime OHS expert with a Class A specialization certificate who will effectively control the implementation of the Project. She/he shall monitor the site implementations. • The consultant and YEKA RES 3 will make sure that the measures provided below are taken by the contractor and enforce necessary actions/sanctions in case of a lack of these measures on-site. In accordance with the Occupational Health and Safety Regulation in Construction Works, the required person, information, plan, and organization will be provided. • An Emergency Response Plan will be prepared and shared with all employees. • YEKA RES 3 will require all employees and contractors to adhere to local and international health and safety legislation and guidelines. Workers will be provided with all necessary personal protective equipment (PPE) (hard hats, safety harnesses, protective coveralls, glasses, gloves, safety shoes, etc.). • Non-smoking areas will be allocated at the construction site. • Appropriate hand and face washing facilities will be provided to the employees, and also shower facilities for dusty works. • Technical and OHS training, including the code of conduct indicating the possible risks regarding the work	Low	YEKA RES 3 Contractor

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Residual Impact (Impact Significance After Mitigation)	Responsible Party/Parties
			site and works to be carried will be given to workers by the contractor.		
Occupational Health and Safety	Work suspension due to work accident (lack of appropriate OHS measures/ unsafe work environment)	High	• Implementing OHS Plan, Emergency Preparedness and Response Plan, Accident/incident Investigation and Reporting and Root Cause Analysis Procedure, and Non-Conformity / Non-Compliance and Corrective / Preventive Action Procedure. • Placing safety barriers and warning signs around work areas. • Conducting occupational safety meetings/toolbox talks with workers before starting work every day. • Legal periodic inspection of work equipment at the construction site by an authorized expert. • Daily control of work equipment by its operators. • First aid boxes for each work team for first aid response. • Providing certified first aid training to workers. • Establishment of a first aid team consisting of workers for each work zone. • Providing workers with Personal Protective Equipment (PPE) specific to their tasks. • Provide a safe and healthy work environment for the workers. Provide equipment that meets international standards in terms of performance and safety. • Inform all workers about the required safety rules, risks, and related regulations to be followed at the construction site throughout the construction period. • Establish emergency teams and carry out training/drills according to the emergency scenarios. • Record all accidents and incidents (fatalities, lost time incidents, any significant events including spills, fire, pandemic outbreak or infectious diseases, social unrest, etc.) as well as near misses. The project owner will ensure that all OHS measures are taken by the Contractor and enforce necessary actions/sanctions in case of lack of these measures on sites. • The Contractor will promptly notify YEKA RES 3 in case of any incident or accident related to the Project that has or is likely to have, a significant adverse effect on the environment, the affected communities, the public and workers such as OHS accidents or that results in threatening community health and safety. • Within the scope of electrical safety, work will not be carried out other than by authorized and competent persons. • Providing periodic training to the workers on OHS issues including emergency response such as firefighting and recording all provided training. • Providing appropriate type and number of fire extinguishing equipment in each working area • Machinery and equipment to be used during land preparation and construction activities will not be operated at the same point/place, but will be distributed homogeneously on the site, • Care will be taken to select equipment with low noise levels within the scope of the project, • Maintenance of construction machinery and equipment will be done regularly and periodically, • In case of complaints, noise measurements will be conducted and additional mitigation measures (such as noise barriers, etc.) will be applied if the measured values exceed the project standards. • Equipment and vehicles used externally will be regularly maintained. • "Low noise" equipment will be used as much as possible during the construction phase. Where construction equipment is provided with impermeable acoustic covers or enclosures, covers will be kept closed while the equipment is in operation. • When equipment is not working, it will be turned off or reduced to the minimum level. • Vibration levels will be monitored in case of complaints, and measures will be taken to reduce vibration if standards are exceeded. • Noise measurement will be carried out at the nearest noise-sensitive receptors in accordance with the international standard, in case of any complaints. • When working at height, all tools and equipment should be fitted with a lanyard, where possible, and capture netting should be used if practicable. • Avoid conducting tower installation or maintenance work during poor weather conditions and especially where there is a risk of lightning strikes. • Ensure all lifting equipment (including load attachment points) is suitable, capable of supporting the load, in good condition, and receipt of any statutory inspections required.	Low	YEKA RES 3 Contractor
Community Health and Safety	Potential Community Disturbance Access from outside, Abnormal load transportation and traffic load	Low	• YEKA RES 3 will ensure that contractors establish the code of conduct and will check that workers will be given training, especially on communication with local people of foreign nationality public before starting work, so that local people of foreign nationality will not be adversely affected by external workers. • The operations to be carried out during construction works will be performed not to restrict/hinder the social and economic life of local people. • To avoid any impact on the safety and daily life of communities, safety and information signs will be placed on site before the work. • The perimeter of the construction areas will be blocked with a wire fence and warning signs will be hung. • Local people will be informed about potential hazards and risks through brochures and posters left in common areas frequently used by local people such as headman's offices, mosques, coffee houses and marketplaces. • The activities affecting the local traffic will be planned considering the rush hours of the traffic as much as possible. • A Community Health and Safety Plan (CHSP) will be implemented. • The Traffic Management Plan (TMP), describing general traffic rules and measures and driving safety measures will be implemented. • Prescribed routes for construction traffic and critical locations will be identified and agreed with the relevant	Low	YEKA RES 3 Contractor

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Residual Impact (Impact Significance After Mitigation)	Responsible Party/Parties
			authorities (i.e. General Directorate of State Highways, local police force), particularly for the transportation of oversized and heavy vehicles. • YEKA RES 3 will undertake official communication with the authorities to ensure collaboration to be able to apply necessary health and safety restrictions in case such restrictions are applied within their jurisdiction areas. • Roads passing through settlements will be avoided whenever alternative routes are available. If Project traffic routing through the settlements is not avoidable, all necessary traffic management measures will be taken. The local communities and if necessary local authorities will be informed about the transportation routes and schedule. • Scheduling of traffic will be undertaken to avoid the peak hours on the local road network wherever practicable (e.g. early in the morning with the daylight). Scheduling information and planned traffic disruptions will be communicated well in advance to all related parties including authorities, local communities and nearby businesses. • Trucks and trailers to be used for off-site transportation will have a gross weight within the axial permissible load to protect the roads from damage. • Deliveries by vehicles carrying hazardous materials and wastes will be planned carefully to avoid risks to the environment, local communities and Project personnel. • Construction contractors will be required to arrange buses/services for the transportation of Project personnel to minimize external traffic. • The roads in the vicinity of the License Area will be closed to local traffic during the transportation of oversized and heavy turbine components. • The Project Company will improve the existing road providing access to the License Area. • Concrete works will be planned at hours when local traffic volumes are normally at their lowest during the day. • Flagmen will accompany concrete mixers at intersections, other and critical locations. • Hazards that may cause traffic accidents within and around the License Area (e.g. locations where fall from height is possible for the vehicles/construction machinery) will be identified and appropriate measures (e.g. placing physical barriers having adequate size and strength at locations where fall from height is a hazard; placing mirrors) will be taken at all critical locations (e.g. sharp bends, bottom of steep sections, narrow sections, edges of the slopes) before the start of construction phase. Hazardous locations will be clearly signposted. • Project-specific Stakeholder Engagement Plan (SEP) will be implemented to address any construction transport/traffic related grievance and plan/take corrective actions in line with the Grievance Mechanisms, where necessary. As part of SEP, local communities will be informed about the construction sites, traffic restrictions to be applied for health and safety purposes and the duration of such restrictions.		
Community Health and Safety: Preserving Existing Infrastructure Utilities and Services	Possibility of damaging infrastructure during pre-construction and construction phase	Low	• The construction works and waste disposal during the pre-construction phase of the Project will be performed by contractors. Therefore, any damage to infrastructure will be repaired or compensated by contractors promptly in accordance with the responsible authority, such as KGM. YEKA RES 3 will closely monitor such issues with the establishment of Public Grievance Mechanism.	Negligible/None	YEKA RES 3 Contractor
Traffic and Pedestrian Safety	Direct and indirect threats posed by construction activities against traffic and pedestrians	Low	• Implementing Traffic Management Plan (TMP). • All vehicles to be used in transportation activities will comply with the speed limits specified in the Highway Traffic Regulation, • Traffic and warning signs will be placed around and near the project area. • The project area will be made visible. • Local people will be informed about potential hazards and risks through brochures and posters left in common areas frequently used by local people such as headman's offices, mosques, coffee houses and marketplaces. • The activities affecting the local traffic will be planned considering the rush hours of the traffic as much as possible. • Vehicles carrying construction machinery and materials will not park outside the project area and parking lot. • Setting speed limits • Protectors carrying work machines and materials must have appropriately qualified persons. • Hanging warning signs about speed limit in the Project Area • All drivers involved in the project will be informed about road safety, speed limits, and traffic rules to be followed during the project, and requirements to be observed.	Low	YEKA RES 3 Contractor
Landscape and Visual: Aesthetic Concerns	Creation of visual pollution Impairment of quality of life due to the overall presence of annoying construction works and activities and altered landscape	Low	• YEKA RES 3 will ensure that Contractor will continue to comply with the Reinstatement Management Plan in pre-construction and construction phases of Project. Contractor will ensure all the employees are trained on the Reinstatement Management Plan and renew the training if necessary; • Landscape disturbed by construction activities will be restored as close to its original condition as possible in a sustainable manner. • Construction works will be performed between 07:00 - 19:00 hours. Unless absolutely necessary, no construction activities will be done at night. In case night operations are deemed necessary, the public will be informed 1 day in advance about the time of construction activities; • The areas used for the temporary storage of excavation waste will be brought to their initial state as soon as the excavation/construction activities in each related area are completed. • The existing vegetation to be protected will be enclosed with temporary protective fencing before works commence on site so that as much vegetation as possible can be retained to maintain the integrity of the landscape and existing visual screening.	Low	YEKA RES 3 Contractor

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Residual Impact (Impact Significance After Mitigation)	Responsible Party/Parties
			• Working areas will be kept as small as practicable. Visual barriers will be implemented if the area is subjected to high visual impacts. • All debris and wastes will be collected, stored, and disposed in a systematic manner to avoid any negative visual impact on the surrounding area.		

Cost of the mitigations proposed in the above table will be included in the construction costs.

Table VII.2 Mitigations for the Operation Phase

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Responsible Party/Parties
Physical Environment					
Air Quality: Exhaust Emissions	Reducing air quality surrounding the Project Area, Possible health hazards due to extended exposure to high emissions in the Project Area.	Low	• YEKA RES 3 will comply with the Pollution Prevention Plan for reduction in exhaust emissions and the Resource Efficiency Management Plan for efficient energy use and low vehicle emissions during the operation phase of the Project. YEKA RES 3 will ensure that all employees are trained on the Pollution Prevention Plan and the Resource Efficiency Management Plan and will update the training if necessary; • Well and adequately maintained operation phase vehicles will be used. Regular maintenance of operation phase machinery and equipment will be ensured; • Exhaust systems of the vehicles will be controlled regularly(daily and periodically); • Transportation vehicles (not including machinery and equipment) will be subjected to regular emission control; • Operation phase vehicles will not be permitted to keep engines running while waiting or standing by for duty. • Relevant provisions of the Regulation on Air Pollution Control Sourced from Industry, the Regulation on Exhaust Gas Emission Control and Regulation on the Assessment and Management of Air Quality will be complied with to minimize air emissions sourced from machinery, equipment, and vehicles that are used in operation phase; • Speed restrictions will be adopted by operation phase vehicles and optimal use of operation phase equipment to optimize fuel efficiency; • Training will be performed for project personnel regarding energy efficiency.	Negligible/None	YEKA RES 3
Soil and Soil Quality: Soil Contamination	Contamination of soil, Possibility of contamination of underground waters close to the surface, Scatter/dispersion of contaminated soil due to improper handling, transferring and disposal of the contaminated soil, Improper reuse of contaminated soil as landscaping, Repair and maintenance works, such as spillage/leakage of wastewater, oil and chemicals to soil.	Low	• YEKA RES 3 will comply with the Soil Management and Erosion Control Plan in operation phase of Project. YEKA RES 3 will ensure all the employees are trained on the Soil Management and Erosion Control Plan and renew the training if necessary; • The staff will be trained in proper management of waste to avoid soil contamination during maintenance and repair works; • The amount of soil that could be subject to contamination will be minimized by ensuring the use of only the designated worksites and routes for the machinery and equipment and field personnel during maintenance and repair works; • Machinery and equipment will be checked regularly for leaking oil and fuel. Regular turbine maintenance will ensure that the potential for fluid leakage is minimized; • Transformer coolant will be free from carcinogenic oils; • In the event of an accident, leak or spill, necessary repair works and/or replacement of parts will be performed promptly in accordance with the standards; • In case of accidental oil or fuel leakage/spill from machinery and equipment, the spread of leakage and spillage will be prevented with absorbent materials and spill kits in accordance with Emergency Preparedness and Response Plan. • All storage tanks and drums, including those containing fuel and oil, will be positioned on concrete surfaces equipped with suitable secondary containment measures. Absorbent materials will be placed close to the storage tanks where necessary; • According to the categories specified in the Regulation on the Control of Waste Oils, waste oils will be stored and disposed of in separate containers; • Provisions of the Regulation on the Control of Soil Pollution and Sites Contaminated by Point Sources will be complied with. • Waste and wastewater to be generated during the operation phase of the Project will be stored and disposed in a controlled manner in accordance with the national legislation, IFC General EHS Guidelines and in line with the management practices described in this report;	Negligible/None	YEKA RES 3
Water Resources and Water Quality: Quality Change in Water Bodies	Possibility of leakage of generated municipal wastewater that may cause to degradation in surface water and groundwater qualities, Deterioration of quality in nearby water bodies due to wastes carried by surface runoff, erosion, waste dispersion or improper waste storage, handling and transfer. Possibility of adversely affecting water quality due to sediment transport by runoff.	Low	• YEKA RES 3 will comply with the Pollution Prevention Plan and the Resource Efficiency Management Plan that are prepared in line with IFC PSs and Equator Principles (IV) in operation phase of the Project. YEKA RES 3 will ensure all the employees are trained on the Pollution Prevention Plan, the Resource Efficiency Management Plan and renew the training if necessary. • The provisions and prohibitions of the Regulation on Water Pollution Control will be complied with and water resources will be protected against possible hazards. • Ensuring all equipment working in or near water is clean and free of fluid leaks, • Restricting fuelling/refilling, chemical handling activities in close vicinity of the water, • No waste material, solid or liquid waste will be poured into the existing stream beds in the vicinity of the Project site, including those with seasonal flow, and their sections will not be narrowed, and the existing and cadastral width of the stream beds will be preserved. • The direct discharge of wastewater to the receiving environments is strictly forbidden.	Low	YEKA RES 3

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Responsible Party/Parties
			• Limited amount of domestic wastewater generated in the operation site will be collected in impermeable septic tanks without damaging water resources and will be disposed of by septic tankers by Elazığ Special Provincial Administration if the septic tanks reach 80% fullness.		
Water Resources and Water Quality: Water Usage	Water used/consumed during works	Low	• YEKA RES 3 will ensure that Contractor will comply with the Resource Efficiency Management Plan in operation phase of the Project. Contractor will ensure all the employees are trained on the Resource Efficiency Management Plan and renew the training if necessary; • Awareness will be raised among employees on the importance of water conservation and proper water use practices will be encouraged.	Negligible/None	YEKA RES 3
Noise and Vibration: Noise Management	Increase in background noise.	Low	• YEKA RES 3 will comply with Pollution Prevention Plan in operation phase of the Project and the employees will be trained on the Plan. • During the procurement of equipment and machinery, turbines with a noise-reduced operating system will be selected; • Relevant provisions and limit values of Regulation on the Environmental Noise Emissions Caused by Equipment Used Outdoors and Regulation on Environmental Noise Control (RENC) and IFC General EHS Guidelines and Sectorial Guidelines will be complied with during the operation phase; • The existing grievance mechanism will be used to effectively manage noise related complaints. If any comments are received regarding noise, monitoring of noise at these receptors will be conducted to ensure compliance with standards and where necessary, mitigation measures will be taken; • WPP components such as inverters, transformers and other equipment and vehicles used for transportation will be periodically maintained to ensure good working conditions.	Low	YEKA RES 3
Use of Resources and Waste Management: Resource Management	Resources used/consumed during operation	Low	• YEKA RES 3 will comply with the Resource Efficiency Management Plan in operation phase of the Project. YEKA RES 3 will ensure all the employees are trained on the Resource Efficiency Management Plan and renew the training if necessary; • Energy-efficient machinery and office equipment will be used. • Routine maintenance of electrical systems will be carried out to ensure that equipment operates at peak efficiency and to avoid wasting energy due to inefficiencies. • Awareness will be raised among employees on the importance of resource conservation and proper resource use practices will be encouraged. • Starting from the operation phase, YEKA RES 3 will seek assistance from technical consultants to reduce energy consumption and related costs through the optimization of the following: ○ Energy conservation, ○ Process efficiency,	Negligible/None	YEKA RES 3
Use of Resources and Waste Management: Waste Management	Inefficient management of resources and increased amount of waste due to not separating waste and/or storing, handling or transferring wastes improperly. Possibility of increased public health hazard risks, deterioration of surface water, underground water and air quality, and/or soil contamination due to improper storage, handling and transfer of hazardous wastes, Possibility of air and/or soil pollution risk due to unauthorized burial and burning of waste on the site.	Low	• YEKA RES 3 will comply with the Waste Management Plan in operation phase of the Project. YEKA RES 3 will ensure all the employees are trained on the Waste Management Plan and renew the training if necessary to reflect the operation phase conditions before commencement of the operation phase. The updated plan will provide procedures for the management of waste; • Waste to be generated within the scope of the Project will be managed in accordance with the waste management hierarchy; • Waste recycling, transport and disposal will be carried out by means of licensed companies and/or Elazığ Metropolitan Municipality; • Incineration or burying of waste by any means on site and/or dumping of waste to nearby roads or water resources will absolutely not be in question; • All kinds of implementations that may threaten personnel or public health will be avoided in all activities involving collection, temporary storage, transport and disposal of waste throughout the Project; • Waste to be temporarily stored on site will be delivered to licensed transport vehicles appropriate to the type of waste for disposal. Information related to the operations in this context will be recorded and the records will be kept in the administrative building; • Waste will be separated (i.e., hazardous / non-hazardous, recyclable / non-recyclable) and stored in designated temporary storage areas; • Temporary storage of waste will be labelled with an indication of hazardous or non-hazardous inscription, waste code, stored waste amount and storage date and classification according to their properties. The reaction of wastes with each other will be prevented by the measures taken in the Temporary Storage Area; and • Hazardous wastes will be stored in designated impermeable waste storage areas. • Impermeability will be provided on the floors of the Temporary Storage Area and a suitable drainage system will be installed. Spill kits will be available at the Temporary Storage Area and necessary precautions will be taken against possible fires such as provision of appropriate firefighting equipment. • Wastewater generated during the operation phase will be temporarily collected in septic tanks and will be periodically collected by Elazığ Special Provincial Administration Water and Canal Services Directorate by vacuum trucks.	Low	YEKA RES 3
Social					
Population and Population Movements	Local employment	Low	• Prioritizing local employment in settlements in AoI. • The Project SEP including the grievance mechanism will be implemented. • Providing regular information to local stakeholders	Low	YEKA RES 3 Contractor
Employment / Economy	Contribution to economy	Low	• Prioritizing local employment in settlements in AoI.	Low	YEKA RES 3

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Responsible Party/Parties
Social Welfare (Quality of Life and Infrastructure)	Potential impact Quality of Life and Infrastructure	Low	• Continuously monitor the effectiveness of measures to minimize negative impacts such as noise, shadow flicker, blade/ice throw, security management and develop additional measures if necessary. • Continuously monitor the effects on infrastructure • The Project SEP including the grievance mechanism will be implemented.	Low	YEKA RES 3
Labour and Working Conditions	Improper Working Conditions, Child labour, forced labour and unregistered employment	Low	• Implementing Labor and Influx Management Plan (LIMP), • Workers will be informed about the Grievance mechanism and will be required to be aware of this Mechanism. • All workers will be given training on discrimination and codes of conduct. The training given to the employees will be explanatory about the concepts of social impact and inclusion, cultural heritage and chance find procedure, environmental impact and biodiversity • Training will be given to Private Security on discrimination and codes of conduct. The training given will be explanatory about the concepts of social impact and inclusion, cultural heritage and chance find procedure, environmental impact and biodiversity, human rights and GBVH. • Minimum legal labour standards will be met (child/forced labour, anti-discrimination, working hours, minimum wages) as per International Labor Organization (ILO) regulations. • At the same time, national laws/ regulations and international conventions/ standards will be complied with in terms of the working conditions. • Discrimination based on language, race, gender, political thought, philosophical belief and religion will be avoided in business relations.	Low	YEKA RES 3
Labour and Working Conditions	Work suspension due to legal noncompliance in Labour and Influx Management	Medium	• Concluding written contracts with workers upon recruitment, including terms and conditions of employment and rights in accordance with national legislation • Keeping personnel data files including contracts, training records, signed codes of conduct, health reports	Low	YEKA RES 3
Labour and Working Conditions	Human Rights	Low	• Implementing Human Rights Management Plan ; • Legal labor standards will be met (child/forced labor, anti-discrimination, working hours, minimum wages) as per International Labor Organization (ILO) regulations. • Discrimination based on language, race, gender, political thought, philosophical belief and religion will be avoided in business relations. • Regular monitoring and control of workers' written contracts, personnel data	Low	YEKA RES 3
Occupational Health and Safety	Work suspension due to work accident (lack of appropriate OHS measures/ unsafe work environment)	High	• Implementing OHS Plan, Emergency Preparedness and Response Plan, Accident/incident Investigation and Reporting and Root Cause Analysis Procedure, and Non-Conformity / Non-Compliance and Corrective / Preventive Action Procedure. • Placing safety barriers and warning signs around work areas. • Conducting occupational safety meetings/toolbox talks with workers before starting maintenance works. • Legal periodic inspection of work equipment by an authorized expert. • Control of work equipment before maintenance works by its operators. • First aid boxes for each work team for first aid response. • Providing certified first aid training to workers. • Establishment of a first aid team consisting of workers for each work zone. • Providing workers with Personal Protective Equipment (PPE) specific to their tasks. • Provide a safe and healthy work environment for the workers. Provide equipment that meets international standards in terms of performance and safety. • Inform all workers about the required safety rules, risks, and related regulations to be followed at the construction site throughout the operation period. • Establish emergency teams and carry out training/drills according to the emergency scenarios. • Record all accidents and incidents (fatalities, lost time incidents, any significant events including spills, fire, pandemic outbreak or infectious diseases, social unrest, etc.) as well as near misses. • Within the scope of electrical safety, work will not be carried out other than by authorized and competent persons. • Providing periodic training to the workers on OHS issues including emergency response such as firefighting and recording all provided training. • Maintenance of construction machinery and equipment will be done regularly and periodically, • Ensure all structures are designed and built to the appropriate standards, and have the appropriate means of working-at-height systems fitted. • Suitable exclusion zones should be established and maintained underneath any working-at height activities, where possible, to protect workers from falling objects. • Ensure all employees working at height are trained and competent in the use of all working-at height and rescue systems in place. • Provide workers with a suitable work-positioning device; also ensure the connectors on positioning systems are compatible with the tower components to which they are attached. • Ensure that hoisting equipment is properly rated and maintained and that hoist operators are properly trained. • Signs and other obstructions should be removed from poles or structures prior to undertaking work. • An approved tool bag should be used for raising or lowering tools or materials for workers on elevated structures. • Ensure all lifting equipment (including load attachment points) is suitable, capable of supporting the load, in good condition, and receipt of any statutory inspections required. • Ensure all relevant information is known about the load, e.g., the size, weight, method of slinging, and attachment points. • Ensure all supervisors, equipment operators, and slingers are trained and competent in the lifting equipment and intended lifting techniques. • Where possible, exclusion zones are to be established and maintained in order to prevent any unauthorized access to lifting areas.	Low	YEKA RES 3

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Responsible Party/Parties
			• When lifting large loads, ensure weather conditions are favourable for the task. Heavy lifting equipment typically has safe operating parameters included in its operating manual and these parameters should not be exceeded at any time. Additional information on severe weather can be found in the General EHS Guidelines		
Community Health and Safety	Potential Community Disturbance Shadow Flicker Blade/Ice Throw Security Management	Low	• YEKA RES 3 will engage with the PAPs fort the potential operational shadow flicker impacts of the Project. • Equip turbines with ice detectors that shut down the turbine to an idling state when ice is present. • Post warning signs at least one rotor diameter from the wind turbine in all directions, if turbines are required to operate in icing conditions, and are in a remote location where people are unlikely to be put at risk. • Equip turbines 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. • YEKA RES 3 will monitor the ice throw risk by means of a review of SCADA results, meteorological data recorded at the WPP and visual observation during the period between December and March (both inclusive) on an on-going basis throughout the operation. • In the first year of operation, monthly reports on icing at the WPP will be produced for the period between December and March (both inclusive) to fully understand and evaluate the ice throw potential of the WPP. This reporting and evaluation will be on-going afterward as necessary and/or if required by the Lenders. • YEKA RES 3 will ensure that periodic blade inspections and repair of defects that could affect blade integrity are performed and recorded.	Low	YEKA RES 3
Traffic and Pedestrian Safety	Direct and indirect threats posed by operation activities against traffic and pedestrians	Low	• Implementing Traffic Management Plan (TMP). • All vehicles to be used in transportation activities will comply with the speed limits specified in the Highway Traffic Regulation, • Traffic and warning signs will be placed around and near the project area. • The activities affecting the local traffic will be planned considering the rush hours of the traffic as much as possible. • Vehicles carrying construction machinery and materials will not park outside the project area and parking lot. • Setting speed limits • Protectors carrying work machines and materials must have appropriately qualified persons. • Hanging warning signs about speed limit in the Project Area • All drivers involved in the project will be informed about road safety, speed limits, and traffic rules to be followed during the project, and requirements to be observed.	Low	YEKA RES 3
Landscape and Visual : Aesthetic Concerns	Creation of visual pollution.	Low	• Turbine rotation direction, turbine and tower type and height will be kept uniform. • Turbines will be a single uniform color. • To ensure flight safety, there will be anti-collision lighting and marking systems on the turbine blades. • Suitable environmental arrangement will be provided around the Project area.	Low	YEKA RES 3

Cost of the mitigations proposed in the above table will be included in the operation costs.

VII.2 Monitoring Plans

In order to ensure the continuity and effectiveness of the implementation of mitigation management strategies defined, monitoring plays a key role. The main objective of the Monitoring Plan is to assess the implementation of the prescribed mitigation measures and requirements of this ESIA Report.

Information collected with the monitoring can be used to improve management plans during all phases of the Project. While impact assessment attempts to encompass all relevant potential impacts to identify their significance and include appropriate responses for these impacts, unanticipated impacts may still arise, which can be managed or mitigated before they become a problem using the information obtained through monitoring. Therefore, monitoring will ensure the successful implementation of the mitigation/management plans and optimize environmental protection through good practice at each and every stage of the Project.

Consequently, monitoring studies will provide implementation of impact mitigation measures and optimization of environmental protection by using best practices at all stages of the Project.

Some of the monitoring parameters are determined in the scope of engineering design studies. Monitoring studies will ensure the accordance with the project standards, contract necessities and implementation of impact mitigation measures.

Monitoring activities are submitted in tabular form in Table VII.3 for pre-construction and construction phases and in Table VII.4 for operation phase.

Table VII.3 Monitoring Plan for the Pre-construction and Construction Phase

Issue	**Parameters to be monitored (What parameter is to be monitored?)**	**Target/Threshold Value***	**Monitoring location (Where the parameter is to be monitored?)**	**Monitoring Method (How** *is the parameter to be monitored/ type of monitoring equipment?)*	**Timing/Frequency of Monitoring (When** *is the parameter to be monitored- frequency of measurement or continuous?)*	**Cost of Monitoring** *(What is the cost of equipment or contractor charges to perform monitoring?)*	**Responsible Party/Parties**	**Supervision observation and comments** *to be filled out during supervision with reference to adequate measuring reports*
Air Quality: Preserving air quality	Settled dust, PM_{10} and $PM_{2.5}$	Below the Project Standards No air quality related grievance received	Air quality measurement points: A-N-1, A-N-2, A-N-3, A-N-4 and A-N-5	Sampling/analysis via an authorized environmental laboratory EHSS-Q Monthly Report	Upon grievance	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
	Maintenance and exhaust control records of all machinery and equipment	Below the Project Standards	Administration office for the follow-up of records	EHSS-Q Monthly Report	Quarterly during the construction phases	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Climate Change: GHG Emissions	GHG emission amounts	Minimum contribution to climate change	Administration office for the follow-up of records	EHSS-Q Monthly Report	Monthly	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Soil and Soil Quality: Storage and use of excavation waste	Amount of refilled, stored and disposed excavation materials	Proper management of excavation wastes	Construction site and storage areas	Visual observation EHSS-Q Monthly Report	Once in a week starting from the initialization of construction phase	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Soil and Soil Quality: Preventing erosion potential	Erosion control measures and structures	No erosion occurs	Construction site	Visual observation	Once in a week starting from the initialization of pre-construction phase After significant rainfall and wind events	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Soil and Soil Quality: Soil contamination	Amount of contaminated soil	No soil contamination resulting from project activities	Project area Septic tank and material storage areas	Sampling/analysis via an authorized environmental laboratory Visual observation EHSS-Q Monthly Report	When a contamination is observed and upon grievance After each incident	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
	Conditions of the storage area Number of leaks, spills, etc.	No chemical spill incident	Project area Chemical storage locations	Visual observation Site inspections EHSS-Q Monthly Report	Once in a week starting from the initialization of construction phase	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Water Resources and Water Quality: Preserving surface and groundwater quality	Surface water / groundwater quality analysis and measurements that include spill-related pollutants including the parameters of pH, BOD, COD, TSS, TDS, TP, TKN, nitrate, nitrite, TN, salinity, etc.	Prevention of water quality deterioration compared to current surface water and groundwater quality	Project area	Sampling and in situ / laboratory measurements via an authorized environmental laboratory Spill notices/correspondences to authorities in case of major spills EHSS-Q Monthly Report	In case of a major spill In case of a leak/spill reaches water bodies Once in a month during construction activities for dust suppression activity	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
	Utility water amount Dust suppression water amount	Optimum water usage	Project area	EHSS-Q Monthly Report	Monthly	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Noise and Vibration Prevention of excessive noise generation	Noise and vibration levels	Not exceeding the Project Standards	Noise and vibration level measurement points: A-N-1, A-N-2, A-N-3, A-N-4, A-N-5	At least 24-hr noise and vibration measurements via an authorized environmental laboratory EHSS-Q Monthly Report	Monthly during the pre-construction phase and Quarterly during the construction phase	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
	Number of complaints	No noise related grievance received	Administration office of Contractor for the follow-up of records	Grievance Registration EHSS-Q Monthly Report	Upon grievance	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Use of Resources and Waste Management: Proper waste	Type and amount of waste generated, stored and disposed	Minimizing the amount of waste to be generated and implementing waste management hierarchy	Construction site, storage areas	EHSS-Q Monthly Report	Once in a month starting from the initialization of the pre-construction phase	Included in construction cost	Contractor, YEKA RES 3 EHSS	

Issue	Parameters to be monitored (What parameter is to be monitored?)	Target/Threshold Value*	Monitoring location (Where the parameter is to be monitored?)	Monitoring Method (How *is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring (When *is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties	Supervision observation and comments *to be filled out during supervision with reference to adequate measuring reports*
management							Team	
Use of Resources and Waste Management: Optimal resource consumption	Types and amounts of materials/resources used	Use of recycled materials whenever possible Reducing energy consumption	Administration office	EHSS-Q Monthly Report	Quarterly starting from the initialization of the pre-construction phase	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Landscape and Visual: Aesthetic Concerns	Visual Pollution	No visual distortion	Construction site	Visual observation	After each process	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Socioeconomic Environment: Preventing Infrastructure Damage	Number and nature of cases and amount of compensation paid	No infrastructure cases	Administration office	Incident records Receipts of compensation payments	Monthly starting from the initialization of the pre-construction phase	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Community Health, Safety and Security	Grievances, Incidents, Accidents. Near miss cases Health and safety signs and traffic signs placed in appropriate locations	No significant increase in communicable and non-communicable diseases No increase in incident and accident numbers	Project Area	Visual observation Site inspection	Daily basis Upon grievance	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Community Health, Safety and Security: Trespassing	Trespassing cases	No trespassing	Administration office	Security reports Visitor logs	Weekly during the pre-construction and construction phases	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
	Condition of CCTV system			System checks	Daily during the pre-construction and construction phase			
Community Health Safety and Security: Construction related general issues	Health and safety signs and traffic signs placed in appropriate locations	No occurrences of community health, safety, and security hazards.	Project Area	Visual observation Site inspection Incident records	Daily basis Upon grievance	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Community Health, Safety and Security: Gender Based Violence and Harassment (GBVH)	GBVH related incidents	No GBVH related issues	Administration office	Document review Grievance records	Quarterly Upon relevant grievances	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Labour Force and Working Conditions: Working Conditions	Workers' grievances Worker 's contracts Number/ hours of training records	All employees will be trained on OHS, GM, GBV, SEA, SH and other E&S issues. All grievances will be closed-out within the target timeframe. Proper management of provisions given in ESIA	Administration office	Visual observation Grievance records	Weekly during the pre-construction and construction phases	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Labor Force and Working Conditions: Protecting the workforce against child labour	Age of candidate employee	Prevent child labour	Administration office	Age verification with National ID	Before each recruitment	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Labor Force and Working Conditions: Occupational Health and Safety	Number of incidents	No OHS incidents occurred	Construction site	Incident records	Daily basis starting from the initialization of the pre-construction and construction phases	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
	Incident investigation	No OHS incidents occurred		Incident investigation records	Daily basis starting from the initialization of the pre-construction and construction phases			
	Period of disease occurrence	No infectious disease is recorded		Disease follow-up register	Daily basis starting from the initialization of the pre-construction and construction phases			

Issue	**Parameters to be monitored (What parameter is to be monitored?)**	**Target/Threshold Value***	**Monitoring location (Where the parameter is to be monitored?)**	**Monitoring Method (How** *is the parameter to be monitored/ type of monitoring equipment?)*	**Timing/Frequency of Monitoring (When** *is the parameter to be monitored- frequency of measurement or continuous?)*	**Cost of Monitoring** *(What is the cost of equipment or contractor charges to perform monitoring?)*	**Responsible Party/Parties**	**Supervision observation and comments** *to be filled out during supervision with reference to adequate measuring reports*
	Number of personnel who are infected with an infectious disease	No infectious disease occurred		Training records	Monthly during the pre-construction and construction phases			
	Training requirements	Every training defined in the Annual ESHS is completed		Annual Environmental, Social Health, and Safety (ESHS) training plan	Annually during the pre-construction and construction phases			
	Adequate OHS organizational structure.	There will always be an adequate OHS organizational structure on site.		Site implementation Site inspection	Quarterly during the pre-construction and construction phases			
Labor Force and Working Conditions: Workers Engaged by Third Parties and the Supply Chain	Contractor and sub-contractor agreements	No nonconformity is observed with the ESIA	Administration office	Contract reviews by ESHS expert(s)	Before each agreement made	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	
Landscape and Visual : Aesthetic Concerns	Visual Pollution	No visual distortion	Construction site	Visual observation	After each process	Included in construction cost	Contractor, YEKA RES 3 EHSS Team	

**In cases where the Turkish requirements differ from the levels and measures presented in the IFC's EHS Guidelines, the more stringent one (such as the most stringent discharge and emission standards) will be applied in the project specifications.*

Table VII.4 Monitoring Plan for the Operation Phase

Issue	Parameters to be monitored (What parameter is to be monitored?)	Target/Threshold Value*	Monitoring location (Where the parameter is to be monitored?)	Monitoring Method (How *is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring (When *is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties
Air Quality: Preserving air quality	Maintenance and exhaust control records of all machinery and equipment	Below the Project Standards	Project area	EHSS-Q Monthly Report	Upon grievance	Included in operation cost	YEKA RES 3
Soil and Soil Quality: Soil contamination	Amount of contaminated soil	No soil contamination resulting from project activities	Project area Septic tank and material storage areas	Sampling/analysis via an authorized environmental laboratory Visual observation EHSS-Q Monthly Report	When a contamination is observed and upon grievance After each incident	Included in operation cost	YEKA RES 3
	Conditions of the storage area Number of leaks, spills, etc.	No chemical spill incident	Project area Chemical storage locations	Visual observation Site inspections EHSS-Q Monthly Report	When a contamination is observed and upon grievance After each incident	Included in operation cost	YEKA RES 3
Water Resources and Water Quality:	Water quality analysis parameters including Ammonium, Oil and Grease, Biological Oxygen Demanded BOD, Dissolved Oxygen DO, Conductivity, Chemical Oxygen Demanded COD, Nitrate, pH, Total Phosphorus, TP, Ortophosphate, Total Kjeldahl Nitrogen, TKN, Total Nitrogen, TN, Fluoride, Manganese, Selenium, Sulphur	Prevention of water quality deterioration compared to current surface water	Water bodies near the project area	In-situ measurements and laboratory measurements and analysis via an authorized environmental laboratory Spill notices/correspondences to authorities in case of major spills EHSS-Q Monthly Report	Upon grievance	Included in operation cost	YEKA RES 3
	Utility water amount	Optimum water usage	Project area	Measurement of the amount of water used for utility water in m^3.	Once in a month during operation phase	Included in operation cost	YEKA RES 3
Noise and Vibration	Noise level	Not exceeding the Project Standards No noise related grievance received	Settlements close to the project area	At least 24-hr noise measurements via an authorized environmental laboratory EHSS-Q Monthly Report	Upon grievance	Included in operation cost	YEKA RES 3
Use of Resources and Waste Management: Waste management	Type and amount of waste generated, stored and disposed	Minimizing the amount of waste to be generated and implementing waste management hierarchy	Project site	Visual inspection regarding proper collection and temporary storage of waste and records kept regarding their coordinated recycle / disposal via licensed firms EHSS-Q Monthly Report	Monthly basis starting from the initialization of the operation phase of the Project	Included in operation cost	YEKA RES 3
Use of Resources and Waste Management: Optimal resource consumption	Types and amounts of materials/resources used	Use of recycled materials whenever possible Reducing energy consumption	Administration office	EHSS-Q Monthly Report	Monthly starting from the initialization of operation phase	Included in operation cost	YEKA RES 3
Socioeconomic Environment: Infrastructure Damage	Number and nature of cases and amount of compensation paid	No infrastructure cases	Project area and Administration office	Incident records Receipts of compensation payments	Monthly during the operation phase	Included in operation cost	YEKA RES 3
Community Health, Safety and Security: Trespassing	Trespassing cases	No trespassing	Administration office	Security reports Visitor logs	Weekly during the operation phase	Included in operation cost	YEKA RES 3
	Condition of CCTV system			System checks	Daily during the operation phase		
Community Health, Safety and Security: Operation related general issues	Health and safety signs and traffic signs placed in appropriate locations	All cases that cause health and safety problems to be prevented	Project area	Visual observation Site inspection	Daily basis Upon grievance	Included in operation cost	YEKA RES 3
Community Health, Safety and Security: Gender Based Violence	GBVH related incidents	No GBVH related issues Minimum 1 annual refresher training	Administration office	Document review Review of grievance logs	Quarterly Upon relevant grievances	Included in operation cost	YEKA RES 3

Issue	Parameters to be monitored (What parameter is to be monitored?)	Target/Threshold Value*	Monitoring location (Where the parameter is to be monitored?)	Monitoring Method (How *is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring (When *is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties
and Harassment (GBVH)				Training records			
Community Health, Safety and Security: blade/ice throw	Number of blade/ice throw reported	Zero reported of blade/ice throw issues	Project area and Administration office	Incident records Receipts of compensation payments	Monthly during the operation phase	Included in operation cost	YEKA RES 3
Community Health, Safety and Security: noise	Grievances about noise	Zero noise grievance	Project area and Administration office	Incident records Receipts of compensation payments	Monthly during the operation phase	Included in operation cost	YEKA RES 3
Community Health, Safety and Security: shadow flicker	Grievances about shadow flicker	Zero shadow flicker grievance	Project area and Administration office	Incident records Receipts of compensation payments	Monthly during the operation phase	Included in operation cost	YEKA RES 3
Labor Force and Working Conditions: Working Conditions	Workers' grievances Worker's contracts	Proper management of provisions given in ESIA	Administration office	Visual observation Grievance records	Weekly during the operation phase	Included in operation cost	YEKA RES 3
Labor Force and Working Conditions: Protecting the workforce against child labor	Age of candidate employee	Prevent child labor	Administration office	Age verification with National ID	Before each recruitment	Included in operation cost	YEKA RES 3
Labor Force and Working Conditions: Workers Engaged by Third Parties and the Supply Chain	Contractor and sub-contractor agreements	No nonconformity is observed with the ESIA	Administration office	Contract reviews by ESHS expert(s)	Before each agreement made	Included in the operation cost	YEKA RES 3
Occupational Health and Safety	Number of incidents	No OHS incidents occurred	Administration office and turbine areas	Incident records	Daily basis starting from the initialization of the operation phase	Included in the operation cost	YEKA RES 3
	Incident investigation	No OHS incidents occurred		Incident investigation records	Daily basis starting from the initialization of the operation phase		
	Period of disease occurrence	No infectious disease is recorded		Disease follow-up register	Daily basis starting from the initialization of the operation phase		
	Number of personnel who are infected with an infectious disease	No infectious disease is occurred		Training records	Monthly during the operation phase		
	Training requirements	Every training defined in the Annual ESHS is completed		Annual ESHS training plan	Annually during the operation phase		
	Adequate OHS organizational structure.	There will always be an adequate OHS organizational structure on site.		Site implementation Site inspection	Quarterly during the operation phase		
Landscape and Visual Shadow flicker	Shadow flicker in residential areas	Shadow flickering times in residential areas are below daily limit values No noise related grievance received	Residential areas	Grievance records	Upon grievance	Included in operation cost	YEKA RES 3

**In cases where the Turkish requirements differ from the levels and measures presented in the IFC's EHS Guidelines, the more stringent one (such as the most stringent discharge and emission standards) will be applied in the project specification.*

VIII.ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM

An Environmental and Social Management System (ESMS) has been developed to manage environmental and social issues in accordance with project standards throughout all phases of the Project. The possible environmental and social impacts of the Project were evaluated within the scope of ESIA.

The ESMS is an integral part of the ESIA as it is a system-setting document for the Project and its contractors and represents a commitment towards environmental and social sustainability applied to the Project's entire life cycle. The ESMP is an overarching document developed in accordance with the corporate policies of YEKA RES 3 with the commitments included in the Environmental and Social Impact Assessment (ESIA) and, more broadly, with the Turkish regulatory framework relevant to the Project as well as with the E&S Standards that apply to the Project. These include International Finance Corporation (IFC) Performance Standards (PS), Guidance Documents, IFC General Environmental, Health, and Safety (EHS) Guidelines, Equator Principles (EP), and Organisation for Economic Co-operation and Development (OECD)'s Common Approaches.

The ESMPs of the Project defined within this ESMS are developed and under continuous improvement to ensure the appropriate management of environmental and social risks to meet the objectives set by existing YEKA RES 3 policies and directives regarding E&S. Environmental and social management system at all phases is required to meet national, international standards, best practices, and Projects' documents and requirements. Referring to the integrated policies, there are targets to achieve the Projects with zero waste, zero incidents, and full respect for humans including vulnerable groups.

Nine elements of ESMS help to assess, control, and continually improve the E&S performance, Project ESMP has to comply with these elements. These elements are illustrated in **Figure VIII.1**.



Figure VIII.1 Elements of ESMS (IFC, 2015)

The E&S mitigation measures defined in the ESIA process inform this ESMP and the associated ESMS planning and methods to be implemented at the various levels of the Project organization to ensure that the Project requirements, regulations, and standards are met.

VIII.1 Environmental and Social Policy

The basis of the ESMS is a set of policies. Environmental and Social Policies provide information to internal and external stakeholders on the efficient use of resources, prevention of environmental pollution, workforce and working conditions, occupational health and safety, and public health safety.

Environment and Climate Change Policies

YEKA RES 3 Rüzgar Enerjisi Yatırımları A.Ş. (“Project Sponsor”), a subsidiary of Kalyon Enerji Yatırımları A.Ş. (Kalyon Enerji) and Kalyon is an energy company that meets Türkiye's energy needs from renewable energy sources and makes its investments in this context. The basic elements of YEKA RES 3’s environment and climate change approaches are;

- Offsetting greenhouse gas emissions,
- Climate change focused design and site selection,
- Waste management hierarchy compatible with circular economy principles,
- Ecosystem based activities.

In this context, YEKA RES 3's Environment and Climate Change Policy is as follows,

- To work to comply with the strategies and contribution commitments established on a global and national scale,
- To reduce the environmental impacts that may arise from its activities and to protect ecosystem components,
- To determine the impacts and impact reduction measures in all its activities, taking into account the requirements of national and international environmental and climate change legislation, company policies and procedures, and to make plans accordingly,
- Sustainable use of natural resources throughout the life cycle of its activities,
- To ensure the reuse, recovery/recycling and disposal of hazardous and non-hazardous wastes that may arise from its activities in accordance with the waste management hierarchy and zero waste targets in order to prevent and reduce their impact on the environment,
- To ensure that investments are made in harmony with humans and nature and that species populations are protected by ensuring biodiversity and ecosystem services management,
- To have climate awareness in line with sustainable development goals by reducing greenhouse gas emissions that may arise from its activities,
- Developing effective design and location selection mechanisms, taking into account the effects of climate change in investments,
- To provide and increase the resources and infrastructure to be used to reduce greenhouse gas emissions and carry out climate change adaptation activities,
- To create a cooperation mechanism to ensure the active participation of all stakeholders in the activities carried out within the scope of climate change,
- To develop environmental and climate change policy with a dynamic understanding within the scope of globally developing and changing legislation.

Social Impact and Human Rights Policy

YEKA RES 3 is responsible for conducting its operations in a manner that respects and upholds human rights and ensuring social inclusion to negate or manage and mitigate any risks of any negative social impacts and human rights breaches while contributing positively to the communities in which the Project affects. The basic elements of YEKA RES 3’s environment and climate change approaches are:

- Social Impact Management and Development
- Diversity, Equity and Inclusion
- Respect for Human Rights
- Code of Conduct and Anti-Corruption
- Supply Chain Management

In this context YEKA RES 3's Social Impact and Human Rights Policy is as follows:

- Negating or managing and mitigating social risks and impacts by identifying, assessing, and addressing potential social risks and adverse impacts of the Project,
- Maximizing positive outcomes for affected stakeholders by proactively identifying, assessing and protecting potential positive social impacts of the Project to ensure continuously contributing to the well-being and prosperity of the Project affected communities/stakeholders,
- Identifying disadvantaged individuals and groups and developing differentiated measures for them and addressing the special situations of such individuals and groups,
- Uphold ethical labor practices by ensuring the fair treatment of workers, preventing discrimination and harassment, promoting health and safety in the workplace, and upholding labor rights and standards in accordance with national laws and international conventions,
- Disclosing relevant information and ensuring community participation in Project activities,
- Managing social risks throughout the life cycle of our investments effectively,
- Providing a detailed grievance mechanism to address concerns and complaints that arise in connection with the Project activities and ensuring that concerns and complaints are addressed,
- Ensuring that the Project employees and all stakeholders affected by the Project activities have access to the grievance mechanism,
- Ensuring that there will be no discriminatory applications of any kind by verifying that all stakeholders have access to services/advantages such as training, health, social and infrastructure services, employment and financial opportunities,
- Implementing the requirements in national and international obligations and also good practices,
- Maximizing stakeholder engagement through consultation, participation and accountability,
- Complying with national and international legislation and standards for the protection of personal data and respecting private life
- Preventing and eliminating of child labor and all forms of forced or compulsory labor,
- Enabling payment of fair wages by upholding the rights of freedom of association and collective bargaining,
- Ensuring to provide employees meet their basic needs,
- Ensuring all Project employees are working in healthy, safe conditions where their rights and dignity are respected,
- Treating all Project employees fairly by not discriminating on any basis, regardless of ethnic origin, nationality, religion, age, gender or disability,
- Respecting the rights of people in communities that may be affected by the Project activities, including minorities, immigrants and other vulnerable groups.

Occupational Health and Safety Policy

YEKA RES 3 recognizes its responsibility to prioritize an up-to-date and sustainable Occupational Health and Safety strategy to achieve zero accidents in its operations. This commitment extends to employees and all parties and stakeholders with whom YEKA RES 3 interacts during the Project.

The basic elements of YEKA RES 3's risk-based and preventive Occupational Health and Safety Management strategy are;

- Occupational hygiene
- Employee safety
- Stakeholder security
- Road safety
- Operation and process security

In this context, YEKA RES 3's Occupational Health and Safety Policy is as follows,

- Taking all necessary precautions and measures to prevent incidents, accidents and occupational diseases within the Project area,
- Ensuring compliance with all national and international legislations through a holistic and systematic approach to Occupational Health and Safety Management Systems,
- Recognizing employees' right to stop working in the presence of unsafe or unhealthy working conditions,
- Eliminating high-risk activities within the Project or reducing them to a manageable level following the Risk Control Hierarchy Framework,
- Implementing the best practices in Occupational Health and Safety by following the current developments in the field,
- Sharing Occupational Health and Safety performance of the Project transparently,
- Ensuring active participation of the Project employees in all processes related to Occupational Health and Safety and providing the necessary resources, training and support for their development,
- Pursuing continuous improvement in Occupational Health and Safety performance,
- Raising the awareness of Occupational Health and Safety among the Project employees, suppliers, visitors, local people, and stakeholders.

VIII.2 Environmental and Social Management Plans

The purpose of the Environmental and Social Management Plans is to apply mitigation measures to reduce the impacts of the Project, to describe the roles of the participating parties and key personnel responsible for the implementation of the mitigation measures, and to identify procedures to ensure that the mitigation measures are implemented adequately during all phases of the Project through the management plan.

Some minor to moderate, and temporary negative environmental and social impacts may occur, resulting mainly from the construction activities. These impacts are localized and not considered significant and long-lasting and can be mitigated through appropriate mitigation measures. The severity and duration of these impacts can be minimized by ensuring that the excavation and construction works are limited to short working sections, and that works are carried out rapidly and efficiently.

The ESMP presents the framework for implementation, management and monitoring of the environmental, social, health & safety, labor and security requirements for the R3-BİLECİK-6 WPP Project and consists of the following sub-plans:

- Waste Management Plan
- Soil Management and Erosion Control Plan
- Emergency Preparedness and Response Plan
- Traffic Management Plan
- Contractor Management Plan
- Supply Chain and Procurement Management Plan
- Reinstatement Management Plan

- Pollution Prevention Plan
- Labor and Influx Management Plan
- Human Rights Management Plan
- Hazardous Materials Management Plan
- Community Health and Safety Management Plan
- Campsite and Offsite Accommodation Management Plan
- Stakeholder Engagement Plan
- Cultural Heritage Management Plan
- Biodiversity Management Plan

VIII.3 Institutional Arrangements and Capacity Building

The main responsible organization for the implementation of this ESIA is YEKA RES 3 (the Project Sponsor). YEKA RES 3 has the adequate ability and capacity to manage the implementation of the Project and in particular the Environmental and Social Management System (ESMS) of YEKA RES 3 covering all phases of the Project and consisting of management plans on different subjects have available staff and capacity to ensure ESIA implementation.

In that scope, it is suggested to add below-mentioned liabilities to the tender documents of any possible contractor(s):

- Technical characteristics of the ESIA,
- Environmental, social and health and safety liabilities,
- Other environmental and social issues can show-up.

VIII.3.1 Environmental and Social Management Structure

E&S aspects and impacts associated with the Project have been identified and evaluated as part of the ESIA process as summarized in Figure VIII.2. Details on the full impact assessment methodology used are provided in the ESIA Chapter V.

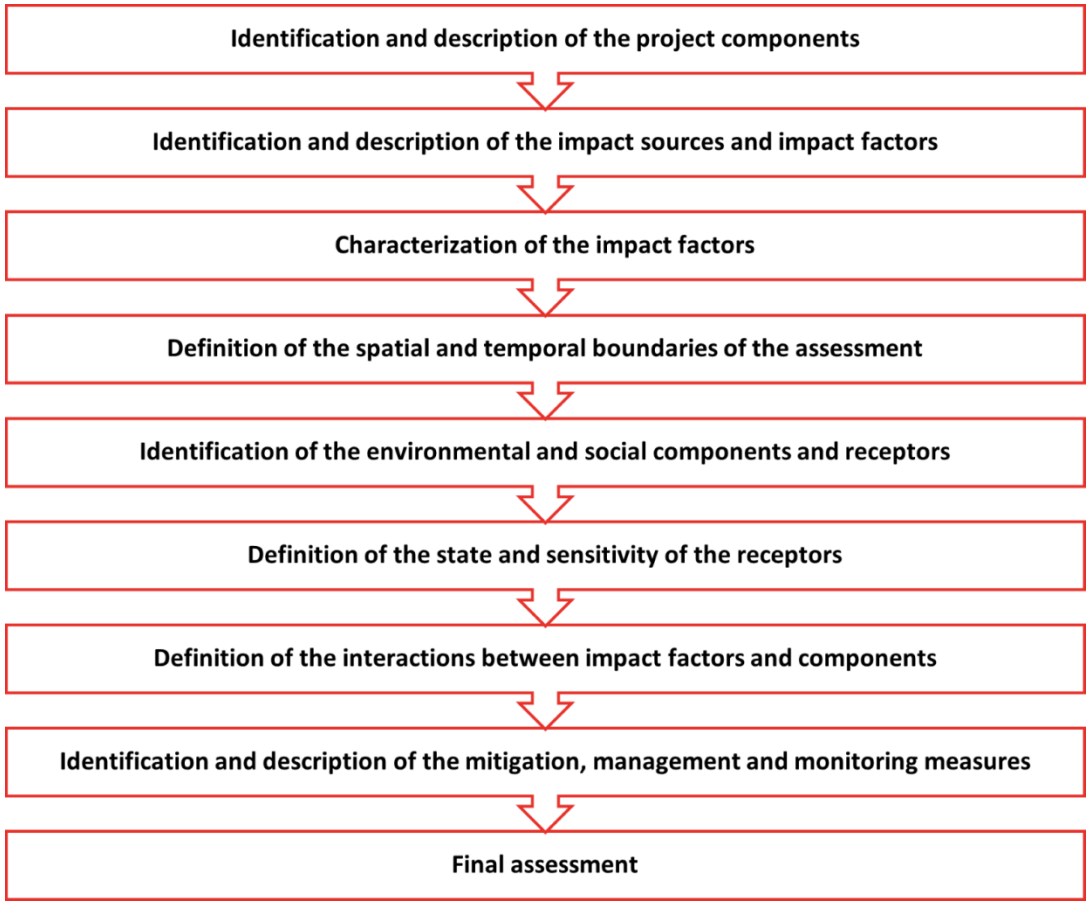


Figure VIII.2 Flowchart of the ESIA Process

The ESIA resulted in the identification of E&S risks and potential impact factors for which specific mitigation measures were identified to mitigate the effects of the impact factors. The ESIA was prepared in accordance with both National Regulations and applicable international standards. The ESIA process included the following steps:

- Review of available Project and environmental and social documentation
- Scoping Report: a Scoping report was prepared prior to the ESIA process and included general project information, legal framework, baseline and preliminary impact assessment and a methodology for ESIA process.
- Site visits to the Project to see the different project areas and meet/work closely with the YEKA RES 3 team
- Biological and physical baseline surveys have been performed for physical (air quality, noise and vibration measurements at sensitive receptors, soil, groundwater) and biological (flora, fauna) components to provide an understanding of the environmental context in the Regional Study Area (RSA) and the Area of Influence (AoI) of the Project before its realization
- A Stakeholder Engagement process including community-level surveys, focus group discussions, key informant interviews
- The ESIA report: an ESIA report has been prepared and includes the results of the ESIA process carried out as well as an assessment of the Project's adverse and positive impacts and includes mitigation measures that will be the basis for the preparation of ESMPs, a component of the Project's ESMS. The ESIA report includes a Non-Technical Summary (NTS) prepared for disclosure.

As the potential impacts and impact levels of the Project vary according to different phases of the Project (construction, operation and decommissioning) environmental and social management of the Project are assessed separately. ESIA consists of three main components in that scope, which are as follows:

- Mitigation Plan,
- Monitoring Plan,
- Monitoring Report.

The graphical representation of the environmental and social management structure is given in Figure VIII.3.



Figure VIII.3 Environmental and Social Management Structure

VIII.3.2 Roles and Responsibilities

YEKA RES 3 (the Project Sponsor) is the driving force behind the contemplated development and construction of Wind Power Projects (WPP) as part of the Renewable Energy Resource Area, YEKA RES 3 Contest. Having successfully clinched victory in the MoENR competition for the allocation of Renewable Energy Resource Areas and Connection Capacities based on Energy, Kalyon has secured authorization for a WPP area that is located in the Maden District of Elazığ. The R3-ELAZIĞ-1 Wind Power Plant Project under the ambit of the STORM Project is developed and also effectively executed by YEKA RES 3.

YEKA RES 3 will be responsible for providing technical and data support during the supervision of contractors and the preparation of technical and financial feasibility reports regarding projects. Moreover, YEKA RES 3 holds ultimate responsibility for the environmental and social performance of the overall Project, including the performance of its contractors and any other contractors.

The parties responsible for the monitoring progress are contractors and YEKA RES 3 during the construction phase, while only YEKA RES 3 is responsible for monitoring progress during the operation phase of the Project. Depending on the monitoring plan, the Contractor will prepare monthly Environmental and Social Monitoring Reports (ESMRs) to be submitted to YEKA RES 3; whereas YEKA RES 3 will review and

submit ESMRs to Lenders, if required. YEKA RES 3 will appoint a sufficient number of representatives on site to lead the development of this ESIA and its onsite implementation. In addition, the final ESIA will be made available to the public on Kalyon's website before any activity on site.

Regarding the implementation of the ESIA, the Sustainability Team to be established by YEKA RES 3 management will be specified to include team members indicated in Figure VIII.4, Figure VIII.5 and detailed in Table VIII.1.

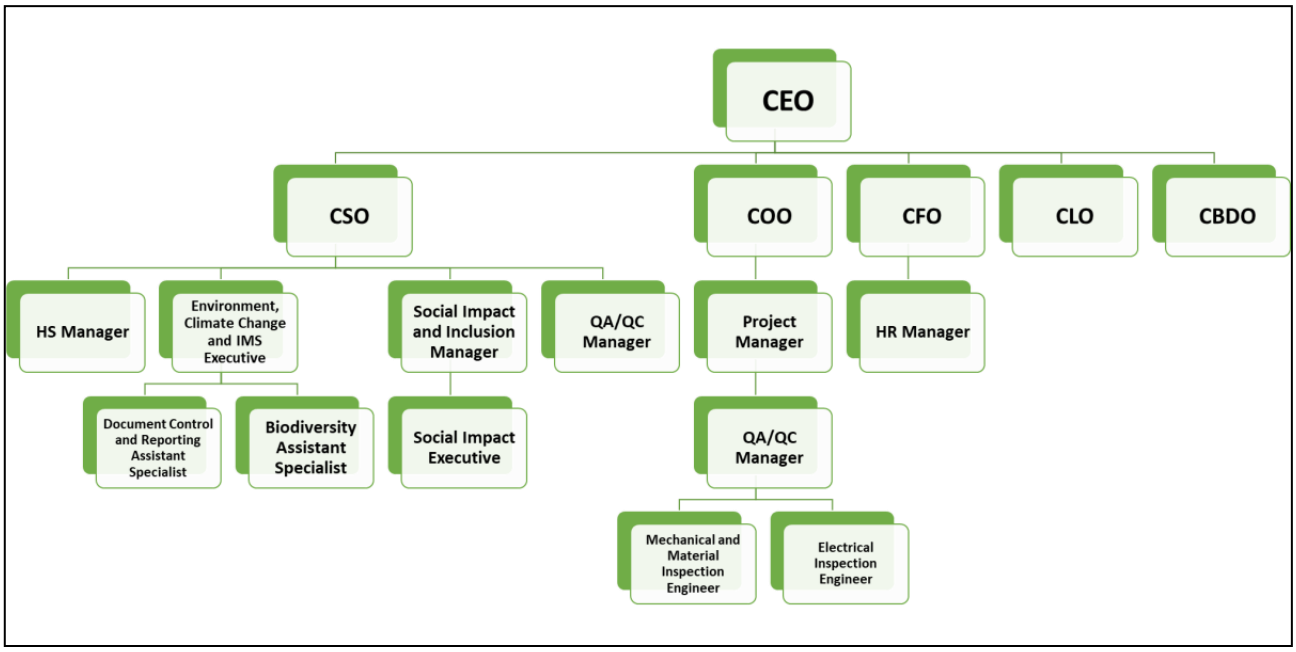


Figure VIII.4 Organizational Structure of the YEKA RES 3

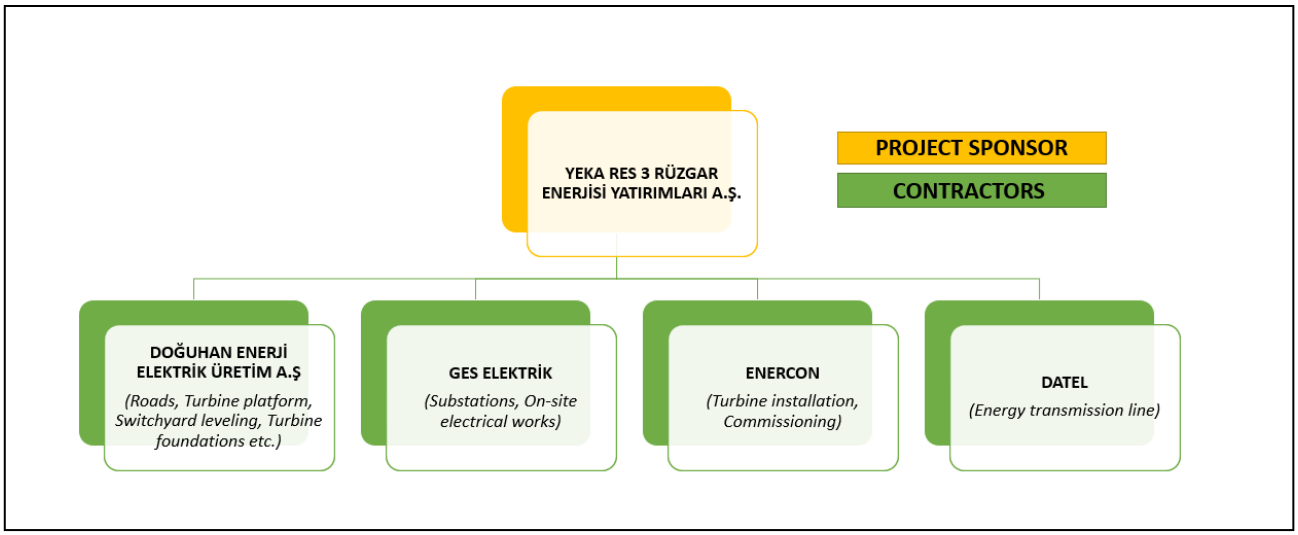


Figure VIII.5 Organizational Structure of the Contractors

Table VIII.1 Roles and Responsibilities

Roles	Responsibilities
YEKA RES 3 Chief Sustainability Officer	• Approval of this Plan. • Ensure adequate resources are provided with respect to sustainability requirements. • Monitor the E&S performance of the Portfolio projects at the corporate level.
YEKA RES 3 Chief Operation Officer	• Ensures implementation of this Plan at the Project level. • Ensure adequate resources are provided with respect to Project requirements.
YEKA RES 3 Construction Works Chief	• Ensure that this Plan is compliant with the national, international requirements and the Project's applicable standards. • Monitor the E&S performance of the Plan at the Project level.
YEKA RES 3 Environment, Climate Change, and IMS Executive	• Manage, improve, monitor, and update this Plan. • Ensure technical support is provided to -EPC and its sub-contractor for implementation of the Plan. • Ensure the execution of the outsourced (contracted) activities in their responsibility areas pursuant to this plan and depending on plans/procedures. • Ensure that training related to this Plan is organized and employees on each level and tasks are trained on this Plan. • Conduct/organize periodic audits.
YEKA RES 3 Quality Assurance and Quality Control Manager	• Coordinating the monitoring of the status of non-conformities identified within the scope of Environmental and Social
YEKA RES 3 HS Manager	• Ensure health and safety practices are implemented, by workers and EPC and its sub-contractor
YEKA RES 3 Social Impact and Inclusion Manager	• Responsible for the corporate communication strategy for stakeholders, attends meetings with the stakeholders if required, and ensures compliance with the Stakeholder Engagement Plan. • Ensure Stakeholder Engagement and GM are understood by all employees. • Responsible for the corporate communication strategy, attending meetings with the stakeholders if required and ensuring compliance with the Stakeholder Engagement Plan.
YEKA RES 3 Social Impact Executive	• Responsible for the follow-up of all activities carried out by the Social Impact and Inclusion Manager
Contractors EHS Team	• Ensure this plan is implemented according to the Project standards. • Record Key Performance Indicators (KPI) and non-compliances; propose corrective actions (if required) and follow-up of the actions. • Ensure all relevant topics followed are reported to YEKA RES 3. • Obtain data from sub-contractors regarding activities defined in this Plan. • Organize trainings related to this Plan. • Conduct periodic internal audits. • Obtain the appropriate permits or permission from the local or national authorities prior to initiating activities (if required). • Conduct periodical site visits/audits to waste disposal/recycling/reuse facilities to visually confirm that the Project wastes are being managed in an environmentally responsible manner. • Ensure site activities are implemented according to applicable H&S requirements. • Engage and inform local communities with respect to Project implementations that would impact on them and assist in delivering the Stakeholder Engagement activities. • Keep in constant contact with nearby settlements and ensure that grievances, if any, are recorded, and resolved in a timely and appropriate manner in collaboration with human resource/personnel affairs and corporate communication teams.
All Employees	• Participate in the trainings. • Ensure compliance with measures defined in this Plan.

A table defining the responsibilities of the YEKA RES 3 EHSS Team, E&S consultant, and contractor is given below. The roles and responsibilities of the relevant institutions which are involved in the management, monitoring, implementation and finalization of the Project in line with both national and international requirements are summarized in Table VIII.2.

Table VIII.2 Parties Responsible for the Management of the Project

Institution	Studies

Institution	Studies
YEKA RES 3 Sustainability Team (YST)	• Assigning/hiring one environmental and one social expert with sufficient qualifications and skills • Implementation of this ESIA and related management plans and achieving all commitments under these plans. Checking both the technical and administrative progress of contract packages and • Providing support to the implementation of the mitigation measures and commitments given in the ESIA and SEP on site • Sharing the ESIA with the Contractor and Construction Supervision Consultant, • Guiding the Contractor in preparing and approving the sub-management plans, • Coordinating the actions and evaluations in case of a change due to engineering/design changes, route/location changes, and legislative changes related to environmental and social issues, authorization provision changes, new environmental/social data, construction/operation strategy changes. • Updating the ESIA when necessary and sharing additional commitments with the Contractor, • Preparing *monthly ES Monitoring Reports* in line with ESMF and submitted by the consultant and contractor, • Auditing contractor activities in line with ESIA requirements, • Ensuring compliance with project standards, taking urgent action in case of non-compliance, • Suspending work in any situation that threatens the environment and community and occupational health and safety, • Analysing and following-up the environmental (including OHS) and social accidents/incidents. *Specifically, for any significant environmental or social incidents (e.g. fatalities, lost time incidents, environmental spills etc.), YEKA RES 3 will inform related authorities in 3 business days,* • Notifying related authorities immediately if any contingencies such as environmental, social and labor issues or accidents, incidents or loss of time that have or are likely to have a significant adverse impact on the environment, affected communities, the public or workers. The incident report including root cause analysis, precautions and compensation measures taken, will be submitted to related authorities in 30 business days,
Consultant	• Preparation and finalizing this ESIA and the SEP as per the concerns/opinions of the stakeholders of the Project, • Supporting the YST to organize and carry out the stakeholder consultation meeting for the draft version of this ESIA and SEP, • Organizing and delivering a training to YEKA RES 3 on ESIA implementations, and commitments, which covers project related environmental and social impacts and risks, and corresponding measures applied to avoid, reduce, and mitigate the risks and potential adverse impacts, roles and responsibilities assigned to the relevant party, monitoring plan and reporting process before the construction activities are commenced.
Join Health and Safety Unit (JHSU)	• .JHSU Company offers all its services in accordance with the current legislation and the standards in force in the working areas of the company and the Ministry of Health to which it will serve. The scope of the legislation also includes new regulations that will come into force in the future.- • Responsible for keeping legal records and archiving them regularly. • Assessing risks in projects and keeping risk assessments up to date. • Creating the project legislation tracking table to cover national and local legal conditions, ensuring it is up-to-date and reporting it to the employer monthly. • Preparation of documents requested by the Sponsor Company. • To ensure that the document management system is in accordance with the Sponsor Company procedures and instructions and is uniform in all segments. • It is obliged to fulfil health services, occupational safety services and training services, including all obligations arising from the legislation.

Institution	Studies
Contractor	• Fulfilment of all requirements of this ESIA and the relevant management plans, • Implementation of additional commitments to be included in the Construction Contract, • Preparation of its site-specific sub-management plans in line with this ESIA, including OHS plans before construction, as part of their method statement and submission to YEKA RES 3 for reviewing and approval, • Ensuring compliance with project standards, obtaining all relevant permits and licenses, • Implementing the mitigation measures provided in this ESIA and monitoring of construction activities (including subcontractor activities) in compliance with the national and international legislation and standards, • Development of monitoring plans/procedures in accordance with the ESIA structure, implementation after the approval of YEKA RES 3, • Employment of competent Environmental, Social and OHS Experts (at least one Social Expert, one Environmental Expert and one full-time OHS Expert) within the scope of the Project, • Training its own and subcontractor's staff on environmental, social and OHS issues, • Carrying out the environmental and social audits to monitor the ESIA practices on site and report on this to the supervision Consultant, • Submission of Environmental and Social Progress Reports (ESPRs) for safeguard issues, mitigation, results and findings throughout the construction period to the Consultant and YST, • Notifying immediately of the contingencies such as environmental, social and labor issues or accidents, incidents or loss of time to Consultant and YEKA RES 3 and keeping an event log on site throughout the life of the Project. The incident report including root cause analysis and the corrective actions to be taken will be submitted to the Consultant and YEKA RES 3 within 30 days, • In addition to the project's Labor Management Procedures, the Labor Management Plan which will be prepared by the contractor will also comply with the Labor Legislation (4857 Labor Law), Occupational Health and Safety Plan and Procedures (6331 Occupational Health and Safety Law) and 5510 Social Insurance Law. • Developing and implementing a Labour Management Plan including working conditions, fair treatment, non-discrimination, equal opportunity, vulnerable/disadvantaged workers, GBV, SEA/SH, prevention of child labor and forced labour issues under the project's Labour and Employment Policy for construction phase.

VIII.3.3 Capacity Building and Training

One of the main necessities of the ESIA is training for YEKA RES 3's and contractor's top-level management and employees.

Necessary training will be given to the personnel immediately after the recruitment process which will be also refreshed during the work period and will be performed at a number of levels. Some short-term training is required for the members of the Sustainability Team and the contractor staff to raise their levels of environmental awareness. The training can be conducted by either some external experts or through the help of in-house expertise of the YEKA RES 3 Sustainability Team and the consultants and help of the Lender. In the long-term training, special environmental and social issues will be examined and likely solutions provided to the Sustainability Team.

The mentioned training will take place in maximum two (2) days. This period will be determined by taking into account the responsible trainer's opinion on how many days it takes to explain the relevant subject the evaluation of the trainees' prior knowledge and capacities on the relevant subjects and the detailed scope of the syllabus that has been prepared. The Sustainability Team is also responsible for the monitoring of the Contractor's actions on training. The training will be given after signing the works contracts and refresher trainings will be held as needed depending on work progress and construction activities. Measurement and evaluation will be performed at the end of the training given to the personnel. This is to measure the effectiveness of the training and to measure the trainees' level of knowledge and competence. According to the review results, the training program can be modified, or trainers can be replaced, or training can be repeated, if needed, upon determining whether the training is effective.

The basic training that is planned to be given are as follows, but not limited to:

- Waste Management,
- Energy Efficiency,
- Safe Driving,
- Occupational Health and Safety,
- Cultural Heritage and Chance Find Procedure,
- Induction regarding the Code of Conduct, GM, EHS and the Lender's Requirements/Standards (if any), and
- First-Aid and Emergency Preparedness Measures

Environmental and Social Training

Environmental and Social Training will cover waste management, energy efficiency, hazardous waste management, traffic management, infectious diseases, social impact management, grievance mechanism and human rights. Environmental and social trainings will be given to the appointed staff and workers of the Contractor by YEKA RES 3 before the construction starts. The planned training is expected to take four (4) hours. The training will be refreshed as the work site changes and/or workers change.

Cultural Heritage and Chance Find Procedure Training

Cultural Heritage and Chance Find Procedure (see Annex 12) training will cover the actions required if previously unknown heritage resources, particularly archaeological resources, during the project construction. The training will be given to the appointed staff and workers of the Contractor by YEKA RES 3 before the construction starts. The training will be refreshed as the work site changes and/or workers change.

Occupational Health and Safety Training

OHS Training will cover work-site accidents and their causes in construction works, special working subjects according to the teams and technical subjects such as the correct use of hand tools and equipment. Also, the training will also focus on information on labor legislation, legal rights and responsibilities of employees, workplace order, legal consequences arising from work accident and occupational disease. The training will be given to the workers of the Contractor by YEKA RES 3 before the construction starts. The training will be refreshed as the work site changes and/or workers change.

Induction Training

Induction Training will cover the current risks and potentially dangerous areas, emergency action and safety practices related to the site. The training will be given to the workers of the Contractor by YEKA RES 3 two months before the construction starts. . The training will be refreshed as the work site changes and/or workers change.

First Aid and Emergency Preparedness Training

The subjects of the First Aid and Emergency Preparedness Training will be defined by the relevant educational institutions. The training will be given to the appointed staff and workers of the Contractor before the construction starts. The planned training is expected to take 16 hours. The training will be refreshed as the work site changes and/or workers change.

Table VIII.3 provides examples of the basic training for the ESIA implementation. The training programs will be developed annually and delivered by the YEKA RES 3 Sustainability Team.

Table VIII.3 Training Program

Training Topics	Responsible Party (Trainer Party)	Target Group	Duration	Time
Overview of potential impacts and mitigation measures	EHSS Team	Contractor, related authorities: On-site construction management staff, EHSS staff of contractor, related authorities	One day of training is to be repeated on at least a yearly basis depending on needs.	After signing the work contract
Requirements of environmental monitoring				
Occupational Health and Safety Training				
Role and responsibilities of the contractor				
Content and methods of implementation of environmental mitigation measures				
Response and risk control				
Preparation and submission of report				
Risk response and control				
Other areas to be determined				
Training for the E&S Documents	**Responsible Party (Trainer Party)**	**Target Group**	**Duration**	**Time**
General environmental and social management relating to the Project	EHSS Team	Whole personnel related to the Project	One day of training to be repeated on a yearly basis until the end of the DLP.	Soon after the Project effectiveness but at least one (1) month before the construction of the contract. The follow-up training will be scheduled as needed.
Requirements for environmental and social monitoring				
Monitoring and implementation of mitigation measures				
Guide and supervise contractors in the implementation of the ESIA				
Documentation and reporting				

Training Topics	Responsible Party (Trainer Party)	Target Group	Duration	Time
Code of conduct				
Risk response and control				
Other areas to be determined				
GBVH training	EHSS Team	Project Social Impact Specialists / CLOs and Private Security Personnel	2 hours of training to be repeated on a yearly basis until the end of the DLP.	Soon after the Project effectiveness but at least one (1) month before the construction of the contract and the training will be renewed whenever a need arises. Minimum one (1) annual refresher training to be conducted after first training.

In addition, the training program/modules shall address a range of issues, including but not limited to:

- Purpose of ESIA regarding the Project activities,
- Requirements in management plans and monitoring activities to be performed within the scope of this plan,
- Understanding of the sensitive environmental and social receptors within the Project area and its vicinity, and
- Awareness-raising about the potential risks and impacts of the Project activities,
- Grievance redress mechanism developed within the scope of the Project, grievance redress mechanism officer and employee rights,
- Community health and safety risks and measures,
- OHS, first aid, emergency preparedness,
- Code of conduct and clothing,
- Communication with the local community,
- Code of conduct training, including gender-based violence and harassment,
- Traffic and road safety principles, and
- Training aiming at the sorting, storage and environmental planning of waste.

VIII.4 Emergency Preparedness and Response

An Emergency Preparedness and Response Plan has been prepared independently of ESIA. It includes preventive measures and strategies in case of possible accidents that may occur during the construction or operation phases of the Project, as well as preparation and response measures to protect public health and safety within and outside the Project area.

This plan applies to all possible emergency situations that may occur for natural or unnatural reasons, employee-induced and contractor or subcontractor-induced emergency situations as part of the Project. It identifies all tasks and responsibilities related to the emergency situations, and also provides guidelines for emergency cases described in the next sections and applicable reporting requirements as well. These assessments/measures apply to all Project personnel, contractor and subcontractor personnel and the general public (including any government authority or similar site visitors) and coves both construction and operation phases.

This management plan shall be reviewed once a year to determine update and revision needs.

To make a better foresight and implement better crisis management, it should be ensured that the following rules are followed. These rules are a synthesis of good practices in terms of institutions, processes, and tools.

Identification of an Emergency Preparedness and Response Coordinator (EPRC) by the Operating Manager is essential. EPRC may be the Operating Manager himself/herself. EPRC will be responsible for the implementation of crisis management processes when any problems occur and will be the main spokesperson while providing information about the situation.

- Establish a Crisis Desk that automatically collects the essential experts within the framework of crisis management in the decision-making process (Chairman, Coordinator), the risk assessment process (Communication, Law), the communication process (Spokesperson) or the organizational (Secretary).
- Members should be the company’s employees who need to be informed when there is a crisis and when the crisis desk needs to be assembled.
- The crisis team must have substitute members who can act immediately in the absence of permanent members. These substitute members should also have the technical skills of the permanent members they replace.

- Organize a decision-making team that will be on the task 24/7.
- Prepare a "call flow" (who will call whom?) to be implemented in the event of a crisis in written and develop a call system that will allow crisis team members to be reached and bring them together in less than three hours.
- According to crisis type and in case of a crisis establish a target list of personnel (within and outside the company) who need to be contacted and keep this list up to date (with all the information: surname, name, telephone number, fax number and address).
- A list containing personal addresses, home, work and mobile numbers and fax numbers, business and personal e-mail addresses of any expert who is likely to participate in the crisis management and members of the Emergency Preparedness and Response Team (EPRT) (experts from within and outside the company) should be prepared.
- Organize crisis management rooms that are isolated, located in a quiet place, dedicated only to this work, fully equipped, and have sufficient space and accessed easily. If the main building is occupied or in a dangerous state, it is necessary to select a different place outside the company.
- Inform those who need to provide in-company services, especially central office and reception, as well as those who provide catering, transportation and any other services.
- During the process implementation, ensure that there is a 24-hour continuous double security system for computers, monitoring systems and doors.
- Prepare operational guidance regarding crisis management for the use of crisis management teams.
- Create crisis scenarios (simulations) and organize drills according to related legislation.
- According to the crisis types, prepare messages for the media together with the crisis communication consultants and the external communication department.

VIII.5 Monitoring and Reporting of the Project

The reporting process that should be put into action during the implementation phase of the project is an important tool to record and chase project activities in compliance with the national and international standards. Therefore, the requirements of such processes are presented in Table VIII.4.

Table VIII.4 Requirements of Such Processes

Responsible Party	Roles & Responsibility
YEKA RES 3 Sustainability Team (YST)	Quarterly inform the Lender with ESRs to include a summary of ESMRs on the progress and updates. Quarterly ESRs will highlight any issues arising from non-compliance with ES requirements and how it has been/are being addressed from the ESF requirements point of view. Submitting the monthly Grievance Mechanism Report (GMR) to the Lender. Site visits will be carried out quarterly and environmental and social issues will be examined on site. Findings after the site visit will be included in the quarterly ESRs.
Contractor	Prepare and submit monthly ESPRs covering the progress of the construction activities and environmental and social issues.

IX. STAKEHOLDER ENGAGEMENT

Stakeholder Engagement Plan (including Gender Based Violence and Sexual Exploitation, Abuse and Harassment) has been prepared for the project.

According to IFC PS1, it is necessary to have effective stakeholder engagement to prevent and reduce social risks and to ensure that the Project maintains a long-term social license to operate. Stakeholder engagement plays a crucial role in establishing strong, positive, and responsive relationships, which are essential for effectively managing the environmental and social risks and impacts associated with a project.

The main objective of effective stakeholder engagement is to provide stakeholders with relevant information about the Project's potential environmental and social impacts through transparent disclosure. This helps ensure that stakeholders have accurate perceptions of the proposed development. It also involves consulting with stakeholders to gather their feedback and opinions, as well as providing a mechanism for addressing any concerns or complaints they may have. Stakeholders can be either external or internal to the Project Sponsor (presumably the organizations involved in the project) and can include individuals or groups who:

- Directly or indirectly affected by the Project,
- Interested in the Project and its activities,
- Able to influence the Project and the expected results.

The stakeholder engagement process helps to:

- identify and involve all stakeholders potentially affected by the Project,
- ensure a good understanding of the Project activities and potential impacts/benefits,
- identify issues early in the Project cycle that may pose risks to the Project or its stakeholders,
- ensure that mitigation measures are appropriate (implementable, effective, and efficient),
- establish a system for long-term and mutual communication between the Project and stakeholders that benefits all parties.

The stakeholder identification process has been performed by the Project sponsor supported by Project consultants during direct meetings with authorities, key stakeholders, and representatives of local communities. Detailed information on stakeholder engagement activities performed and planned are presented in the SEP and included:

- Publication of planned activity (which is the legal definition for the project) through regional and local newspapers and the Project website,
- Public hearings in a frame of public discussion procedure,
- Consultations with public authorities at national, regional, and local levels.

The SEP outlines a systematic approach to stakeholder engagement to support the Project sponsor in developing and maintaining strong and constructive relationships with the stakeholders and in addressing their concerns about the Project. The SEP and its implementation fall under the Project sponsor’s responsibility. In particular, the SEP for the construction phase includes provisions for the disclosure to the affected communities of relevant information on:

- The purpose, nature and scale of the Project,
- The duration of proposed Project activities,
- Potential risks/impacts and relevant mitigation measures,
- The stakeholder engagement process envisaged going forward and,
- A Grievance Mechanism is consistent with IFC PS1 requirements scaled to the risks and impacts of the project.

- Provisions for a stakeholders' consultation and participation process appropriate for the potentially affected communities, their decision-making process and the need to reach/include disadvantaged or vulnerable groups,
- Documents to demonstrate how the feedback from stakeholders' consultation and participation has been included in the Project sponsor management decision-making process and used to identify specific mitigation measures, as needed,
- The provision of periodic reports to the potentially affected communities to update them on progresses of the implementation of the ESMPs, also addressing eventual grievances received,
- An internal Grievance Mechanism for all employees and contractors and,
- An external Grievance Mechanism with a procedure providing a framework for receiving, recording, and facilitating the resolution of concerns raised by affected communities.

The SEP is considered a living document and will be regularly monitored, reviewed and updated by the Project sponsor throughout all stages of the Project implementation to ensure:

- It remains fit for the purpose at each phase of the Project,
- It addresses the outcomes of stakeholders' consultation activities,
- It addresses the grievances received from stakeholders.

IX.1 Previous Stakeholder Engagement Activities

IX.1.1 Stakeholder Engagement in the Pre-ESIA Process

The stakeholder engagement activities specific to the Project started at the time of the national EIA process. In this context, the formal stakeholder engagement (public participation) meeting, a requirement of the Turkish EIA Regulation was held on 13.01.2023 at Hanevleri village of Maden as part of the scoping stage of the national EIA process. The meeting was announced in one local and one national newspaper as per the regulatory requirements. The meeting comprised of presentation of the Project details such as construction and operation activities, recording of comments and suggestions.

The EIA Review and Evaluation Commission set up by the MoEUCC; General Directorate of EIA, Permit and Inspection at the scoping stage of the national EIA processes included the governmental stakeholders listed in Table IX.1.

Table IX.1 Governmental Stakeholders Involved in the Scoping, Review and Evaluation of the National EIA Process

Organization	Directorate/ Administration
Elazığ Municipality	• Elazığ Municipality • Department of Zoning and Urban Planning • General Directorate of Elazığ Water and Sewerage Administration
Governorship of Elazığ	• Investment Monitoring and Coordination Department
Maden District Governorate	• Department of Zoning and Urban Planning
Elazığ Special Provincial Administration	• Environmental Protection and Control Directorate
General Directorate of Highways	• General Directorate of Highways 8th Regional Directorate

Ministry of Agriculture and Forestry	• General Directorate of State Hydraulic Works 9th Regional Directorate • Ministry of Agriculture and Forestry, General Directorate of Nature Conservation and National Parks • General Directorate of Forestry, Department of Permission and Easement • General Directorate of Meteorology • Elazığ Provincial Directorate of Agriculture and Forestry • Maden District Directorate of Agriculture and Forestry
Ministry of Energy and Natural Resources	• General Directorate of Mining and Petroleum Affairs Department of Special Areas and Mapping • General Directorate of Turkish Electricity Transmission Corporation, Department of Environment and Expropriation
Ministry of Culture and Tourism	• Ministry of Culture and Tourism General Directorate of Cultural Heritage and Museums • Diyarbakır Regional Directorate for the Protection of Cultural Assets • Elazığ Governorship Provincial Directorate of Culture and Tourism • Elazığ Museum Directorate
Ministry of Environment, Urbanization and Climate Change	• General Directorate of Spatial Planning • General Directorate of Conservation of Natural Assets • Elazığ Provincial Directorate of Environment, Urbanization and Climate Change

The EIA Report for the Project was prepared taking the comments and opinions of the local communities raised during the Public Participation Meeting and the official views of the governmental stakeholders that formed the EIA Review and Evaluation Commission. Following the finalization of the report, the EIA was disclosed to the public for 10 days at the MoEUCC and the Provincial Directorates of the Environment, Urbanization and Climate Change as per the requirements of the national EIA Regulation.

IX.1.2 Stakeholder Engagement as part of the ESIA Process

Two separate field visits were held by the social team as part of the ESIA study, as summarized in Table IX.2. The first one was a reconnaissance study carried out with the attendance of two senior social experts on August 9, 2023. The aim reconnaissance study was to assess the Project's impact area. During the scoping site visit, locations of the new turbines and structures in the vicinity were visited to assess the potential land acquisition impact of the Project.

The second field visit which was conducted on 10-11 September 2023 focused on focus group discussions, key-informant interviews and household surveys. During this field visit, in-depth interviews were conducted with the headmen of six settlements previously determined. One focus group discussion was held in Cayirkoy villages with the participation of three people each. The outcomes of the focus group discussions and in-depth interviews were used to understand the concerns/perceptions of the local communities about the Project.

Table IX.2 Summary of the Social Field Studies Conducted as part of the ESIA

Tasks	Date of the Field Study	Scope of the Field Study
Scoping study	9 August 2023	• Visiting the License Area, turbine locations, parcels to be affected by Project-related land acquisition, nearby structures and the main access road route • Meeting with the available headmen to inform them about the study and field studies to be performed
In-depth interviews and focus group meetings	10-11 September 2023	• In-depth interviews with the headmen (headmen surveys) of settlements (Akboğa, Çayırköy, Dutpınar, Hanevleri, Işıktepe and Çitli). • Household surveys (Çayırköy and Dutpınar settlements) • Focus group discussions (Çayırköy settlement)

In parallel to the ESIA studies, the Company has started to establish close relationships. In this scope, YEKA RES 3 Social Impact and Inclusion team visited the project area in November.

EMRA has started negotiations with the shareholders of the privately owned parcels to be acquired for the Project.

A Stakeholder Consultation Meeting (SCM) will be organized after the approval of the Draft ESIA. During the meeting, details about the project, its potential environmental and social impacts/risks, mitigation measures to be taken, and implementation/ monitoring/reporting responsibilities of different parties will be shared with the stakeholders; and then their opinions and suggestions will be received during the question-answer (Q&A) session.

IX.2 Stakeholder Identification

Within the scope of the Project, it is important to identify stakeholders at the beginning of the process to inform key stakeholders (local people, relevant state institutions and NGOs) about the Project and provide effective participation of the stakeholders. To this end, the following individuals and groups should be considered specifically:

- People who are likely to be affected, directly or indirectly by the Project,
- People or institutions may have an interest in the Project,
- People or institutions that have the potential to influence Project outcomes or company operations.

Besides it is an important process to identify vulnerable or disadvantaged people or groups, who are likely to be affected by the Project in certain phases, accurately during the identification of stakeholders.

Possible stakeholders who are likely to be affected by the Project or have an influence on the Project are listed below:

- National public institutions and organizations,
- Local public institutions and organizations,
- Non-governmental organizations,
- Local people,
- Local businesses,
- Project employees, including contractors.

IX.2.1 Identification of Vulnerable Groups

Vulnerable groups refer to the persons that have specific characteristics that make them more likely than others to require humanitarian assistance or being excluded from financial and social services. As also included in the IFC standards, Project owner should take age, gender, ethnicity, mental and physical disability, poverty, socioeconomic status, educational levels, and dependence on unique natural resources of people into account.

According to the results of the surveys, vulnerable groups of the local communities were identified and presented in this SEP. The categories of vulnerable groups for this Project are defined as Illiterate, People who cannot speak Turkish, Seasonal workers, Nomads, Mobile beekeepers, Refugees, Women-headed households, People living with social assistance, Children of education age but not participating in education, Bedridden patients, People over 70 years old living alone, People with physical disabilities, People with mental disabilities, and earthquake victims.

Identification of vulnerable groups will be an ongoing process; therefore, the Project CLOs will be responsible to identify and continue to engage with vulnerable groups throughout the Project's lifespan.

From the early phases of the Project, special consideration and assistance will be provided to people identified as vulnerable to ensure inclusivity on decision making, grievance mechanism and information spread has been established to all targeted stakeholders. All Project related information will be provided to vulnerable groups in a timely and culturally appropriate manner.

Within the scope of the Project, Project Stakeholder Groups are given in below:

National Governmental Organizations

Primary:

- Energy Market Regulatory Authority
- Ministry of Energy and Natural Resources
- Ministry of Agriculture and Forestry
- Ministry of Environment, Urbanization and Climate Change
- General Directorate of Spatial Planning
- General Directorate of Environmental Management
- General Directorate of Preservation of Natural Heritage
- General Directorate of Land Registry and Cadaster
- Ministry of Culture and Tourism
- General Directorate of Cultural Heritage and Museums
- Diyarbakır Regional Directorate of Cultural Heritage Preservation Board
- Ministry of Energy and Natural Resources
- General Directorate of Mineral Research and Exploration
- General Directorate of Highways
- General Directorate of Highways 8th Regional Directorate
- Ministry of Interior
- General Directorate of Security Affairs
- General Directorate of Meteorology
- General Directorate of State Airports Authority
- Directorate General of Civil Aviation

Secondary:

- Ministry of Labor and Social Security
- Ministry of Family and Social Services
- General Directorate of Turkish Employment Agency (İŞKUR)
- Ministry of National Education
- General Directorate of State Hydraulic Works (DSİ)
- General Directorate of Forestry
- Disaster and Emergency Management Presidency (AFAD)

Local Governmental Organizations

Primary:

- Governorship of Elazığ
- Maden District Governorate
- Elazığ Municipality
- Elazığ Provincial Directorate of Environment, Urbanization and Climate Change
- Elazığ Provincial Directorate of Agriculture and Forestry
- Maden District Directorate of Agriculture and Forestry

Secondary:

- Elazığ Provincial Directorate of Employment Agency
- Maden Gendarmerie
- Local Police Force
- Local Emergency and Health Services
- Elazığ Provincial Directorate of Health
- Elazığ Provincial Directorate of Culture and Tourism

Public Economic Enterprises

- General Directorate of Electricity Generation Corporation (EÜAŞ)
- General Directorate of Electricity Transmission Company (TEİAŞ)

Headmen/ Local Communities/ Residents (including landowners and/or users)

- Akboğa village
- Çayırköy village
- Dutpınar village
- Işıktepe village
- Hanevleri village
- Çitli village
- Users of the pasture located within the License Area of the Project

Vulnerable persons/groups

The poor/elderly/people with disabilities, women-headed households in;

- Akboğa village
- Çayırköy village
- Dutpınar village
- Işıktepe village
- Hanevleri village
- Çitli village

Non-governmental Organizations (NGO's) – international, national and local

Primary:

- Primary NGO is not defined.

Secondary:

- Environment Foundation of Türkiye
- Nature Association (Doğa Derneği)
- World Wildlife Fund (WWF) Türkiye

Academic/Educational Institutions

- Fırat University Maden Vocational High School

Local Media

- Local newspapers, local television channels, etc. (e.g. Elazığ Hakimiyet newspaper)

Lenders

- International finance institutions
- Private banks

Internal Stakeholders

- Company Employees
- Employees of Contractors and Sub-contractors
- Consultants, Contractors, Sub-contractors

This list should be considered a living list, which may be expanded or narrowed down based on the findings of the initial consultations to be done depending on the relevance of each stakeholder group to the Project.

IX.3 Resources and Responsibilities for Implementing Stakeholder Engagement Activities

IX.3.1 Resources

YEKA RES 3 will be in charge of stakeholder engagement activities The costs associated with the implementation of SEP-related activities (meetings, dissemination materials, digital communication activities, etc.) will be covered under the budgets allocated by the YEKA RES 3. All the activities will be conducted by the use of the human resources of YEKA RES 3.

IX.3.2 Management Functions and Responsibilities

The entities responsible for carrying out stakeholder engagement activities are;

- YEKA RES 3 Chief Sustainability Officer,
- YEKA RES 3 Chief Operation Officer,
- YEKA RES 3 Project Manager,
- YEKA RES 3 Social Impact and Inclusion Manager,
- YEKA RES 3 HS Manager,
- EPC Project Manager,
- EPC EHSS Department,
- EPC HR Chief,
- Community Liaison Officers,
- YEKA RES 3 Operation Manager,
- YEKA RES 3 Operation Unit Manager.
- Sub-contractors.

Detailed roles and responsibilities for the stakeholder engagement of the Project are given in Table IX.3.

Table IX.3 Roles and Responsibilities for Social Engagement Framework

Roles	Responsibilities
YEKA RES 3 Chief Sustainability Officer	• Approval of this Plan. • Ensure adequate resources are provided with respect to sustainability requirements. • Monitor the E&S performance of the Portfolio projects at the corporate level.
YEKA RES 3 Chief Operation Officer	• Ensures implementation of this Plan at the Project level. • Ensure adequate resources are provided with respect to Project requirements.
YEKA RES 3 Construction Works Chief	• Ensure that this Plan is compliant with the national, international requirements and the Project's applicable standards. • Monitor the E&S performance of the Plan at the Project level.
YEKA RES 3 Environment, Climate Change, and IMS Executive	• Ensure the execution of the outsourced (contracted) activities in their responsibility areas pursuant to this plan and depending on plans/procedures.
YEKA RES 3 HS Manager	• Ensure health and safety practices are implemented by workers and contractors and all sub-contractors
YEKA RES 3 Social Impact and Inclusion Manager	• Responsible for the corporate communication strategy for stakeholders, attends meetings with the stakeholders if required, and ensures compliance with the Stakeholder Engagement Plan. • Manage, improve, monitor and update this Plan • Ensure technical support is provided to -EPC and its sub-contractor for implementation of the Plan. • Ensure Stakeholder Engagement and GM are understood by all employees. • Responsible for the corporate communication strategy, attending meetings with the stakeholders if required and ensuring compliance with the Stakeholder Engagement Plan. • Ensure the execution of the outsourced (contracted) activities in their responsibility areas pursuant to this plan and depending on plans/procedures. • Ensure that training related to this Plan is organized and employees on each level and tasks are trained on this Plan. • Conduct/organize periodic audits.
YEKA RES 3 Social Impact Executive	• Responsible for the follow-up of all activities carried out by the Social Impact and Inclusion Manager
Contractors EHSS Team	• Ensure this plan is implemented according to the Project standards. • Record Key Performance Indicators (KPI), non-compliances, propose corrective actions (if required) and follow-up of the actions. • Ensure all relevant topics followed are reported to YEKA RES 3 Rüzgar Enerjisi Yatırımları A.Ş. • Obtain data from sub-contractors regarding activities defined in this Plan. • Organize trainings related to this Plan. • Conduct periodic internal audits. • Obtain the appropriate permits or permission from the local or national authorities prior to initiating activities (if required). • Conduct periodical site visits/audits to waste disposal/recycling/reuse facilities to visually confirm that the Project wastes are being managed in an environmentally responsible manner. • Ensure site activities are implemented according to applicable H&S requirements. • Engage and inform local communities with respect to Project implementations that would impact on them and assist in delivering the Stakeholder Engagement activities. • Keep in constant contact with nearby settlements and ensure that grievances, if any, are recorded, resolved in a timely and appropriate manner in collaboration with human resource/personnel affairs and corporate communication teams.
All Employees	• Participate in the trainings. • Ensure compliance with measures defined in this Plan.

IX.4 Grievance Mechanism

IX.4.1 Grievance Mechanism at the National Level

The Presidency's Communication Centre (CİMER) provides a centralized complaint system for Turkish citizens, legal persons and foreigners. CİMER only allows applications in Turkish. Contact details of CİMER are given in Table 9.

Through CİMER, applicants can direct their requests directly to the relevant authorities. The requests submitted to CİMER are resolved within 30 days. If the applicants do not receive feedback within this period, they can re-submit their grievance to CİMER or elevate it to the Ombudsman Institution (www.ombudsman.gov.tr).

In addition to CİMER, there is the Foreigners Communication Center (YİMER) which provides a centralized grievance system for foreigners.

CİMER

Website: https://www.cimer.gov.tr/
Hotline: 150
Postal Address: TC Cumhurbaşkanlığı Külliyesi Beştepe/ANKARA
Phone: +90 312 590 20 00
Fax: + 90 312 473 64 94

YİMER

Website: www.yimer.gov.tr
Hotline: 157
Postal Address: Çamlıca Mahallesi 122. Sokak No: 4 Yenimahalle/ANKARA
Phone: +90 312 5157 11 22

IX.4.2 Project Level Grievance Mechanism

IX.4.2.1 External Grievance Mechanism

An external grievance mechanism of the Project sponsor has been developed for the Project. The external grievance mechanism is a part of the management system, and it is responsive to any concerns and complaints, particularly from affected stakeholders and communities. Special care will be focused on training the designated staff involved in the management of the grievance mechanism. The overarching aim of this grievance mechanism is to provide all stakeholders with the opportunity to obtain information about the Project Sponsor activities and facilities, deliver their complaints and requests in a structured and formal manner and receive prompt, fair and effective responses.

Any comments or concerns will be brought to the Company's attention verbally or in writing (by post or e-mail) or by filling in a grievance form. The grievance form will be made available on the Company website, at the Project site, at the Mukhtar's office, alongside a description of the grievance mechanism. Grievance forms can then be submitted to the contact points. All grievances will be:

- Acknowledged within seven working days after receipt; and
- Responded no later than within 30 working days after receipt.

Specifically, nominated, and trained members of staff will record grievance information in a grievance register the information in the grievance register will include the Stakeholder name and contact details and details of the grievance and how and when it was submitted, acknowledged, responded to and closed out.

The grievance mechanism is widely announced to the public with stakeholder meetings held for project-affected communities. Additional meetings will be organized to target women Project Affected People (PAPs) and vulnerable groups for sharing information on grievance mechanism that also allows anonymous grievances.

Gender equality is observed by the Project sponsor. There will be a woman in charge in the Project. She will deal with the complaints and demands of women in the Project area. The grievances will be reviewed by the team according to the Project's human rights and grievance mechanism.

The grievance mechanism will be applied to record any gender-based complaints, and necessary measures will be taken accordingly.

External stakeholders can initiate the grievance/comment mechanism by using the following methods:

- Grievance/comment boxes and forms to be placed in public places including places commonly/ comfortably visited by women)
- Verbally during face-to-face meetings/visits to be held by the Project personnel (e.g. site chiefs/ managers, CLOs)
- Telephone (the contact numbers that can be used to submit grievances/comments) of the CLO will be shared with the local communities in due course)
- E-mail (the e-mail address for the submittal of grievances/comments will be shared with the local communities in due course)
- Website (the contact number of the CLO will be shared with the local communities in due course)

On the website of Kalyon Enerji, there is a Contact page (https://www.kalyonenerji.com/tr/iletisim) which is available in Turkish and English. The grievances/requests related to Kalyon Enerji's activities can be communicated through this page and the resolution process is followed. The page includes information on the email, phone number and mailing address of Kalyon Enerji. There is also an Online Contact Form menu on the page. Name e-mail address, telephone number and explanation/message/grievance are entered in the online Contact Form. Filling all fields is obligatory on this form. Notification that the application has been received is made via e-mail address.

IX.4.2.2 Internal Grievance Mechanism

An internal grievance mechanism has been developed for the Project. All direct and indirect Project workers will follow this procedure. The procedure defines grievances as a statement of dissatisfaction over any condition that allegedly harms the employee. A grievance may relate to matters involving internal communication, responsibilities abuse, abuse in the authority line, race, colour, ancestry, national origin, religion, age, sex, sexual orientation, gender identity, sexual harassment, or disability status.

The grievance mechanism will be applied to record any gender-based complaints, and necessary measures will be taken accordingly. In case requested, all grievance holders will have the right to remain anonymous and maintain their confidentiality. The Project sponsor will not disclose any grievance holder's credentials without ensuring their consent first. If such consent is given, only the managers and personnel related to that specific grievance will be informed.

The employee Request and Grievance Register of the Project Sponsor used for the STORM Project is presented in the appendix of the SEP.

X. CONCLUSION

YEKA RES 3 Rüzgar Enerjisi Yatırımları A.Ş., known as the Project Sponsor herein, is considering the development and construction of Wind Power Projects (WPP) within the Renewable Energy Resource Area, YEKA RES 3 Contest, as announced by the Ministry of Energy and Natural Resources (MoENR) in Turkey's Official Gazette on May 29, 2021, under number 31495. By emerging victorious in the competition announced by MoENR regarding the allocation of Renewable Energy Resource Areas and Connection Capacities based on Energy, Kalyon Enerji obtained authorization for 5 WPP areas spanning various cities. The Storm Project comprises 5 distinct sub-projects situated in Ankara, Bilecik, Bayburt, Elazığ, and Trabzon. This ESIA Report has specifically been prepared by ENCON in the scope of the Environmental and Social Impact Assessment (ESIA), for the R3-ELAZIĞ-1 Wind Power Plant Project (the "Project"). Project Sponsor will oversee the Project's execution at the local level. This Environmental and Social Impact Assessment report has been prepared based on the baseline conditions, the site visit realized in August 2023, information obtained from the Project Sponsor, internationally accepted principles and procedures and national legislation.

Within the scope of the "Contest Announcement on the Allocation of Renewable Energy Resource Areas and Connection Capacities Based on Solar Energy" published in the Official Gazette dated May 29, 2021 and 31495 numbered; YEKA RES-3 competitions were held on June 14, 2022. YEKA (Renewable Energy Resource Areas) Right of Use Contract was signed on July 20 2022 between the winner of the competition, Kalyon Enerji and the Ministry of Energy and Natural Resources. Pre-license was given by the Ministry of Industry and Technology, numbered ÖN/11826-16/05444 and dated May 4, 2023. YEKAs are determined within the scope of administrative and technical studies carried out by the Ministry of Energy and Natural Resources and announced in the Official Gazette.

The Project Sponsor has been developing R3-ELAZIĞ-1 Wind Power Plant Project with a total installed capacity of 42.6 MWm/40 MWe on an area of 1993.42 hectares. 10 turbines will be installed in the Project. R3-ELAZIĞ-1 WPP will be located in Akboğa, Hanevleri, Çayırköy, Dutpınar, Camikebir settlements in Maden District of Elazığ Province in Türkiye. The maximum electricity production amount in the Project is planned as 127,578.9 MWh/year. Additionally, the production Pre-License for the Project has been issued by the Ministry of Energy and Natural Resources with License No: ÖN/11826-16/05444 and dated May 4, 2023.

This report based on a detailed review and evaluation of a number of screening criteria defined in International Finance Cooperation’s (IFC) policies and guidelines, Turkish EIA Regulation as well as Equator Principles, and European Bank for Reconstruction and Development (EBRD) Environmental and Social Policy and Performance Requirements. R3-ELAZIĞ-1 Wind Power Plant Project, with its specifically identified physical elements, aspects and facilities that are likely to generate potentially significant adverse environmental and social risks and impacts, has been proposed as a “Category A” Project. For “Category A” projects, a comprehensive full-scale ESIA is required to be conducted. Category A Projects are business activities with potential significant adverse environmental or social risks and/or impacts that are diverse, irreversible, or unprecedented (IFC Environmental and Social Categorization). In parallel to the categorization approach of EU’s EIA Directive, the Turkish EIA Regulation requires an EIA Report to be prepared for the activities listed under Annex-1 of the EIA Regulation. Wind Power Plant projects are listed as Annex-1 activities (Annex 1, item 41) so R3-ELAZIĞ-1 WPP is an Annex-1 activity according to the Turkish EIA Regulation and the Project has passed through the Turkish EIA process. The MoEUCC issued an 'EIA Positive' decision on October 16, 2023.

R3-ELAZIĞ-1 WPP Project, consisting of 10 turbines, in Maden district of Elazığ province. Within the scope of the Project, the annual maximum electricity production amount is planned as 127,578.9 MWh/year. The power plant area is 1993.42 ha and it is planned to construct 10 turbines, switchyard center, connection roads and transmission lines. Within the scope of the project, turbines, switchyards and access roads are defined as project components, while the Energy Transmission Line is defined as the associated facility. An approximately 8 km long ETL that will consist of 32 towers will be constructed to transmit the electricity to be generated by the Project. The Project Sponsor will construct the ETL and the Türkiye Electricity Transmission Corporation (TEİAŞ) will be responsible for the operation of the ETL in line with the national requirements.

The selection of the location for the Project is done by the Ministry of Energy and Natural Resources (MoENR). The selection of the Project's location is influenced by several crucial factors, which can be summarized as wind speed, topography, accessibility, infrastructure and environment.

Within the scope of the Project, after the construction site facility is established, the existing roads will be improved for access to turbine locations if necessary. Material will be supplied to the Project area from İzmir and İskenderun.

It is planned that the pre-construction and construction phase of the Project will last for 12 months and the operation phase will be started. After the completion of the Project construction, the Defects Liability Period (DLP) begins and lasts for 12 months. The license period of the Project is foreseen as 49 years. There will be 10, 80 and 10 employees during the pre-construction, construction and operation phases of the Project, respectively. For all phases of the Project, there will be a camp area where the employees can meet their basic requirements such as toilets, but there will be no accommodation on site.

The main purpose of an environmental and social impact assessment is to identify and assess the potential positive and adverse impacts/risks that may be caused by the Project activities on the natural environment and on the socio-economic wellbeing and conditions of the population (community and workforce) at local and regional level. The assessment is based on the potential risks and impacts of the Project, taking into account all relevant environmental and social risks and impacts that may arise throughout the entire duration of the Project (pre-construction, construction and operational activities). This comprehensive assessment covers direct, indirect and cumulative factors, including those specifically identified in all PSs. In other words, after all risks and impacts arising from the Project were evaluated, a cumulative impact assessment was made within the scope of ESIA.

Following this evaluation, appropriate steps were devised to prevent, reduce, alleviate, and counteract notable negative effects while augmenting positive impacts. Additionally, the significance of residual adverse effects on the environment and community resulting from the Project, despite mitigation efforts, was evaluated. Lastly, monitoring activities were planned to ensure the effectiveness of the proposed mitigation measures.

The ESIA report underlines the importance of comprehensive assessment and proactive mitigation measures to address the potential negative impacts of the R3-ELAZIĞ-1 WPP Project on both the environment and local communities. It aims to ensure the Project's compliance with environmental regulations and sustainable integration into the surrounding ecosystem by implementing recommended mitigation strategies and conducting ongoing monitoring activities.

The result obtained from all these evaluations are; wind power plants contribute to the production of clean and renewable energy while reducing dependence on fossil fuels. WPPs contribute to reduce climate change and air pollution. They also benefit local communities from a socioeconomic perspective through job creation and investment in local infrastructure services. Within the scope of the Project, it will contribute to Türkiye’s achievement of its renewable energy targets, and economic growth and development will be achieved by reducing dependence on imported fossil fuels.

REFERENCES

Adaramola, M. (ed.), (2014). Wind Turbine Technology: Principles and Design, Apple Academic Press, Oakville, Canada

Anonymous Birds of Türkiye: TRAKUS (https://www.trakus.org/)

Anonymous Mammalia of Türkiye: TRAMEM (https://www.tramem.org/)

Appianos, Rhomaika, Appian"s Roman History, çev. H. White, Londra, New York 1912, II. 12, 1.

Atienza, J.C., I. Martín Fierro, O. Infante, J. Valls and J. Domínguez. (2011). Directrices para la evaluacíon del impacto de los parques eólicus e naves y murciélagos (version 3.0) SEO/BirdLife Madrid (translated into English as Guidelines for Assessing the Impact of the Wind Farms on Birds and Bats (Version 4.0).

Baran, İ., Ilgaz, Ç., Avcı, A., Kumlutaş, Y & Olgun K. (2012). Türkiye Amfibi ve Sürüngenleri. Ankara: TÜBİTAK Popüler Bilim Kitapları.

Barataud, M. (2015). Acoustic Ecology of European Bats: Species Identification and Studies of Their Habitats and Foraging Behaviour. Paris: Biotepe Editions, Meze; National Museum of Natural History.

Bruderer, B. & Boldt, A. (2001). Flight Characteristics of Birds. IBIS International Journal of Avian Science.143(2): 178-204.

Calder,W.M. 1928, “Exploration Archeologique de la Phrigie”, Monumenta Asiae Minoris Antiqua I,harita. XXIX,XXXI.

Convention on Biological Diversity (CBD). (2014). Strategic Plan for Biodiversity 2011-2020, Including Aichi Biodiversity Targets. Retrieved from: http://www.cbd.int/sp/default.shtml

Colak İ., (2016). Wind Energy in Turkey and Cost Benefit Analysis of Wind Turbines in Smart Grid Systems, JRC Workshop, June 23-24, 2016, Bari, Italy.

Çoraman, E., Bilgin, R., Karataş, A. & Furman, A. (2013). Phylogeographic analysis of Anatolian bats highlights the importance of the region for preserving the Chiropteran mitochondrial genetic diversity in the Western Palaearctic. Conservation Genetics. 14(6): 1205-1216.

Database of Ministry of Agricultural and Forestry, General Directorate of Nature Conservation and National Parks (https://www.tarimorman.gov.tr/DKMP)

Davis, P.H. (ed.). (1965-1988). Flora of Turkey and the East Aegean Islands, vol. 1-10. Edinburgh: Edinburgh University Press.

Demirsoy, A. (2002). Genel ve Türkiye Zoocoğrafyası (General and Turkish Zoogeography). Ankara:Meteksan.

Denny B. A. E., (2007). A Cost Benefit Analysis of Wind Power, PhD Thesis, School of Electrical, Electronic and Mechanical Engineering, National University of Ireland, University College Dublin, Ireland

Dudley, N. & Stolton, S. (eds.). (2008). Defining Protected Areas: An International Conference in Almeria, Spain. Gland, Switzerland: IUCN.

Eken, G. Bozdoğan, M. İsfendiyaroğlu, S. Kılıç DT Lise, Y. (eds). (2006). Türkiye’nin Önemli Doğa Alanları.Ankara: Doğa Derneği.

Ekim, T. et al. (ed.), The Red Book of Plants of Türkiye (Ferns and Seed Plants), Nature Conservation Society of Türkiye, Barışcan Ofset, Ankara, 2000.

EMEP/EEA Air Pollutant Emission Inventory Guide 2016 – Updated July 2018 for passenger cars, light commercial vehicles, heavy-duty vehicles like buses and motorcycles

EMEP/EEA Air Pollutant Emission Inventory Guide 2016 – Updated July 2018 – Equation 16

European Bank for Reconstruction and Development (EBRD), (2014). Environmental and Social Policy

European Bird Census Council (EBCC). (2017a.). 2nd European Breeding Bird Atlas. Retrieved from: www.ebba2.info

European Bird Census Council (EBCC). (2017b.). Atlas Codes. Retrieved from: www.ebba2.info/atlas-codes/

European Commission (EC). Lightning Protection of Wind Turbines – Publishable Final Report

European Commission (EC). (2014a). EU Nature Legislation. Retrieved from: http://ec.euorpa.eu/environment/nature/legislation/index_en.htm

European Commission (EC). (2014b). General Union Environment Action Programme to 2020: Living well, within the limits of our planet. Luxembourg : Publications Office of the European Union.

European Environmental Agency (EEA). (2012). European Nature Information System (EUNIS). Retrieved from: http://eunis.eea.europa.eu

General Directorate of Meteorology, 2023. Long Term Meteorological Data of ,Elazığ Province

Gregory, R.D,. Gibbons, D. W and. Donald P F. (1996). Bird census and survey techniques. In Sutherland, W.J. (ed). Ecological Census Techniques, A Handbook. UK: Cambridge University Press.

Herodotos, Historia, the Histories, A. D. Godley v.d., (Çev.), Londra 1920-1957, VII 75.

ICOMOS, (2011). Guidance on Heritage Impact Assessments for Cultural World Heritage Properties

Ilhan, Ali, Süleyman BALIK, and S. A. R. I. Hasan. "Current Distribution and Conservation Status of Inland Endemic Fishes in Central and Western Anatolia." Aquatic Sciences and Engineering 29.2 (2014): 9-34.

Intergovernmental Panel on Climate Change (IPCC), (2012). Special Report on Renewable Energy Sources and Climate Change Mitigation: Special Report of the Intergovernmental Panel on Climate Change, Chapter 7 – Wind Energy

International Energy Agency (IEA), (2017). Recommended Practice 13: Wind Energy Projects in Cold Climates (Task 19)

International Finance Corporation (IFC), (2007). Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution

International Finance Corporation (IFC), (2007). Environmental, Health, and Safety Guidelines for Wind Energy

International Finance Corporation (IFC), (2007). General EHS Guidelines, Community Health and Safety

International Finance Corporation (IFC), (2007). General EHS Guidelines, Construction and Decommissioning

International Finance Corporation (IFC), (2007). General EHS Guidelines, Occupational Health and Safety

International Finance Corporation (IFC), (2012). The Interpretation Note on Environmental and Social Categorization

International Finance Corporation (IFC), (2015) Environmental and Social Management System Implementation Handbook – General

International Labour Organization (ILO), (2016). Occupational Safety and Health Profile: Turkey

International Renewable Energy Agency (IRENA), (2012). Renewable Energy Technologies: Cost Analysis Series – Wind Power, Volume 1: Power Sector, Issue 5/5.

International Union for Conservation of Nature (IUCN). (2017). Protected Areas: IUCN Global Protected Areas Programme and IUCN World Commission on Protected Areas Delivering the Promise of Sydney. IUCN. Retrieved from: https://www.iucn.org/theme/protected-areas

IUCN 2022. The IUCN Red List of Threatened Species. Version 2021-3. (https://www.iucnredlist.org)

IUCN Standards and Petitions Subcommittee (SPSC). (2017). Guidelines for Using the IUCN Red List Categories and Criteria. Version 13. Prepared by the Standards and Petitions Subcommittee. Retrieved from: http://www.iucnredlist.org/documents/RedListGuidelines.pdf.

Jenkins, A.R., van Rooyen, C.S., Smallie, J.J., Harrison, J.A., Diamond, M., Smit-Robinson, H.A. & Ralston, S. (2015). Birds and Wind-Energy Best-Practice Guidelines: Best-Practice Guidelines for Assessing and Monitoring the Impact of Wind-Energy Facilities on Birds in Southern Africa. BirdLife South Africa/Endangered Wildlife Trust. Retrieved from: https://www.birdlife.org.za

Key Biodiversity Areas, 2023 (https://www.keybiodiversityareas.org)

Kirwan, G.M, K.A. Boyla, P. Castell, B. Demirci, M. Özen, H. Welch and T. Marlow. (2008). The Birds of Turkey: A Study of The Distribution, Taxonomy And Breeding of Turkish Birds. London: Christopher Helm.

Kiziroglu, I. (2009). The Pocket Book for Birds of Türkiye. Ankamat Printing House, Ankara, 564

Knopper, L.D., Ollson, C.A., McCallum, L.C., Knopper, L. D., Ollson, C. A., McCallum, L. C., Whitfield Aslund, M. L., Berger, R. G., Souweine, K., & McDaniel, M. (2014). Wind Turbines and Human Health. Frontiers in Public Health, 2, 63.

Kurt, B., (2014). Türkiye'de Orman Yangınlarının Coğrafi Dağılışı, Yüksek Lisans Tezi, Coğrafya (Türkiye Coğrafyası) Anabilim Dalı, Sosyal Bilimler Enstitüsü, Ankara Üniversitesi

Kuru. H, 1987. Vertebrate Animals. Atatürk University Press House, Ankara

Kuvlesky, W.P., Brennan, L.a., Morrison, M.L., Boydston, K.K., Ballard, B.M. & Bryant, F.C. (2007). Wind Energy Development and Wildlife Conservation: Challenges and Opportunities. Journal of Wildlife Management. 71(8): 2487-2498.

Landsberg, F., Stickler, M. Henninger, N., Treweek, J. & Venn, O. (2013). Weaving Ecosystem Services into Impact Assessment: A Step-by-Step Method. Retrieved from: http://www.wri.org/publication/weaving- ecosyste-services-into-impact-assessment

Megavind, (2016). Strategy for Extending the Useful Lifetime of a Wind Turbine.

Millennium Ecosystem Assessment (MA). 2005. Ecosystems and Human Well-being: Biodiversity Synthesis. World Resources Institute: Washington, D.C.

Ministry of Agricultural and Rural Services (former) (2008). Technical Instruction on Soil and Land Classification Standards and Related Legislation

Ministry of Agriculture and Forestry General Directorate of Water Management-Sensitive Area Maps (https://www.tarimorman.gov.tr/SYGM/Link/17/Hassas-Alanlar-Haritalari)

Ministry of Energy and Natural Resources, (2023). Performance Report

Ministry of Environment and Forestry (former), (2004). Environment Atlas of Turkey.

Ministry of Environment and Forestry (former), (2007). The National Biological Diversity Strategy and Action Plan. Ankara: Republic of Turkey Ministry of Environment and Forestry.

Ministry of Environment, Urbanization and Climate Change, (2021). Environmental Status Report for Elazığ

Ministry of Interior, (2017). Highland Inventory of Turkey

Ministry of Public Works and Settlement General Directorate of Disaster Affairs (abolished), (2008). Türkiye Landslide Intensity Map

Ministry of Science, Industry and Technology (former), 2014. Composition of Municipal Waste

Mitchell-Jones, T., Zoltan, B., Masing, M, & Rodrigues, L. (2005). Report of the IWG on Transboundary Programme. Habitats: Data Compilation

Mitchell-Jones, T., Zoltan, B, Masing, M., Rodrigues, L. (2005): Report of the IWG on Transboundary Programme. Habitats: Data Compilation. Retrieved from: http://www.eurobats.org/documents/pdf/AC10/Doc_AC10_10_Report_IWG_HabitatsDataCompilation.pdf.

Maden Tetkik ve Arama Genel Müdürlüğü (MTA), (2024). Yerbilimleri Harita Görüntüleyici. Retrieved from: http://yerbilimleri.mta.gov.tr/anasayfa.aspx

Olgun, Kurtulus Kumlutas, Yusuf and Baran İbrahim. Türkiye Amphibians and Reptiles. TUBITAK, 2012.

Onder, N., (2013). Female Labour Force in Turkey, Labour World, 1,1, 35-61, Ministry of Labour and Social Security

Ramsey, W.M. (1890). Historical Geography of Asia Minor. London., Ramsey, W.M. (1895). Cities and Bishopries of Phrygia I, II. London.

Rodrigues, L., Bach, M.-J., Dubourg-Savage, B., Karapandza, D., Kovac, T., Kervyn, J., Dekker, A., Kepel, O., Bach, J., Collins, C., Harbusch, K., Park, B., Micevski, J., Minderman. (2015). Guidelines for Consideration of Bats in Wind Farm Projects – Revision 2014. EUROBATS Publication Series No.6 (English Version). Bonn, Germany: UNEP/EUROBATS Secretariat.

Sastresa, E. L.; Usón, A. A.; Bribián, I. Z. and Scarpellini, S.; (2010). Local impact of renewables on employment: Assessment methodology and case study, Renew. Sust. Energ. Rev., Vol. 14, No. 2, pp. 679–690, 2010

SATIL, Fatih, Selami SELVİ, and Gulendam TUMEN. "A Study on Native Plant Taxa with Invasive Characteristics in the Balıkesir Flora." Kahramanmaraş Sütçü İmam University Journal of Agriculture and Nature 23.4 (2020): 928-946.

Scottish Natural Heritage (SNH). (2000). Windfarms and Birds: Calculating a theoretical collision risk assuming no avoiding action. Retrieved from: http://www.snh.org.uk/pdfs/strategy/renewable/COLLIS.pdf

Scottish Natural Heritage (SNH). (2010). Use of Avoidance Rates in the SNH Windfarm Collision Risk Model. Retrieved from: https://www.nature.scot/professional-advice/planning-and-development/renewable-energy-development/types-renewable-technologies/onshore-wind-energy/wind-farm-impacts-birds

The Amphibians and Reptiles Monitoring & Photography Society in Türkiye (AdaMerOs Herptil Türkiye) (http://www.turkherptil.org/).

TurkStat, (2013). Child Labour Force Survey 2012.

TurkStat, (2020). Waste Statistics

TurkStat, (2022). Water and Wastewater Statistics

Türkiye General Directorate for Rural Services (former), (1993). Database analysis

Türkiye National Geographic Information Systems, National Geographic Information Platform (https://www.atlas.gov.tr/)

Türkiye Plants Lists (www.bizimbitkiler.org.tr)

UN Framework Convention on Climate Change (UNFCCC), (2023). 28th session of the Conference of the Parties (COP28)

World Bank, (2015). IFI approach to GHG accounting for renewable energy projects.

World Bank, (2024). Climate Change Portal. Retrieved from: (https://climateknowledgeportal.worldbank.org/country/turkiye/trends-variability-projections).