



KIYIKOY WIND POWER PLANT CAPACITY EXTENSION PROJECT

Environmental and Social Impact Assessment (ESIA) Report

ALENKA Enerji Uretim ve Yatirim A.Ş.

December 2019

| Project | Details |
|--------------|--|
| Reference | E19_002 |
| Name | Environmental and Social Impact Assessment (ESIA) Report for Kiyikoy Wind Power Plant Capacity Extension Project |
| Submitted to | Borusan EnBW, Lenders |
| Prepared by | GEM Sustainability Services and Consultancy Inc. www.gemtr.com |

| Revision No. | Revision Date | Revision Detail |
|--------------|------------------|---------------------------------------|
| 01 | 8 October 2019 | ESIA for Public Disclosure |
| 02 | 20 December 2019 | Final ESIA after Public Disclosure |

This document has been prepared by GEM Sürdürülebilirlik Hizmetleri ve Danışmanlık A.Ş. ("GEM") for sole use of our client (the "Client") in accordance with generally accepted consultancy principles and the terms of reference agreed between GEM and the Client. Any information provided by third parties and referred to herein has not been checked or verified by GEM, unless otherwise explicitly stated in this document. No third party may rely upon this document without the prior and written agreement of GEM.

© 2019 GEM Sürdürülebilirlik Hizmetleri ve Danışmanlık A.Ş. All Rights Reserved.

Table of Contents

| | |
|--|----|
| ABBREVIATIONS | 19 |
| 1. THE PROJECT | 24 |
| 1.1. Background..... | 25 |
| 1.2. Project Location | 27 |
| 1.3. Project Characteristics and Components | 30 |
| 1.3.1. Wind Turbines | 30 |
| 1.3.2. Access Roads | 35 |
| 1.3.3. Substation | 36 |
| 1.3.4. Underground Cable Network | 37 |
| 1.3.5. Temporary Construction Facilities | 39 |
| 1.3.5.1. Construction Camp Site | 39 |
| 1.3.5.2. Topsoil Storage Areas | 39 |
| 1.4. Project Activities | 39 |
| 1.5. Material Requirements..... | 40 |
| 1.5.1. Construction Phase | 40 |
| 1.5.2. Operation Phase | 41 |
| 1.6. Project Machinery and Equipment | 41 |
| 1.7. Workforce Requirements | 42 |
| 1.8. Project Schedule..... | 42 |
| 1.9. Permits, Licenses and Approvals Under National Legislation..... | 44 |
| 2. INSTITUTIONAL AND LEGAL FRAMEWORK..... | 45 |
| 2.1. Institutional Framework..... | 45 |
| 2.2. National Legislation..... | 47 |
| 2.2.1. Environmental Impact Assessment..... | 51 |
| 2.3. International Agreements, Conventions and Protocols | 55 |
| 2.4. International Environmental and Social Standards and Guidelines | 57 |
| 2.5. European Union (EU) Environmental Legislation | 58 |
| 2.6. Project Environmental and Social Categorisation..... | 58 |
| 3. PROJECT ALTERNATIVES..... | 59 |
| 3.1. Energy Generation Alternatives | 59 |
| 3.2. Turbine Alternatives | 61 |
| 3.3. Site and Layout Alternatives | 61 |
| 3.3.1. Turbine Locations..... | 62 |

| | | |
|--------|--|-----|
| 3.3.2. | Internal Site Access Roads | 64 |
| 3.3.3. | ETL and Substation..... | 64 |
| 3.4. | Non-Project Alternative | 64 |
| 4. | ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) METHODOLOGY | 66 |
| 4.1. | The ESIA Process..... | 66 |
| 4.2. | The ESIA Methodology | 68 |
| 4.2.1. | Assessment of Impact Significance | 68 |
| 4.2.2. | Approach to Management of Potential Impacts | 71 |
| 4.3. | Project Impact Area | 72 |
| 4.4. | Structure of the ESIA Report..... | 74 |
| 5. | LAND USE | 75 |
| 5.1. | Project Standards | 75 |
| 5.2. | Baseline Conditions | 76 |
| 5.2.1. | Land Cover Types According to CORINE..... | 76 |
| 5.2.2. | Land Registry Status of Parcels Corresponding to the License Area | 76 |
| 5.2.3. | Land Use Capability Classes of Agricultural Parcels to be Acquired | 77 |
| 5.2.4. | Forestry Stand Status According to Forest Stand Data Map..... | 78 |
| 5.3. | Impact Assessment and Management | 82 |
| 5.3.1. | Land Preparation and Construction Phase | 82 |
| 5.3.2. | Operation Phase | 88 |
| 5.3.3. | Closure Phase..... | 88 |
| 5.3.4. | Impact Significance, Management and Residual Impacts | 88 |
| 6. | NOISE | 90 |
| 6.1. | Project Standards | 90 |
| 6.2. | Baseline Conditions | 90 |
| 6.3. | Impact Assessment and Management | 95 |
| 6.3.1. | Land Preparation and Construction Phase | 96 |
| 6.3.2. | Operation Phase | 101 |
| 6.3.3. | Closure Phase..... | 109 |
| 6.3.4. | Impact Significance, Management and Residual Impacts | 109 |
| 7. | AIR QUALITY AND GREENHOUSE GAS EMISSIONS | 113 |
| 7.1. | Project Standards | 113 |
| 7.2. | Baseline Conditions | 113 |
| 7.3. | Impact Assessment and Management | 114 |
| 7.3.1. | Land Preparation and Construction Phase | 115 |

| | | |
|-----------|--|-----|
| 7.3.2. | Operation Phase | 120 |
| 7.3.3. | Closure Phase..... | 120 |
| 7.4. | Greenhouse Gas Emissions | 120 |
| 7.5. | Impact Significance, Management and Residual Impacts | 122 |
| 8. | WATER AND WASTEWATER MANAGEMENT | 125 |
| 8.1. | Project Standards | 125 |
| 8.2. | Baseline Conditions | 128 |
| 8.2.1. | Surface Water Resources | 128 |
| 8.2.2. | Groundwater Resources..... | 133 |
| 8.3. | Impact Assessment and Management | 133 |
| 8.3.1. | Land Preparation and Construction Phase | 133 |
| 8.3.2. | Operation Phase | 134 |
| 8.3.3. | Closure Phase..... | 135 |
| 8.3.4. | Impact Significance, Management and Residual Impacts | 135 |
| 9. | WASTE MANAGEMENT | 137 |
| 9.1. | Project Standards | 137 |
| 9.2. | Baseline Conditions | 138 |
| 9.3. | Impact Assessment and Management | 138 |
| 9.3.1. | Land Preparation and Construction Phase | 139 |
| 9.3.2. | Operation Phase | 141 |
| 9.3.3. | Closure Phase..... | 142 |
| 9.3.4. | Impact Significance, Management and Residual Impacts | 142 |
| 10. | BIODIVERSITY | 145 |
| 10.1. | Project Standards..... | 145 |
| 10.2. | Baseline Conditions..... | 146 |
| 10.2.1. | Legally Protected and Internationally Recognised Areas | 146 |
| 10.2.2. | Biodiversity Study Area | 151 |
| 10.2.3. | Flora Studies | 151 |
| 10.2.4. | Habitat Classification and Vegetation Characteristics | 166 |
| 10.2.5. | Fauna Studies | 172 |
| 10.2.5.1. | Butterflies (Lepidoptera)..... | 172 |
| 10.2.5.2. | Damselflies and Dragonflies (Odonata)..... | 175 |
| 10.2.5.3. | Amphibians and Reptiles (Herpetofauna)..... | 176 |
| 10.2.5.4. | Mammals | 179 |
| 10.2.6. | Avifauna Studies | 183 |

| | | |
|-----------|---|-----|
| 10.2.6.1. | Spring 2019 VP Survey Results | 187 |
| 10.2.6.2. | Autumn 2019 VP Survey Results | 189 |
| 10.2.6.3. | Collision Risk Assessment | 192 |
| 10.2.6.4. | Breeding Bird Survey Results | 201 |
| 10.2.7. | Bat Studies | 205 |
| 10.2.7.1. | Static Acoustic Survey Results | 213 |
| 10.2.7.2. | Transect Acoustic Survey Results | 221 |
| 10.2.8. | Spring 2019 and Autumn 2019 Bird and Bat Mortality Monitoring Survey Results 225 | |
| 10.2.9. | Invasive Alien Species | 231 |
| 10.2.10. | Ecosystem Services | 232 |
| 10.2.11. | Priority Biodiversity Features | 232 |
| 10.2.12. | Critical Habitat Assessment | 232 |
| 10.3. | Impact Assessment and Management | 242 |
| 10.3.1. | Land Preparation and Construction Phase | 256 |
| 10.3.2. | Operation Phase | 256 |
| 10.3.3. | Closure Phase | 257 |
| 10.3.4. | Impact Significance, Management and Residual Impacts | 257 |
| 11. | VISUAL IMPACT ASSESSMENT | 264 |
| 11.1. | Project Standards | 264 |
| 11.2. | Baseline Conditions | 264 |
| 11.3. | Impact Assessment and Management | 266 |
| 11.3.1. | Land Preparation and Construction Phase | 267 |
| 11.3.2. | Operation Phase | 267 |
| 11.3.3. | Closure Phase | 285 |
| 11.3.4. | Impact Significance, Management and Residual Impacts | 285 |
| 12. | SOCIO-ECONOMY | 291 |
| 12.1. | Methodology | 291 |
| 12.1.1. | Desktop Study | 293 |
| 12.1.2. | Field Study | 293 |
| 12.1.3. | Impact Assessment Methodology | 298 |
| 12.1.4. | Impact Area | 298 |
| 12.1.5. | Limitations | 298 |
| 12.2. | Project Standards | 299 |
| 12.3. | Baseline Conditions | 300 |

| | |
|--|-----|
| 12.3.1. Population and Demographics..... | 300 |
| 12.3.2. Income Sources | 301 |
| 12.3.2.1. Forestry Activities | 301 |
| 12.3.2.2. Agriculture Activities and Animal Husbandry | 305 |
| 12.3.2.3. Pastureland and Grazing Area within Forested Land | 306 |
| 12.3.2.4. Beekeeping..... | 307 |
| 12.3.2.5. Mushroom Gathering | 308 |
| 12.3.2.6. Fishery..... | 308 |
| 12.3.2.7. Tourism..... | 309 |
| 12.3.3. Education and Health Services..... | 310 |
| 12.3.4. Vulnerable Groups | 310 |
| 12.3.5. Hunting Activities in the Region | 310 |
| 12.4. Impact Assessment and Management..... | 312 |
| 12.4.1. Land Preparation and Construction Phase..... | 312 |
| 12.4.1.1. Population and Demographics | 312 |
| 12.4.1.2. Local Economy | 312 |
| 12.4.1.3. Employment..... | 313 |
| 12.4.1.4. Land Acquisition | 313 |
| 12.4.1.5. Impacts on Livelihoods | 315 |
| 12.4.1.6. Public Education and Health Services | 319 |
| 12.4.1.7. Vulnerable Groups..... | 319 |
| 12.4.1.8. Hunting Activities | 319 |
| 12.4.2. Operation Phase..... | 319 |
| 12.4.3. Closure Phase | 320 |
| 12.4.4. Impact Significance, Management and Residual Impacts | 320 |
| 13. LABOUR AND WORKING CONDITIONS | 326 |
| 13.1. Project Standards..... | 326 |
| 13.2. Baseline Conditions..... | 326 |
| 13.2.1. Labour and Working Conditions | 327 |
| 13.2.2. OHS in Wind Energy Sector | 328 |
| 13.3. Impact Assessment and Management..... | 331 |
| 13.3.1. Land Preparation and Construction Phase | 331 |
| 13.3.2. Operation Phase | 333 |
| 13.3.3. Closure Phase..... | 333 |
| 13.3.4. Impact Significance, Management and Residual Impacts..... | 333 |

| | |
|---|-----|
| 14. COMMUNITY HEALTH AND SAFETY..... | 337 |
| 14.1. Project Standards..... | 337 |
| 14.2. Baseline Conditions..... | 337 |
| 14.2.1. Existing Transport Network..... | 337 |
| 14.2.2. Forest Fires and Existing Infrastructure | 339 |
| 14.3. Impact Assessment and Management..... | 339 |
| 14.3.1. Land Preparation and Construction Phase | 340 |
| 14.3.1.1. Abnormal Load Transportation and Traffic Load | 340 |
| 14.3.1.2. Workers' Influx..... | 344 |
| 14.3.1.3. Exposure to Diseases | 345 |
| 14.3.1.4. Emergency Preparedness and Response..... | 345 |
| 14.3.1.5. Public Access | 346 |
| 14.3.1.6. Security Personnel..... | 347 |
| 14.3.2. Operation Phase | 349 |
| 14.3.2.1. Shadow Flicker | 349 |
| 14.3.2.2. Blade and Ice Throw | 354 |
| 14.3.2.3. Public Access | 355 |
| 14.3.2.4. Aviation..... | 355 |
| 14.3.2.5. Electromagnetic Interference | 356 |
| 14.3.2.6. Emergency Preparedness and Response..... | 356 |
| 14.3.3. Closure Phase..... | 357 |
| 14.3.4. Impact Significance, Management and Residual Impacts..... | 357 |
| 15. CULTURAL HERITAGE..... | 367 |
| 15.1. Methodology..... | 367 |
| 15.1.1. Desktop Study | 367 |
| 15.1.2. Field Research..... | 367 |
| 15.1.2.1. Archaeological Field Surveys..... | 367 |
| 15.1.2.2. Intangible Cultural Heritage Surveys..... | 368 |
| 15.2. Project Standards..... | 371 |
| 15.2.1. National Legislation..... | 371 |
| 15.2.2. International Conventions, Standards and Guidance | 372 |
| 15.3. Baseline Conditions..... | 372 |
| 15.3.1. Archaeological and Historical Background | 373 |
| 15.3.2. Tangible Cultural Heritage | 374 |
| 15.3.2.1. Registered Archaeological Site | 376 |

| | | |
|-----------|--|-----|
| 15.3.2.2. | Non-registered Potential Site | 377 |
| 15.3.3. | Intangible Cultural Heritage..... | 378 |
| 15.4. | Impact Assessment and Management..... | 381 |
| 15.4.1. | Land Preparation and Construction Phase..... | 381 |
| 15.4.2. | Operation Phase | 383 |
| 15.4.3. | Closure Phase | 383 |
| 15.4.4. | Impact Significance, Management and Residual Impacts | 383 |
| 16. | CUMULATIVE IMPACT ASSESSMENT | 387 |
| 16.1. | Methodology..... | 387 |
| 16.2. | Cumulative Impact Assessment Study | 389 |
| 16.2.1. | Step 1 – Scoping Phase I: VECs, Spatial and Temporal Boundaries..... | 389 |
| 16.2.2. | Step 2 – Scoping Phase II: Other Developments and E&S Drivers..... | 393 |
| 16.2.3. | Step 3: Establish Information on Baseline Status of VECs | 396 |
| 16.2.4. | Step 4: Assess Cumulative Impacts on VECs | 396 |
| 16.2.5. | Step 5: Assess Significance of Predicted Cumulative Impacts..... | 398 |
| 16.2.6. | Step 6: Management of Cumulative Impacts – Design and Implementation | 399 |
| 17. | STAKEHOLDER ENGAGEMENT | 400 |
| 17.1. | Stakeholder Engagement in the Pre-ESIA Process | 400 |
| 17.2. | Stakeholder Engagement as part of the ESIA Process..... | 403 |
| 17.3. | ESIA Disclosure Process..... | 404 |
| 17.4. | Existing Corporate Procedures and Documentation | 407 |
| 17.5. | Project SEP and Grievance Mechanism | 407 |
| 18. | ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM | 409 |
| 18.1. | Key Elements of the Project ESMS | 409 |
| 18.1.1. | Environmental and Social Policy | 410 |
| 18.1.2. | Environmental and Social Management Plan (ESMP) | 411 |
| 18.1.2.1. | Corporate E&S Programs, Plans and Procedures..... | 412 |
| 18.1.2.2. | Existing Project Specific E&S Management Plans and Procedures Implemented at the Kiyikoy WPP..... | 412 |
| 18.1.2.3. | Project Specific E&S Management Plans Developed as part of ESIA | 412 |
| 18.1.3. | Organisational Capacity and Commitment..... | 413 |
| 18.1.4. | Stakeholder Engagement | 420 |
| 18.1.4.1. | External Communications and Grievance Mechanism | 420 |
| 18.1.4.2. | Information Disclosure | 421 |
| 18.1.4.3. | Ongoing Reporting to Affected Communities | 421 |

| | |
|--|-----|
| 18.1.5. Emergency Preparedness and Response | 421 |
| 18.1.6. Monitoring and Review | 422 |
| Appendix A. Noise Measurement Data Sheets..... | 423 |
| Appendix A.1. Measurement Point N-01..... | 423 |
| Appendix A.2. Measurement Point N-02..... | 427 |
| Appendix A.3. Measurement Point N-03..... | 431 |
| Appendix A.4. Measurement Point N-04..... | 435 |
| Appendix B. Laboratory Result Forms for Air Quality Measurements | 437 |
| Appendix B.1. Laboratory Result Forms for Pm10..... | 437 |
| Appendix B.2. Laboratory Result Forms for Pm2.5..... | 441 |
| Appendix B.3. Laboratory Result Forms for Passive Measurements | 445 |
| Appendix C. Social Field Study Photographs | 449 |
| Appendix D. Supplementary Documents for Cultural Heritage Surveys And Assessments | 453 |
| Appendix D.1. Intangible Cultural Heritage Questionnaire | 453 |
| Appendix D.2. Edirne Regional Board for Conservation of Cultural Assets regarding the 3rd Degree Archaeological Site located within the License Area (in Turkish)..... | 455 |
| Appendix D.3. Edirne Regional Board for Conservation of Cultural Assets' Clearance Letter regarding the Non-Registered Potential Site Identified near T18 (in Turkish)..... | 457 |
| Appendix E. Environmental and Social Management System | 458 |
| Appendix E.1. Health, Safety, Environment and Energy Policy..... | 458 |
| Appendix E.2. Social Guidelines..... | 459 |
| Appendix E.3. ISO/OHSAS Certifications Valid for the Project | 460 |
| E.3.1. ISO 9001: 2015..... | 460 |
| E.3.2. ISO 14001: 2015..... | 462 |
| E.3.3. OHSAS 18001: 2007 | 464 |
| Appendix F. Environmental and Social Management and Monitoring Plan..... | 466 |
| Appendix F.1. Project ESMMP | 467 |

List of Tables

| | |
|---|----|
| Table 1-1. Settlements Located near the License Area | 27 |
| Table 1-2. Closest Parcels to the Turbines on which Buildings/Structures are Located | 29 |
| Table 1-3. Project Characteristics | 30 |
| Table 1-4. Turbine Specifications of the Capacity Extension Project | 31 |
| Table 1-5. Turbine Locations and Elevations at the Foundation Locations | 33 |
| Table 1-6. Cable Trench Types | 37 |
| Table 1-7. Main Project Activities per Project Phase | 39 |
| Table 1-8. Material Requirement for the Construction Activities | 40 |
| Table 1-9. Construction Phase Machinery and Equipment | 41 |
| Table 1-10. Operations Team of the Existing Kiyikoy WPP | 42 |
| Table 1-11. Status of Permits, Licenses and Approvals | 44 |
| Table 2-1. Amendments Made in the Current EIA Regulation | 52 |
| Table 2-2. Conventions, Agreements and Protocols | 55 |
| Table 2-3. ILO Conventions Relevant to the Project | 56 |
| Table 2-4. Applicability of EBRD PRs to the Project and/or ESIA | 57 |
| Table 3-1. Annual Average Energy Generation Data for the Existing Kiyikoy WPP | 62 |
| Table 3-2. Summary of the Slight Revisions Done for the Turbine Coordinates | 64 |
| Table 3-3. Comparison of With Project and Non-Project Alternatives | 65 |
| Table 4-1. Specific Criteria for Predicting Overall Magnitude of Impacts | 69 |
| Table 4-2. Generic Criteria for Identification of Receptor/Resource Sensitivity and Impact Magnitude | 69 |
| Table 4-3. General Significance Assessment Matrix and Definition of Significance Levels .. | 70 |
| Table 4-4. Significance Assessment Matrix for Cultural Heritage | 71 |
| Table 4-5. General Outline of the ESIA Report | 74 |
| Table 5-1. Land Cover Distribution within the License Area | 76 |
| Table 5-2. Registered Parcels Corresponding to the License Area | 77 |
| Table 5-3. Land Use Capability Classes of the Agricultural Parcels subject to Project-related Land Acquisition | 78 |
| Table 5-4. Criteria for the Sensitivity of Resources | 82 |
| Table 5-5. Area of the Footprint of Existing Kiyikoy WPP and Capacity Extension Project Units | 83 |
| Table 5-6. Detailed Land Use Characteristics at the Footprint of Project Units (according to CORINE 2012) | 84 |
| Table 5-7. Summary of the Land Use at the Footprint of Project Units (according to CORINE 2012) | 86 |
| Table 5-8. Affected Areas of the Agricultural and Pasture Parcels being Acquired by the Project | 87 |
| Table 5-9. Estimated Volume of the Topsoil to be Stripped | 88 |
| Table 5-10. Impacts, Proposed Mitigation Measures and Residual Impacts (Land Use) | 89 |
| Table 6-1. Noise Standards for Residential Receptors | 90 |
| Table 6-2. Noise Sensitive Receptors (NSR) Selected for Baseline Noise Measurements .. | 91 |
| Table 6-3. Baseline Noise Measurement Results at the NSRs | 92 |
| Table 6-4. Criteria for the Sensitivity of Noise Receptors | 95 |
| Table 6-5. Criteria for Magnitude of Change | 96 |

| | |
|--|-----|
| Table 6-6. Sound Power Levels for the Construction Machinery and Equipment..... | 96 |
| Table 6-7. Cumulative Construction Noise Level Modelled at the NSRs..... | 98 |
| Table 6-8. Turbine Noise Characteristics | 101 |
| Table 6-9. Cumulative Operational Noise Level Modelled at NSRs | 108 |
| Table 6-10. Impacts, Proposed Mitigation Measures and Residual Impacts (Noise) | 110 |
| Table 7-1. Air Quality Standards | 113 |
| Table 7-2. Baseline Air Quality (Dust) Measurement Results | 114 |
| Table 7-3. Criteria for Magnitude of Change | 115 |
| Table 7-4. Emission Factors and Emission Calculations | 115 |
| Table 7-5. Air Quality Modelling Results..... | 117 |
| Table 7-6. Pollutant Emission Factors for Non-road Mobile Sources and Machinery (Diesel Fuel) | 122 |
| Table 7-7. Scope 1 and Scope 2 GHG Emission Calculations for the Construction Phase of the Project..... | 123 |
| Table 7-8. Impacts, Proposed Mitigation Measures and Residual Impacts (Air Quality and GHG Emissions) | 124 |
| Table 8-1. Project Standards for Drinking Water | 126 |
| Table 8-2. Project Standards for the Treated Sanitary Wastewater Discharges | 127 |
| Table 8-3. Dams and Ponds in the Vicinity (within 30 km) of the Project Area..... | 128 |
| Table 8-4. Estimated Daily Domestic Water Use and Wastewater Generation | 134 |
| Table 8-5. Impacts, Proposed Mitigation Measures and Residual Impacts (Water and Wastewater Management) | 136 |
| Table 9-1. Monthly Municipal Solid Waste Generation Amounts | 139 |
| Table 9-2. Monthly Recyclable Waste Generation Amounts..... | 140 |
| Table 9-3. Estimated Excavation and Fill Volumes for the Turbine Platform and Site Access Road Construction | 140 |
| Table 9-4. Types of Wastes Identified in the Existing Approved Industrial Waste Management Plan of the Kiyikoy WPP | 141 |
| Table 9-5. Monthly Waste Generation Amounts in 2018 at the Existing Kiyikoy WPP | 141 |
| Table 9-6. Impacts, Proposed Mitigation Measures and Residual Impacts (Waste Management)..... | 144 |
| Table 10-1. Legally Protected Areas in the vicinity of the Project | 146 |
| Table 10-2. KBA Qualifying Species of Istranca Mountains KBA..... | 148 |
| Table 10-3. Flora Species Identified at the Project License Area | 153 |
| Table 10-4. Flora Species of Importance Identified at the Project Area (*) | 160 |
| Table 10-5. Habitat Classification and Vegetation Characteristics of the Project License Area | 167 |
| Table 10-6. Butterflies (Lepidoptera) Observed at the Project Area..... | 173 |
| Table 10-7. Damselflies and Dragonflies (Odonata) Observed at the Project Area | 175 |
| Table 10-8. Amphibians and Reptiles (Herpetofauna) Observed at the Project Area | 177 |
| Table 10-9. Location of Sherman Traps | 179 |
| Table 10-10. Location of Photo traps | 180 |
| Table 10-11. Mammals Observed at the Project Area between 2015-2017 | 181 |
| Table 10-12. Baseline Avifauna Studies – 2019 Spring and Autumn Migration | 185 |
| Table 10-13. Survey Effort at Vantage Points | 187 |
| Table 10-14. Summary of Bird Observations in Spring 2019 | 187 |
| Table 10-15. Flight Duration of Resident Birds at Risk Height/Zone (Spring 2019)..... | 189 |

| | |
|---|-----|
| Table 10-16. Survey Effort at Vantage Points | 189 |
| Table 10-17. Summary of Bird Observations in Autumn 2019 | 190 |
| Table 10-18. Flight Duration of Resident Birds at Risk Height/Zone (Autumn 2019)..... | 191 |
| Table 10-19. Estimation of Total Number of Migratory Birds (Spring 2019) | 193 |
| Table 10-20. Regular Flights Through a Wind Farm (Migratory Bird Species, Spring 2019) | 193 |
| Table 10-21. Theoretical Mortality Rate per Migratory Bird Species (Spring 2019)..... | 194 |
| Table 10-22. Estimation of Total Number of Migratory Birds (Autumn 2019) | 194 |
| Table 10-23. Regular Flights Through a Wind Farm (Migratory Bird Species, Autumn 2019) | 195 |
| Table 10-24. Theoretical Mortality Rate per Migratory Bird Species (Autumn 2019)..... | 195 |
| Table 10-25. Bird Occupancy at Risk Height/Zone (Spring 2019) | 196 |
| Table 10-26. Birds Using the Wind Farm Airspace (Resident Bird Species, Spring 2019). | 197 |
| Table 10-27. Theoretical Mortality Rate per Resident Bird Species (Spring 2019) | 197 |
| Table 10-28. Bird Occupancy at Risk Height/Zone (Autumn 2019)..... | 198 |
| Table 10-29. Birds Using the Wind Farm Airspace (Resident Bird Species, Autumn 2019) | 199 |
| Table 10-30. Theoretical Mortality Rate per Resident Bird Species (Autumn 2019) | 199 |
| Table 10-31. Spring 2019 and Autumn 2019 Theoretical Mortality Rate per Migratory Bird Species | 200 |
| Table 10-32. Breeding Bird Species Observed at the Project Area | 201 |
| Table 10-33. Breeding Raptors at the Project Area | 202 |
| Table 10-34. Field Conditions during Spring 2019, Summer 2019 and Autumn 2019 Surveys | 205 |
| Table 10-35. Bat Species Expected at the Project Area | 207 |
| Table 10-36. Spring 2019 and Summer 2019 Survey Findings of Bat Species Expected at the Project Area | 211 |
| Table 10-37. Spring 2019 Static Acoustic Survey Results | 214 |
| Table 10-38. Summer 2019 Static Acoustic Survey Results | 216 |
| Table 10-39. Autumn 2019 Static Acoustic Survey Results | 219 |
| Table 10-40. Spring 2019 Transect Acoustic Survey Results | 222 |
| Table 10-37. Summer 2019 Transect Acoustic Survey Results | 224 |
| Table 10-42. Searcher Efficiency Trials | 227 |
| Table 10-43. Weekly Distribution of Bat Fatalities per Turbine (Spring 2019) | 228 |
| Table 10-44. Weekly Distribution of Fatalities per Turbine (Autumn 2019) | 229 |
| Table 10-45. Bird Fatalities at the Turbine Area | 230 |
| Table 10-46. Bird Fatalities at the ETL Area | 231 |
| Table 10-47. Critical Habitat Criteria as per IFC PS6 Guidance Note (2019) | 233 |
| Table 10-48. Priority Biodiversity Features | 235 |
| Table 10-49. Critical Habitat Triggering Features | 237 |
| Table 10-50. Species of Conservation Importance | 243 |
| Table 10-51. Ecology of the Confirmed and Potential CH Trigger Species | 251 |
| Table 10-52. Potential Impacts of WPP Projects | 252 |
| Table 10-53. Criteria for Sensitivity of Receptors | 252 |
| Table 10-54. Impacts, Proposed Mitigation Measures and Residual Impacts (Biodiversity) | 258 |
| Table 11-1. Criteria for the Sensitivity of Visual Receptors (for potential adverse impacts) | 266 |

| | |
|--|-----|
| Table 11-2. Criteria for the Magnitude of Change for Visual Receptors (for Operation Phase only)..... | 266 |
| Table 11-3. Project Characteristics Related to Visual Impacts | 267 |
| Table 11-4. Visibility (basis for Magnitude of Change) of Turbines from Selected Viewpoints (According to 3D Visual Images for the Worst Case) | 271 |
| Table 11-5. Impacts, Proposed Mitigation Measures and Residual Impacts (Visual Impacts) | 289 |
| Table 12-1. Summary of the Social Field Studies Conducted as part of the ESIA | 295 |
| Table 12-2. Field Study Summary (see Table 12-3 for the detailed specific stakeholders consulted) | 295 |
| Table 12-3. List of the Stakeholders Consulted..... | 296 |
| Table 12-4. Population Data of the Settlements | 300 |
| Table 12-5. Population Change in Vize, Kiyikoy and Kislacik, 2014-2018 | 300 |
| Table 12-6. Primary, Secondary and Tertiary Income Sources of the Neighbourhoods..... | 301 |
| Table 12-7. Forest Land of Kiyikoy and Kislacik that falls within the Jurisdiction of Kiyikoy Forestry Sub-district Directorate..... | 301 |
| Table 12-8. Number of the Development Cooperatives..... | 302 |
| Table 12-9. Market Sale by Villagers..... | 303 |
| Table 12-10. Average Annual Planted Tree Sale | 304 |
| Table 12-11. Forestry Expenses | 305 |
| Table 12-12. Income Earned through Wood Sales..... | 305 |
| Table 12-13. Agricultural Data..... | 305 |
| Table 12-14. Animal Numbers..... | 306 |
| Table 12-15. Number of Households Breeding Animal..... | 306 |
| Table 12-16. Pasture Area | 306 |
| Table 12-17. Grazing Capacity..... | 306 |
| Table 12-18. Grazing Capacity and Current Livestock of the Forest Land..... | 307 |
| Table 12-19. Number of Beekeepers and Beehives | 307 |
| Table 12-20. Vulnerable Groups in the Settlements | 310 |
| Table 12-21. Hunting Season and The Bird Categories Allowed for Hunting within the Specified Seasons | 311 |
| Table 12-22. Kiyikoy State Hunting Ground | 311 |
| Table 12-23. Impact Summary for the Pasture Parcel No. 319/1 | 314 |
| Table 12-24. Impact Summary for the Agricultural Parcels Subject to Land Acquisition | 314 |
| Table 12-25. Local Touristic Locations and Their Distance to the Project License Area.... | 318 |
| Table 12-26. Impacts, Proposed Mitigation Measures and Residual Impacts (Socio-economy) | 321 |
| Table 13-1. Global Wind Energy Accident/Incident Statistics | 329 |
| Table 13-2. Wind Energy Accidents in Turkey..... | 330 |
| Table 13-3. Impacts, Proposed Mitigation Measures and Residual Impacts (Labour and Working Conditions)..... | 334 |
| Table 14-1. Annual Average Daily Vehicle Values | 338 |
| Table 14-2. Forest Fire Statistics (2014-2018) | 339 |
| Table 14-3. Summary of Project Transportation Plan | 342 |
| Table 14-4. Shadow Flicker Modelling Results – Worst-Case Scenario | 350 |
| Table 14-5. Shadow Flicker – Calendar per Turbine (Worst Case Scenario)..... | 352 |
| Table 14-6. Shadow Flicker Modelling Results – Realistic Scenario..... | 352 |

| | |
|---|-----|
| Table 14-7. Shadow Flicker – Calendar (Realistic Case Scenario)..... | 354 |
| Table 14-8. Impacts, Proposed Mitigation Measures and Residual Impacts (Community Health and Safety) | 358 |
| Table 15-1. Respondents* of the Intangible Cultural Heritage Interviews | 368 |
| Table 15-2. Summary of Responses Provided to Intangible Cultural Heritage Questionnaires | 378 |
| Table 15-3. Criteria for the Sensitivity of Cultural Heritage Receptors | 383 |
| Table 15-4. Criteria for Magnitude of Change | 385 |
| Table 15-5 Impacts, Proposed Mitigation Measures and Residual Impacts (Cultural Heritage) | 386 |
| Table 16-1. Specific VECs of Kiyikoy WPP Project | 390 |
| Table 16-2. Existing and Future Developments in the CIA Study Area..... | 394 |
| Table 16-3. Interaction of Existing and Future Developments (Certain and Reasonably Foreseeable) with the Selected VECs | 397 |
| Table 17-1. Governmental Stakeholders Involved in the Scoping, Review and Evaluation of the national EIA Process..... | 400 |
| Table 17-2. Governmental Stakeholders Involved in the Zoning Process..... | 401 |
| Table 17-3. Summary of the Stakeholder Engagement Activities Conducted as part of the ESIA | 403 |
| Table 17-4. Stakeholder Engagement Plan for the ESIA Disclosure Period | 405 |
| Table 18-1. Existing Management System Certifications of Borusan EnBW Applicable to the Project | 411 |
| Table 18-2. Roles and Responsibilities of the Project ESMS Team..... | 415 |

List of Figures

| | |
|--|-----|
| Figure 1-1. Key Milestones of the Kiyikoy WPP Project..... | 26 |
| Figure 1-2. Project License Area and the Surroundings | 28 |
| Figure 1-3. Turbines Operating at the Existing Kiyikoy WPP (Looking East-Southeast) | 29 |
| Figure 1-4. Illustration of Outer Dimensions of V136 | 31 |
| Figure 1-5. Platform Design (units in meters) | 32 |
| Figure 1-6. Project Layout..... | 34 |
| Figure 1-7. Pavement Structure of the Internal Site Access Roads | 35 |
| Figure 1-8. Existing Substation | 36 |
| Figure 1-9. Control Room at the Existing Kiyikoy WPP | 37 |
| Figure 1-10. Typical Cross-sections of the Cable Trench Types | 38 |
| Figure 1-11. Current Schedule of the Capacity Extension Project | 43 |
| Figure 2-1. Institutional Framework with relevance to the Project..... | 46 |
| Figure 2-2. The EIA Process under the National EIA Regulation..... | 53 |
| Figure 3-1. Assessment of Relative Benefits and Impacts of Electricity Generation Technologies (Source: Electric Power Research Institute, 2016) | 60 |
| Figure 3-2. Turbine Micro-siting | 63 |
| Figure 4-1. ESIA Process..... | 67 |
| Figure 4-2. ESIA Study Area | 73 |
| Figure 5-1. CORINE Land Cover Distribution within the License Area | 79 |
| Figure 5-2. Forestry Stand Map of the License Area | 80 |
| Figure 5-3. Forestry Function Map of the License Area..... | 81 |
| Figure 5-4. Representative Layout for Turbine Foundations..... | 83 |
| Figure 6-1. Photographs Showing the Existing Conditions of the Residential Building located 200 m North of T15 | 93 |
| Figure 6-2. Noise Measurement Locations..... | 94 |
| Figure 6-3. Photographs Showing the Noise Measurement Locations | 95 |
| Figure 6-4. Model Area Topography..... | 97 |
| Figure 6-5. Noise Sensitive Receptors (N-01, N-02, and N-03), N-04 and Construction Phase Noise Map..... | 99 |
| Figure 6-6. Construction Phase Noise Map for T15..... | 100 |
| Figure 6-7. Operation Phase L_{day} Noise Map (as per Turkish RAMEN) | 101 |
| Figure 6-8. Operation Phase $L_{evening}$ Noise Map (as per Turkish RAMEN) | 102 |
| Figure 6-9. Operation Phase L_{night} Noise Map (as per Turkish RAMEN) | 103 |
| Figure 6-10. Operation Phase L_{day} Noise Map (as per IFC EHS Guidelines) | 104 |
| Figure 6-11. Operation Phase L_{night} Noise Map (as per IFC EHS Guidelines)..... | 105 |
| Figure 6-12. Operation Phase L_{day} Noise Map for T15 (as per IFC EHS Guidelines) | 106 |
| Figure 6-13. Operation Phase L_{night} Noise Map for T15 (as per IFC EHS Guidelines) | 107 |
| Figure 7-1. Baseline Air Quality Measurement Locations | 116 |
| Figure 7-2. Impact Area Selected for the Air Quality Modelling Study | 117 |
| Figure 7-3. Maximum Daily Average PM10 Emissions from Project Activities | 118 |
| Figure 7-4. Maximum Daily Average PM2.5 Emissions from Project Activities | 119 |
| Figure 8-1. Project License Area within Marmara River Catchment..... | 129 |
| Figure 8-2. Lakes, Dams and Ponds in the Vicinity of the Project License Area | 130 |
| Figure 8-3. Streams/creeks within the Project | 132 |

| | |
|---|-----|
| Figure 9-1. Temporary Waste Storage Area at the Existing Kiyikoy WPP | 143 |
| Figure 10-1. Protected Areas in the Vicinity of the Project License Area | 149 |
| Figure 10-2. Key Biodiversity Areas in the Vicinity of the Project License Area | 150 |
| Figure 10-3. Flora Species of Importance Identified at the Project Area | 161 |
| Figure 10-4. Distribution Maps of Regional Endemic Species (as listed in Table 10-4) | 162 |
| Figure 10-5. Distribution Maps of Rare Species (as listed in Table 10-4) | 163 |
| Figure 10-6. Rare but not Endemic Flora Species Identified at the Project License Area .. | 164 |
| Figure 10-7. Regional Endemic Flora Species Identified at the Project License Area..... | 165 |
| Figure 10-7. Meso and Eutrophic Mixed Deciduous Forests at the Project License Area .. | 166 |
| Figure 10-8. Permanent Mesotrophic Pastures at the Project License Area | 166 |
| Figure 10-9. EUNIS Habitat Map of the Project License Area | 168 |
| Figure 10-10. Sub-Flora Species at Habitat G1.A | 169 |
| Figure 10-11. Sub-Flora Species at Habitat G1.A | 170 |
| Figure 10-12. Sub-Flora Species at Habitat G1.A | 171 |
| Figure 10-13. Butterfly Species Identified in 2019 Fauna Survey | 174 |
| Figure 10-14. Somatochlora borisi (Bulgarian emerald) | 176 |
| Figure 10-15. Pelophylax ridibundus (Marsh frog) | 178 |
| Figure 10-16. Rana dalmatina (Agile frog)..... | 178 |
| Figure 10-17. Sherman Traps across the Project License Area | 179 |
| Figure 10-18. Location of Photo traps | 180 |
| Figure 10-19. A Photo trap at the Project License Area..... | 181 |
| Figure 10-20. Mammal Species Identified at the Project Area | 182 |
| Figure 10-21. Location of Turbines and Vantage Points..... | 184 |
| Figure 10-22. Location of the Transects for Breeding Bird Surveys..... | 186 |
| Figure 10-24. Predicted Breeding Territories of Raptors (1/2) | 203 |
| Figure 10-25. Predicted Breeding Territories of Raptors (2/2) | 204 |
| Figure 10-26. Bat Activity Study Area..... | 209 |
| Figure 10-27. Static Acoustic Survey Sampling Points (SP) | 210 |
| Figure 10-28. Species Composition at the SPs in Spring 2019 | 213 |
| Figure 10-29. Species Composition at the SPs in Summer 2019 | 215 |
| Figure 10-30. Bat Species Recorded at SPs in Spring 2019 and Summer 2019 | 218 |
| Figure 10-31. Species Composition on 2 nd Night of the Survey at SP5 in Autumn 2019.... | 219 |
| Figure 10-32. Maximum Seasonal Bat Recordings per SP | 220 |
| Figure 10-33. Transect Acoustic Surveys (Spring 2019) | 221 |
| Figure 10-34. Transect Acoustic Surveys (Summer 2019) | 223 |
| Figure 10-35. Methodological Steps of Carcass Surveys | 226 |
| Figure 10-36. Carcass Persistency Trial..... | 228 |
| Figure 10-37. Bat Fatalities at Operational Turbines during Seasonal Carcass Study | 229 |
| Figure 10-38. Location of Bird Carcasses under the ETL | 231 |
| Figure 10-33. Distribution Map of Ciconia ciconia (White Stork) | 240 |
| Figure 10-34. Distribution Map of Pernis apivorus (European Honey-Buzzard) | 241 |
| Figure 11-1. Comparison of the Existing and Final Layouts | 268 |
| Figure 11-2. Zone of Visibility for Existing and Planned Turbines (Cumulative) | 270 |
| Figure 11-3. Visual Representation of the Turbines from each VP | 284 |
| Figure 11-4. Photomontage Result for VP3 (Closest Residential Building to the Wind Turbines in Kiyikoy)..... | 286 |

| | |
|--|-----|
| Figure 11-5. Photomontage Result for VP8 (Looking towards Southeast from the Forest Road Passing Adjacent to the Building in the North of T15)..... | 287 |
| Figure 11-6. Photomontage Result for VP8 (Looking towards Southwest from Southern Wall of the Building in the North of T15)..... | 288 |
| Figure 12-1. Social Study Area | 292 |
| Figure 12-2. Location of Existing Beehives | 317 |
| Figure 14-1. Existing Road Infrastructure (Source: KGM, May 2019. 2018 Traffic and Transportation Data) | 338 |
| Figure 14-2. Site Transportation Plan..... | 348 |
| Figure 14-3. Shadow Map – Worst-case Scenario | 351 |
| Figure 14-4. Shadow Map – Realistic Scenario..... | 353 |
| Figure 15-1. Intangible Cultural Heritage Interviews at a Local Market Place in Kiyikoy | 369 |
| Figure 15-2. Intangible Cultural Heritage Interviews with Local Charcoal Producers | 369 |
| Figure 15-3. Intangible Cultural Heritage Interviews with Kiyikoy Water Products Cooperative | 370 |
| Figure 15-4. Intangible Cultural Heritage Interviews | 370 |
| Figure 15-5. Intangible Cultural Heritage Interviews | 370 |
| Figure 15-6. Locations of the 3 rd Degree Archaeological Site and the Non-registered Potential Site within the Project License Area | 375 |
| Figure 15-7. Remains of the Structure at Cingene İskelesi 3 rd Degree Archaeological Site..... | 376 |
| Figure 15-8. A Piece of Marble Slab with Relief at Cingene İskelesi 3 rd Degree Archaeological Site | 376 |
| Figure 15-9. Foundation Remains at Kiremitlimandıra Potential Site..... | 377 |
| Figure 15-10. Water Well at Kiremitlimandıra Potential Site | 378 |
| Figure 15-11. Ceramic Fragments at Kiremitlimandıra Potential Site | 378 |
| Figure 15-12. Kiremitlimandıra Potential Archaeological Site | 382 |
| Figure 16-1. Illustration of Cumulative Impacts..... | 387 |
| Figure 16-2. IFC's Six-step CIA Approach..... | 388 |
| Figure 16-3. ESIA (Project-centred) vs. CIA (VEC-centred) Perspectives | 389 |
| Figure 16-4. CIA Study Area, VECs and Projects Included in the CIA Study | 392 |
| Figure 16-5. Categorisation of Future Projects | 393 |
| Figure 17-1. Project Grievance Mechanism | 408 |
| Figure 18-1. Key Elements of ESMS..... | 409 |
| Figure 18-2. Summary of ESMP Implementation under the Project ESMS..... | 411 |
| Figure 18-3. Kiyikoy WPP Project ESMS Team | 414 |

ABBREVIATIONS

| Abbreviation | Definition |
|-----------------|---|
| Aarhus | The UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters |
| asl | Above sea level |
| BAP | Biodiversity Action Plan |
| BCE | Before Common Era |
| BD | Borusan Danışmanlık Ortak Hizmetleri A.Ş. |
| BEE | Borusan EnBW Enerji Yatırımları ve Üretim A.Ş. |
| BERN | Convention for the Conservation of European Wildlife and Natural Habitats |
| BOD | Biochemical Oxygen Demand |
| BOTAS | Petroleum Pipeline Corporation |
| CCD | Convention to Combat Desertification |
| CHMP | Cultural Heritage Management Plan |
| CHS | Community Health and Safety |
| CIA | Cumulative Impact Assessment |
| CITES | Convention on International Trade in Endangered Species of Wild Fauna and Flora |
| CLO | Community Liaison Officer |
| CMS | Convention on the Conservation of Migratory Species of Wild Animals |
| CO ₂ | Carbon dioxide |
| COD | Chemical Oxygen Demand |
| CORINE | Coordination of Information on the Environment |
| CPR | Communications and Public Relations |
| CSR | Corporate Social Responsibility |
| CWIF | Caithness Wind Farm Information Forum |
| DSI | State Hydraulic Works |
| E&S | Environmental and Social |
| EBRD | The European Bank for Reconstruction and Development |
| EC | European Commission |
| EHS | Environmental, Health and Safety |
| EIA | Environmental Impact Assessment |
| EMRA | Energy Market Regulatory Authority |
| ESAP | Environmental and Social Action Plan |
| ESDD | Environmental and Social Due Diligence |
| ESIA | Environmental and Social Impact Assessment |
| ESMP | Environmental and Social Management Plan |
| ESMS | Environmental and Social Management System |
| Espoo | The Convention on Environmental Impact Assessment in a Transboundary Context |

| Abbreviation | Definition |
|--------------|--|
| ETL | Energy Transmission Line |
| EU | European Union |
| EUAS | Electricity Generation Company |
| EU OSHA | European Agency for Safety and Health at Work |
| FHC | Family Health Centre |
| Frekans | Frekans Acoustics and Environmental Laboratory |
| FRS | Farmer Registration System |
| FUND | The International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage |
| G | Ground Absorption |
| GAZDAS | Thrace Region Gas Distribution Company |
| GEM | GEM Sustainability Services and Consultancy Inc. |
| GHG | Greenhouse Gas Emissions |
| GPS | Geographical Positioning System |
| GIP | Good Industry Practice |
| GIS | Geographic Information System |
| HA | Highways Agency |
| HAWT | Horizontal Axis Wind Turbine |
| HH | Household |
| HQs | Headquarters |
| HR | Human Resources |
| HV | High Voltage |
| IBA | Important Bird Area |
| ICAO | International Civil Aviation Organization |
| ICOMOS | International Council on Monuments and Sites |
| IEC | International Electrotechnical Commission |
| IEMA | Institute of Environmental Management and Assessment |
| IFC | International Finance Corporation |
| ILO | International Labour Organization |
| IPEC | International Programme on the Elimination of Child Labour |
| ISKI | Istanbul Water and Sewerage Administration |
| ISO | International Standards Organisation |
| KAYSIS | State Organization Central Registration System |
| KBA | Key Biodiversity Area |
| KGM | General Directorate of Highways |
| LPS | Lightning Protection System |
| LRP | Livelihood Restoration Plan |
| MoENR | Ministry of Energy and Natural Resources |

| Abbreviation | Definition |
|-----------------|--|
| MoEU | Ministry of Environment and Urbanization |
| NGOs | Non-governmental Organisations |
| NSR | Noise Sensitive Receptor |
| NTS | Non-technical Summary |
| OHS | Occupational Health and Safety |
| OM | Operations Manager |
| PAPs | Project Affected Persons |
| PAS | Project Affected Settlements |
| PCBs | Polychlorinated Biphenyls |
| PCTs | Polychlorinated Terphenyls |
| PDF | Project Description File |
| PDoEU | Provincial Directorate of Environment and Urbanisation |
| PM | Project Manager |
| POPs | Stockholm Convention on Persistent Organic Pollutant |
| PPE | Personal Protective Equipment |
| Project Company | ALENKA Enerji Üretim ve Yatırım A.Ş. |
| PSO | Project Social Officer |
| PSs | Performance Standards |
| QCRR | Questions/Complaints/Request/Recommendations |
| RAMEN | Regulation on the Assessment and Management of Environmental Noise |
| RAMSAR | International Convention on Wetlands of International Importance especially as Waterfowl Habitat |
| RCNM | Roadway Construction Noise Model User's Guide |
| REGIO | REGIO Cultural Heritage Management Consultancy |
| RWIHC | Regulation on Waters Intended for Human Consumption |
| SEP | Stakeholder Engagement Plan |
| SGK | Social Security Institute |
| SMC | Social Monitoring Committee |
| SNH | Scottish Natural Heritage |
| SPV | Special Purpose Vehicle |
| SWQR | Surface Water Quality Regulation |
| The Bank | The European Bank for Reconstruction and Development |
| TCDD | Turkish State Railways |
| TEDAS | Turkish Electricity Distribution Corporation |
| TEIAS | Turkish Electricity Transmission Company |
| Trakya | Thrace Region |
| TREDAS | Thrace Region Electricity Distribution Company |
| TUREB | Turkish Wind Energy Association |

| Abbreviation | Definition |
|---------------|---|
| TurkStat | Turkish Statistical Institute |
| UK | United Kingdom |
| UN | United Nations |
| UNECE | UN Economic Commission for Europe |
| UNEP/EUROBATS | Agreement on the Conservation of Populations of European Bats |
| UNESCO | United Nations Educational, Scientific, and Cultural Organization |
| UNFCCC | United Nations Framework Convention on Climate Change |
| US | United States |
| VAWT | Vertical Axis Wind Turbine |
| VECs | Valued Environmental and Social Components |
| VFR | Visual Flight Rules |
| VP | Viewpoint |
| WBCSD | World Business Council on Sustainable Development |
| WBG | World Bank Group |
| WHO | World Health Organisation |
| WPCR | Water Pollution Control Regulation |
| WPP | Wind Power Plant |
| WRI | World Resources Institute |

List of the Individuals / Organizations that Prepared or Contributed to the Environmental and Social Impact Assessment (ESIA) Disclosure Package

| Individual/ Organisation | Company/Party | Position/ Expertise | Contribution to Relevant ESIA Chapter/ Component |
|--|--|---|--|
| Dr. Hande Yukseler | GEM Sustainability Services and Consultancy Inc. | Project Director | Full ESIA |
| Burcu Yazgan Kayabali | GEM Sustainability Services and Consultancy Inc. | Project Manager | Full ESIA |
| Sevil Avsaroglu | GEM Sustainability Services and Consultancy Inc. | Environmental, Health and Safety Specialist | Chapter 8 "Water and Wastewater" Chapter 9 "Waste" Management Plans Chapter 14 "Labour and Working Conditions" |
| İpek Karasu | GEM Sustainability Services and Consultancy Inc. | Environmental and GIS Specialist | Chapter 5 "Land Use" |
| Ekim Bakirci Mahmut Cetin | Frekans Environmental Laboratory | Noise Assessment and WindPro Modeling Experts | Chapter 6 "Noise" Chapter 11 "Visual" Chapter 13 "Community Health and Safety" |
| Ismail Ulusoy | Ennotes Air Quality Management and Consultancy Services Co. | Air Quality Assessment Experts | Chapter 7 "Air Quality and Greenhouse Gas Emission" |
| Prof. Dr. Hayri Duman | Gazi University | Flora Expert | Chapter 10 "Biodiversity" (Baseline) |
| Prof. Dr. Mustafa Sozen | Bulent Ecevit University | Fauna Expert | Chapter 10 "Biodiversity" (Baseline) |
| Kerem Ali Boyla | Independent Consultant | Senior Avi-fauna Expert | Chapter 10 "Biodiversity" (Baseline) |
| Dr. Emrah Coraman | Independent Consultant | Senior Bat Expert | Chapter 10 "Biodiversity" (Baseline) |
| Didem Sivri Ece Kılıçoğlu Sadık Avcı Gokhan Metin Zeynepcan Akar | SRM Consultancy Ltd. Co. | Social / Stakeholder Engagement Experts | Chapter 12 "Socio-economic Environment and Social Impact Assessment" Chapter 17 "Stakeholder Engagement" Stakeholder Engagement Plan (SEP) Livelihood Restoration Plan (LRP) Framework |
| Dr. Ugur Dag Halim Ozatay Seray Ayaz Akdemir Serkan Akdemir | REGIO Cultural Heritage Management Consultancy Co. | Cultural Heritage Experts | Chapter 15 "Cultural Heritage" Cultural Heritage Management Plan (including Chance Find Procedure) |

1. THE PROJECT

Kiyikoy Wind Power Plant ("Kiyikoy WPP" or the "Plant") is located in Vize district of Kırklareli province in the northwestern part of Turkey. ALENKA Enerji Üretim ve Yatırım A.Ş. ("ALENKA" or the "Project Company"), a special purpose vehicle (SPV) established for the development of the Project by the previous owner of the Project, has been operating the first phase of the Kiyikoy WPP with an installed capacity of 28 MWm/27 MWe (14 turbines, 2 MWm each) since August 2014.

On 1 December 2017, Borusan EnBW Enerji Yatırımları ve Üretim A.Ş. ("BEE") and Borusan Danışmanlık Ortak Hizmetleri A.Ş. ("BD") (jointly referred to as "Borusan" or "BEE") acquired the Kiyikoy WPP from its previous owner, AKSA Enerji Üretim A.Ş., and became the sole owner of the Project.

BEE, through the Project Company, considers increasing the total installed capacity of the Project to 100 MWm/99 MWe as part of the Kiyikoy WPP Capacity Extension Project (the "Capacity Extension Project"). Accordingly, the Project Company plans to construct and operate an additional capacity of 72 MWm/72 MWe. The Project Company initially considered 21 turbines, but the technological advancements have allowed the Company to build and operate this additional capacity with 20 turbines, each having a capacity of 3.6 MWm. Following the construction and commissioning of the Capacity Extension Project, the Kiyikoy WPP will have a total installed capacity of 100 MWm/99 MWe to be provided by a total of 34 turbines (including the existing 14 turbines and the 20 new turbines to be built and operated as part of the Capacity Extension Project). As of September 2019, the Company is in the process of selecting the ultimate 20 turbines to be built and operated as part of the Project; as such one of the 21 turbines considered in the initial Capacity Extension Project will be eliminated before the finalisation of the Project design. As the turbine to be eliminated as part of this process has not been selected at the time of writing this report, all the 21 turbines have been considered in the identification, assessment and management of potential impacts as part of the ESIA study.

BEE is considering international and national finance for the implementation of the Project. The European Bank for Reconstruction and Development (the "EBRD" or the "Bank") as the potential lender of the Project, has assigned the Kiyikoy WPP Capacity Extension Project as Category A as it involves further expansion and development of a greenfield WPP located close to a major bird migratory route (via Pontica). As per the requirements of the EBRD, an Environmental and Social Due Diligence (ESDD) Report, a Stakeholder Engagement Plan (SEP), a Non-technical Summary (NTS) and an Environmental and Social Action Plan (ESAP) have been prepared and issued by the Bank's advisor in February 2019.

The ESAP approved by the EBRD required a set of environmental and social (E&S) actions to be taken to ensure that the Project meets the Bank's standards. GEM Sustainability Services and Consultancy Inc. ("GEM") has been retained in March 2019 to perform the studies and assessments required by the ESAP as part of a comprehensive Environmental and Social Impact Assessment (ESIA) process. The following documentation have been prepared by GEM in line with the E&S Policy and related Performance Requirements (2014) of the EBRD:

- ESIA Report
- Environmental and Social Management and Monitoring Plan (ESMMP)
- Non-Technical Summary (NTS)
- Stakeholder Engagement Plan (SEP)
- Livelihood Restoration Plan (LRP)
- Specific Environmental and Social Management and Action Plans

1.1. Background

The Energy Market Regulatory Authority (EMRA) granted an Energy Generation License ("License") to the Project on 4 April 2007 ("License Date") on behalf of the Project Company. This License (License No: EU/1149-3/823) has authorized the Company for electricity generation for 49 years ("License Duration") starting from the License Date.

The Project Description File (PDF) was prepared in line with the Environmental Impact Assessment (EIA) Regulation in force for the first phase of the Project ("existing Kiyikoy WPP Project") with an installed capacity of 28 MWm/27 MWe provided by 18 turbines (each turbine with a capacity of 1.5 MW). An "EIA not Required" Decision was secured from the Kırklareli Provincial Directorate of Environment and Urbanization (the provincial organisation of the Ministry of Environment and Urbanization – MoEU) on 8 May 2009 (Decision No: 2009/07).

Following the "EIA not Required" Decision, the site wind measurements continued leading to the optimization of the Project design. The final design completed by the Project Company based on the optimisation analyses included 14 turbines (2 MWm each) providing the same total installed capacity of 28 MWm/27 MWe. The Project Company applied to the MoEU and obtained an official letter on 2 May 2013 confirming that the "EIA not Required" Decision granted on 8 May 2009 is valid for the final design with 14 turbines (2 MWm each) as the total installed capacity of the Project has not changed.

In August 2014, the existing Kiyikoy WPP Project started commercial operation. Following this, the potential for a capacity extension was assessed by the Project Company and it was concluded that the installed capacity of the WPP can be extended up to 100 MWm/99 MWe with the construction and operation of 20¹ additional turbines (3.6 MWm each) making a total of 34 turbines.

The EIA Regulation in force required an EIA Report to be prepared for the Capacity Extension Project. The Project Company made an EIA application to the MoEU. Upon completion of the EIA process, the MoEU granted an "EIA Positive Decision" on 14 September 2017 (Decision No: 4763) to the Kiyikoy WPP Capacity Extension Project. The "EIA Positive Decision" has allowed the Company to increase the existing capacity of the Kiyikoy WPP from 28 MWm/27 MWe to 100 MWm/99 MWe.

Following the "EIA Positive Decision", the coordinates and/or codes of certain turbines have changed² as a result of the Project development and ongoing license amendment process with the EMRA. The Project Company applied to the MoEU and obtained an official letter on 25 January 2019 confirming that the "EIA Positive Decision" granted for the Capacity Extension Project on 14 September 2017 is valid for the revised coordinates of the turbines and a total capacity of 100.45 MWm/99.45 MWe³.

The key Project milestones to date are summarized in Figure 1-1. As of September 2019, the first phase of the Kiyikoy WPP is in operation with 28 MWm/27 MWe capacity (14 turbines, 2 MWm each) and the pre-construction planning and final engineering studies are ongoing for the Capacity Extension Project.

¹ The Project Company initially considered 21 turbines, but the technological advancements have allowed the Company to build and operate this additional capacity with 20 turbines, each having a capacity of 3.6 MWm.

² Coordinates specified in the final national EIA Report for the turbines T16, T17, T19, T20, T22, and T32 have slightly changed within the License Area. Codes specified in the final national EIA Report for the turbines T25, T26, T27, T28, T29, and T30 have changed (coordinates remaining the same) during the License Amendment Process being executed with EMRA.

³ The total capacity planned to be operated by the Project Company is 100MWm/99MWe.

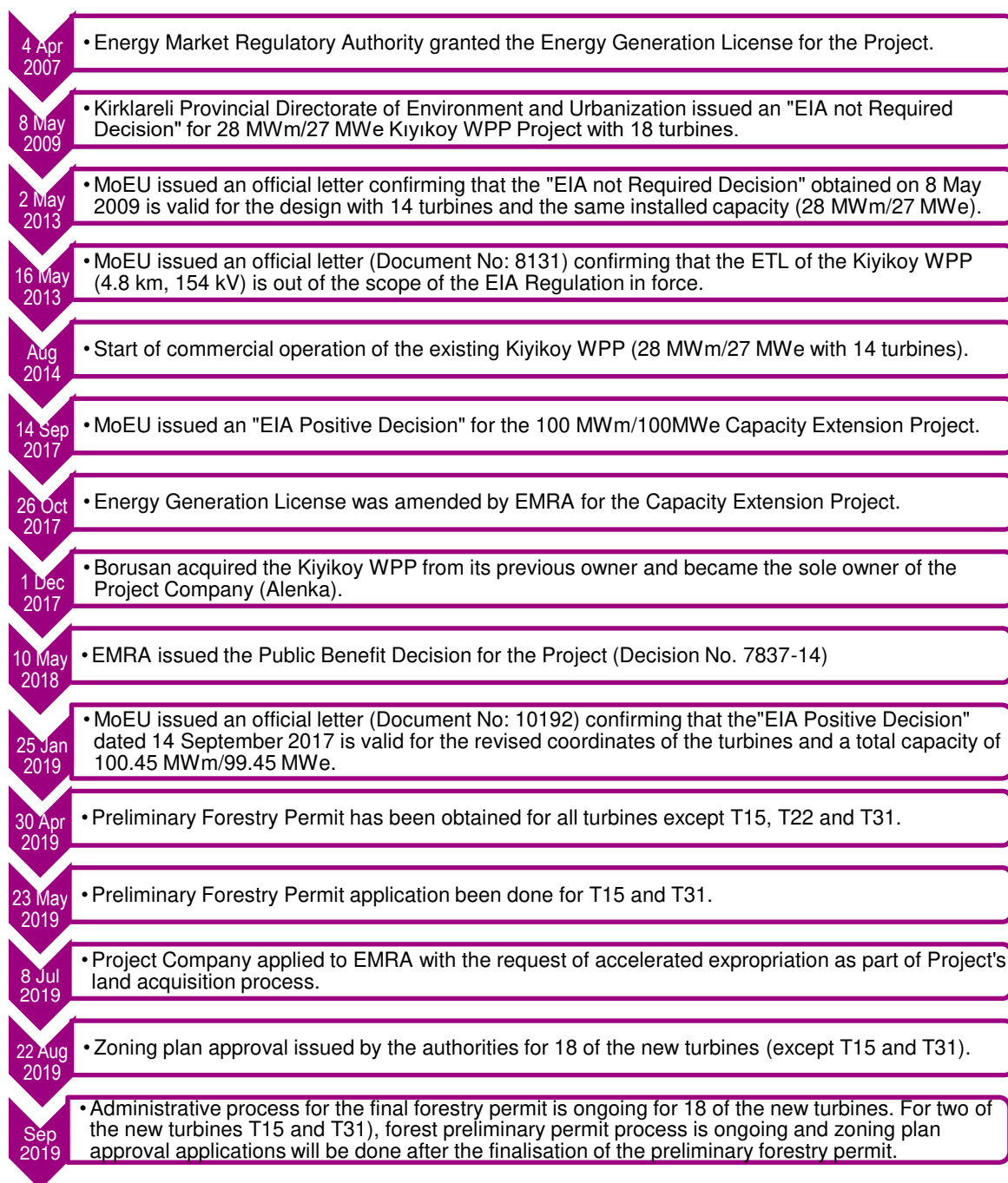


Figure 1-1. Key Milestones of the Kiyikoy WPP Project

1.2. Project Location

Kiyikoy WPP Project is located within the administrative borders of Vize district of Kırklareli province. The License Area, specified in the Energy Generation Licenses issued by the EMRA, covers 2,453.3 ha.

The License Area is located approximately 65 km (air distance) southeast of the Kırklareli city centre and 25 km northeast of the Vize district centre. The License Area, turbine locations and the surrounding settlements and roads are shown in Figure 1-2.

The closest settlement to the License Area is Kiyikoy town. The settlements located in the surroundings of the License Area (within a 10 km radius) and the distance of the settlement centres to the License Area boundary are listed in Table 1-1.

Table 1-1. Settlements Located near the License Area

| Settlement | District | Air Distance of the Settlement Centre to the License Area Border (km) | Direction of the Settlement with Respect to the License Area |
|---------------|----------|---|--|
| Kiyikoy town | Vize | 2.2 | Southeast |
| Hamidiye town | Vize | 3.6 | West |
| Aksicim town | Vize | 4.2 | Southwest |
| Kislacik town | Vize | 5.2 | West-northwest |
| Balkaya town | Vize | 8.1 | Southwest |

Access to the Project site is provided through the centre of Saray district located in Tekirdag province. From Saray district centre, the Saray-Kiyikoy road is followed for about 25 km, which diverges to the north in the direction of the existing Kiyikoy WPP. From this point, the stabilised forest road is followed for about 12 km to access the site through the existing main access road of the operational Kiyikoy WPP.

The License Area is located at the coast of Black Sea. The elevations (above sea level - asl) within the License Area range between 135 m (north-western part) and 20 m (southern part). The majority of the License Area is situated on state forest land, where there are patches of parcels registered as agricultural, pasture, raw soil.

The License Area falls within the boundaries of Istranca Mountains Key Biodiversity Area (KBA) and located on the "Via Pontica" bird migration corridor along the west coast of the Black Sea. Via Pontica is a major route for raptors in the region. This said, there are no migratory soaring birds that qualify the Istranca Mountains KBA. Detailed assessments on the biodiversity features in and around the Project License Area, including the Istranca Mountains KBA as well as KBA qualifying species, are provided in Chapter 10 "Biodiversity" of this ESIA Report.



There are few buildings/structures located within the Project License Area. The closest parcels to the turbines, on which building/structures are located, are listed in Table 1-2. The closest building/structure to the turbines is located approximately 200 m north of T15, which is situated on a registered agricultural parcel.

Table 1-2. Closest Parcels to the Turbines on which Buildings/Structures are Located

| Number of Parcel | Registry Settlement | Position with respect to License Area Boundary | Type of Parcel (as registered on the Title Deed) | Closest Turbine to the Settlement | App. Distance (Air) of Turbine Foundation to Building/Structure (m) | Direction of the Building/Structure with respect to the Turbine |
|------------------|---------------------|--|--|-----------------------------------|---|---|
| 101/205 | Kislacik | Inside | Agricultural land and masonry barn | T15 | 200 | North |
| 101/126 | Kislacik | Inside | Agricultural land | T15 | 430 | Southwest |
| 101/210 | Kislacik | Inside | Agricultural land and masonry building | T15 | 485 | Southwest |
| 101/200 | Kislacik | Inside | Agricultural land and masonry barn | T15 | 650 | Northwest |
| 101/202 | Kislacik | Outside | Agricultural land | T15 | 840 | West |
| 101/212 | Kislacik | Inside | Agricultural land | T16 | 980 | Southwest |
| 325/1 | Kiyikoy | Inside | State forest land | T30 | 1,200 | South |

The TurkStream Project is located at the southern/south-eastern boundary of the Kiyikoy WPP License Area. As of September 2019, construction works of the TurkStream Project are ongoing. The construction camp site and some of the facilities of the TurkStream Project falls within the boundaries of the Kiyikoy WPP License Area. The construction camp site of the TurkStream Project is located on the existing route of the main access road of the Kiyikoy WPP. The main access road of the Kiyikoy WPP was partly being affected by the TurkStream Project's planned facilities. Thus, the affect part was relocated by TurkStream before the start of their construction activities.

A photograph showing the existing operational turbines at the Kiyikoy WPP is provided in Figure 1-3.



Figure 1-3. Turbines Operating at the Existing Kiyikoy WPP (Looking East-Southeast)

1.3. Project Characteristics and Components

The existing Kiyikoy WPP, which is in operation since August 2014, consists of 14 turbines (each having a capacity of 2 MWm), a substation, main access road and internal site access roads. The WPP is connected to the national grid through a 4.8 km 154 kV overhead energy transmission line (ETL), which is built between the Project substation and the Kiyikoy substation (Kiyikoy TM). The ETL is being operated and maintained by the Turkish Electricity Transmission Company (TEIAS). The existing WPP generated approximately 79 GWh electrical energy in 2018.

The Capacity Extension Project involves construction and operation of 20 additional wind turbines (each having a capacity of 3.6 MWm), necessary internal site access roads and underground collector (i.e. cabling) system. Improvements will also be made at the existing switchyard and the control room as part of the Capacity Extension Project. A temporary construction camp site will be built at a convenient location at the existing substation site. The Capacity Extension Project will provide an additional installed capacity of 72 MWm/72 MWe. Once the Capacity Extension Project is commissioned, the total installed capacity of the Kiyikoy WPP will be 100 MWm/99 MWe to be provided by a total of 34 turbines. The characteristics of the existing operational Kiyikoy WPP and the Capacity Extension Project are summarised in Table 1-3. Further information on the Project components to be built and operated as part of the Capacity Extension Project is provided in the following sections.

Table 1-3. Project Characteristics

| Information | Existing Project (in operation) | Planned Capacity Extension Project |
|---------------------------------------|---|------------------------------------|
| Installed capacity | 28 MWm / 27 MWe | 72 MWm / 72 MWe |
| Number of turbines | 14 | 20 ⁴ |
| Capacity of each turbine | 2.0 MWm | 3.6 MWm |
| Turbine type | Gamesa G90 (2 turbines) Gamesa G97 (12 turbines) | Vestas V136 |
| Hub height | 78 m (2 G90 turbines) 78 m (12 G97 turbines) | 112 m |
| Rotor Diameter | 90 m (G90) 97 m (G97) | 136 m |
| Annual average electricity generation | 79 GWh (in 2018) | 200.6 GWh |
| Energy Transmission Line (ETL) | 154 kV, 4.8 m long | No new ETL is required |

1.3.1. Wind Turbines

The Project Company has designed the Capacity Extension Project based on Vestas V136 - 3.6 MWm turbines. Each wind turbine will be equipped with a rotor consisting of three blades and a hub mounted on tubular towers. The electrical equipment within the turbines will consist of generators, convertors, high voltage (HV) transformers within the nacelle, HV cables, switchgears, wind sensors, etc. Technical specifications of the turbine model to be used in the Capacity Extension Project is provided in Table 1-4. Outer dimensions of the selected turbine model (V136 3.6 MW) are illustrated in Figure 1-4.

Each turbine will be controlled and monitored by a system that allows monitoring and supervision of overall operation, power control, variable speed operation, monitoring of ambient conditions, ice detection (at the station to be established at T17) and smoke detection system. The selected turbine model has a silent operation mode to control noise emissions as required. The turbines will include sensors to protect the system against overspeed and rotating errors. The blades, nacelle, hub and the tower will have lightning protection system to protect them against physical damage that may be caused by lightning strikes.

⁴ The Project Company initially considered 21 turbines, but the technological advancements have allowed the Company to build and operate this additional capacity with 20 turbines, each having a capacity of 3.6 MWm.

The internal and external areas of the nacelle, hub and the tower will be protected against corrosion according to International Standards Organisation (ISO) 12944-2.

Table 1-4. Turbine Specifications of the Capacity Extension Project

| Data | Specification |
|--|--------------------------|
| Model | Vestas V136 |
| Capacity | 3.6 MWm |
| Swept Area | 14,527.00 m ² |
| Hub height | 112.00 m |
| Rotor diameter | 136.00 m |
| Blade length | 66.66 m |
| Cut-in (V_{in}) | 3.00 m/s |
| Cut-out (V_{out}) (10 min exponential average) | 22.50 m/s |

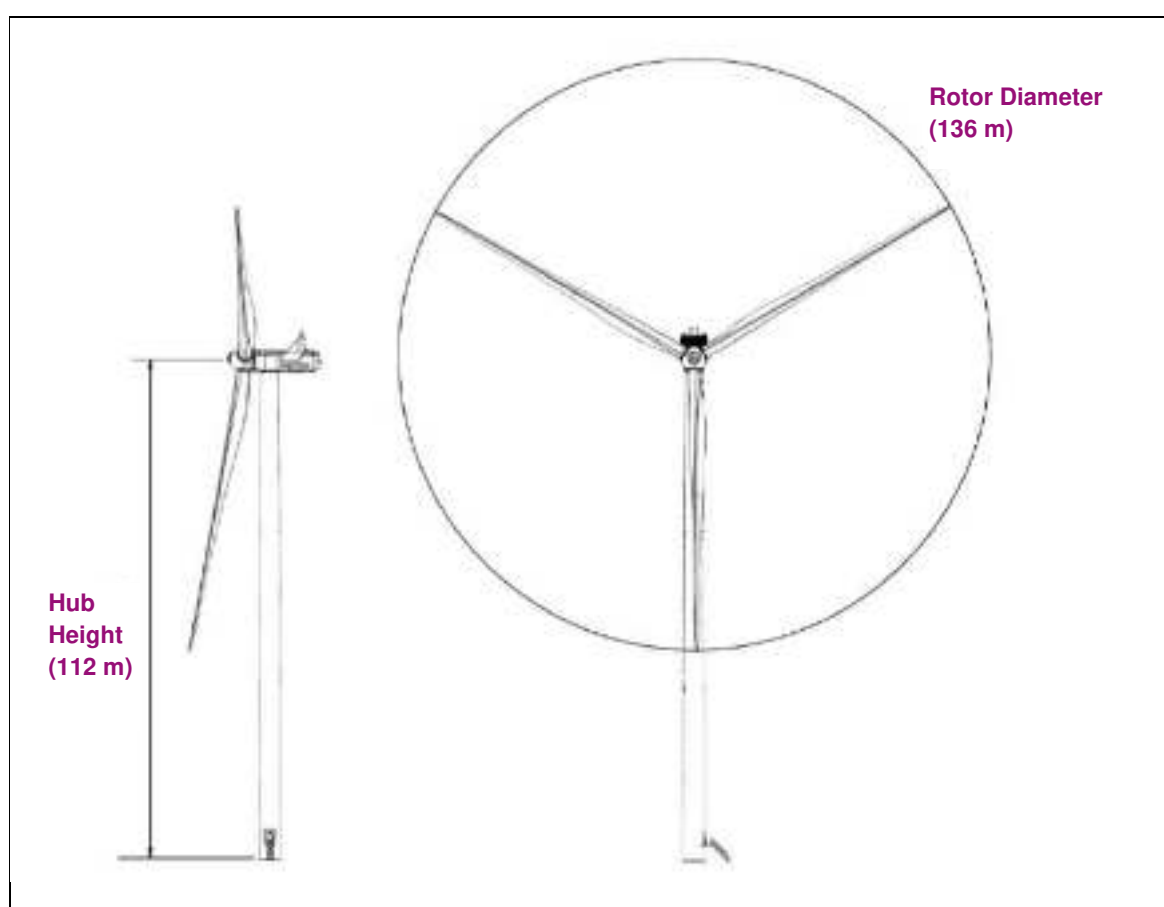


Figure 1-4. Illustration of Outer Dimensions of V136

The turbines will not be fenced as all the electrical equipment is enclosed. Access to the turbines by the operation and maintenance personnel will be provided through a door located at the entrance platform, which will be equipped with lock. Access to the top platform in the tower will be by a ladder (with a fall arrest system) or service lift.

The turbines will be equipped with light in the tower, nacelle and hub. There will be emergency light in case of the loss of electrical power. There will be emergency stop buttons in the nacelle, hub and bottom of the tower.

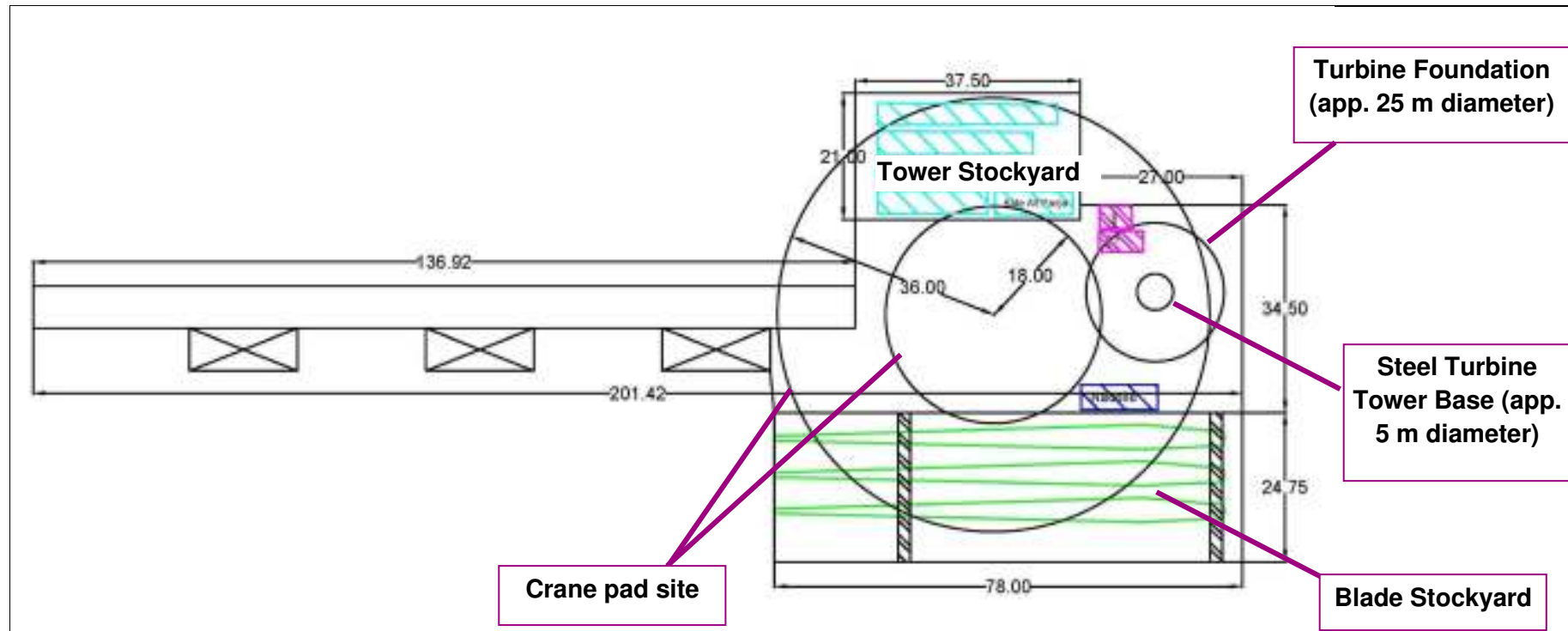


Figure 1-5. Platform Design (units in meters)

Coordinates of the turbines and the elevations at the foundation locations are listed in Table 1-5. The layout of the turbines within the License Area is shown in Figure 1-6.

Table 1-5. Turbine Locations and Elevations at the Foundation Locations

| Turbine | Elevation (asl) at the Foundation (m) | Coordinates (WGS 84) | | Coordinates (UTM ED50 6 degrees) | |
|---------|---|-------------------------|-----------|-------------------------------------|---------|
| | | Y | X | Y | X |
| T15 | 145 | 28.022167 | 41.689926 | 585112 | 4616036 |
| T16 | 137 | 28.025896 | 41.687155 | 585426 | 4615732 |
| T17 | 128 | 28.030506 | 41.685421 | 585812 | 4615544 |
| T18 | 96 | 28.048418 | 41.684475 | 587304 | 4615457 |
| T19 | 94 | 28.056641 | 41.687714 | 587984 | 4615825 |
| T20 | 93 | 28.061774 | 41.690729 | 588407 | 4616165 |
| T21 | 77 | 28.066078 | 41.688672 | 588768 | 4615941 |
| T22 | 73 | 28.071385 | 41.687001 | 589212 | 4615761 |
| T23 | 66 | 28.078271 | 41.687054 | 589785 | 4615774 |
| T24 | 66 | 28.082347 | 41.684377 | 590128 | 4615481 |
| T25 | 11 | 28.057264 | 41.679485 | 588047 | 4614912 |
| T26 | 119 | 28.067499 | 41.680904 | 588897 | 4615080 |
| T27 | 121 | 28.071779 | 41.679612 | 589255 | 4614941 |
| T28 | 107 | 28.076030 | 41.678041 | 589611 | 4614771 |
| T29 | 98 | 28.080178 | 41.676075 | 589959 | 4614557 |
| T30 | 117 | 28.034252 | 41.671750 | 586142 | 4614030 |
| T31 | 87 | 28.056224 | 41.657058 | 587991 | 4612421 |
| T32 | 103 | 28.059779 | 41.665096 | 588276 | 4613317 |
| T33 | 87 | 28.065031 | 41.664534 | 588714 | 4613260 |
| T34 | 76 | 28.088792 | 41.666815 | 590689 | 4613538 |
| T35 | 34 | 28.093595 | 41.666743 | 591089 | 4613535 |

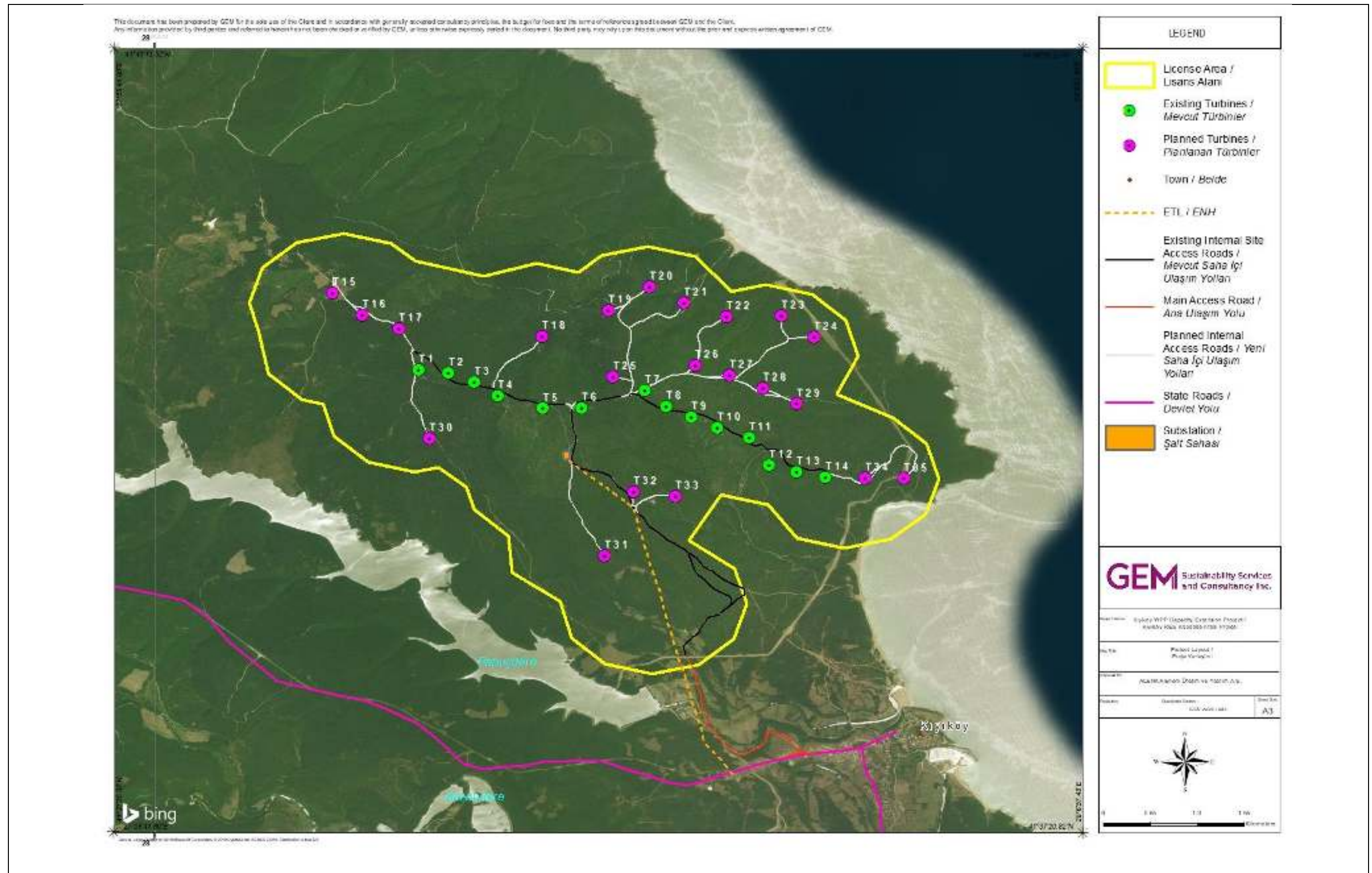


Figure 1-6. Project Layout

1.3.2. Access Roads

The Capacity Extension Project will use the existing main access road of the Kiyikoy WPP. The existing access road is stabilised and has a width of minimum 6 meters. According to the transport surveys, road widening will be required at one location along the main access road.

The existing Kiyikoy WPP has internal site access roads ensuring access between turbine locations and the substation site. Additional internal site access roads will be built within the License Area based on the locations of the new turbines. The existing internal site access roads have a total length of approximately 7.7 km. The total length of the new roads to be built as part of the Capacity Extension Project is 11.2 km. The route of the new roads will follow the existing forest roads to the extent possible. As such, a major part of the new roads to be built (approximately 90%) is anticipated to consist of existing forests roads to be improved and approximately 2 kilometres of these roads consists of existing forests roads that require only minor improvement works.

The effective width of the internal site access roads will be 6 m (which increases to 7.7 m when the drainage and cable channels are included). Typical cross-section of the internal site access roads, including the pavement structure, is provided in Figure 1-7. The Project Company is currently conducting soil investigation studies and also searching licensed sources for the supply of material (e.g. plants in Pinarhisar town in Kırklareli) for the plant mix layer. The subbase material will be supplied from the rocky soils to be excavated at the construction sites. Under the subbase, there will be foundation layer that will be constructed by using the soils blended with rocky materials to be excavated at the construction sites.

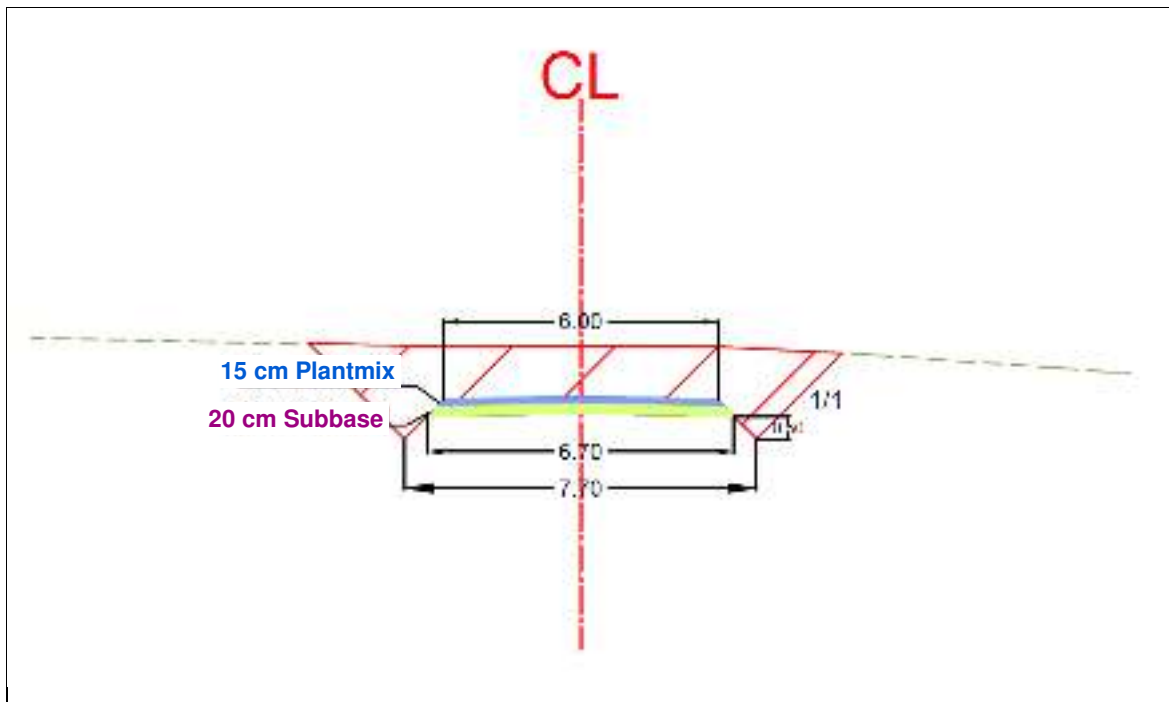


Figure 1-7. Pavement Structure of the Internal Site Access Roads

The underground cables to be used for transmission of energy to be generated by the turbines will be placed in the trenches to be excavated in parallel to the internal site access roads (under the drainage channels or the road).

1.3.3. Substation

The existing substation (see Figure 1-8) at the Kiyikoy WPP adjusts the voltage level of the energy generated at the WPP and provides connection of the WPP to the national grid by using an existing 154 kV overhead ETL. The Capacity Extension Project will utilise the same substation after completion of necessary improvements.



Figure 1-8. Existing Substation

The existing substation site includes administrative offices, a temporary waste storage area, a water tank building, a non-leaking septic tank and a parking area. The Project Company will be responsible from the operation and maintenance of the substation during the operation period.

There is a control centre at the administrative building (see Figure 1-9). Existing control building is required to be improved to accommodate the ancillary equipment and a new 34,5 kV switchgear necessary for capacity extension. To this end, the existing building will be refurbished through necessary concrete and building works to contain auxiliary transformer and diesel generator set, which are currently located outdoors, next to the existing control building. The control building will provide kitchen facilities, a meeting room, offices and operator rooms. The SCADA system at the control centre will also be improved to serve the Kiyikoy WPP after the commissioning of the Capacity Extension Project.



Figure 1-9. Control Room at the Existing Kiyikoy WPP

1.3.4. Underground Cable Network

The collector system serving the existing Kiyikoy WPP consists of 110 km cable network. As part of the Capacity Extension Project, approximately 35 km 34,5 kV medium voltage collector system will be built to transmit the energy generated by the turbines to the Project substation. Five different cable trench types will be used. Cable trenches will be excavated in parallel to the internal site access roads. In addition to the 34,5 kV cables, these trenches will also accommodate fibre optic cables to be used in the scope of Project communication purposes and an earthing line.

Dimensions of the cable trench types are summarised in Table 1-6. Drawings showing the typical cross sections of the cable trench types are presented in Figure 1-10. Special designs will be implemented at the road crossings. The cables will be normally buried in 80 cm deep trenches, while the depth of the trenches will be 100 cm at road crossing locations. The total length of the cable trenches will sum up to approximately 21 km.

Table 1-6. Cable Trench Types

| Cable Trench | Trench Dimensions | |
|-------------------|-------------------|------------|
| | Depth (cm) | Width (cm) |
| Single Circuit | 80 | 36 |
| Double Circuit | 80 | 57 |
| Triple Circuit | 80 | 76 |
| Quadruple Circuit | 80 | 94 |
| Quintuple Circuit | 80 | 114 |

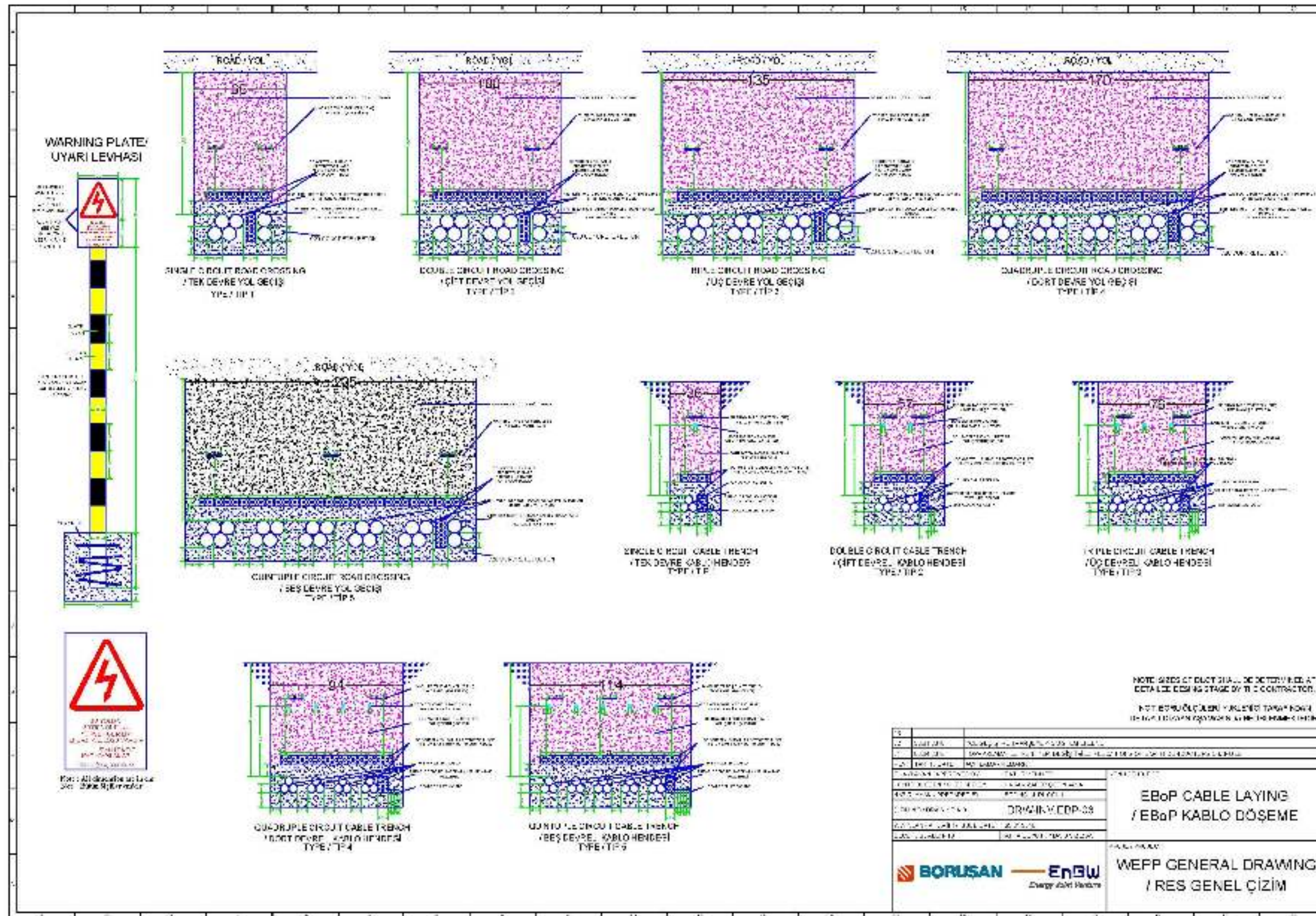


Figure 1-10. Typical Cross-sections of the Cable Trench Types

1.3.5. Temporary Construction Facilities

1.3.5.1. Construction Camp Site

A camp site will be established by the contractors at the existing substation site. At the camp site, administrative offices, wastewater management facilities (e.g. package domestic wastewater treatment unit), waste storage areas, material storage areas, etc. will be provided for the construction personnel. The offices at the camps site will be converted to and used as storage buildings upon the completion of the construction activities as part of the Capacity Extension Project.

There will be no on-site accommodation during the construction and operation phases of the Project. Local people will be prioritised during the construction period. Construction personnel will be transported to the Project site by service buses.

1.3.5.2. Topsoil Storage Areas

Topsoil to be stripped from the footprint of the Project facilities (e.g. turbine foundations, new access roads) will be temporarily stored at designated topsoil storage areas, which would be close to the turbine platforms until being reused for landscaping and reinstatement activities. Locations of these areas within the License Area will further be identified by the Project Company following the completion of vegetation clearance. Locations with low slopes (less than 5%) and sparse vegetation will be prioritised where possible.

1.4. Project Activities

The Project will include land preparation, construction, operation and closure phases. Platforms will be established at the turbine foundation locations to enable erection and assembly of turbine components during the construction phase. Each platform will have a total area of approximately 6,400 m² (including the crane booms). Turbine tower stockyard, blade stockyard, crane pad area, etc. will be located on the platform area. Turbine foundations will have a footprint diameter of approximately 25 meters. Steel turbine tower bases (having a diameter of around 5 meters) will be erected at the centre of the foundations. Depth of the foundations is estimated to be around 3.5 meters, while the final depths will be determined after the finalisation of design and engineering studies. Final design will be based on the results of geotechnical surveys to be conducted prior to construction phase. The main activities to be conducted in each Project phase are summarised in Table 1-7.

Table 1-7. Main Project Activities per Project Phase

| Project Phase | Main Activities | Planned Duration of Activities |
|-----------------------------------|--|--------------------------------|
| Land preparation and Construction | Designation of the construction site boundaries Site mobilisation Vegetation clearance, tree logging (where necessary) and top soil stripping and storage Construction of service and access roads including excavation and fill activities Construction of cable trenches and cable laying Transportation and lifting of heavy and oversize equipment Construction of platforms and conducting soil compression tests Construction of turbine foundations including concrete and steel works Erection of turbines Electrical works Commissioning and energizing Demobilisation Rehabilitation of temporary construction sites | 11 months |

| Project Phase | Main Activities | Planned Duration of Activities |
|---------------|---|---|
| Operation | Energy generation by operation of turbines Preventive (routine) and corrective maintenance of the turbines, substation components, access roads, etc. Monitoring of the operations for metering, alarms, etc. | Design lifetime of the wind turbines is at least 20 years As the License Duration is 49 years starting from the License Date, the Project Company would seek to extend the lifetime of the Project components with proper maintenance to be done as per the state of the art technologies. |
| Closure | Dismantling of the Project units Rehabilitation of the footprints of the operational Project units (e.g. turbine foundations, access roads, substation site, etc.) in consultation with the governmental authorities and local communities | To be determined |

1.5. Material Requirements

1.5.1. Construction Phase

Amount of the materials estimated to be required for the construction activities is provided in Table 1-8. The Project Company plans to use the excavated materials as fill material (subbase and foundation) in the construction of internal site access (as the foundation material under the subbase) roads, turbine foundations, etc.

Concrete will be supplied from local licensed concrete plants. Hazardous materials such as oil, paint, solvents, cleaning agents, etc. will also be required in limited amounts in the scope of the construction activities. Diesel fuel will be used by the construction machinery and equipment. No explosives will be used as there will be no blasting activity required for the Project.

Table 1-8. Material Requirement for the Construction Activities

| Material | Estimated Amount | Source of Material |
|--|-------------------------------|--|
| Fill/cover material | 81,000 m ³ | Site excavation works |
| Concrete | 15,000 m ³ | Licensed concrete plants in the region (e.g. alternative plants in Pınarhisar town and Evrencik village of Kırklareli and in Saray district of Tekirdağ) |
| Steel | 1,500,000 kg | From a reputable local manufacturer in the region |
| Diesel fuel for construction machinery and equipment | 5 litres per vehicle per hour | Local fuel stations |

1.5.2. Operation Phase

The first phase of the Kiyikoy WPP (14 turbines) is in operation since August 2014. The main substances being used in the current plant operations and maintenance include mineral oil, hydraulic oil, lubricating grease, degreasing agents, acrylic paints, liquid nitrogen, anti-freeze agents, inhibitor agents, ink.

As per V136 turbine specifications, the following chemicals, which are evaluated according to the Vestas Wind Systems A/S Environmental System certified according to ISO 14001:2015, will be used in the turbine during operation phase as necessary:

- Anti-freeze to help prevent the cooling system from freezing.
- Gear oil for lubricating the gearbox.
- Hydraulic oil to pitch the blades and operate the brake.
- Grease to lubricate bearings.
- Various cleaning agents and chemicals for maintenance of the turbine.

1.6. Project Machinery and Equipment

Construction machinery and equipment planned to be used in the land preparation and construction activities are listed in Table 1-9.

Table 1-9. Construction Phase Machinery and Equipment

| Type of Machinery/Equipment | Maximum Number of Machinery/ Equipment Planned to be Used |
|--|---|
| Dump truck | 14 |
| Excavator (minimum 21 ton, equipped with crushing utilities) | 10 |
| Vibratory earth roller (self-propelled, minimum 16 ton vibrating capacity) | 3 |
| Grader (Cat 140 G or equivalent) | 2 |
| Water truck (with sprinkler) | 2 |
| Track loader | 2 |
| Backhoe loader (JCB or equivalent) | 2 |
| Vibrating gauge (mastar) | 2 |
| Hot air blower (concrete cure) | 2 |
| Manuel compactor | 2 |
| Portable generator | 2 |
| Dozer (ripper) | 1 |
| Compressor | 1 |
| Tractor (trailed) | 1 |
| Lighting pylon | 1 |
| Iron cutting bending machine | 1 set |
| Water pump and accessories | 2 set |

1.7. Workforce Requirements

The current operations team of the existing Kiyikoy WPP consists of 16 personnel in total, including staff from Borusan Headquarters (HQs), Project Company (Alenka) and the contractors for private security and services (see Table 1-10). All the Project staff are male and 12 of them permanently works at the site operations (one of the senior technicians temporarily works at the site). All the contractor personnel and 2 of the operation technicians working at the Project Company are from the local (in total 8 local personnel are from Kiyikoy town). The current operations are conducted in three shifts.

Table 1-10. Operations Team of the Existing Kiyikoy WPP

| Company | Position | Work Location | Number of Personnel |
|---------------------------------------|---|---------------|---------------------|
| Borusan | Assistant General Manager | HQs | 1 |
| | Operation Manager | HQs | 1 |
| | Unit Manager | HQs | 1 |
| | Operation Senior Technician (temporary) | HQs/Site | 1 |
| Project Company (Alenka) | Operation Technician | Site | 5 |
| Contractor (Services) | Service officer | Site | 1 |
| Contractor (Private Security Company) | Private security officer | Site | 6 |
| Total | | | 16 |

Construction activities will be conducted in one shift, which includes eight hours (08:00-18:00, with two hours break in total). In case of technical requirements, additional shifts could be planned for certain tasks such as turbine erection that may need suitable wind speeds.

It is anticipated that there will be 100 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 maximise use of local workforce, especially by utilising the experienced and qualified workforce available in Kiyikoy. As stated in Section 1.3.5.1, there will be no on-site accommodation during the construction and operation phases of the Project. Local people will be prioritised during the construction period. All the workers to be contracted for Capacity Extension Project construction will be provided with environmental and social trainings, which will include induction and job-specific trainings, as part of the Project ESMS (see "Chapter 18"). Further discussion of potential social impacts of the Project is provided in Chapter 12 ("Socio-economy").

The contracts to be executed with the contractors will be Project-based covering the duration of the limited construction period for specifically defined construction tasks. The contractors will be required to inform the contracted workers about the temporary nature of the construction works at the time of hiring and terminate the contracts upon completion of construction works in line with the requirements of the relevant national legislation as well as EBRD PR2.

The existing operation teams will continue operating the Kiyikoy WPP after the Capacity Extension Project is commissioned by strengthening the capacity of the Environmental and Social Management System (ESMS) as specified in Chapter 18 ("Environmental and Social Management System").

1.8. Project Schedule

The schedule of the Capacity Extension Project is presented Figure 1-11. As of September 2019, pre-construction planning and final design and engineering studies as well as national permitting process are ongoing for the Project. According to the current schedule, the construction phase is planned to be started in Q4 2019. The Capacity Extension Project is planned to be taken into operation in Q4 2020. Current schedule of the Capacity Extension Project is provided in Figure 1-11.

| No. | Key Activities in Each Project Phase | Year 1 | | | | Year 2 | | | |
|----------|--|--------|----|----|----|--------|----|----|----|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| 1 | Pre-construction Phase | | | | | | | | |
| 1.1 | Soil Investigation Studies | | | | | | | | |
| 1.2 | Civil Balance of Plant (Foundation Design) | | | | | | | | |
| 1.3 | Delivery of WPP Equipment (Turbine Towers, Nacelles, Hubs, Blades) to the Site | | | | | | | | |
| 2 | Construction Phase | | | | | | | | |
| 2.1 | Construction of Access Roads (Excavation, Subbase and Final Base) | | | | | | | | |
| 2.2 | Construction of Service Roads | | | | | | | | |
| 2.3 | Construction of Turbine Foundations | | | | | | | | |
| 2.4 | Electrical Works at the Existing and New Control Building and the Switchyard | | | | | | | | |
| 2.5 | Electrical Test and Commissioning at the Control Building and Switchyard | | | | | | | | |
| 2.6 | Collector System Construction and Cabling Works | | | | | | | | |
| 2.7 | Installation of Turbine Towers, Nacelles, Hubs and Blades and Other Systems | | | | | | | | |
| 3 | Testing and Commissioning | | | | | | | | |
| 3.1 | WPP Trial Tests and Ministry Acceptance | | | | | | | | |
| 3.2 | Full Commercial Operation | | | | | | | | |
| 3.3 | Completion of Punch List Items and Submission of As-Built Documentation | | | | | | | | |

Figure 1-11. Current Schedule of the Capacity Extension Project

1.9. Permits, Licenses and Approvals Under National Legislation

For the implementation of the Capacity Extension Project, the Company is to secure the permits, licenses and approvals listed in Table 1-11.

Table 1-11. Status of Permits, Licenses and Approvals

| Permit, License, Approval | Related Authority | Status/Remarks |
|---|--|---|
| Construction Phase | | |
| Energy Generation License | Energy Market Regulation Authority | Obtained on 4 April 2007. The License covers 49 years of energy generation. The License will be updated in case of any change in the number of turbines |
| EIA Positive Certificate for the Capacity Extension Project | Ministry of Environment and Urbanization | Obtained on 14 September 2017; Confirmation of validity of the existing EIA Positive Certificate for the current layout has been obtained on 25 January 2019. |
| ETL Connection Agreement | Turkish Electricity Transmission Company (TEIAS) | Signed with TEIAS on 20 October 2017 for the existing 27 MWe capacity. The Project Company verified TEIAS's confirmation of validity of the existing connection agreement for the Capacity Extension Project. |
| Forestry Permit | Ministry of Agriculture and Forestry | The Project has obtained the Preliminary Forestry Permit from the Ministry of Agriculture and Forestry, General Directorate of Forestry in April 2019 for 18 of the new turbines (except T15 and T31) and made application for T15 and T31 ⁵ . The process for the Final Forestry Permit will be completed prior to start of construction as per the requirements of the Forestry Law. |
| Preliminary and Final Design Approval | Ministry of Energy and Natural Resources | To be obtained prior to start of construction |
| Building Permit | Municipality of Kırklareli | To be obtained prior to start of construction |
| Industrial Waste Management Plan Approval | Provincial Directorate of Environment and Urbanization | Obtained on 4 April 2018 for the existing Kiyikoy WPP |
| Waste Disposal Agreements | Municipality/Licensed Disposal Firms | The Company has in place agreement with the Kiyikoy Municipality for the disposal of municipal solid wastes (dated 22 February 2018) and with licensed recycling/recovery/disposal companies for the disposal of other non-hazardous and hazardous wastes generated at the existing WPP |
| Wastewater Collection Agreement | Municipality | The Company has in place agreement with the Kiyikoy Municipality |
| Zoning Plan Approval | Ministry of Environment and Urbanization | The Project Company has completed zoning plan approval process for 18 of the new turbines (except T15, T22 and T31) (as of 22 August 2019). Zoning plan approval process for the two of the new turbines (T15 and T31) is ongoing and will be completed prior to start of construction |
| Operation Phase | | |
| Preliminary Acceptance/Final Acceptance | Ministry of Energy and Natural Resources | To be applied to the Ministry following the completion of testing and commissioning work |
| Workplace Opening and Operating Permit | Municipality/Governorate | To be obtained prior to operation phase, if required for the new control building |

⁵ The Project Company initially considered 21 turbines, but the technological advancements have allowed the Company to build and operate this additional capacity with 20 turbines, each having a capacity of 3.6 MWm. Thus, the permitting process has been executed for 20 turbines.

2. INSTITUTIONAL AND LEGAL FRAMEWORK

This Chapter describes the institutional and legal framework applicable to the Kiyikoy WPP Capacity Extension Project. This includes the national environmental, cultural and health and safety legislation, E&S Policy and related Performance Requirements (2014) of the EBRD, , key European Union (EU) legislation, as well as the relevant international agreements, conventions and protocols to which Turkey is a party.

2.1. Institutional Framework

Administrative structure in Turkey consists of central and local administrations. The country is divided into provinces and the provinces are divided into further smaller divisions namely, districts, municipalities, towns, villages/neighbourhoods. This division is mainly based on geographic and economic conditions and need of public services. Each province, municipality, village/neighbourhood are administered by the local units of the government. Hence, at the local level, municipality mayors and headmen of neighbourhoods/villages (mukhtar) are the representatives of the administrative structure.

Ministries, headquartered in Ankara, serve as the core bodies of the central administration. Local branches of the ministries include provincial organisations connected to governors and district organisations connected to district governors. The institutional structure applicable to the Project is presented in Figure 2-1.

The key central administration for the Project is the Ministry of Energy and Natural Resources (MoENR). The Energy Market Regulatory Authority (EMRA), which is amongst the related institutions of the MoENR, issues the Electricity Generation License for power plant projects, including the Kiyikoy WPP.

The Ministry of Environment and Urbanization (MoEU) is the key organisation responsible from the development and implementation of policies and procedures for the protection and conservation of the environment and for sustainable development and management of natural resources.

The MoEU, with its thirteen different general directorates, has a coordinating role in the development and implementation of environmental policies in Turkey including harmonisation of the EU environmental acquis in the scope of the EU accession period.

The following general directorates of the MoEU would particularly be relevant to the Kiyiköy WPP Capacity Extension Project:

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

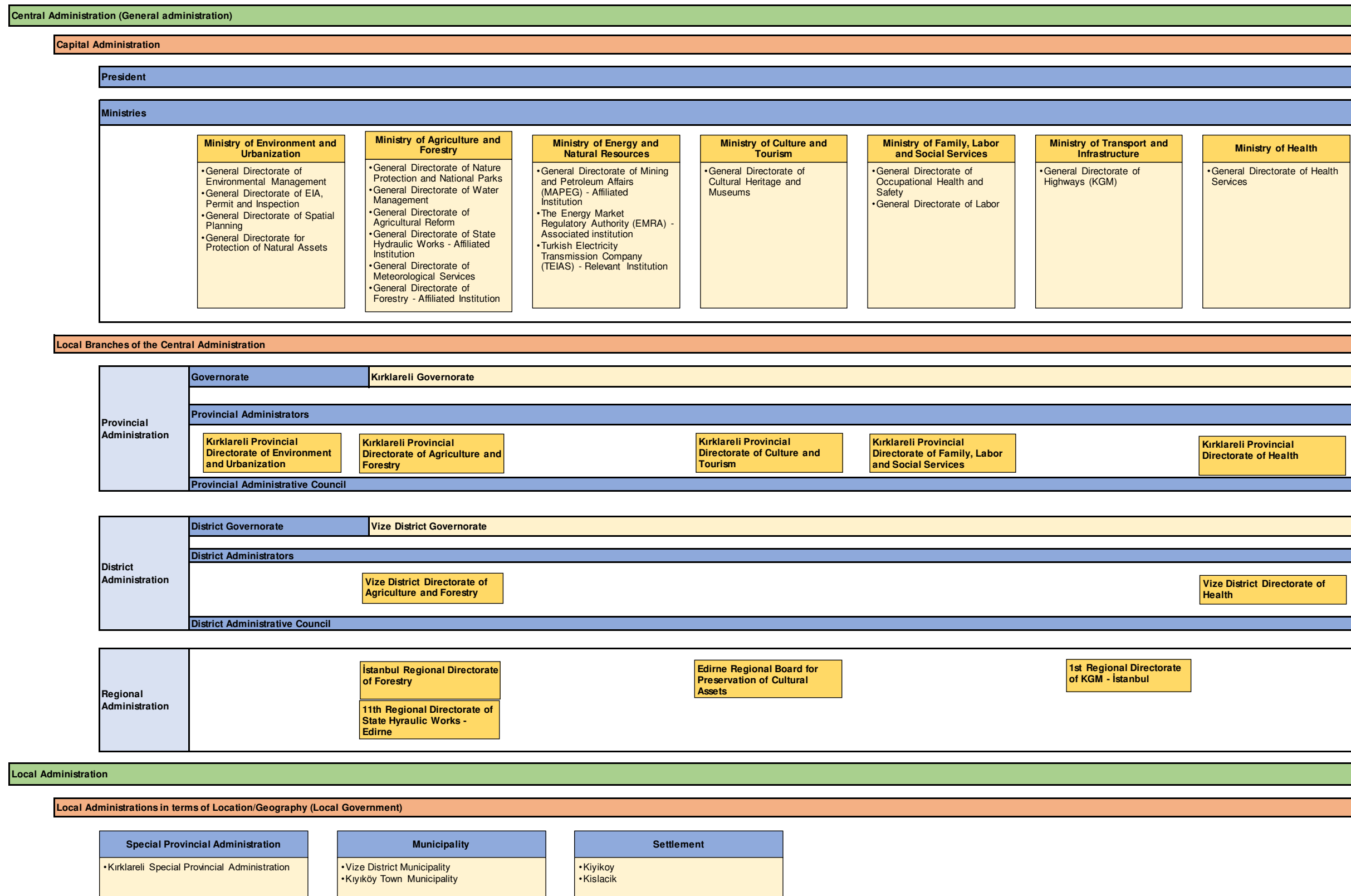


Figure 2-1. Institutional Framework with relevance to the Project

Source: State Organization Central Registration System (KAYSIS) Website, <https://www.kaysis.gov.tr/>; Kirklareli Governorate Website, <http://www.kirklareli.gov.tr/>; Vize District Governorate Website <http://www.vize.gov.tr/>

Other ministries, with which the MoEU, the MoENR and the Project Company would collaborate for the management of environmental and social aspects (management of environmental and social performance of the Project, auditing, permitting, etc.) of the Project includes the following:

- Ministry of Agriculture and Forestry
 - General Directorate of Agricultural Reform
 - General Directorate of Forestry
 - General Directorate of Meteorological Services
 - General Directorate of Nature Protection and National Parks
 - General Directorate of State Hydraulic Works
 - General Directorate of Water Management
- Ministry of Culture and Tourism
 - General Directorate of Cultural Heritage and Museums
- Ministry of Family, Labour and Social Services
 - General Directorate of Labour
 - General Directorate of Occupational Health and Safety
- Ministry of Health
 - General Directorate of Health Services
- Ministry of Transport and Infrastructure
 - General Directorate of Highways (KGM)

The License Area falls within the jurisdiction of Kırklareli Governorate and District Governorate of Kırklareli. The Kırklareli Municipality, the district municipality of Vize and the town municipality of Kiyıkoy are the local administrations.

2.2. National Legislation

This section of the ESIA Report summarises the national legislation applicable to the Project.

The Turkish Environmental Law (No. 2872) first came into force after being published in the Official Gazette No. 18132 dated August 11, 1983. The Environmental Law sets out the main principles for the environmental protection in line with sustainability principles and relevant institutional responsibilities. Under its broad scope, it also provides the legislative framework for regulation of industries/facilities and their liabilities regarding the assessment and management of their potential impacts on the environment including permitting and information/declaration requirements. Several amendments have been done in the Environmental Law since 1983.

Specific environmental regulations have been developed under the Environmental Law to set out the procedures and principles for management of particular environmental aspects. As part of the EU accession process, fundamental reforms, have been done in the environment chapter in the last decade to ensure harmonisation and alignment with the EU acquis. Such reforms have covered the transposition of environmental legislation, enforcement and reorganisation of institutional structure.

Complementary to the Environmental Law and its associated regulations, the following laws regulating the aspects related to the protection of environment and rights and safety of people would be applicable to the Kiyikoy WPP Capacity Extension Project:

- Expropriation Law (No. 2942)
- Forestry Law (No. 6831)
- Groundwater Law (No. 167)
- Highways Traffic Law (No. 2918)
- Labour Law (No. 4857)
- Law on National Parks (No. 2873)
- Law on Utilisation of Renewable Energy Resources for Electricity Generation (Law No: 5346)
- Law on Preservation of Cultural and Natural Assets (No. 2863)
- Law on Soil Conservation and Land Use (No. 5403)
- Law on Terrestrial Hunting (Law No. 4915)
- Municipality Law (No. 5393)
- Occupational Health and Safety Law (No. 6331)
- Public Health Law (No. 1593)

The regulations published to regulate licensing, generation and distribution in Turkey include, but are not limited to, the following:

- Electricity Market Connection and System Use Regulation
- Electricity Market Distribution Regulation
- Electricity Market License Regulation
- Regulation on Competitions Regarding Preliminary License Applications Made for Installation of Energy Generation Facilities Based on Wind and Solar Power

Under the relevant laws, regulations, communiques, by-laws, etc. have been published and put in force to provide specific provisions for environmental and social management. Those that pertain to wind energy developments include, but are not limited to, the following:

Air Quality and Greenhouse Gas Emissions

- Regulation on Reduction of Sulphur Rates in Certain Types of Fuels
- Regulation on Assessment and Management of Air Quality
- Regulation of Control of Air Pollution Originated from Heating
- Regulation on Control of Industrial Air Pollution
- Regulation on Control of Exhaust Gas Emissions

- Regulation on Monitoring of Greenhouse Gas Emissions
- Regulation on Fluorinated Greenhouse Gases
- Regulation on Ozone Depleting Substances

Biodiversity and Nature Protection

- Implementation Regulation for the Convention on International Trade in Endangered Species of Wild Fauna and Flora
- Regulation Concerning the Wild Life Protection and Wild Life Development Areas
- Regulation on the Conservation of Wetlands

Chemicals

- Regulation on Classification, Labelling and Package of the Materials and Mixtures
- Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals
- Regulation on Material Data Sheets regarding Dangerous Materials and Mixtures
- Regulation on Persistent Organic Pollutants

Environmental Permits and Licenses

- Environmental Impact Assessment (EIA) Regulation
- Regulation on Environmental Permits and Licenses
- Regulation on Environmental Audit
- Regulation Concerning Environmental Management Services
- Communique on Certificate of Competency
- Regulation for Starting Up and Opening a Workplace
- Regulation on the Implementation of the Law Concerning Private Security Services

Health and Safety and Labour

- Regulation on Emergency Situations in Workplaces
- Regulation on Health and Safety at Construction Works
- Regulation on Health and Safety Conditions Regarding Use of Work Equipment
- Regulation on Health and Safety Precautions Regarding Working with Chemicals
- Regulation on Health and Safety Regarding Temporary and Time Limited Works
- Regulation on Health and Safety Signs
- Regulation on Management of Dust
- Regulation on Material Safety Data Sheets on Hazardous Materials and Mixtures

- Regulation on Occupational Health and Safety
- Regulation on Personal Protective Equipment
- Regulation on Use of Personal Protective Equipment in Workplaces
- Regulation on Protection of Workers from Risks Created by Noise
- Regulation on Risk Assessment for Occupational Health and Safety
- Regulation on Subcontractors
- Regulation on Suspension of Work in Workplaces
- Regulation on Vocational Training of the Employees Working in Dangerous and Highly Dangerous Workplaces

Land Use and Soils

- Implementation Regulation of 16th Article of the Forestry Law
- Implementation Regulation of 17/3rd and 18th Articles of the Forestry Law
- Regulation on Protection, Use and Planning of Agricultural Lands
- Regulation on the Control of Soil Pollution and Lands Contaminated by Point Sources

Noise

- Regulation on Assessment and Management of Environmental Noise
- Regulation Related to Noise Emissions by Equipment for Outdoor Use

Waste

- Regulation on Waste Management
- Regulation on Control of Packaging Wastes
- Regulation on the Control of Medical Wastes
- Regulation on the Control of Waste Oils
- Regulation on the Control of Waste Batteries and Accumulators
- Regulation on the Control of Waste Tires
- Regulation on the Control of Waste Vegetable Oils
- Regulation on the Control of Excavation Soil, Construction and Demolition Waste
- Regulation on the Landfill of Wastes
- Communiqué on Transportation of Wastes by Highway
- Regulation on the Control of Waste Electrical and Electronic Equipment
- Communiqué on Recovery of Some Non-Hazardous Wastes

- Regulation on the Control of End-of-Life Vehicles
- Regulation on the Control of Polychlorinated Biphenyls (PCBs) and Polychlorinated Terphenyls (PCTs)

Water

- Regulation on Control of Pollution Caused by Hazardous Substances in the Aquatic Environment and Its Surroundings
- Regulation on Monitoring of Surface Water and Groundwater
- Regulation on Protection of Groundwater against Pollution and Deterioration
- Regulation on Pit Opening Where Sewer System Construction is not Applicable
- Regulation on Quality and Treatment of Surface Waters Used to Obtain Drinking Water
- Regulation on Water Intended for Human Consumption
- Water Pollution Control Regulation

Structural Safety

- Regulation on Building Constructions in Earthquake Zones
- Regulation on Structures in Natural Hazard Areas

Traffic

- Regulation on Highways Traffic
- Regulation on the Transportation of Hazardous Substances by Road

2.2.1. Environmental Impact Assessment

The Article 10 of the Environmental Law sets forth the legal basis for the EIA procedure in Turkey. According to this article, the institutions, organizations and facilities that can lead to environmental impacts as a result of their planned activities are obliged to prepare an EIA Report or a Project Description File. Gaining its legal stand from the Environmental Law, the EIA Regulation was put into force for the first time after being published in the Official Gazette numbered 21489 and dated February 7, 1993. Since this date, several amendments were made on the original EIA Regulation and new EIA regulations were published in 2008 and 2013, repealing their predecessors. The latest and currently in force EIA Regulation was published in the Official Gazette dated 25 November 2014, numbered 29186. Amendments were made on certain articles of the current EIA Regulation as summarised in Table 2-1.

The EIA Regulation, based on the type of activity and/or capacity, categorises investments as:

- Annex-1: projects subject to full-scale EIA process that shall prepare an EIA Report; and
- Annex-2: projects subject to screening-elimination criteria that shall prepare a PDF.

If the planned investment is defined as an activity under Annex-1 of the EIA Regulation, a full EIA Report is required. If the planned investment is defined as an activity under Annex-2 of the EIA Regulation, initially a Project Description File (PDF) is prepared in accordance with a limited format specified in the Annex-4 of the EIA Regulation and the MoEU evaluates the need for a full EIA process for the project. The full EIA process under the national legislation is presented in Figure 2-2.

Table 2-1. Amendments Made in the Current EIA Regulation

| Official Gazette Date | Official Gazette Number | Relevant Article Subject to Amendment | Subject of Amendment |
|-----------------------|-------------------------|---------------------------------------|--|
| 9 February 2016 | 29619 | Article 4 | Definition of the announcements made and notices put in the affected settlements |
| | | Article 18 | Monitoring and Control of the Investment Suspension of activities that are not compliant with the Regulation |
| | | Article 24 | Extraordinary conditions and special provisions |
| | | Article 27/A | Capacity extensions |
| | | Article 27/B | Notification and information liabilities |
| 26 May 2017 | 30077 | Article 2 | Scope of the Regulation |
| | | Article 4 | Definition of the institutions competent to prepare EIA Application Files, EIA Reports, Project Description Files |
| | | Article 6 | Permitting processes other than EIA |
| | | Article 10 | Special format of the EIA Report |
| | | Article 11 | Submission of the EIA Report to the Ministry |
| | | Article 20 | Capacity extensions |
| | | Article 25 | Integrated projects |
| | | Annex-1 | Water transmission projects Wind Power Plant projects Solar Power Plant projects |
| | | Annex-2 | Waste recovery facilities Surface coating facilities Collective housing projects Shopping malls Wind Power Plant projects Solar Power Plant projects Groundwater extraction and underground water storage projects |
| | | Annex-2 | Mining projects |
| 14 June 2018 | 30451 | Annex-2 | Mining projects |
| 19 April 2019 | 30750 | Annex-1 | Mining projects |
| 08 July 2019 | 30825 | Article 4/b | Companies that have been authorised by the Ministry |
| | | Article 4/p | Audit |
| | | Article 4/z | Project Progress Report |
| | | Article 4/aa | Monitoring |
| | | Article 8/1 | EIA Application File |
| | | Article 8/2 | |
| | | Article 16/1 | Project Owner's undertaking of the information and documents contained in the PDF |
| | | Article 18/1 | Monitoring and control of the implementation of commitments provided in the PDF and EIA Report |
| | | Article 18/5 | Liability of Project Owner regarding submission of periodical Project Progress Reports (to be prepared by an authorised company that was not involved in the preparation of the EIA Report) to the Ministry |

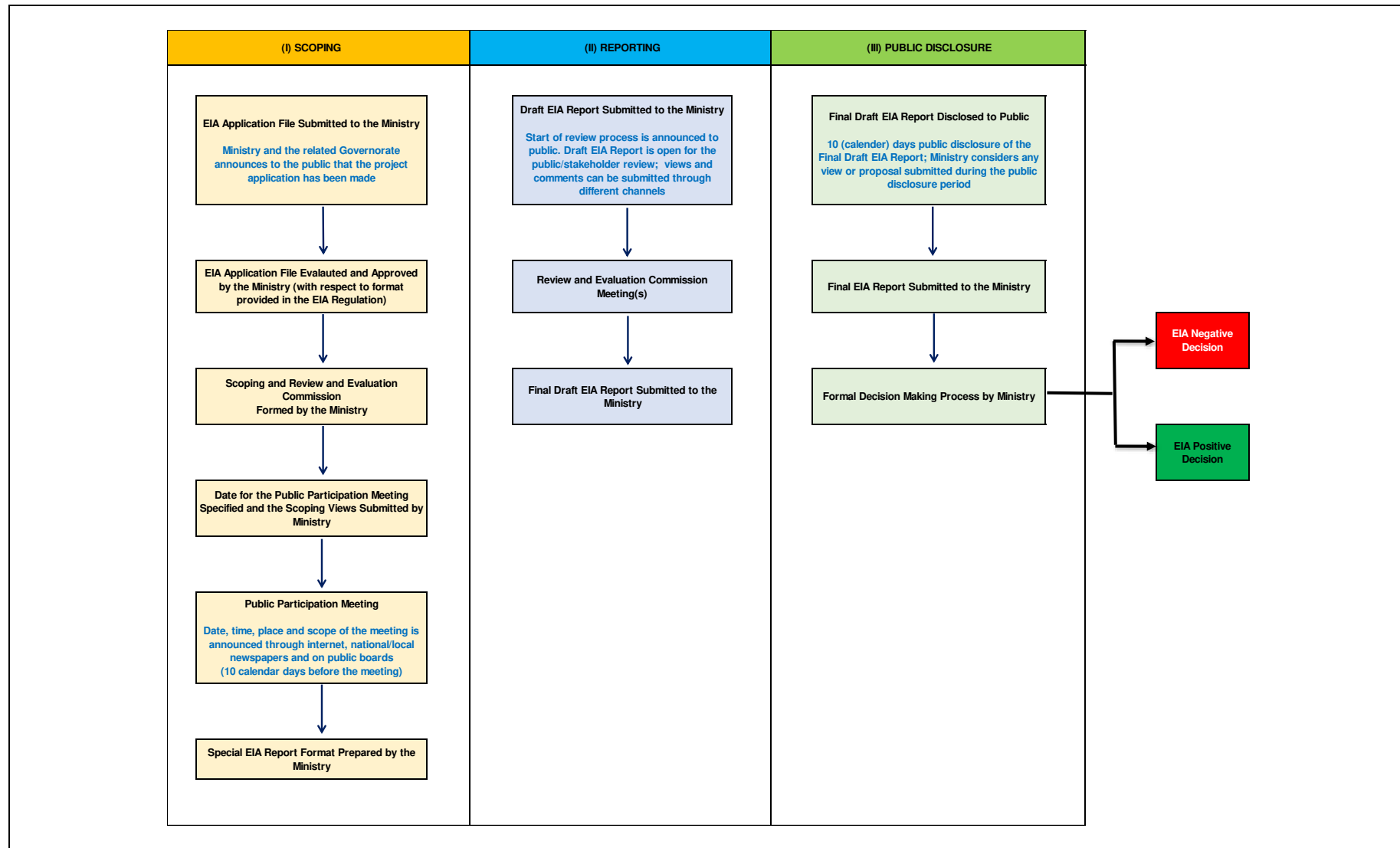


Figure 2-2. The EIA Process under the National EIA Regulation

Categorisation of WPP Projects in the Current EIA Regulation

The current EIA Regulation (2014) categorises WPP projects as follows:

- Annex-1 of the EIA Regulation (Item 43): Full EIA process is required for WPP projects with a total number of 20 or more turbines and a total installed capacity of and above 50 MWm
- Annex-2 of the EIA Regulation (Item 42): Limited EIA process is required for WPP projects with a total number of 5 or more turbines (up to the threshold given for Annex-1 projects) and a total installed capacity of and above 10 MWm to 50 MWm
- WPP projects that have less than 5 turbines or 10 MWm installed capacity are out of scope of the EIA Regulation.

Initially, in 2009, the Kiyikoy WPP Project was planned to include 18 turbines and a total installed capacity of 27 MWe and therefore the Project was subject to the 2008 EIA Regulation. According to the 2008 EIA Regulation, the WPP projects with a total installed capacity of 10 MW and more have been included in Annex-2. As the total installed capacity was planned as 27 MW, a PDF was prepared and submitted to the Kırklareli Provincial Directorate of Environment and Forestry (current Kırklareli PDoEU) on April 21, 2009. The Provincial Directorate reviewed the PDF and issued "EIA Not Required" Decision (No: 2009/07) for the Project on May 8, 2009. The Project was then revised to include 14 turbines and a total installed capacity of 28 MWm/27 MWe. An official letter was secured from the MoEU on May 2, 2013 confirming the validity of the "EIA Not Required" Decision (No. 2009/07) since the installed capacity of the revised Project did not change. Since 2014, Kiyikoy WPP is in operation with 14 turbines each having a capacity of 2 MW and total installed capacity of 28 MWm/27 MWe.

The Project Company is planning to increase the total installed capacity from 28 MWm/27 MWe to 100 MWm/99 MWe by construction and operation of additional 21 turbines at the Project Area. For this purpose, an EIA Report was prepared in accordance with the 2014 EIA Regulation and the final version of the EIA Report was submitted to the MoEU on September 6, 2017. The MoEU issued an EIA Positive Decision (No: 4763) on September 14, 2017.

Following the "EIA Positive Decision", the coordinates and/or codes of certain turbines have changed⁶ as a result of the Project development and ongoing license amendment process with the EMRA. The Project Company applied to the MoEU and obtained an official letter on 25 January 2019 confirming that the "EIA Positive Decision" granted for the Capacity Extension Project on 14 September 2017 is valid for the revised coordinates of the turbines and a total capacity of 100.45 MWm/99.45 MWe⁷.

Categorisation of Energy Transmission Line (ETL) Projects in the Current EIA Regulation

The current EIA Regulation (2014) categorises ETL projects as follows:

- Annex-1 of the EIA Regulation (Item 46): Full EIA process is required for ETLs with a voltage level of and above 154 kV and length of and over 15 km
- Annex-2 of the EIA Regulation (Item 40): Limited EIA process is required for ETLs with a voltage level of and above 154 kV and length of 5-15 km
- ETLs with voltage level below 154 kV or ETLs with voltage level above 154 kV but length less than 5 km are out of the scope of the EIA Regulation.

⁶ Coordinates specified in the final national EIA Report for the turbines T16, T17, T19, T20, T22, and T32 have slightly changed within the License Area. Codes specified in the final national EIA Report for the turbines T25, T26, T27, T28, T29, and T30 have changed (coordinates remaining the same) during the License Amendment Process being executed with EMRA.

⁷ The total capacity planned to be operated by the Project Company is 100MWm/99MWe.

The existing 14 turbines of Kiyikoy WPP are connected to the national electricity grid at Kiyikoy substation (Kiyikoy TM) through a 154 kV and 4.8 km long ETL. The Kiyikoy WPP Capacity Extension Project will use the same ETL to connect to the national grid; thus no new ETL is required to be constructed or operated as part of the Capacity Extension Project.

2.3. International Agreements, Conventions and Protocols

Turkey has become party to several conventions and protocols to contribute to the management of environmental resources, biodiversity and cultural heritage at regional and global scales. Applicable international conventions and protocols are given in Table 2-2.

Table 2-2. Conventions, Agreements and Protocols

| Convention, Agreement, Protocol | Date of Signature | Date of Ratification by Turkey |
|---|---------------------------|---|
| <i>Air Quality and Climate Change</i> | | |
| Convention on Long Range Transboundary Air Pollution | 13.11.1979 | 18.04.1983 |
| Vienna Convention for the Protection of the Ozone Layer | 22.03.1985 | 20.09.1991 |
| Montreal Protocol on Substances Depleting the Ozone Layer (1990) | 16.09.1987 | 19.12.1991 |
| United Nations Framework Convention on Climate Change (UNFCCC) | 21.03.1994 | 24.05.2004 |
| Kyoto Protocol | 11.12.1997 | 26.08.2009 |
| United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa | 14.11.1994 | 31.03.1998 |
| <i>Biodiversity</i> | | |
| International Convention on Wetlands of International Importance especially as Waterfowl Habitat (RAMSAR Convention) | 21.12.1975 | 13.11.1994 |
| Convention for the Conservation of European Wildlife and Natural Habitats (BERN) | 19.09.1979 | 02.05.1984 |
| UN Convention on Biological Diversity and the Cartagena Protocol on Biosafety | 29.12.1993 | 14.02.1997 |
| Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) | 03.03.1973 | 22.12.1996 |
| Mediterranean Sea Protocol Concerning Specially Protected Areas and Biodiversity (1988) | 16.02.1976 | 22.08.2002 |
| Convention on the Conservation of Migratory Species of Wild Animals (CMS) / Agreement on the Conservation of Populations of European Bats (UNEP/EUROBATS) | 01.11.1983 /16.01.1994 | Turkey is not a party / Turkey is not a party |
| Convention to Combat Desertification (CCD) | 14.11.1994 | 31.03.1998 |
| Convention (International Treaty) on Plant Genetic Resources for Food and Agriculture | 29.06.2004 | 07.06.2007 |
| European Landscape Convention | 20.10.2000 | 27.07.2003 |
| <i>Cultural Heritage</i> | | |
| Convention on the Protection of the World Cultural and Natural Heritage (1983) | 17.12.1975 | 16.03.1983 |
| European Charter of the Architectural Heritage | 1975 | 1989 |
| European Convention on the Protection of the Archaeological Heritage | 1969 | 29.11.1999 |
| European Cultural Convention | 19.12.1954 | 10.10.1957 |
| Convention for the Protection of the Architectural Heritage of Europe | 03.10.1985 | 11.10.1989 |

| Convention, Agreement, Protocol | Date of Signature | Date of Ratification by Turkey |
|---|----------------------------|--------------------------------|
| Convention for the Protection of Human Rights and Fundamental Freedoms (ETS No. 5) (the European Convention on Human Rights) and its protocols | 04.11.1950 | 18.05.1954 |
| UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property | 14.11.1970 (21.07.1981) | 21.04.1981 |
| UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage | 17.11.2003 | 27.03.2016 |
| UNESCO Convention on the Protection and Promotion of the Diversity of Cultural Expressions | 20.11.2005 | 02.11.2017 (Accession) |
| UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage | 16.06.1983) | 16.03.1983 |
| Environmental Protection | | |
| The Convention for the Protection of Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) | 16.02.1976 | 22.08.2002 |
| The International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (FUND) | 1992 | 17.08.2002 |
| International Convention on Civil Liability for Oil Pollution Damage | 1992 | 27.07.2001 |
| Convention for the Protection of the Black Sea Against Pollution (Bucharest) and its protocols including the Protocol for the Protection of Biological and Landscape Diversity in the Black Sea | 21.04.1992 | 1994 |
| Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal | 22.05.1989 | 07.02.1994 |
| Stockholm Convention on Persistent Organic Pollutant (POPs) | 22.05.2001 | 12.01.2010 |

In 1932, Turkey became a member of the International Labour Organization (ILO), a specialized United Nations (UN) agency, and ratified 59 of the ILO conventions, of which 3 were later denounced by the ILO (<http://www.ilo.org/ankara/conventions-ratified-by-turkey/lang--tr/index.htm>). ILO Conventions relevant to the Project are listed in Table 2-3.

Table 2-3. ILO Conventions Relevant to the Project

| Convention, Agreement, Protocol | Date of Signature | Date of Ratification by Turkey |
|--|--------------------------|--------------------------------|
| ILO Safety and Health in Construction Convention | 11.01.1991 (enforced) | 23.03.2015 |
| ILO Occupational Safety and Health Convention | 11.08.1983 (enforced) | 22.04.2005 |
| ILO Worst Forms of Child Labour Convention | 19.11.2000 (enforced) | 02.08.2001 |
| ILO Forced Labour Convention | 01.05.1932 (enforced) | 30.11.1998 |
| ILO Minimum Age Convention | 19.06.1976 (enforced) | 30.11.1998 |

| Convention, Agreement, Protocol | Date of Signature | Date of Ratification by Turkey |
|---|--------------------------|--------------------------------|
| ILO Freedom of Association and Protection of the Right to Organize Convention | 04.07.1950 (enforced) | 12.07.1993 |
| ILO Worker's Representatives Convention | 30.06.1973 (enforced) | 12.07.1993 |
| ILO Human Resources Development Convention | 19.07.1977 (enforced) | 12.07.1993 |
| ILO Employment Policy Convention | 15.07.1966 (enforced) | 13.12.1977 |
| ILO Social Security Convention | 17.04.1955 (enforced) | 29.01.1975 |
| ILO Equal Remuneration Convention | 23.05.1953 (enforced) | 19.07.1967 |
| ILO Discrimination (Employment and Occupation) Convention | 15.06.1960 (enforced) | 19.07.1967 |
| ILO Abolition of Forced Labour Convention | 17.01.1959 (enforced) | 29.03.1961 |
| ILO Right to Organize and Collective Bargaining Convention | 18.07.1951 (enforced) | 23.01.1952 |

Turkey is not yet party to the following international conventions:

- The Convention on Environmental Impact Assessment in a Transboundary Context (Espoo)
- The UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus)

2.4. International Environmental and Social Standards and Guidelines

The Kiyikoy WPP Capacity Extension Project will be implemented in compliance with EBRD's Environmental and Social Policy (2014) and related PRs. The applicability of the EBRD PRs to the Kiyikoy WPP Capacity Extension Project is presented in Table 2-4.

Table 2-4. Applicability of EBRD PRs to the Project and/or ESIA

| PR | Definition | Applicability to the Project/ESIA |
|-------|--|-----------------------------------|
| PR 1 | Assessment and Management of Environmental and Social Impacts and Issues | Applicable |
| PR 2 | Labour and Working Conditions | Applicable |
| PR 3 | Resource Efficiency and Pollution Prevention and Control | Applicable |
| PR 4 | Health and Safety | Applicable |
| PR 5 | Land Acquisition, Involuntary Resettlement and Economic Displacement | Applicable |
| PR 6 | Biodiversity Conservation and Sustainable Management of Living Natural Resources | Applicable |
| PR 7 | Indigenous Peoples | Not applicable to the Project |
| PR 8 | Cultural Heritage | Applicable |
| PR 9 | Financial Intermediaries | Not applicable to the ESIA |
| PR 10 | Information Disclosure and Stakeholder Engagement | Applicable |

2.5. European Union (EU) Environmental Legislation

The EBRD, as a signatory to the European Principles for the Environment, is committed to promoting the adoption of EU environmental principles, practices and substantive standards (as contained in EU secondary legislation, for example, regulations, directives and decisions) by EBRD-financed projects, where these can be applied at the project level, regardless of their geographical location. When host country regulations differ from EU substantive environmental standards, projects will be expected to meet whichever is more stringent.

- EU EIA Directive 2011/92/EU
- EU Habitats Directive 92/43/EEC
- EU Birds Directive 2009/147/EC
- EU Environmental Noise Directive 2002/49/EC
- EU Waste Framework Directive 2008/98/EC

2.6. Project Environmental and Social Categorisation

During the Environmental and Social Due Diligence (ESDD) process conducted prior to the ESIA, the EBRD as the potential lender of the Project, has assigned the Kiyikoy WPP Capacity Extension Project as Category A⁸ as it involves further expansion and development of a greenfield WPP located close to a major bird migratory route (via Pontica).

The EBRD describes Category A projects as projects that could result in potentially significant adverse future environmental and/or social impacts which, at the time of categorization, cannot readily be identified or assessed, and which, therefore, require a formalized and participatory environmental and social impact assessment process.

The EBRD requires ESIA's prepared for Category A (private sector) projects to be disclosed for a minimum of 60 calendar days in accordance with its Public Information Policy (May 2014).

⁸ The EBRD provides an indicative list for Category A projects within its Environmental and Social Policy (2014). The "Large scale wind power installations for energy production (wind farms)" are included in this list under Item 22. Item 27 of the list separately includes the projects (including renewables) which are planned to be carried out or are likely to have a perceptible impact on sensitive locations of international, national or regional importance, even if the project category does not appear in this list. Such sensitive locations include, inter alia, nature protected areas designated by national or international law, critical habitat or other ecosystems which support priority biodiversity features, areas of archaeological or cultural significance, and areas of importance for Indigenous Peoples or other vulnerable groups.

3. PROJECT ALTERNATIVES

This Chapter of the ESIA Report provides an analysis of the following Project alternatives including the non-Project alternative.

- Energy Generation Alternatives
- Turbine Alternatives
- Site and Layout Alternatives
- Non-Project Alternative

3.1. Energy Generation Alternatives

The Turkish Energy Policy draws attention to concentrating on domestic resources for meeting the increasing energy demands through use of resource diversity. The Strategic Plan (2015-2019) of the Ministry of Energy and Natural Resources (MoENR) aims to encourage use of renewable energy potential in Turkish economy.

The MoENR states on its website that according to the Wind Energy Potential Atlas of Turkey, the country's wind energy potential is 48,000 MW. As of January 2019, the total installed capacity of the operational WPPs is reported as 7,369.35 MW (*Turkish Wind Energy Association-TUREB, January 2019. Turkish Wind Power Plant Atlas*). Thus, wind energy emerges as a highly viable option for Turkey to achieve its strategic energy goals.

Each energy generation technology requires particular environmental and social management approaches as they have their own benefits and impacts in terms of emissions to environment, water and resource consumption trends, waste generation, land requirements, impacts on biodiversity elements and social impacts

The typical attributes associated with different energy generation technologies are comparatively given in Figure 3-1.

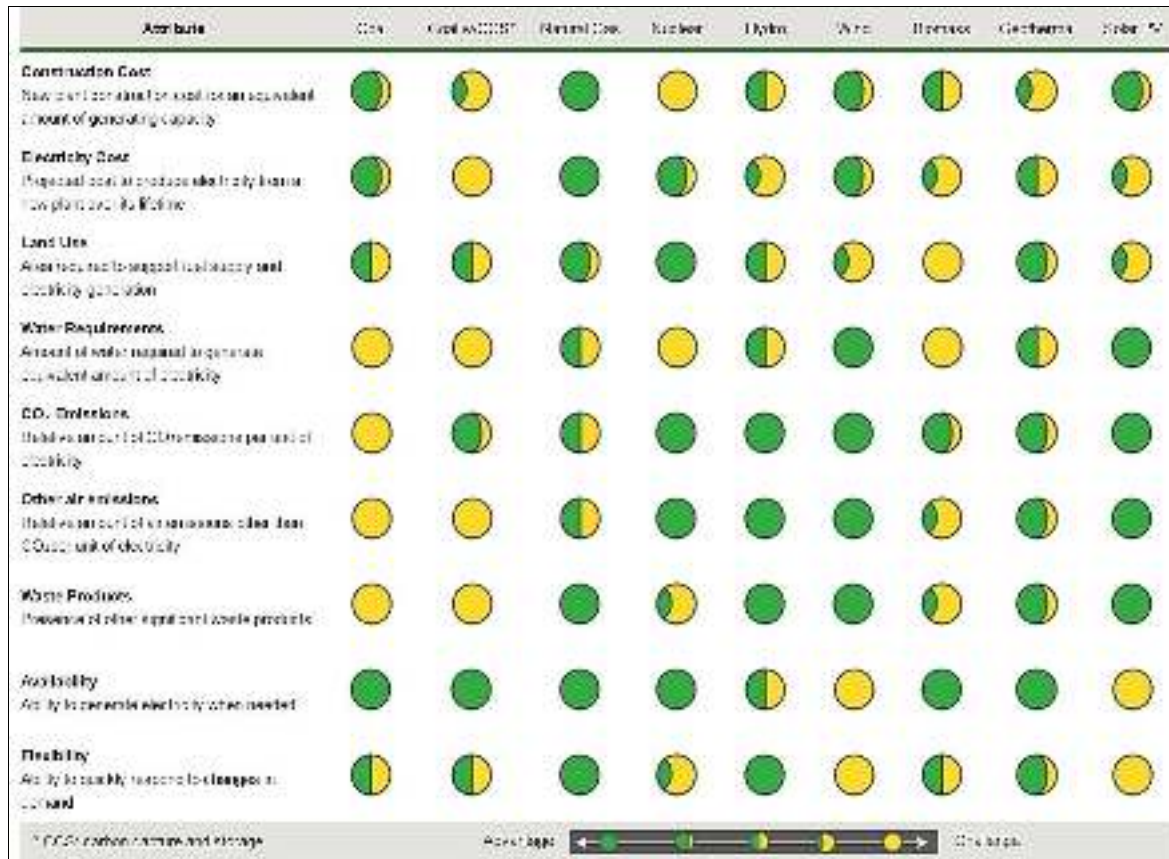


Figure 3-1. Assessment of Relative Benefits and Impacts of Electricity Generation Technologies
(Source: Electric Power Research Institute, 2016)

As far as the water use, air emissions (including carbon dioxide) and waste generation are concerned the impacts are limited to the construction phase of the WPP projects. Even though the license areas granted to the Project by EMRA are usually cover a significantly larger area than the land physically required by the footprint of Project units such as turbine foundations, substation and access roads, potential impacts of the WPP projects on land use within the wider license areas can be mitigated by diligent planning and siting on the basis of the state of the art technologies.

Amongst the renewable energy alternatives, the WPPs due to smaller land occupation by their equipment, have limited impact on terrestrial and aquatic flora/fauna species. On the other hand, their potential impacts on birds and bats need to be carefully assessed through baseline studies up to international standards and the results of the assessments to be incorporated into active turbine management plans as part of operation phase management programs.

All types of energy generation projects will have visual impacts, which is more dependent on the perception of the receptors.

WPP Projects that are developed with proper siting and effective management of the potential environmental and social impacts identified through an appropriate impact assessment process would provide a beneficial alternative for meeting the growing energy demand in comparison to the other available technologies.

3.2. Turbine Alternatives

The two main types of turbines currently in use are the horizontal axis wind turbine (HAWT) and the vertical axis wind turbine (VAWT). Of these, HAWTs are the most extensively used turbine type for large scale wind farm developments, due to their various advantages such as high energy generation capacity, better efficiency, adjustable tower length to capture large amounts of wind energy, variable pitch blade capacity, etc.

The first phase of the Kiyikoy WPP is in operation since August 2014 with an installed capacity of 28 MWm/27 MWe (14 turbines, 2 MWm each). With the Capacity Extension Project, the WPP will reach an installed capacity of 100 MWm/99 MWe with the construction and operation of 20 additional turbines (3.6 MWm each) making a total of 34 turbines.

The existing 14 turbines are Gamesa G90 and Gamesa G97 (12 turbines; 2 MWm; with a rotor diameter of 97 m). Since the construction of the first phase of the Project with Gamesa G90, technological advancements have occurred in the turbine types. In consideration of the current technologies, the Project Company has decided to implement the Capacity Extension Project (providing an additional installed capacity of 72 MWm/72 MWe) utilising 20⁹ Vestas V136 turbines (3.6 MWm each) with a rotor diameter of 136 m and hub height of 112 m. A total of 36 Gamesa G90 turbines (2 MWm each) would provide this additional installed capacity planned to be provided 14 Vestas V136 (3.6 MWm) turbines.

The Project Company has selected one of the most advanced turbine types available (Vestas V136). All electrical equipment required for the operation of a turbine is enclosed within the turbine structure. Accordingly, this turbine does not require fencing for any community health and safety concern. Thus, the License Area will remain accessible to public forestry and grazing activities with the exception of the substation area. The Project Company is also conducting assessments for removing the existing fences surrounding the 14 operational turbines.

The selected Vestas V136 turbine model provides two different sound modes including a silent operation mode to control noise emissions as required. The existing SCADA system used to control and monitor the current operational turbines will be modernised and improved.

3.3. Site and Layout Alternatives

The amount of available wind is the determining factor of potential maximum energy that can be generated on a specific site since wind, as a resource, varies both geographically and temporarily. The existing Kiyikoy WPP is in operation since August 2014 and wind measurements have been conducted at the operating turbines since the beginning of operations. The records of wind direction and average wind speed have been kept through the Supervisory Control and Data Acquisition (SCADA) system since the start of operations in August 2014. As discussed in detail in Chapter 6 ("Noise"), wind speeds are densifying in between 7 – 9 m/s and average of wind speeds during the Day – Evening – Night periods are in between 7 – 8 m/s.

Based on an analysis of the past energy generation performance of the existing 14 turbines and the continuous wind measurement records supporting the site-specific energy generation potential of this geographical location, the Project Company has decided to extend the total installed capacity of the WPP up to 100 MWm/99 MWe with the construction and operation of 20 additional turbines (3.6 MWm each) making a total of 34 turbines. The annual average energy generation performance of the existing WPP (14 turbines, each 2 MWm) since commissioning is presented in Table 3-1.

⁹ The Project Company initially considered 21 turbines, but the technological advancements have allowed the Company to build and operate this additional capacity with 20 turbines, each having a capacity of 3.6 MWm.

Table 3-1. Annual Average Energy Generation Data for the Existing Kiyikoy WPP

| Years | Annual Energy Generation (MWh) |
|-------|--------------------------------|
| 2014 | 25.9 |
| 2015 | 72.7 |
| 2016 | 80.3 |
| 2017 | 72.0 |
| 2018 | 78.9 |

3.3.1. Turbine Locations

The Capacity Extension Project was initially designed to include 21 turbines. As a result of the detailed energy assessments and the evaluation of layout alternatives for the additional turbines, the Project Company, taking the technological advancements into consideration, has concluded that the Capacity Extension Project would be feasible with the construction and operation of 20 turbines, each having a capacity of 3.6 MWm. As of September 2019, the Company is in the process of selecting the ultimate 20 turbines to be built and operated as part of the Project; as such one of the 21 turbines considered in the initial Capacity Extension Project will be eliminated before the finalisation of the Project design. As the turbine to be eliminated as part of this process has not been selected at the time of writing this report, all the alternative locations for the 21 turbines have been considered in the identification, assessment and management of potential impacts as part of the ESIA study.

For the Kiyikoy WPP, the License Areas specified in the Energy Generation Licenses issued by the EMRA covers 2,453.3 ha. On the other hand, the footprint of the Capacity Extension Project units covers 25.9 ha (1% of the License Area). The Project Company has evaluated alternatives to minimise the footprint area and the platform areas (including crane booms) for the turbine foundations was restricted to 6,400.00 m².

As per the legal requirements, a buffer zone of 300 m has been designated from the outer border of the License Area. No turbine has been planned within this 300 m-buffer zone. Micro siting of the turbine locations within the rest of the License Areas has been duly conducted to maximise/optimize the energy production and minimisation of environmental and social impacts. To this end, the Project Company has decided to eliminate one of the 21 turbines, which is currently at the stage of selection. Slight changes have been made at the locations of T16, T17, T19, T20 and T32 as summarised in Table 3-2. Micro-siting of the turbines within the License area is shown on the map presented in Figure 3-2.

As part of the Energy Generation License amendment process with the EMRA, codes of the turbines T25, T26, T27, T28, T29 and T30 have also changed.

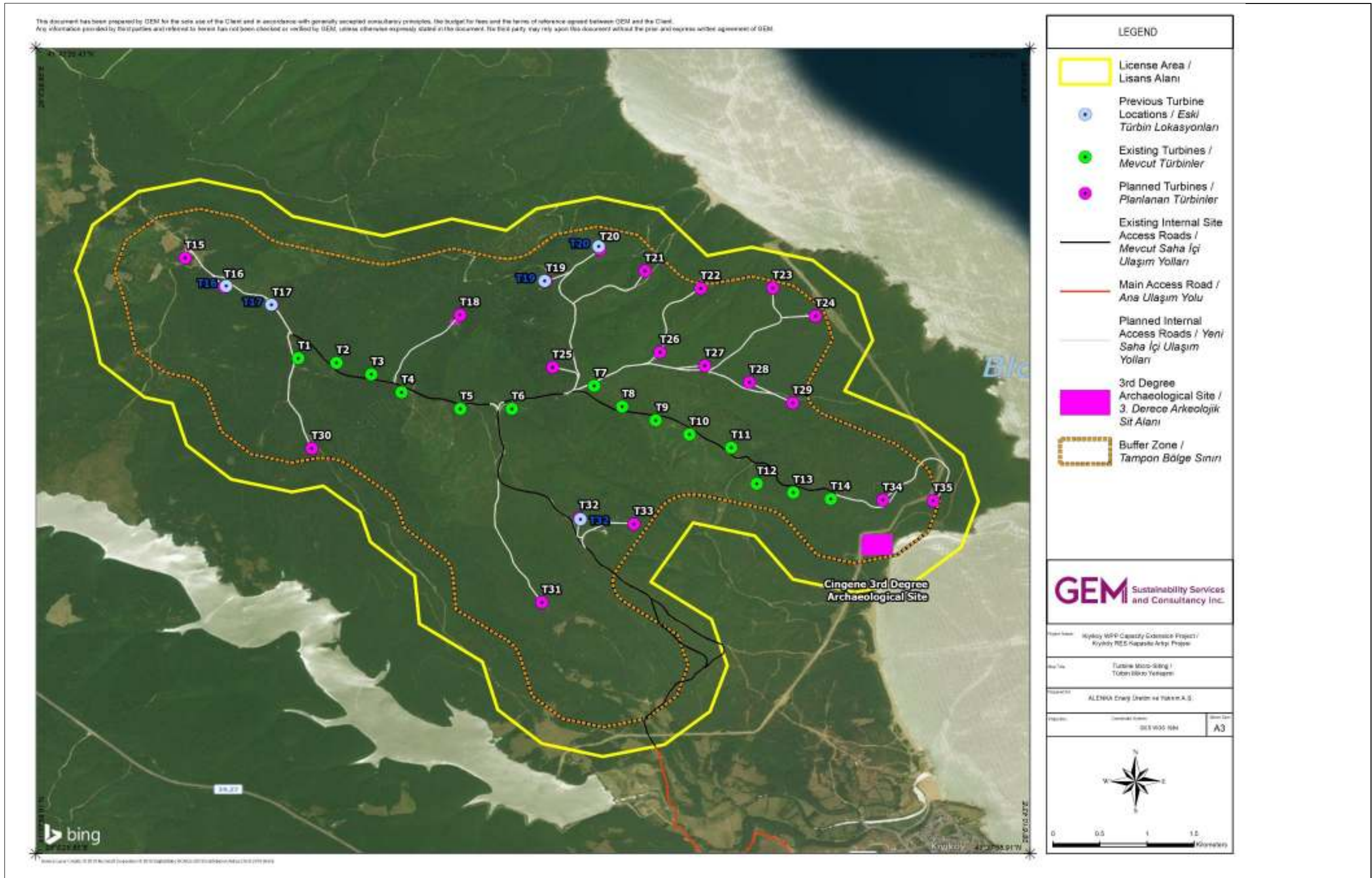


Figure 3-2. Turbine Micro-siting

Table 3-2. Summary of the Slight Revisions Done for the Turbine Coordinates

| Turbine | Previous Coordinates ⁽¹⁾ before Micro-siting | | Final Coordinates ⁽²⁾ after Micro-siting | | Distance Difference between the Previous and Final Turbine Locations | |
|---------|--|---------|--|---------|--|-------|
| | Y (m) | X (m) | Y (m) | X (m) | Y (m) | X (m) |
| T16 | 585442 | 4615741 | 585426 | 4615732 | 16 | 9 |
| T17 | 585805 | 4615547 | 585812 | 4615544 | -7 | 3 |
| T18 | 587304 | 4615457 | 587304 | 4615457 | 0 | 0 |
| T19 | 587971 | 4615825 | 587984 | 4615825 | -13 | 0 |
| T20 | 588396 | 4616196 | 588407 | 4616165 | -11 | 31 |
| T32 | 588286 | 4613305 | 588276 | 4613317 | 10 | -12 |

⁽¹⁾ Indicated in the EIA Positive Decision dated 14 September 2017.

⁽²⁾ Indicated in the official letter dated 25 January 2018 confirming that the "EIA Positive Decision" granted for the Capacity Extension Project on 14 September 2017 is valid for the revised coordinates of the turbines.

The basis of the slight revisions made for the turbines listed Table 3-2 is the Project Company's objective to minimise excavation requirements and thus the area of the land to be disturbed.

A third degree archaeological site (Cingene Iskelesi) is located approximately 380 m south of T34. The location of this registered site has also been considered in selecting the turbine locations for T34 and T35. A non-registered potential site has also been identified by qualified cultural experts retained by the ESIA Consultant (see Chapter 15 "Cultural Heritage" for detailed information). The Project Company informed the Ministry of Culture and Tourism, Edirne Regional Board for the Conservation of Cultural Heritage on the surface finds discovered at this location (with the Official Letter dated 16 May 2019). The experts of the Edirne Regional Board visited the potential site and identified/reported that the site does not have any features that is under the scope of the "Law on Preservation of Cultural and Natural Assets" (Law No. 2863) approving the implementation of the Project.

3.3.2. Internal Site Access Roads

Additionally, existing forest roads have been analysed and the majority of the locations of the new turbines have been selected along the existing forest roads in order to minimise the land to be disturbed for internal access road construction.

3.3.3. ETL and Substation

As the Capacity Extension Project has been designed to utilise the existing substation of the Kiyikoy WPP with necessary technological improvements, construction of a new substation site has been avoided. Connection of the Capacity Extension units to the national grid will be provided via the existing 4.8 km 154 kV overhead ETL, eliminating the need for a new ETL construction and minimizing the associated environmental and social impacts (e.g. land use, impacts on biodiversity, land acquisition, etc.).

3.4. Non-Project Alternative

As a renewable energy generation Project, the Kiyikoy WPP will contribute to meet the ever growing national energy demand and reduce the dependency of the country on the foreign energy resources. In the non-project alternative, the Project will not bring the benefits foreseen by its implementation, whilst there would be no potential environmental or social impact that are to be managed by the Project Company throughout the life of the Project. On the other hand, the national energy demand is to be met by a feasible energy generation method that is sound and suitable in terms of the site-specific resources. A simplified comparison of the with project and non-project alternatives is summarised in Table 3-3.

Table 3-3. Comparison of With Project and Non-Project Alternatives

| Subject | With Project | Without Project (Non-Project Alternative) |
|------------------------------|--|---|
| National Benefits | After Capacity Extension, the Kiyikoy WPP is anticipated to contribute to meeting the national electricity demand by approximately 200.6 GWh electricity on an annual basis. | If the same annual electricity amount (200.6 GWh) is to be produced at a conventional fossil fuel fired thermal power plant, additional mitigation measures would be required for sustainable management of the natural resources and the potential environmental and social impacts. |
| Environmental impacts | The Project will not cause air emissions, GHG emissions, process wastewater generation during the long-term operation phase. The amount of hazardous materials use, domestic wastewater and waste generation will be very limited. Potential impacts of the turbines on biodiversity, including birds and bats, as well as Project-specific impacts such as shadow flicker, ice throw, noise generation, will require particular management in line with the Project-specific Environmental and Social Management System (ESMS). | Specific environmental investments would be required to mitigate the GHGs and manage the environmental and social impacts, if the same annual electricity amount is to be produced at a conventional fossil fuel fired thermal power plant to meet the national energy demand. |
| Employment | Employment opportunities to be provided by the Project will be relatively limited, but still beneficial at the local-scale if local employment is prioritized wherever possible. At the peak construction phase, the Project will provide employment opportunities for a total of 100 personnel. The existing operation workforce (a total of 16 personnel (in total 8 local personnel are from Kiyikoy town) will continue their services during the construction and operation phases of the Capacity Extension. The Project Company will endeavour to maximise the localisation of the workforce during the construction phase. | In conventional energy generation projects (i.e. thermal power), employment opportunities to be provided during the operation phases would be higher. Management of labour and working conditions including occupational health and safety would be among the most important aspects influencing the environmental and social performance of such large-scale projects. |
| Procurement and Supply Chain | The Project Company will aim to maximise local procurement to the extent the local sources meet the Project's requirements including ethics, quality, health and safety, etc. | In the non-project alternative, there would be no economic benefit that would be provided as part of the procurement processes. In conventional energy generation projects (i.e. thermal power), large scale procurement opportunities would be provided. |

The Project Company is committed to manage the environmental and social impacts of the Project in compliance with the requirements of applicable national legislation as well as EBRD Environmental and Social Policy (2014) and PRs. A Project-specific ESMS has been established for the Project as detailed in Chapter 18 ("Environmental and Social Management System). With effective implementation of the Project-specific ESMS, Project's potential environmental and social impacts, as identified in this ESIA, will be manageable with a sustainable approach and the benefits of the Project to the local communities could be maximised. Hence, the Non-Project Alternative has not been assessed as a viable alternative

4. ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) METHODOLOGY

This Chapter presents the proposed process for undertaking the ESIA of the Project and the methodology used for the assessment of identified potential impacts, taking into account both the receptor/resource sensitivity and the magnitude of the impact.

4.1. The ESIA Process

The ESIA is the process that predicts and assesses a project's potential environmental and social risks and impacts, in quantitative terms to the extent possible, and identifies mitigation and management measures to be implemented during the Project lifetime to avoid, minimise, mitigate, or compensate/offset risks and impacts.

As highlighted in the EBRD E&S Policy (2014), the ESIA process includes a scoping stage to identify the potential future environmental and social impacts associated with the project. The ESIA includes an examination of technically and financially feasible alternatives to the source of such impacts, including the non-project alternative, and document the rationale for selecting the particular course of action proposed. It will also identify potential improvement opportunities and recommend any measures needed to avoid, or where avoidance is not possible, minimise and mitigate adverse impacts. The assessment of environmental and social impacts will consider potential direct, indirect and cumulative impacts related to the project, as well as potential transboundary impacts, where relevant.

The ESIA process will also include a public disclosure and consultation process as specified in EBRD PR 10. As depicted by PR10, the process of stakeholder engagement should begin at the earliest stage of project planning and continue throughout the life of the project. It is an integral part of the assessment, management and monitoring of environmental and social impacts and issues of the project. Stakeholder engagement is an ongoing process which involves: (i) public disclosure of appropriate information; (ii) meaningful consultation with stakeholders; and (iii) an effective procedure or mechanism by which people can make comments or raise grievances.

The Kiyikoy WPP Capacity Extension Project has been assigned as a Category A Project by the EBRD which means that the ESIA Report and the other relevant E&S documents will be disclosed for the public for a minimum period of 60 days both at the Project website and the EBRD website.

In the post-ESIA period, environmental and social performance of the Project will be continually monitored and improved through monitoring activities in accordance with the Project ESAP and ESMMP.

The ESIA process and the approach to the assessment of environmental and social impacts followed for the Project is given in Figure 4-1.

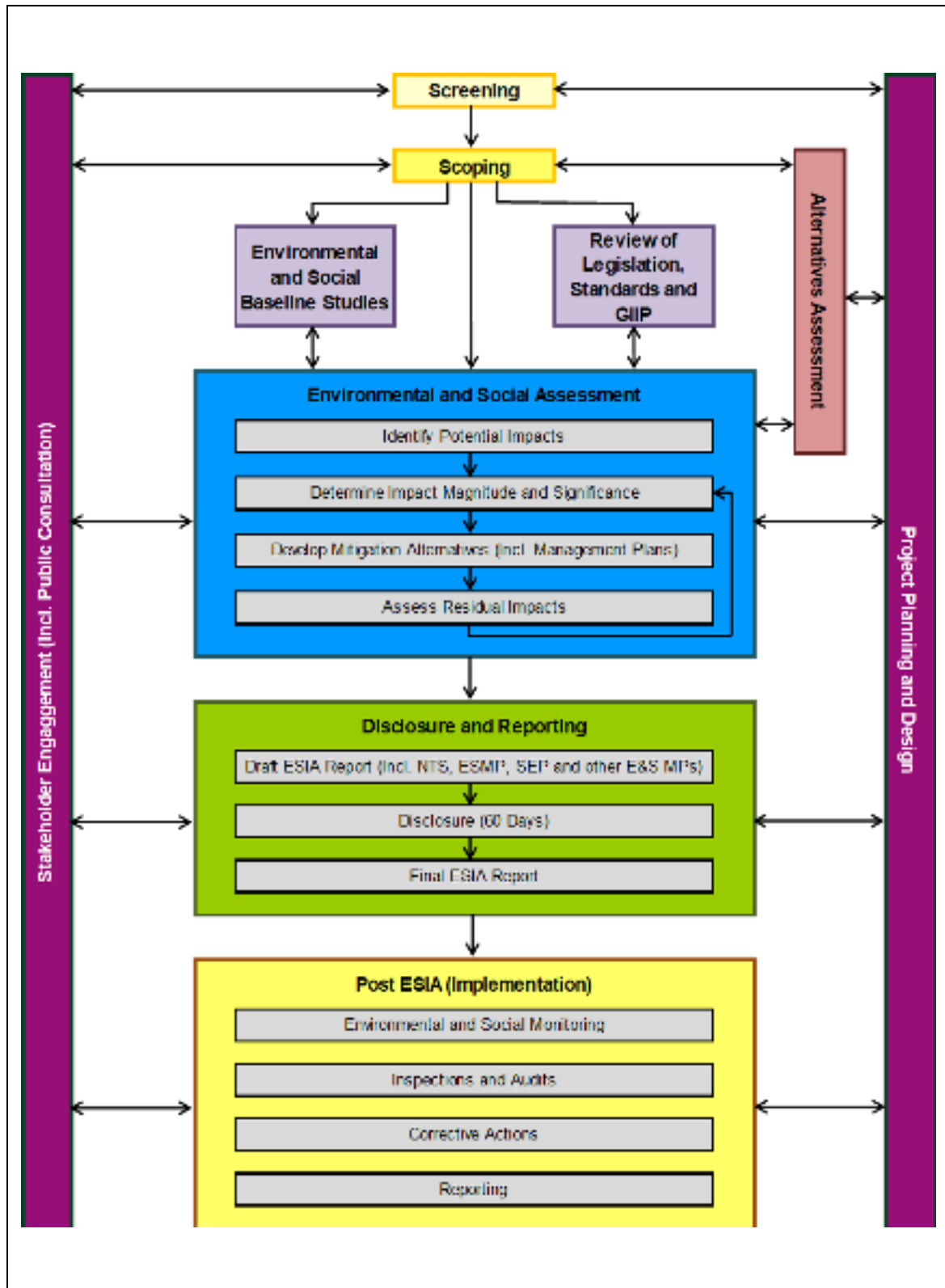


Figure 4-1. ESIA Process

4.2. The ESIA Methodology

The methodology for the assessment of potential environmental and social impacts of Kiyikoy WPP Project is based on, but not limited to, the following available and applicable literature on environmental and social impact assessment:

- Institute of Environmental Management and Assessment (IEMA), 2011: The State of Environmental Impact Assessment Practice in the UK;
- HA 205/08: Volume 11, Section 2 Environmental Impact Assessment and Handbook for Scoping Projects: Environmental Impact Assessment;
- Scottish Natural Heritage's (SNH) Handbook on Environmental Impact Assessment (2013);
- Other available guidance documents and literature (*e.g. Canter, L. 1993, The role of environmental management in responsible project management, The Environmental Professional 15: 76-87; Canter, L. 1996, Environmental Impact Assessment; Standards Association of Australia, 1999*)

4.2.1. Assessment of Impact Significance

In accordance with international good ESIA practice, significance of impacts will be determined based on the sensitivity of the receptor/resource and the overall magnitude of the Project's impact on that specific receptor/resource. The magnitude of the impact is determined using quantitative or, where this is not practicable, qualitative methods based mainly on professional judgement. An impact may be either beneficial or adverse, direct or indirect.

The sensitivity of the receptor/resource is identified based on the available baseline information for the Project considering public interest, designations, legal requirements, acceptability, sustainability, etc., and where relevant, in consultation with the affected communities.

The overall magnitude of the impact, on the other hand, represents the degree of change and is influenced by several different factors as given below:

- Geographical extent (wide, local or restricted);
- Magnitude (high, medium or low; *e.g.* size of the area, number of trees, level of air/water/noise emissions, etc.);
- Reversibility (long-term reversible, short-term reversible or irreversible);
- Duration (long-term, mid-term or short-term);
- Frequency (continuous, intermittent or one-off).

The specific criteria to be considered for the prediction of impact magnitude in this Project are given in Table 4-1.

Table 4-1. Specific Criteria for Predicting Overall Magnitude of Impacts

| Factor of Overall Magnitude | Scales | | |
|-----------------------------|---|--|--|
| | Restricted (at the footprint) | Local (within License Area) | Wide (beyond License Area) |
| Geographical Extent | Restricted (at the footprint) | Local (within License Area) | Wide (beyond License Area) |
| Duration | Short (less than 1 year) | Medium (1-3 years) | Long (more than 3 years) |
| Reversibility | Short term reversible (within 3 years) | Medium term reversible (3-15 years) | Long term reversible or Irreversible (> 15 years) |
| Frequency | One-off/rare | Intermittent | Continuous/Recurrent |
| Magnitude* | Low | Medium | High |
| Overall Magnitude | Major / Moderate / Minor / Negligible | | |

(*) To be determined separately for each subject based on applicable thresholds, where available, or professional judgement.

The sensitivity of the receptor/resource and the overall magnitude of the Project's impact on that receptor/resource are specifically identified for each environmental and social assessment topic. The generic criteria are given in Table 4-2, whilst specific assessments will be done for each environmental and/or social component in the relevant chapters of this ESIA report.

Table 4-2. Generic Criteria for Identification of Receptor/Resource Sensitivity and Impact Magnitude

| Level | Receptor/Resource Sensitivity | Impact Magnitude | |
|------------|---|---|---|
| | | Adverse | Beneficial |
| High | Highly important (national and international scale of importance), high rarity, potential for substitution very limited | Loss of resource and/or quality and integrity of resources; severe damage to key characteristics, features or elements. | Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality. |
| Medium | Moderately important (regional scale of importance) and moderate rarity, potential for substitution limited | Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features and elements | Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality. |
| Low | Minor importance (local scale of importance), not rare | Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements | Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring. |
| Negligible | No or very low importance and rarity | No or very minor loss or detrimental alteration to one or more characteristics, features or elements | No or very minor benefit to or positive addition of one or more characteristics, features or elements |

Source: HA 205/08 Volume 11, Section 2.

Once the sensitivity of the receptor/resource and the overall magnitude of the impact on that specific receptor/resource are identified, the significance of the impact is determined by using a standard 4x4 matrix¹⁰ as given in Table 4-3 including the description of each significance level.

¹⁰ A separate matrix published by the ICOMOS will be used for the assessment of impacts on cultural heritage.

Table 4-3. General Significance Assessment Matrix and Definition of Significance Levels¹¹

| | | Receptor/Resource Sensitivity | | | |
|-------------------|--|-------------------------------|--------|-----|------------|
| | | High | Medium | Low | Negligible |
| Overall Magnitude | High | | | | |
| | Medium | | | | |
| | Low | | | | |
| | Negligible | | | | |
| Major | Impacts are considered to be very important and are likely to be material in decision-making, which would be associated with sites or features of international, national or regional importance as well as local importance if the site or feature is subject to a major change. Mitigation measures are imperative to reduce the significance to lower levels before proceeding with the Project. | | | | |
| Moderate | Impacts are not likely to be key decision-making factors. The cumulative impacts of such factors may influence decision-making, if they lead to an increase in the overall adverse effect on a particular receptor/resource. If possible, impact significance are to be reduced to lower levels by taking mitigation measures; otherwise acceptance of associated risks is required for proceeding with the Project. | | | | |
| Minor | Impacts may be raised as local factors, which are unlikely to be critical in the decision-making process, but important in enhancing the subsequent design of the Project. Assurance of compliance with standards and safety criteria is sufficient to proceed. | | | | |
| Negligible | No impact or impacts are beneath the level of perception so that they are acceptable with normal operating procedures. | | | | |

As the Burra Charter (*International Council on Monuments and Sites-ICOMOS, 1999*) defines specific criteria for the assessment of heritage significance, the assessments included in Chapter 15 ("Cultural Heritage") uniquely follows ICOMOS approach and the principles of Guidance on Heritage Impact Assessment for Cultural World Heritage Properties (UNESCO 2011). Thus, the magnitude of the impact of the Project activities on the registered and non-registered cultural heritage sites and the degree of importance of the sites will be identified in accordance with the criteria proposed in ICOMOS Guidance (2011), which is recommended by the Ministry of Culture and Tourism for cultural heritage impact assessment studies. The significance of impacts will be identified through professional judgement using the impact assessment matrices published by the ICOMOS¹² utilising the matrices provided in Table 4-4.

¹¹ The matrix and the definitions have been adapted from IEMA, 2011; HA 205/08 Volume 11, Section 2 and other impact assessment methodology guidances/handbooks.

¹² Guidance on Heritage Impact Assessments for Cultural World Heritage Properties, January 2011, pages 9-10.

Table 4-4. Significance Assessment Matrix for Cultural Heritage

| Value of Heritage Asset | Scale and Severity of Change/Impact | | | | |
|-------------------------|-------------------------------------|-------------------|------------------|-------------------|------------------|
| | No Change | Negligible Change | Minor Change | Moderate Change | Major Change |
| 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 criteria for the World Heritage Properties Very High – attributes which convey Outstanding Universal Value have not been provided in this matrix.

4.2.2. Approach to Management of Potential Impacts

Based on the outcomes of the impact assessment, measures and management plans/programs that would avoid, minimise, mitigate, and as a last resort, offset and/or compensate any potential residual adverse impacts will be developed in line with the mitigation hierarchy. This ESIA study proposes measures regardless of the identified level of significance, except for some of the impacts identified as “negligible”.

Effective implementation of the management measures, plans and programs will aim at ensuring Project's environmental and social performance is maintained at a level that achieves compliance with national and international standards.

Residual impacts are impacts that remain after the implementation of the proposed management measures, plans and programs. Significance of residual impacts will also be assessed as part of the ESIA study.

4.3. Project Impact Area

The Project Impact Area is the area over which environmental and social impacts could reasonably occur, either on their own or in combination with those of other developments. The potential environmental and social impacts of the Project is identified and assessed within the Project Impact Area. As per EBRD PR1, the assessment process is required to cover the following:

- All relevant direct and indirect environmental and social impacts and issues of the project, and the relevant stages of the project cycle (for example, preconstruction, construction, operation, and decommissioning or closure and reinstatement).
- Environmental and social issues associated with activities or facilities which are not part of the project, but which may be directly or indirectly influenced by the project, exist solely because of the project or could present a risk to the project. These associated activities or facilities may be essential for the viability of the project and may either be under the control of the client or carried out by, or belong to, third parties.
- Cumulative impacts of the project in combination with impacts from other relevant past, present and reasonably foreseeable developments as well as unplanned but predictable activities enabled by the project that may occur later or at a different location.

As part of the ESIA process conducted for the Project, an ESIA Study Area covering the Project Impact Area has been defined so as to ensure that the Project impacts are thoroughly assessed and managed. For each environmental and social component assessed, specific study areas have been identified and described in respective chapters of this ESIA Report. Direct physical impacts of the construction activities will be restricted to the License Area. The specific study areas identified for the assessment of biodiversity, socio-economic environment, cultural heritage, noise, air quality as well as the cumulative impacts are summarised below and shown on the map presented in Figure 4-1.

The terrestrial flora and fauna experts have conducted field surveys within the study area they identified within the boundaries of the License Area. The vantage points for the bird surveys have been selected within the License Area and observations have been made by the field experts at these vantage points. Bat detectors for the static acoustic surveys have also been installed at suitable locations identified by the field experts.

- Socio-economic field surveys with the local communities and people affected from land acquisition were conducted at Kiyikoy and Kislacik settlements. Social surveys and interviews were also performed with the governmental stakeholders located in Kırklareli province and the Vize district. The surveys and interviews were extended to the adjacent Edirne province to cover related non-governmental stakeholders.
- Archaeological field surveys were conducted by the experts within the License Area, at the footprint of the Project units (e.g. turbine foundations, access road routes). Intangible cultural heritage surveys and interviews were conducted in Kiyikoy, Kislacik, Hamidiye and Aksicim.
- For the air quality modelling, a study area of 7.5 km x 7.5 km has been selected and the baseline measurements were conducted at the receptors identified in consideration of the potential emission sources during the construction and operation phases of the Project.
- Noise modelling and assessments have been conducted for the Noise Sensitive Receptors (NSRs) selected within and in close vicinity of the License Area and along the main site access road.
- Cumulative Impact Assessment (CIA) area has been identified as a significantly larger area than the study areas identified for the assessment of Project-level impacts for each environmental and social component. The present and reasonably foreseeable developments and the valued environmental and social components (VECs) within 30 km from the boundaries of the License Area have been searched and taken into consideration in the CIA Study presented in Chapter 16 ("Cumulative Impact Assessment").

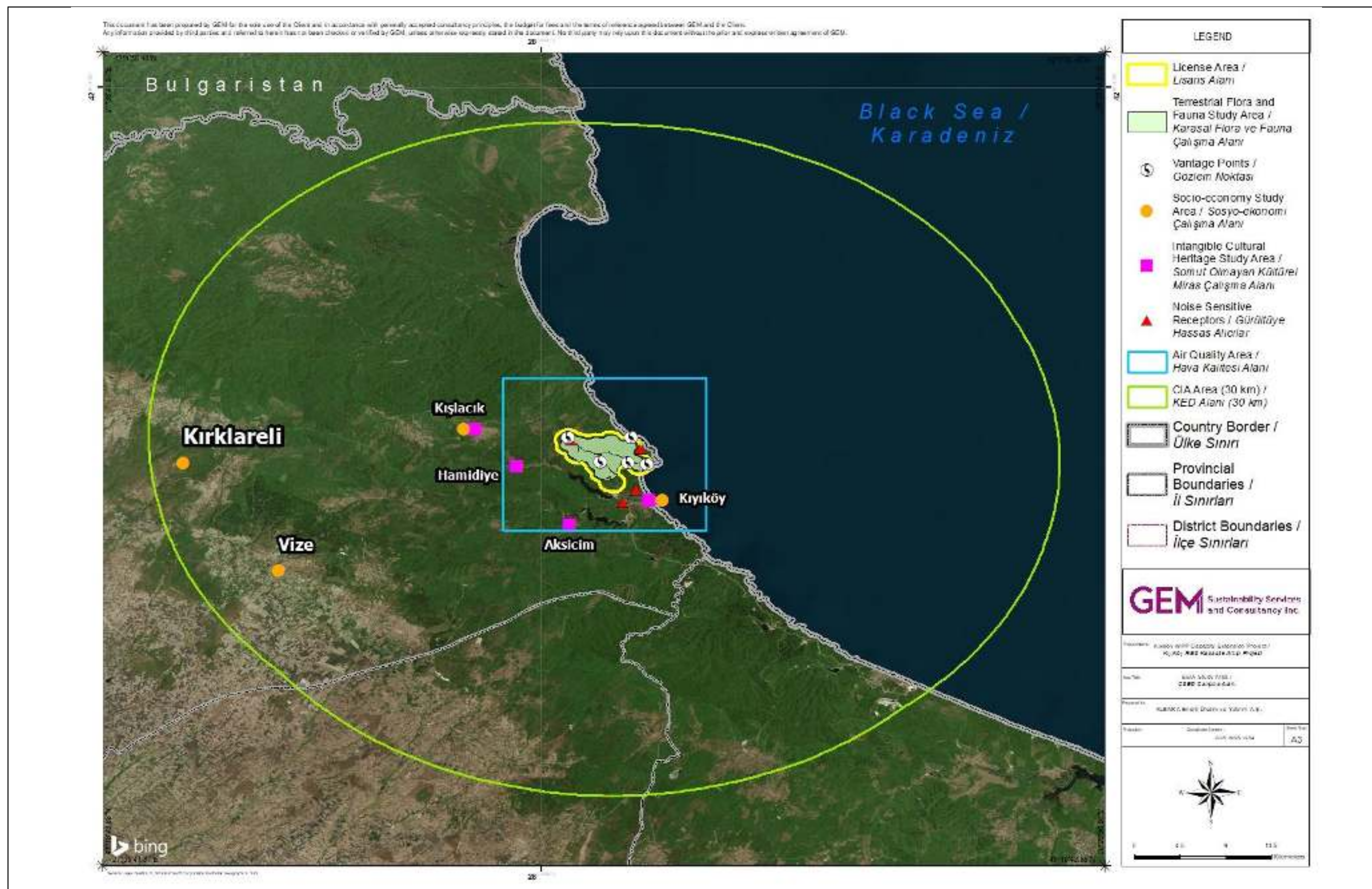


Figure 4-2. ESIA Study Area

4.4. Structure of the ESIA Report

The general outline of the ESIA Report is given in Table 4-5 to cover all the key environmental and social subjects relevant to the Project.

Table 4-5. General Outline of the ESIA Report

| Chapter No | Chapter Title |
|------------|---|
| | Executive Summary |
| Chapter 1 | The Project |
| Chapter 2 | Institutional and Legal Framework |
| Chapter 3 | Project Alternatives |
| Chapter 4 | E&S Impact Assessment Methodology |
| Chapter 5 | Land Use |
| Chapter 6 | Noise |
| Chapter 7 | Air Quality and Greenhouse Gas Emissions |
| Chapter 8 | Water and Wastewater Management |
| Chapter 9 | Waste Management |
| Chapter 10 | Biodiversity |
| Chapter 11 | Visual Impact Assessment |
| Chapter 12 | Socio-economy |
| Chapter 13 | Labour and Working Conditions |
| Chapter 14 | Community Health and Safety |
| Chapter 15 | Cultural Heritage |
| Chapter 16 | Cumulative Impact Assessment |
| Chapter 17 | Stakeholder Engagement |
| Chapter 18 | Environmental and Social Management System (ESMS) |

The ESMS ("Chapter 18") includes the Environmental and Social Management and Monitoring Plan (ESMMP) that lists all the commitments and management measures proposed throughout the ESIA Report, with monitoring provisions and key indicators for successful implementation defined.

5. LAND USE

The majority of the License Area consists of state-owned forest land, where there are patches of parcels registered as agricultural, pasture, raw soil. The lands required for the construction and operation of the existing Kiyikoy WPP had already been acquired and the land use characteristics have already changed at the footprints of the existing Project units. This Chapter sets out the baseline characteristics of the lands corresponding to the Project License Area and footprints of Capacity Extension Project units. It further assesses the changes that have occurred as a result of the construction of existing Project units and that will occur as a result of the construction activities of Capacity Extension Project units and the measures to be taken to mitigate the impacts. The operation activities will not cause any additional change in the land use. The potential social impacts of the Project on the existing landowners and users due to land acquisition and change in the use of corresponding lands are discussed in Chapter 12 ("Socio-economy").

5.1. Project Standards

As the land to be acquired for the Capacity Extension Project (turbines and access roads) includes state-owned forest as well as parcels registered agricultural and pasture parcels, the Project will be subject to the relevant processes and permits required by the follows national laws:

- Forestry Law (No. 6831)
- Law on Soil Conservation and Land Use (No. 5403)
- Pasture Law (No. 4342)

The Preliminary Forestry Permit has been obtained from the Ministry of Agriculture and Forestry, General Directorate of Forestry in April 2019 for 18 of the new turbines (except T15 and T31). The Preliminary Forestry Permit application has been made for T15 and T31 and the process is on-going as of September 2019¹³.

Expropriation of the privately-owned agricultural parcels will be conducted by the related governmental authorities as per the requirements of the Expropriation Law (No. 2942). The Project will aim to meet the requirements of EBRD PR5 on Land Acquisition, Involuntary Resettlement and Economic Displacement for the compensation and mitigation of land acquisition related socio-economic impacts as discussed in Chapter 12 ("Socio-economy") of this ESIA Report. A Livelihood Restoration Plan (LRP) has been developed for the Project as part of the ESIA Disclosure Package. The LRP will be implemented by the Project Company. Should the Project require relocation of houses for the mitigation of E&S impacts in order to ensure compliance with EBRD PRs, the livelihood compensation and/or assistance measures specified in this LRP will be incorporated into a Resettlement Action Plan (RAP) that will address and compensate the impacts associated with physical displacement.

The management of impacts on the biodiversity components, which will be meet the objectives and requirements of EBRD PR 6 on "Biodiversity Conservation and Sustainable Management of Living Natural Resources", will further support rehabilitation of affected lands as it will aim restoration of the degraded habitats as a result of the Project's construction activities.

Conservation of the soils corresponding to the lands to be acquired and used as part of the Project will be subject to the provisions of the Turkish Regulation on Soil Pollution Control and Contaminated Sites by Point Sources. The structural stability of the Project units will meet the requirements of the Regulation on Structures in Natural Hazard Areas and Regulation on Building Constructions in Earthquake Zones.

¹³ The Project Company initially considered 21 turbines, but the technological advancements have allowed the Company to build and operate this additional capacity with 20 turbines, each having a capacity of 3.6 MWm. Thus, the permitting process has been executed for 20 turbines.

5.2. Baseline Conditions

The baseline conditions of the land use characteristics within the License Area have been analysed by using Geographic Information System (GIS) tools based on the following main data sources:

- The land cover database of the Coordination of Information on the Environment (CORINE, 2012);
- The public information system of the General Directorate of Land Registry and Cadastre;
- Non-agricultural Permit Query Database of the Ministry of Agriculture and Forestry;
- 1/25.000 scale Forest Stand Data Map issued by the Istanbul Regional Directorate of Forestry, Vize Directorate of Forestry, Midye Sub-directorate of Forestry.

5.2.1. Land Cover Types According to CORINE

The CORINE land cover distribution of the License Area is presented in Table 5-1. The majority of the License Area (96%) is covered with broad-leaved forests. The map showing the land cover distribution within the License Area is presented in Figure 5-1.

Table 5-1. Land Cover Distribution within the License Area

| Level 1 | Level 2 | Level 3 | Area (ha) | Percent (%) |
|-------------------------------|--|---|----------------|---------------|
| Agricultural areas | 2.4. Heterogeneous agricultural areas | 2.4.3. Land principally occupied by agriculture, with significant areas of natural vegetation | 42.9 | 1.8 |
| Forest and semi natural areas | 3.2. Scrub and/or herbaceous vegetation associations | 3.2.4. Transitional woodland-shrub | 32.6 | 1.3 |
| Forest and semi natural areas | 3.1. Forests | 3.1.1. Broad-leaved forest | 2,354.0 | 96.0 |
| Water bodies | 5.2. Marine waters | 5.2.3. Sea and ocean | 23.8 | 0.9 |
| Total | | | 2,453.3 | 100.00 |

5.2.2. Land Registry Status of Parcels Corresponding to the License Area

According to the public information system of the General Directorate of Land Registry and Cadastre, the majority of the License Area falls within a single state-owned forest parcel, whilst there are also patches of Treasury pastures and privately-owned agricultural parcels. Registered parcels corresponding to the License Area are listed in Table 5-2.

Table 5-2. Registered Parcels Corresponding to the License Area

| Registry Settlement | Number of Parcel | Type of Parcel (as specified in the Land Registry System) | Area (m ²) |
|---------------------|------------------|---|------------------------|
| Kislacik | 101/93 | Woodland | 986.11 |
| | 101/103 | Woodland | 10,741.51 |
| | 101/113 | Woodland | 4,277.57 |
| | 101/200 | Agricultural land and masonry barn | 7,672.13 |
| | 101/203 | Agricultural land | 5,579.13 |
| | 101/204 | Agricultural land | 5,986.68 |
| | 101/205 | Agricultural land and masonry barn | 4,242.99 |
| | 101/206 | Agricultural land | 5,025.71 |
| | 101/207 | Agricultural land | 9,441.75 |
| | 101/208 | Agricultural land | 4,345.56 |
| | 101/209 | Agricultural land | 6,997.59 |
| | 101/211 | Agricultural land | 7,173.13 |
| | 101/126 | Agricultural land | 1,457.31 |
| | 101/196 | Agricultural land | 16,351.28 |
| | 101/201 | Agricultural land | 40,000.00 |
| | 101/210 | Agricultural land and masonry building | 30,857.09 |
| | 101/212 | Agricultural land | 22,169.49 |
| | 101/200 | Agricultural land and masonry barn | 7,672.13 |
| | 101/202 | Agricultural land | 5,804.26 |
| | 101/226 | Agricultural land | 32,137.51 |
| | 101/246 | State forest land | 42,138,188.19 |
| Kiyikoy | 318/1 | Pasture | 55,052.00 |
| | 319/1 | Pasture | 44,981.00 |
| | 325/1 | State forest land | 42,301,511.49 |
| | 387/1 | Agricultural land | 4,547.26 |

5.2.3. Land Use Capability Classes of Agricultural Parcels to be Acquired

The land use capability classes of the agricultural parcels being acquired for the Capacity Extension Project have been determined based on the Non-agricultural Permit Query Database of the Ministry of Agriculture and Forestry (see listed in Table 5-3). Both parcels 129/27 and 129/31 have the land use capability class of VII, which represents the soils that are not feasible for agricultural activities and have only limited suitability for pasture (referred to as weak pasture) or afforestation purposes as they have limitations caused by shallow soil features, stone content, inclination and erosion. According to the Non-agricultural Permit Query Database of the Ministry of Agriculture and Forestry, the thickness of the topsoil on the agricultural lands is below 20 cm.

Table 5-3. Land Use Capability Classes of the Agricultural Parcels subject to Project-related Land Acquisition

| Parcel no. | Registry Settlement | Type of Parcel (as specified in the Land Registry System) | Area (m ²) | Land Use Capability Class |
|------------|---------------------|---|------------------------|---------------------------|
| 129/27 | Kiyikoy | Agriculture | 4,560.00 | Class VII |
| 129/31 | Kiyikoy | Agriculture | 1,242.00 | Class VII |
| 101/206 | Kislacik | Agriculture | 5,025.71 | N/A** |

*Source: Non-agricultural Permit Query Database of the Ministry of Agriculture and Forestry.

The Non-agricultural Permit Query Database of the Ministry of Agriculture and Forestry specifies 11/206 as a non-agricultural parcel.

As part of the ESIA surveys, the topsoil thickness for the forest lands within the License Area have been identified by the flora expert as approximately 30 cm.

5.2.4. Forestry Stand Status According to Forest Stand Data Map

According to the 1/25.000 scale Forest Stand Data Map issued by the Istanbul Regional Directorate of Forestry, Vize Directorate of Forestry, Midye Sub-directorate of Forestry, the majority of the License Area correspond to the areas reserved by the forestry authorities for forestry maintenance. The Forestry Stand Map of the License Area is presented in Figure 5-2.

The functions of the forests are divided into three category as economic, ecological and socio-cultural. The Kiyikoy WPP License Area corresponds to mainly Forest Products Production Function, partly Hydrological Function and very finitely Nature Protection Function. Forests with economic functions serve for forestry product production. The Forestry Function Map of the License Area is presented in Figure 5-3.

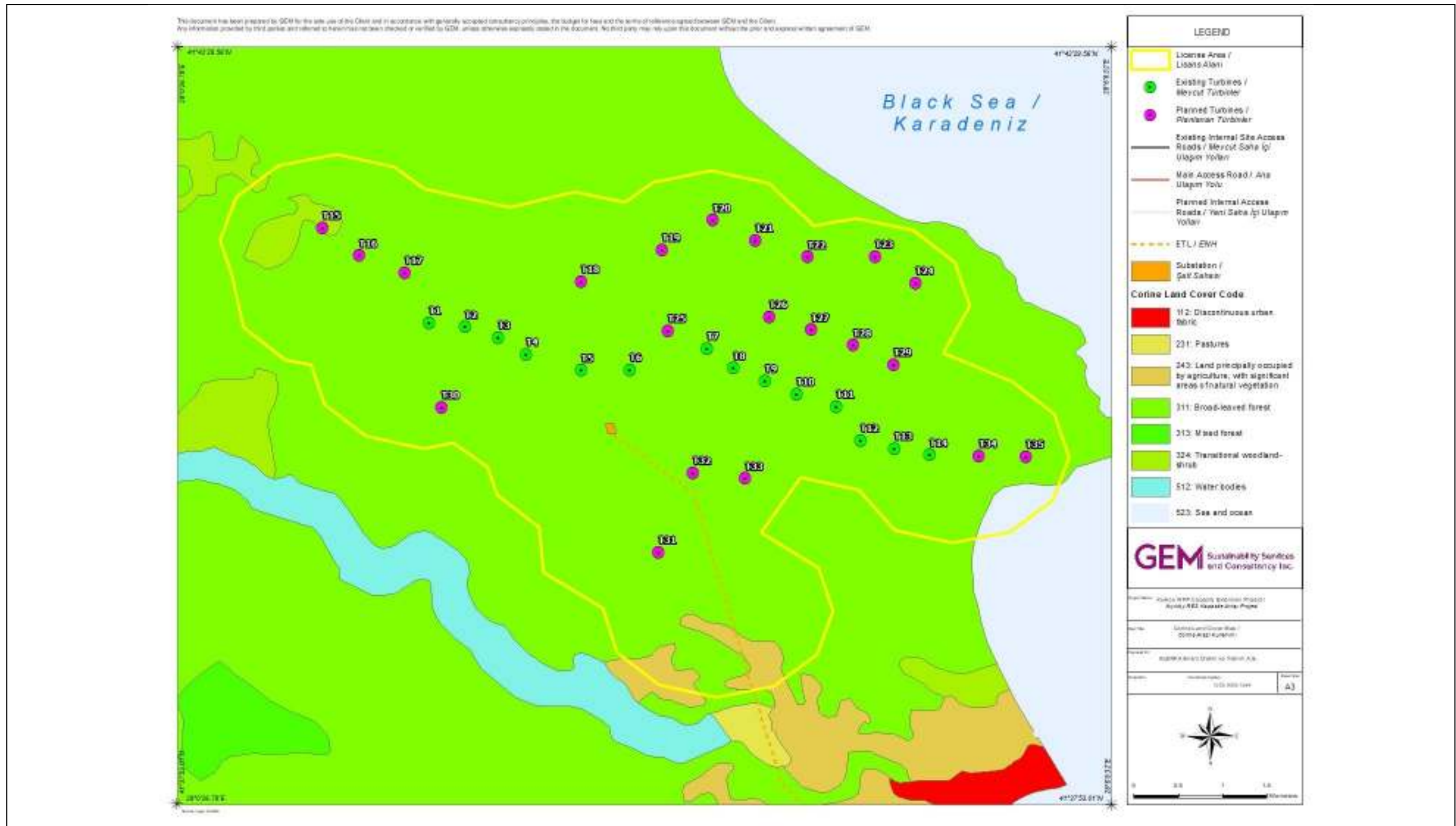


Figure 5-1. CORINE Land Cover Distribution within the License Area

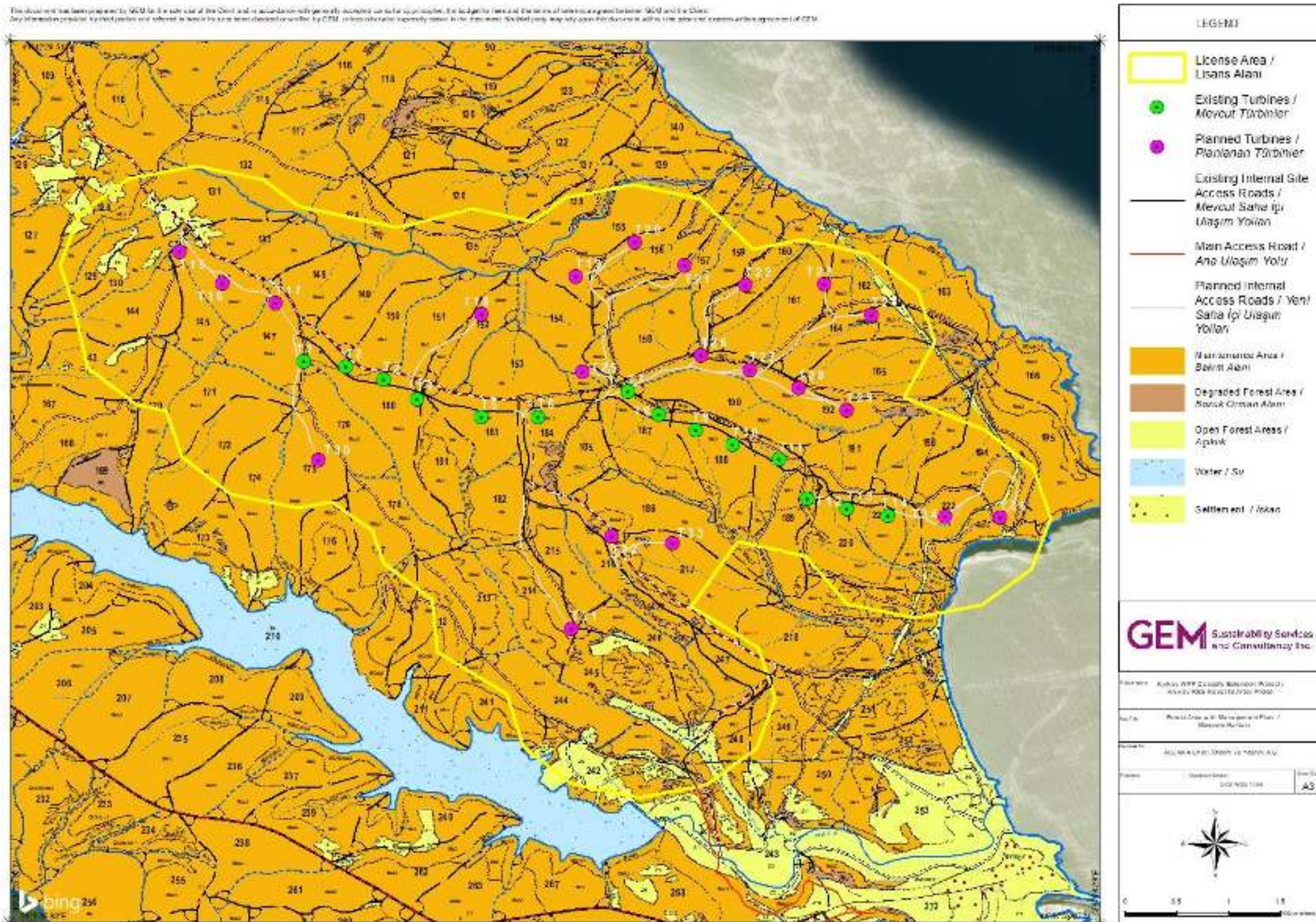


Figure 5-2. Forestry Stand Map of the License Area

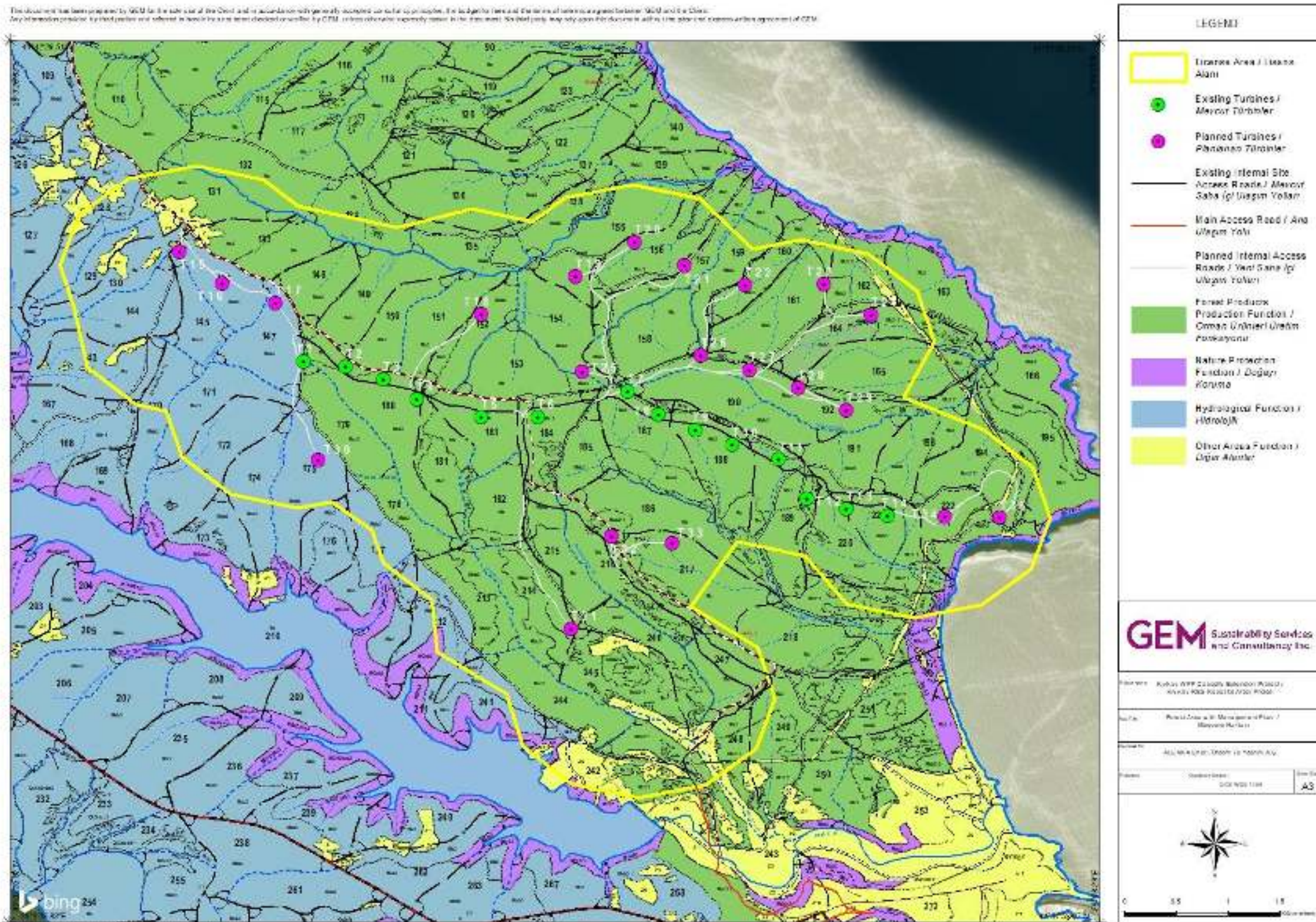


Figure 5-3. Forestry Function Map of the License Area

5.3. Impact Assessment and Management

This section of the ESIA Report assesses the potential impacts of the Project on the land use and soils in accordance with the methodology defined in Chapter 4 ("ESIA Methodology"). The magnitude of change for impacts on forest and agricultural lands has been determined based on professional judgement by the aid of GIS analysis. The specific sensitivity criteria used for the evaluation of resources have been developed in consideration of the definitions present in the national legislation (see Table 5-4).

Table 5-4. Criteria for the Sensitivity of Resources

| High | Medium | Low | Negligible |
|---|---|--|--|
| Forests with ecological functions according to the related Forestry Management Plan | Forests with social and cultural functions according to the related Forestry Man. Plan | Forests with economic functions according to the related Forestry Management Plan | Open areas or degraded forests |
| Agricultural lands suitable for agricultural soil cultivation | Agricultural lands suitable for agricultural soil cultivation | Agricultural lands not suitable for soil cultivation | Non-arable lands |
| <i>(Class I-II soils according to Non-agricultural Permit Query Database of the Ministry of Agriculture and Forestry)</i> | <i>(Class III-IV soils according to Non-agricultural Permit Query Database of the Ministry of Agriculture and Forestry)</i> | <i>(Class V-VII soils according to Non-agricultural Permit Query Database of the Ministry of Agriculture and Forestry)</i> | <i>(Class VII soils according to Non-agricultural Permit Query Database of the Ministry of Agriculture and Forestry)</i> |
| Pastures with intensive capacity | Pastures with moderate capacity | Weak pastures | |
| <i>(Class V soils according to Non-agricultural Permit Query Database of the Ministry of Agriculture and Forestry)</i> | <i>(Class VI soils according to Non-agricultural Permit Query Database of the Ministry of Agriculture and Forestry)</i> | <i>(Class VII soils according to Non-agricultural Permit Query Database of the Ministry of Agriculture and Forestry)</i> | |

5.3.1. Land Preparation and Construction Phase

The lands required for the construction and operation of the existing Kiyikoy WPP had already been acquired and the land use characteristics have already changed at the footprints of the existing Project units, including the main access road, 14 turbines, associated internal site access roads, and the substation site. The Capacity Extension Project will further change the land use characteristics at the footprint of the Capacity Extension Project units due to the construction of 21 turbines¹⁴ and new site access roads.

The Capacity Extension Project will primarily use the current main access road, substation and ETL of the existing Kiyikoy WPP. This avoids any additional impact that would be caused by construction of related units. The underground cables to be used for transmission of energy to be generated by the turbines will be placed in the trenches to be excavated along the routes of the internal site access roads (under the drainage channels or the road) , thus the affected area will be limited to the footprint area of the site access roads.

¹⁴ The Project Company initially considered 21 turbines, but the technological advancements have allowed the Company to build and operate this additional capacity with 20 turbines, each having a capacity of 3.6 MWm. The ESIA assessments have been made for 21 turbines in order to represent the worst case conditions.

The area to be affected at each turbine platform will be approximately 0.64 ha, which will include the footprints of the turbine foundation (approximately 25 m diameter), steel turbine tower base (approximately 5 m diameter) tower stockyard, blade stockyard, crane pad site, and the related part of the access road) (see Figure 5-4).



Figure 5-4. Representative Layout for Turbine Foundations

The footprint areas of the Existing Kiyikoy WPP and Capacity Extension Project units are summarised in Table 5-5. A detailed distribution of each unit within the corresponding CORINE land covers is further provided in Table 5-6. The summary of the footprint areas of the Existing Kiyikoy WPP and Capacity Extension Project units is provided in Table 5-7.

Table 5-5. Area of the Footprint of Existing Kiyikoy WPP and Capacity Extension Project Units

| Project Units | Area of Existing WPP Project Units (ha) | Area of Capacity Extension Project Units (ha) | Cumulative Area (ha) |
|----------------------------|---|---|----------------------|
| Turbines | 4.5 | 13.4 | 17.9 |
| Internal Site Access Roads | 8.1 | 12.5 | 20.5 |
| Substation | 0.8 | 0.0 | 0.8 |
| Total | 13.4 | 25.9 | 39.3 |

**Minor digit differences are caused by rounding.*

Table 5-6. Detailed Land Use Characteristics at the Footprint of Project Units (according to CORINE 2012)

| Project Units | Type of Unit | No | Corine Code | Level 1 | Level 2 | Level 3 | Area (Hectare) |
|--------------------|--------------------|-----|----------------------------------|--|------------------------------------|----------------------------|----------------|
| Turbines | Existing | T1 | 311 | 3. Forest and semi natural areas | 3.1. Forests | 3.1.1. Broad-leaved forest | 0.2 |
| | | T2 | | | | | 0.3 |
| | | T3 | | | | | 0.3 |
| | | T4 | | | | | 0.3 |
| | | T5 | | | | | 0.4 |
| | | T6 | | | | | 0.3 |
| | | T7 | | | | | 0.3 |
| | | T8 | | | | | 0.2 |
| | | T9 | | | | | 0.3 |
| | | T10 | | | | | 0.3 |
| | | T11 | | | | | 0.5 |
| | | T12 | | | | | 0.4 |
| | | T13 | | | | | 0.4 |
| | | T14 | | | | | 0.4 |
| | Sub-total Existing | | | | | | |
| Capacity Extension | T15 | 324 | 3. Forest and semi natural areas | 3.2. Scrub and/or herbaceous vegetation associations | 3.2.4. Transitional woodland-shrub | 0.64 | |
| | T16 | 311 | 3. Forest and semi natural areas | 3.1. Forests | 3.1.1. Broad-leaved forest | 0.64 | |
| | T17 | | | | | 0.64 | |
| | T18 | | | | | 0.64 | |
| | T19 | | | | | 0.64 | |
| | T20 | | | | | 0.64 | |
| | T21 | | | | | 0.64 | |
| | T22 | | | | | 0.64 | |
| | T23 | | | | | 0.64 | |
| | T24 | | | | | 0.64 | |
| | T25 | | | | | 0.64 | |
| | T26 | | | | | 0.64 | |
| | T27 | | | | | 0.64 | |
| | T28 | | | | | 0.64 | |

| Project Units | Type of Unit | No | Corine Code | Level 1 | Level 2 | Level 3 | Area (Hectare) |
|--------------------|------------------------------|-----|----------------------------------|--|---|---------|----------------|
| | | T29 | | | | | 0.64 |
| | | T30 | | | | | 0.64 |
| | | T31 | | | | | 0.64 |
| | | T32 | | | | | 0.64 |
| | | T33 | | | | | 0.64 |
| | | T34 | | | | | 0.64 |
| | | T35 | | | | | 0.64 |
| | Sub-total Capacity Extension | | | | | | 13.4 |
| Turbines Total | | | | | | 17.9 | |
| Access Roads | Existing WPP | 243 | 2. Agricultural areas | 2.4. Heterogeneous agricultural areas | 2.4.3. Land principally occupied by agriculture, with significant areas of natural vegetation | 0.5 | |
| | | 311 | 3. Forest and semi natural areas | 3.1. Forests | 3.1.1. Broad-leaved forest | 7.6 | |
| | Sub-total Existing | | | | | | 8.1 |
| | Capacity Extension | 311 | 3. Forest and semi natural areas | 3.1. Forests | 3.1.1. Broad-leaved forest | 12.1 | |
| | | 324 | 3. Forest and semi natural areas | 3.2. Shrub and/or herbaceous vegetation associations | 3.2.4. Transitional woodland-shrub | 0.4 | |
| | Sub-total Capacity Extension | | | | | | 12.5 |
| Access Roads Total | | | | | | 20.5 | |
| Substation | Existing WPP | 311 | 3. Forest and semi natural areas | 3.1. Forests | 3.1.1. Broad-leaved forest | 0.8 | |
| | Sub-total Existing | | | | | | 0.8 |
| Substation Total | | | | | | 0.8 | |
| Cumulative | | | | | | 39.3 | |

*Minor digit differences are caused by rounding.

Table 5-7. Summary of the Land Use at the Footprint of Project Units (according to CORINE 2012)

| Project Units | Exiting Kiyikoy WPP Project Footprint Area (ha) | | | Capacity Extension Project Footprint Area (ha) | | | Cumulative Area (ha) | | | |
|---------------|---|---|-------------|---|--|-------------|---|---|--|-------------|
| | Agriculture (2.4.3. Land principally occupied by agri., with sig. areas of nat. veg.) | Forests (3.1.1. Broad-leaved forest) | Total | Forests (3.1.1. Broad- leaved forest) | Shrubs (3.2.4. Transitional woodland- shrub) | Total | Agriculture (2.4.3. Land principally occupied by agri., with sig. areas of nat. veg.) | Forests (3.1.1. Broad-leaved forest) | Shrubs (3.2.4. Transit. woodland- shrub) | Total |
| Turbines | 0.0 | 4.5 | 4.5 | 12.8 | 0.6 | 13.4 | 0.0 | 17.3 | 0.6 | 17.9 |
| Access Roads | 0.5 | 7.6 | 8.1 | 12.1 | 0.4 | 12.5 | 0.5 | 19.7 | 0.4 | 20.5 |
| Substation | 0.0 | 0.8 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.8 |
| Total | 0.5 | 13.0 | 13.5 | 24.9 | 1.0 | 25.9 | 0.5 | 37.8 | 1.0 | 39.3 |

*Minor digit differences are caused by rounding.

The Project areas (two parcels at the footprint of T15) corresponding to transitional woodland-shrubs in the CORINE land cover system are registered as pasture in the public information system of the General Directorate of Land Registry and Cadastre.

There are only two registered pasture parcels on the main access road, which will be acquired to ensure necessary traffic safety for the transportation of heavy plant equipment. These lands correspond to lands principally occupied by agricultural, with significant areas of natural vegetation.

The affected areas of these agricultural and pasture parcels are listed in Table 5-8.

Table 5-8. Affected Areas of the Agricultural and Pasture Parcels being Acquired by the Project

| Parcel no. | Registry Settlement | Type of Parcel (as specified in the Land Registry System) | Total Parcel Area (m ²) | Affected Parcel Area (m ²) | Percentage of the Affected Area of the Parcel (%) | Project Unit that requires Acquisition of the Parcel |
|------------|---------------------|---|-------------------------------------|--|---|--|
| 129/27 | Kiyikoy | Agriculture | 4,560.00 | 2,005.17 | 44.0 | Main access road |
| 129/31 | Kiyikoy | Agriculture | 1,242.00 | 1,126.91 | 90.7 | Main access road |
| 101/206 | Kislacik | Agriculture | 5,025.71 | 2,357.90 | 46.9 | T15 |
| 319/1 | Kislacik | Pasture | 44,981.00 | 11,804.08 | 26.2 | T15 |

Prior to the start of earthworks and construction activities at each work site, the vegetation (e.g. grass, brushes, trees) and topsoil will be stripped.

The Project has obtained the Preliminary Forestry Permit from the Ministry of Agriculture and Forestry, General Directorate of Forestry in April 2019 for 18 of the new turbines (except T15 and T31) and made application for T15 and T31¹⁵. The number of trees to be logged will be determined by the forestry authorities as part of the national permitting process. As discussed earlier in Section 5.2.4, the Kiyikoy WPP License Area, thus the Capacity Extension Project units, corresponds mainly to areas designated by the related Regional Directorate of the Forestry with the Forest Products Production Function. Thus, tree logging activities are systematically carried out within the License Area at the divisions identified and scheduled by the forestry authorities as part of their maintenance program. This aims ensuring healthy growth of the forests, as well as meeting social needs of the communities.

The Project Company will implement the actions defined in the Project Biodiversity Action Plan (BAP) and the Habitat Restoration (Rehabilitation) Plan to ensure that the Project-related impacts on the affected habitats are mitigated/compensated in accordance with the objectives of EBRD PR6. Detailed description of the biodiversity management measures is provided in Chapter 10 ("Biodiversity").

Topsoil Management

As identified in previously Section 5.2.3, the agricultural parcels to be acquired as part of the Project are composed of Class VII soils, which are not suitable for agricultural activities. Topsoil thickness has been identified as 20 cm for the agricultural and pasture parcels and 30 cm for the forest parcels corresponding to the footprint of the Project units. For the sake of worst-case calculations, it has been assumed in this ESIA that all the footprint areas of the Capacity Extension Project units correspond to lands with topsoil thickness of approximately 30 cm.

¹⁵ The Project Company initially considered 21 turbines, but the technological advancements have allowed the Company to build and operate this additional capacity with 20 turbines, each having a capacity of 3.6 MWm. Thus, the permitting process has been executed for 20 turbines.

The estimated volume of topsoil to be stripped at the footprint of the Capacity Extension Project units ("affected area") is provided in Table 5-9.

Table 5-9. Estimated Volume of the Topsoil to be Stripped

| Size of the Affected Area (ha) | Thickness of Topsoil Corresponding to the Affected Area (cm) | Estimated Volume of Topsoil to be Stripped from the Affected Area (m3) |
|--------------------------------|--|--|
| 24.9 | 30 cm | 77,700 |

The stripped topsoil will be temporarily stored at designated locations close to the turbine platforms, separate from the subsoil. The following topsoil management measures will be taken:

- Storage areas for temporary topsoil storage will be selected at locations with low slopes (less than 5%) and sparse vegetation, where possible.
- The height of the topsoil stockpiles will not exceed 1.5 meters (which requires approximately 5 ha total surface area for topsoil storage sites, which can be provided at multiple locations within the License Area)
- Where possible, it will be ensured that topsoil storage durations do not exceed three months.
- In case of longer storage durations, the upper part of the fertile soil will be maintained fertile by using suitable species and seed mixture ratios where necessary.
- For the flora species (*Crocus olivieri* subsp. *Istanbulensis*) that requires conservation, the topsoil stripping, storage and reinstatement will be provided in line with the Project BAP.
- Topsoil storage areas will be provided with drainage by means of open channels.
- Topsoil will be reused for the rehabilitation of the construction sites.
- Subject to Forest Authorities' approval, if there is an excess of topsoil, farmers in Kiyikoy and Kislacik will be consulted to identify their potential needs for topsoil. The PAPs affected by the Project-related land acquisition will be prioritised.

5.3.2. Operation Phase

The operation activities of the Project will not cause any additional impact on the existing land use characteristics. There will be no impact on soil quality under normal operation conditions. In case of potential spill and/or leakage incidents, which are evaluated to be unlikely as the Project's use of chemicals will be limited during the operation period, the measures defined in the Project Emergency Preparedness and Action Plan will be taken.

5.3.3. Closure Phase

During the closure phase, the Project units will be decommissioned and dismantled as per the state-of-the-art technologies and in line with the future legislative requirements in force. The footprints of the operational Project units (e.g. turbine foundations, access roads, substation site, etc.) will be rehabilitated in consultation with the governmental authorities and local communities.

5.3.4. Impact Significance, Management and Residual Impacts

The potential Project impacts, proposed mitigation measures and residual impact significances are summarized in Table 5-10.

Table 5-10. Impacts, Proposed Mitigation Measures and Residual Impacts (Land Use)

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|------------------------------|-----------------------------------|---|------------------|---------------------------------|---------------------------------------|------------|-----------|----------------------|---|--|---|--|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| Impact on forest land | Land preparation and construction | Forest parcel no. 325/1 in Kiyikoy Forest parcel no. 101/246 in Kislacik | Restricted | Low (24.9 ha) | Irreversible/ Long term reversible | Long term | One-off | Medium | Low (Economic Function) | Minor | <ul style="list-style-type: none"> Implement Biodiversity Action Plan Implement Habitat Restoration (Rehabilitation) Plan | <ul style="list-style-type: none"> Minor |
| Impact on agricultural lands | Land preparation and construction | Parcel no.129/27 Parcel no.129/31 | Restricted | Low (0.5 ha) | Irreversible/ Long term reversible | Long term | One-off | Medium | Low (Class VII soil) | Minor | <ul style="list-style-type: none"> Implement Livelihood Restoration Plan (LRP) | <ul style="list-style-type: none"> Negligible |
| Impact on pasture | Land preparation and construction | Parcel 101/206 | Restricted | Low (0.5 ha) | Irreversible/ Long term reversible | Long term | One-off | Medium | Low (Class VII soil) | Minor | <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> Negligible |
| Topsoil stripping | Land preparation and construction | Topsoil corresponding to footprint areas of Project units | Restricted | Low (77,700 m ³) | Short-term reversible | Short term | One-off | Medium | Low (Class VII soil) | Minor | <ul style="list-style-type: none"> Storage areas for temporary topsoil storage will be selected at locations with low slopes (less than 5%) and sparse vegetation, where possible. The height of the topsoil stockpiles will not exceed 1.5 meters (which requires approximately 5 ha total surface area for topsoil storage sites, which can be provided at multiple locations within the License Area) Where possible, it will be ensured that topsoil storage durations do not exceed three months. In case of longer storage durations, the upper part of the fertile soil will be maintained fertile by using suitable species and seed mixture ratios where necessary. For the flora species (<i>Crocus olivieri</i> subsp. <i>Istanbulensis</i>) that requires conservation, the topsoil stripping, storage and reinstation will be provided in line with the Project BAP. Topsoil storage areas will be provided with drainage by means of open channels. Topsoil will be reused for the rehabilitation of the construction sites. Subject to Forest Authorities' approval, if there is an excess of topsoil, farmers in Kiyikoy and Kislacik will be consulted to identify their potential needs for topsoil. The PAPs affected by the Project-related land acquisition will be prioritised. | <ul style="list-style-type: none"> Negligible |

6. NOISE

This Chapter provides information on the background noise level at the receptors selected in and around the License Area, includes assessment of the potential construction and operation phase impacts on the noise sensitive receptors and describes the mitigation measures to be taken for the management of potential impacts on the noise sensitive receptors.

6.1. Project Standards

The Turkish Regulation on the Assessment and Management of Environmental Noise (RAMEN) provides limit values for the environmental noise during the construction and operation phase of the projects for receptor with different sensitivity levels for day-time (07:00-19:00), evening-time (19:00-23:00) and night-time (23:00-07:00).

The IFC General EHS Guidelines also provides noise guideline values separately for residential, institutional, educational receptors and industrial, commercial receptors for the daytime (07:00-22:00) and night-time (22:00-07:00). The IFC General EHS Guidelines: Environmental, Noise Management further states that the noise impacts should not exceed the levels provided in Table 1.7.1 of the Guidelines or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

The noise limits set by the above-mentioned standards have been considered and the most strict levels have been adopted as Project standards as presented in Table 6-1. It should be noted that the Project Standards for the operation phase reflect the guidelines values of IFC (2007).

Table 6-1. Noise Standards for Residential Receptors

| Time of the Day | Noise Limits for Residential Receptors* | | | Project Standards at Residential Receptors | |
|-----------------|---|----------------------------|-------------------------|--|-----------|
| | IFC EHS Guidelines (2007)* | Turkish RAMEN Construction | Turkish RAMEN Operation | Construction | Operation |
| Day-time | 55 dBA | 70 dBA | 65 dBA | 70 dBA | 55 dBA |
| Evening-time | - | - | 60 dBA | | |
| Night-time | 45 dBA | - | 55 dBA | | 45 dBA |

*Guidelines values are applicable to noise levels measured out of doors. Acceptable indoor noise levels for residential, institutional, and educational settings are provided by World Health Organisation (WHO) Guidelines, which recommends, at night-time, outside sound levels about 1 meter from facades of the living spaces should not exceed 45 dB LAeq, so that people may sleep with bedroom windows open (WHO, 1999).

6.2. Baseline Conditions

Background environmental noise levels were determined at four locations in line with ISO 1996-2: 2017 for outdoor noise measurement. Noise measurement data sheets including information on the measurement location, time period, microphone height and measurement results are presented in Appendix A.

Three of these receptors have been qualified as noise sensitive receptors (NSRs) as listed in Table 6-2. The fourth receptor proposed for measurement as part of Project's ESDD process was identified to be at an unused/unoccupied coastline outside the License Area Border, thus has been disqualified from the list of NSRs.

The measurement locations for the NSRs and the station located at the unused/unoccupied coastline are presented in Table 6-2.

Table 6-2. Noise Sensitive Receptors (NSR) Selected for Baseline Noise Measurements

| Station Code | Location (according to Land Registry) | | | Description of the Receptor | Closest Project Component | Distance to the Closest Project Unit |
|--------------|---------------------------------------|----------|--------------|--|---------------------------|---|
| | Province | District | Town/Village | | | |
| N-01 | Kirklareli | Vize | Kislacik | Noise sensitive receptor (residential receptor ¹⁶ , which is an isolated building located 6.5 km east of Kislacik village centre and surrounded by forests) | T15 | 210 m |
| N-02 | Kirklareli | Vize | Kiyikoy | Noise sensitive receptor (residential receptor, which is an isolated building located app. 1.2 km north-northeast of Kiyikoy centre) | T34 | 2,580 m |
| N-03 | Kirklareli | Vize | Kiyikoy | Noise sensitive receptor (residential receptor, which is an isolated building located app. 1 km west of Kiyikoy centre, on a parcel adjacent to the existing main access road of Kiyikoy WPP that is also used to access TurkStream construction site) | Main access road | On the main access road (existing) of Kiyikoy WPP |
| N-04 | Kirklareli | Vize | Kiyikoy | Unused/unoccupied coastline outside the License Area Border, where there are no buildings or structures, or beaches used temporarily or permanently | T21 | 800 m |

The measurements were conducted in April 2019 following a period of rainy season. Information on date, time and duration of the measurements are presented in Appendix A. The site measurement experts made their best efforts to reach the measurement locations selected. However, when the road conditions did not allow, the experts selected the most secure and suitable representative locations to set up the devices and conduct the measurements. The noise measurements at the NSRs, N-01, N-02 and N-03, were conducted for 48 hours as per the IFC General EHS Guidelines. N-04¹⁷ was initially planned to be at the coastline to the north-east of T21. However, due to extremely unfavourable soil conditions along the forest roads leading to safety risks¹⁸, it was not possible to access the planned location. Thus, the closest accessible point was renominated as N-04. Due to security concerns at the accessible point, measurement was conducted for an indicative period of one hour at this location. It should be noted that, as the initially planned location is an unused/unoccupied coastline outside the License Area border and as the indicative measurements conducted at the closest possible locations shows that the background noise levels are lower than the baseline levels identified at all other three locations, no further measurement was conducted at this location as it is not considered as a sensitive receptor.

¹⁶ The legal owner of the building lives at the centre of Kislacik. The legal owner of the building allowed a man living on his own to use this building for accommodation.

¹⁷ N-01 has not been qualified as an NSR, as the ESIA Consultant identified during the field surveys that it is an unused/unoccupied coastline where there is no receptor.

¹⁸ The site measurement team attempted to use two alternative forest roads to reach the pre-selected location of N-04 at the coastline. However, it was not possible to access the pre-selected location by these roads. A third alternative road, with a longer route was identified, which allowed the team to approach to the approximately 2 km southeast of the pre-selected location. Noise measurement was conducted at this point.

The baseline noise measurement results are given in Table 6-3. The exact noise measurement locations are given in Figure 6-2 and the photographs showing the noise measurement locations are presented in Figure 6-3.

Table 6-3. Baseline Noise Measurement Results at the NSRs

| NSR No. | Measurement Day | Measurement Results (dBA) | | | | |
|---------|-----------------|---------------------------|---------------------------|-------------------------|-----------------------|-------------------------|
| | | Turkish RAMEN | | | IFC | |
| | | Lday (07:00-19:00) | Levening (19:00-23:00) | Lnight (23:00-07:00) | Lday (07:00-22:00) | Lnight (22:00-07:00) |
| N-01 | Day 1 | 41.3 | 32.2 | 33.6 | 39.5 | 33.2 |
| | Day 2 | 39.8 | 31.2 | 34.6 | 37.4 | 34.1 |
| N-02 | Day 1 | 44.1 | 41.8 | 41.8 | 43.8 | 41.4 |
| | Day 2 | 42.3 | 39.7 | 38.7 | 41.5 | 37.9 |
| N-03 | Day 1 | 45.8 | 40.2 | 40.1 | 44.9 | 41.4 |
| | Day 2 | 46.3 | 40.4 | 40.7 | 45.4 | 41.2 |

*At N-04, the L_{day} was measured as 41.2 dBA.

Photographs showing the existing conditions of the residential building located 200 m north of T15 are presented in Figure 6-1.





Figure 6-1. Photographs Showing the Existing Conditions of the Residential Building located 200 m North of T15

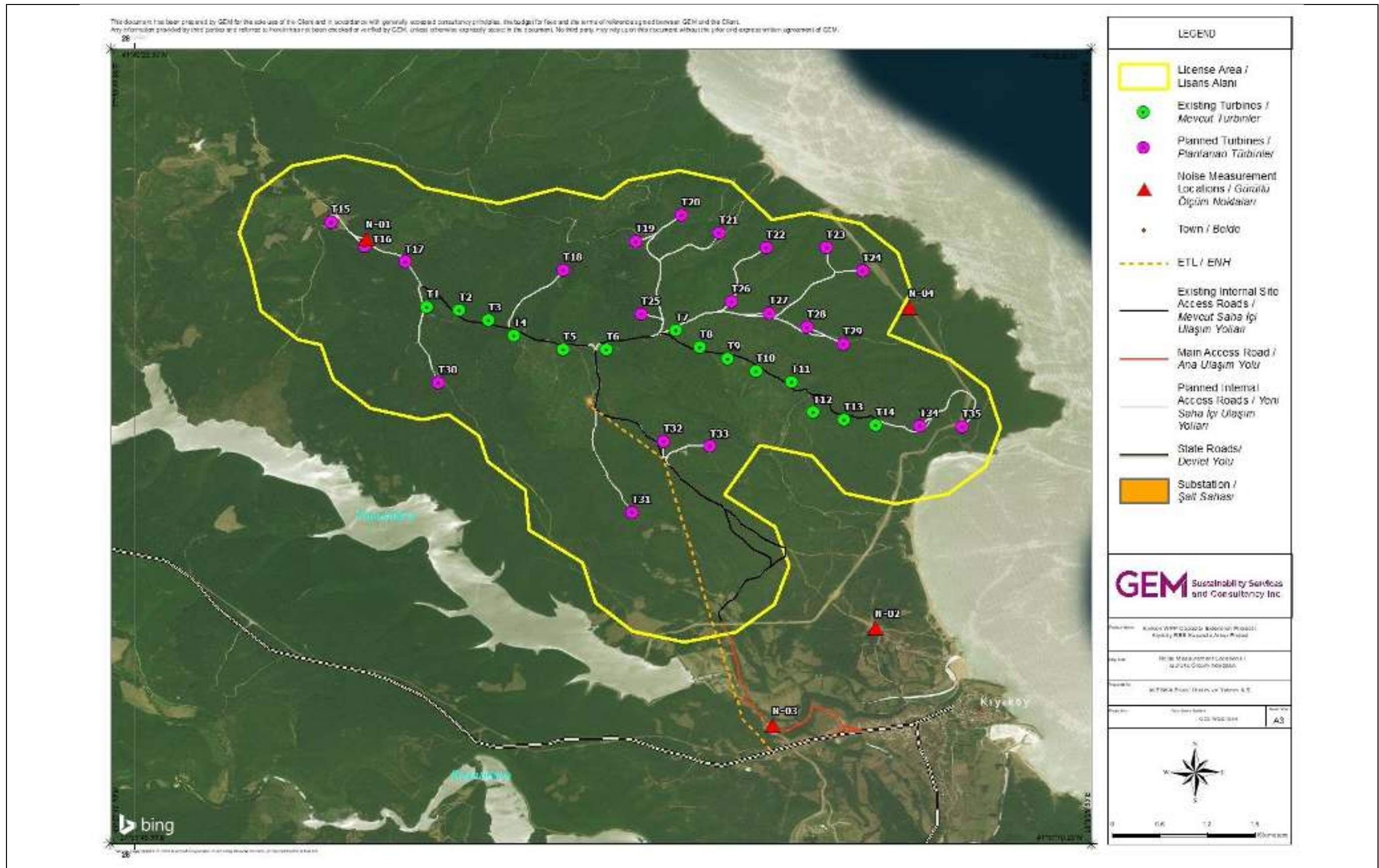


Figure 6-2. Noise Measurement Locations



Figure 6-3. Photographs Showing the Noise Measurement Locations

6.3. Impact Assessment and Management

This section of the ESIA Report assesses the potential impacts of the noise to be generated as a result of the construction activities and operation of the turbines in accordance with the methodology defined in Chapter 4 ("ESIA Methodology").

The specific sensitivity criteria used for the evaluation of noise receptors have been developed in consideration of the definitions provided in the Turkish RAMEN and GIPs and presented in Table 5-4.

Table 6-4. Criteria for the Sensitivity of Noise Receptors

| High | Medium | Low | Negligible |
|---|--|--|------------------|
| Areas mainly used by noise sensitive uses including educational, cultural and healthcare facilities and recreational/summer houses, camping sites | Areas dominated by residential buildings where workplaces/ commercial buildings are found together with noise sensitive uses | Areas dominated by workplaces/commercial buildings where commercial sites are found together with noise sensitive uses | Industrial areas |

The overall magnitude of each impact is estimated in line with the methodology defined in Chapter 4. The criteria for the magnitude of change component of the overall magnitude are provided in Table 6-5.

Table 6-5. Criteria for Magnitude of Change

| High | Medium | Low | Negligible |
|--|--|---|---|
| More than 10 dBA increase in background noise level in case of exceedence of Project Standards | 5-10 dBA increase in background noise level in case of exceedence of Project Standards | 3-5 dBA increase in background noise level in case of exceedence of Project Standards | Compliance with regulatory limits and less than 3 dBA increase in background noise levels |

6.3.1. Land Preparation and Construction Phase

The construction of the new internal site access roads and turbine foundations and platforms will result in generation of noise due to operation of relevant construction machinery and equipment. According to the planning as of September 2019, the land preparation and construction activities will be completed in 11 months. Activities at each turbine platform site are planned to be completed in 2 months, while activities at different sites will progress in parallel to each other.

The sound power levels and quantities for the construction machinery and equipment are provided in Table 6-6.

Table 6-6. Sound Power Levels for the Construction Machinery and Equipment

| Machine/Equipment | Quantity | Sound Power Level (Lw)* |
|-------------------|----------|-------------------------|
| Truck | 10 | 103.5 |
| Excavator | 5 | 104.5 |
| Grader | 2 | 104.5 |
| Roller | 2 | 101.5 |
| Street Sweeper | 2 | 93.5 |

*Taken from Roadway Construction Noise Model User's Guide (RCNM), US Federal Highway Administration

Cumulative Construction Noise Modelling

The construction phase noise has been modelled by using the software IMMI¹⁹ v2011-1 and v2016 premium noise model. As sound propagation is strongly affected by the terrain levels as obstacles, the construction phase noise model took the topographical conditions in and around the License Area into consideration. The ground topography data was from taken from Digital Elevation Model Dataset of NASA, Reverb Earth Science Discovery tool as shown in Figure 6-4.

Meteorological data for the modeling study (average relative humidity, average temperature, wind frequencies and directions) was obtained from the General Directorate of Meteorology. The analysis of the site wind speed data shows that the wind speed is between 7 – 9 m/s.

¹⁹ www.immi.eu

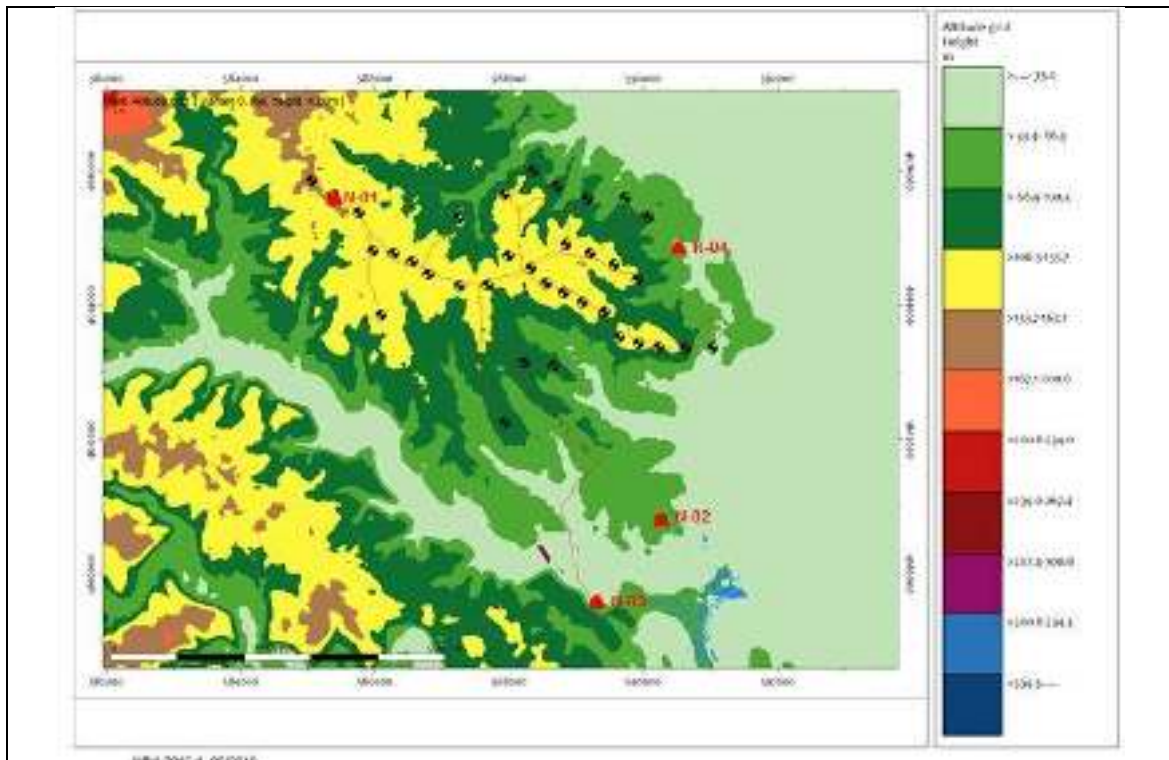


Figure 6-4. Model Area Topography

The sound power level (L_w) of each source is used in the noise model as given Table 6-6. Different types of noise sources can be used in the model including point, line and area sources. Because of the mobility and dynamic behaviors of the construction equipment, they are modeled as area sources.

Another important parameter for the noise model is the ground absorption (G). Ground absorption varies between 0 to 1 for hard - reflective surfaces and soft - absorptive surfaces, respectively. When calculating the noise propagation, G was assumed to be 0.9 due to heavy forest blanket.

Identification of the calculation area is critical for the noise model. This area was determined as wide as possible such that the noise emission levels at the source will diminish to a level which is lower than the lowest possible background noise level. Through this method, the calculations continue to an extent that the impact of any noise would be negligible as per both RAMEN and IFC.

The construction activities will be conducted during the daytime period specified by Turkish RAMEN. Even though the construction activities will take place at different locations with different set of equipment at the work sites within the License Area, it has been assumed that the construction noise sources operate simultaneously at each construction site. In addition, access road has also been considered in the noise model to predict transportation noise emitted by the mobile vehicles. It has been assumed that all the trucks work homogeneously during the working hours and throughout the License Area and the main access road. This leads to a traffic load of approximately one truck per hour two hours with speed of 50 km/h on a rough structured pavement road surface.

Construction phase noise modelling results at the NSRs are given in Table 6-7. Construction phase noise modelling results at each NSR and N-04 are provided in Figure 6-5. The exact noise measurement locations are given in Figure 6-2. It should be noted that the site measurement experts made their best efforts to reach exactly the identified NSR locations. However, when the road conditions did not allow, the experts selected the most secure and suitable representative locations to set up the devices and conduct the measurements and for that reason there is slight shift of the measurement location and NSR location for N-01 and N-04 as can be seen from the figures. The construction noise modeling map for N-01 (north of T15) is provided in Figure 6-6.

Table 6-7. Cumulative Construction Noise Level Modelled at the NSRs

| NSR No. | Description | Closest Project Unit | Distance to the Closest Project Unit | Background Noise Level (dBA) | | Construction Noise Level Modelled at the Receptor (dBA) | | Cumulative Noise Level at the Receptor including Background Noise Level (dBA) | | Project Standard for Construction Phase (dBA) |
|---------|--|----------------------|--------------------------------------|---|---|---|---|---|---|---|
| | | | | L _{day} as per RAMEN (07:00-19:00) | L _{day} as per IFC (07:00-22:00) | L _{day} as per RAMEN (07:00-19:00) | L _{day} as per IFC (07:00-22:00) | L _{day} as per RAMEN (07:00-19:00) | L _{day} as per IFC (07:00-22:00) | |
| N-01 | Noise sensitive receptor (residential receptor ²⁰) | T15 | 210 m | 41.3 (Day 1) 39.8 (Day 2) | 39.5 (Day 1) 37.4 (Day 2) | 43.54 | 43.69 | 45.6 (Day 1) 45.1 (Day 2) | 45.1 (Day 1) 44.6 (Day 2) | 70 |
| N-02 | Noise sensitive receptor (residential receptor) | T34 | 2,580 m | 44.1 (Day 1) 42.3 (Day 2) | 43.8 (Day 1) 41.5 (Day 2) | 24.77 | 25.05 | 44.2 (Day 1) 42.4 (Day 2) | 43.9 (Day 1) 41.6 (Day 2) | 70 |
| N-03 | Noise sensitive receptor (residential receptor) | Main access road | On the road | 45.8 (Day 1) 46.3 (Day 2) | 44.9 (Day 1) 45.4 (Day 2) | 47.11 | 47.15 | 49.5 (Day 1) 49.7 (Day 2) | 49.2 (Day 1) 49.4 (Day 2) | 70 |

²⁰ The legal owner of the building lives at the centre of Kislacik. The legal owner of the building allowed a man living on his own to use this building for accommodation.





Figure 6-6. Construction Phase Noise Map for T15

6.3.2. Operation Phase

The operation phase noise will be sourced from the operation of turbines. The noise from the existing operational turbines is included within the baseline noise measurements.

The turbine type to be used in the Kiyikoy WPP Capacity Extension Project is Vestas V136-3.6 MW. Table 6-8 provides the turbine noise characteristics as taken from the turbine technical data sheets of Vestas V136-3.6 MW.

Table 6-8. Turbine Noise Characteristics

| Turbine Model | Mode No. | Max Sound Power Level (dBA) |
|---------------|----------------|-----------------------------|
| V136-3.6MW | PO1 (standard) | 105.5 |
| | PO1-0S | 108.2 |

Operation phase noise modelling results at each NSR is mapped in for the time periods defined in the Turkish RAMEN (L_{day} , $L_{evening}$ and L_{night}) in Figure 6-7, Figure 6-8, and Figure 6-9., and for the time periods defined in IFC EHS Guidelines in Figure 6-10 and Figure 6-11.



Figure 6-7. Operation Phase L_{day} Noise Map (as per Turkish RAMEN)



Figure 6-8. Operation Phase Levening Noise Map (as per Turkish RAMEN)



Figure 6-9. Operation Phase L_{night} Noise Map (as per Turkish RAMEN)



Figure 6-10. Operation Phase L_{day} Noise Map (as per IFC EHS Guidelines)



Figure 6-11. Operation Phase L_{night} Noise Map (as per IFC EHS Guidelines)

The operation phase noise maps specific for T15 are presented in Figure 6-12 and Figure 6-13.

Cumulative operational noise levels modelled at NSRs for different scenarios are provided in Table 6-9.

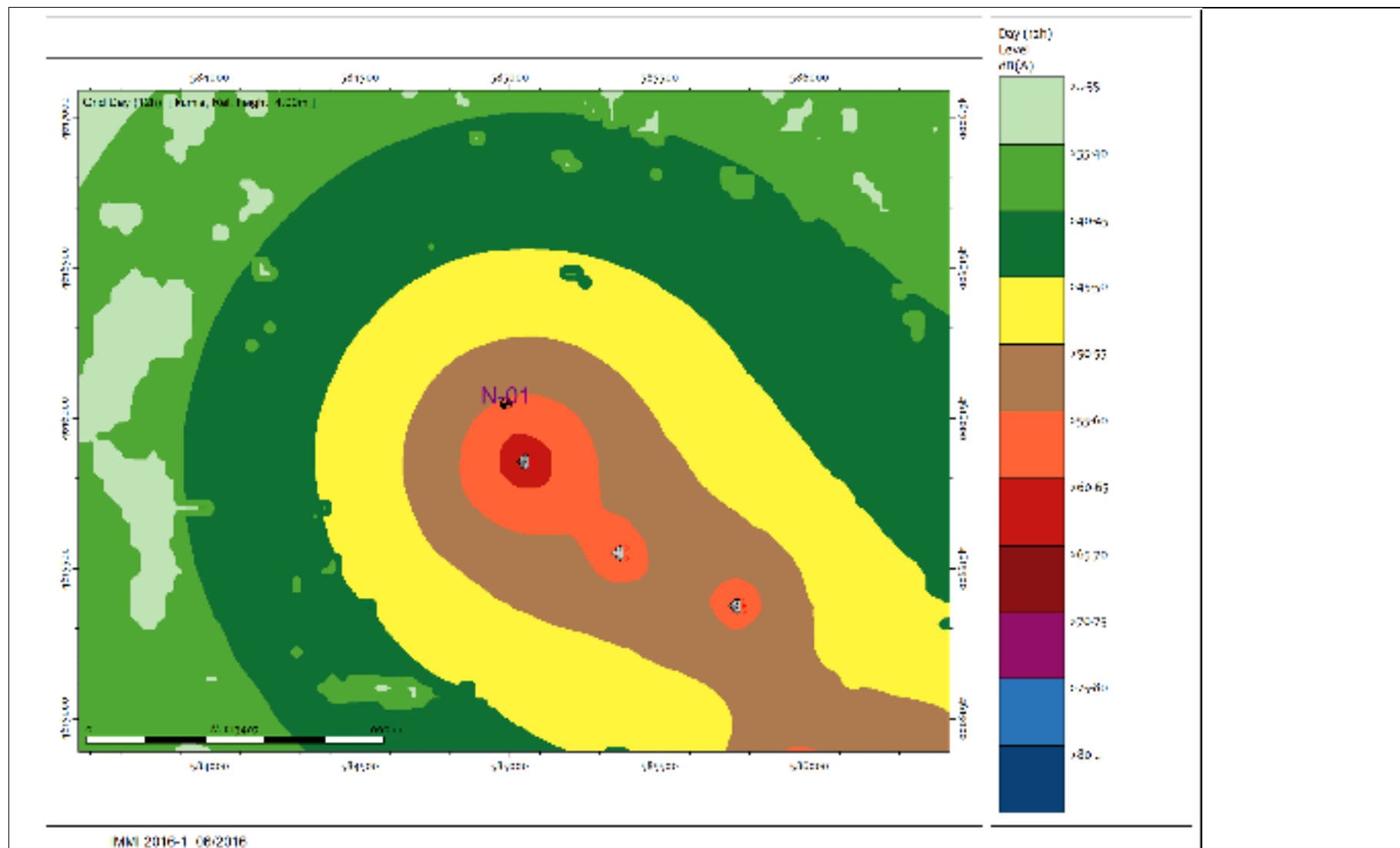


Figure 6-12. Operation Phase L_{day} Noise Map for T15 (as per IFC EHS Guidelines)

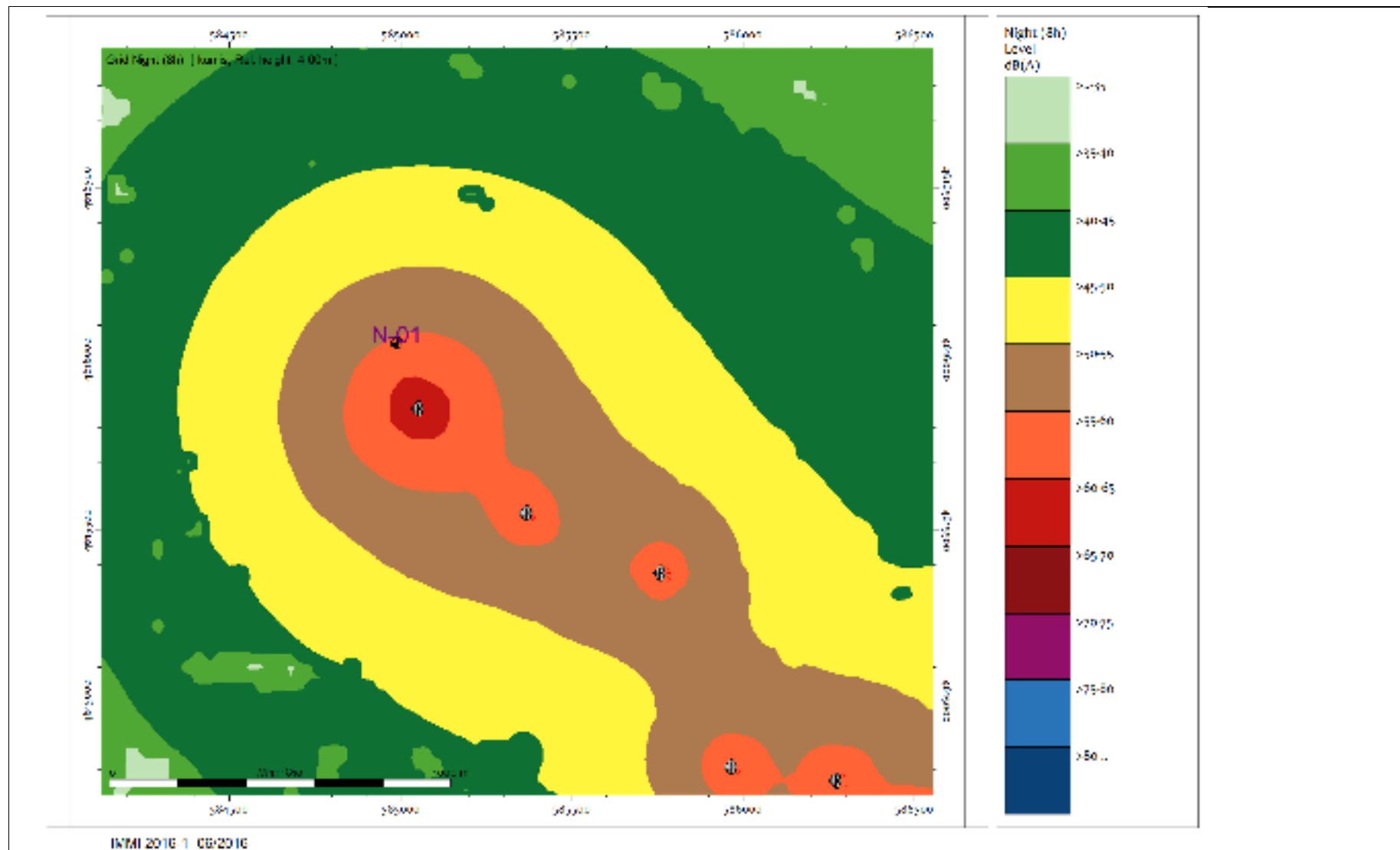


Figure 6-13. Operation Phase L_{night} Noise Map for T15 (as per IFC EHS Guidelines)

Table 6-9. Cumulative Operational Noise Level Modelled at NSRs

| NSR No. | Measurement Day | Baseline Noise Measurement Results (dBA) | | | | | Operation Noise Level Modelled at the Receptor (dBA) | | | | | Cumulative Noise Level at the Receptor (dBA) including Background Noise Level | | | | | Project Standards for Operation Phase (dBA) | |
|--|-----------------|--|------------------------|----------------------|--------------------|----------------------|--|------------------------|----------------------|--------------------|----------------------|---|------------------------|----------------------|--------------------|----------------------|---|----|
| | | Turkish RAMEN | | | IFC | | Lday (07:00-19:00) | Levening (19:00-23:00) | Lnight (23:00-07:00) | Lday (07:00-22:00) | Lnight (22:00-07:00) | Lday (07:00-19:00) | Levening (19:00-23:00) | Lnight (23:00-07:00) | Lday (07:00-22:00) | Lnight (22:00-07:00) | | |
| | | Lday (07:00-19:00) | Levening (19:00-23:00) | Lnight (23:00-07:00) | Lday (07:00-22:00) | Lnight (22:00-07:00) | | | | | | | | | | | | |
| Scenario 1: Worst Case Condition (T15 operates at P01-OS mode (108.2 dBA) and all other turbines operate at standard mode (105.5 dBA)) | | | | | | | | | | | | | | | | | | |
| N-01 | Day 1 | 41.3 | 32.2 | 33.6 | 39.5 | 33.2 | 55.5 | 55.5 | 55.5 | 55.5 | 55.5 | 55.7 | 55.6 | 55.6 | 55.6 | 55.6 | 55 | 45 |
| | Day 2 | 39.8 | 31.2 | 34.6 | 37.4 | 34.1 | | | | | | 55.7 | 55.6 | 55.6 | 55.6 | 55.6 | | |
| N-02 | Day 1 | 44.1 | 41.8 | 41.8 | 43.8 | 41.4 | 28.4 | 28.9 | 29.4 | 28.5 | 29.3 | 44.2 | 42.0 | 42.0 | 43.9 | 41.7 | | |
| | Day 2 | 42.3 | 39.7 | 38.7 | 41.5 | 37.9 | | | | | | 42.5 | 40.0 | 39.2 | 41.7 | 38.5 | | |
| N-03 | Day 1 | 45.8 | 40.2 | 40.1 | 44.9 | 41.4 | 23.4 | 24.0 | 24.5 | 23.5 | 24.4 | 45.8 | 40.3 | 40.2 | 44.9 | 41.5 | | |
| | Day 2 | 46.3 | 40.4 | 40.7 | 45.4 | 41.2 | | | | | | 46.3 | 40.5 | 40.8 | 45.4 | 41.3 | | |
| Scenario 2: Standard Condition (All turbines including T15 operate at standard mode (105.5 dBA)) | | | | | | | | | | | | | | | | | | |
| N-01 | Day 1 | 41.3 | 32.2 | 33.6 | 39.5 | 33.2 | 52.7 | 52.7 | 52.7 | 52.7 | 52.7 | 53.0 | 52.7 | 52.8 | 52.9 | 52.7 | 55 | 45 |
| | Day 2 | 39.8 | 31.2 | 34.6 | 37.4 | 34.1 | | | | | | 52.9 | 52.7 | 52.8 | 52.8 | 52.8 | | |
| N-02 | Day 1 | 44.1 | 41.8 | 41.8 | 43.8 | 41.4 | 28.4 | 28.9 | 29.4 | 28.5 | 29.3 | 44.2 | 42.0 | 42.0 | 43.9 | 41.7 | | |
| | Day 2 | 42.3 | 39.7 | 38.7 | 41.5 | 37.9 | | | | | | 42.5 | 40.0 | 39.2 | 41.7 | 38.5 | | |
| N-03 | Day 1 | 45.8 | 40.2 | 40.1 | 44.9 | 41.4 | 23.4 | 24.0 | 24.5 | 23.5 | 24.4 | 45.8 | 40.3 | 40.2 | 44.9 | 41.5 | | |
| | Day 2 | 46.3 | 40.4 | 40.7 | 45.4 | 41.2 | | | | | | 46.3 | 40.5 | 40.8 | 45.4 | 41.3 | | |
| Scenario 3: Worst Case Condition (All turbines including T15 operate at P01-OS mode (108.2 dBA)) | | | | | | | | | | | | | | | | | | |
| N-01 | Day 1 | 41.3 | 32.2 | 33.6 | 39.5 | 33.2 | 55.5 | 55.5 | 55.5 | 55.5 | 55.5 | 55.7 | 55.5 | 55.5 | 55.6 | 55.5 | 55 | 45 |
| | Day 2 | 39.8 | 31.2 | 34.6 | 37.4 | 34.1 | | | | | | 55.6 | 55.5 | 55.5 | 55.6 | 55.5 | | |
| N-02 | Day 1 | 44.1 | 41.8 | 41.8 | 43.8 | 41.4 | 31.1 | 31.6 | 32.0 | 31.1 | 32.0 | 44.3 | 42.2 | 42.2 | 44.0 | 41.9 | | |
| | Day 2 | 42.3 | 39.7 | 38.7 | 41.5 | 37.9 | | | | | | 42.6 | 40.3 | 39.5 | 41.9 | 38.9 | | |
| N-03 | Day 1 | 45.8 | 40.2 | 40.1 | 44.9 | 41.4 | 26 | 26.6 | 27.1 | 26.1 | 27.2 | 45.8 | 40.4 | 40.3 | 45.0 | 41.6 | | |
| | Day 2 | 46.3 | 40.4 | 40.7 | 45.4 | 41.2 | | | | | | 46.3 | 40.6 | 40.9 | 45.5 | 41.4 | | |
| Scenario 4: Standard Condition (T15 operates at P01 standard mode (105.5 dBA) and all other turbines operate at PO1-OS (108.2 dBA)) | | | | | | | | | | | | | | | | | | |
| N-01 | Day 1 | 41.3 | 32.2 | 33.6 | 39.5 | 33.2 | 52.7 | 52.7 | 52.7 | 52.7 | 52.7 | 53.0 | 52.7 | 52.8 | 52.9 | 52.7 | 55 | 45 |
| | Day 2 | 39.8 | 31.2 | 34.6 | 37.4 | 34.1 | | | | | | 52.9 | 52.7 | 52.8 | 52.8 | 52.8 | | |
| N-02 | Day 1 | 44.1 | 41.8 | 41.8 | 43.8 | 41.4 | 31.1 | 31.6 | 32.0 | 31.1 | 32.0 | 44.3 | 42.2 | 42.2 | 44.0 | 41.9 | | |
| | Day 2 | 42.3 | 39.7 | 38.7 | 41.5 | 37.9 | | | | | | 42.6 | 40.3 | 39.5 | 41.9 | 38.9 | | |
| N-03 | Day 1 | 45.8 | 40.2 | 40.1 | 44.9 | 41.4 | 26 | 26.6 | 27.1 | 26.1 | 27.2 | 45.8 | 40.4 | 40.3 | 45.0 | 41.6 | | |
| | Day 2 | 46.3 | 40.4 | 40.7 | 45.4 | 41.2 | | | | | | 46.3 | 40.6 | 40.9 | 45.5 | 41.4 | | |
| Scenario 5: Standard Condition (T15 operates at silent mode (103.5 dBA) and all other turbines operate at PO1-OS (108.2 dBA)) | | | | | | | | | | | | | | | | | | |
| N-01 | Day 1 | 41.3 | 32.2 | 33.6 | 39.5 | 33.2 | 51.1 | 51.1 | 51.1 | 51.1 | 51.1 | 51.5 | 51.2 | 51.2 | 51.4 | 51.2 | 55 | 45 |
| | Day 2 | 39.8 | 31.2 | 34.6 | 37.4 | 34.1 | | | | | | 51.4 | 51.1 | 51.2 | 51.3 | 51.2 | | |
| N-02 | Day 1 | 44.1 | 41.8 | 41.8 | 43.8 | 41.4 | 31.1 | 31.6 | 32.0 | 31.1 | 32.0 | 44.3 | 42.2 | 42.2 | 44.0 | 41.9 | | |
| | Day 2 | 42.3 | 39.7 | 38.7 | 41.5 | 37.9 | | | | | | 42.6 | 40.3 | 39.5 | 41.9 | 38.9 | | |
| N-03 | Day 1 | 45.8 | 40.2 | 40.1 | 44.9 | 41.4 | 26.0 | 26.6 | 27.1 | 26.1 | 27.2 | 45.8 | 40.4 | 40.3 | 45.0 | 41.6 | | |
| | Day 2 | 46.3 | 40.4 | 40.7 | 45.4 | 41.2 | | | | | | 46.3 | 40.6 | 40.9 | 45.5 | 41.4 | | |

6.3.3. Closure Phase

The magnitude of the noise impact during the decommissioning phase would be lower than the construction noise. The impact would be local, short-term and reversible.

6.3.4. Impact Significance, Management and Residual Impacts

The potential Project impacts, proposed mitigation measures and residual impact significances are summarized in Table 6-10.

Table 6-10. Impacts, Proposed Mitigation Measures and Residual Impacts (Noise)

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance | |
|--|-------------------------------------|--------------------------------|------------------|------------|-----------------------|------------|--------------|--|---|------------------------------|---|-------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | | | | | Overall Magnitude |
| Noise generation due to construction | • Land preparation and construction | N-01 (210 m northeast of T15) | Local | Negligible | Short term Reversible | Short-term | Intermittent | Negligible | High | Minor | <ul style="list-style-type: none">Project-specific Noise Management Plan will be implemented by the Project Company and the contractors (through contractual requirements).All Project personnel including direct and contracted workers will be trained on the implementation of Noise Management Plan.The Project Company will enforce speed limits for the Project vehicles that will transport construction materials/equipment along the existing main access road.The Project Company will consult with the user of the building located in the north of T15 (within the setback distance of T15) prior to the start of and during the construction activities to be conducted at this location in order to inform the user about the scope and duration of the activities and mitigate the potential impacts for the period of construction at this turbine site.Project-specific Stakeholder Engagement Plan will be implemented to address any noise-related grievance and plan/take corrective actions, where necessary.To verify compliance with Project standards, noise monitoring will be conducted one-off at each NSR identified in this ESIA, at the peak period of construction works to be conducted in the vicinity of the relevant NSR and also in case of receipt of noise-related grievances. | Minor |
| | | N-02 (2,580 m south of T34) | Wide | Negligible | Short term Reversible | Short-term | Intermittent | Negligible | High | Minor | | |
| | | N-03 (on the main access road) | Restricted | Negligible | Short term Reversible | Short-term | Intermittent | Negligible | High | Minor | | |
| Noise generation due to operation of wind turbines | • Operation | N-01 (vulnerable PAP) | Local | High | Long term reversible | Long-term | Continuous | High | High | Major | <ul style="list-style-type: none">The Project Company will further engage with the vulnerable PAP living in the setback distance of T15 during the ESIA public disclosure period regarding relocation and inform the PAP on the potential operational noise impacts of the Project based on the findings of the ESIA and the proposed mitigation measures including the option for relocation during the construction and operation.Based on the engagement, the Project Company will document vulnerable PAP's willingness or unwillingness to relocate during the ESIA public disclosure period.In case the vulnerable PAP declares his unwillingness to relocate during the ESIA disclosure period, the Project | Minor |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--------------------|---------------|----------|------------------|-----------|---------------|----------|-----------|--|---|---|------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | |
| | | | | | | | | | | <p>Company will recognise the right of the PAP to choose relocation until the end of second year of operation.</p> <p><u>If the PAP is willing to relocate:</u></p> <ul style="list-style-type: none"> If the PAP is willing to relocate, a RAP will be prepared in line with EBRD PR5, submitted to Lenders for approval and implemented for the vulnerable PAP living in the setback distance of T15. <p>The RAP will ensure that the operational noise impact on the vulnerable PAP is avoided at the resettlement site, which will provide adequate housing with improved living conditions, where the PAP would feel himself comfortable to stay (considering his vulnerability) and continue his current economic activities, if there is any.</p> <p><u>If the PAP is unwilling to relocate:</u></p> <ul style="list-style-type: none"> If the PAP is unwilling to relocate, the noise impact will be monitored at N-01 through monthly measurements to be conducted by an accredited laboratory (for 48 hours each month) during the first year of operation of T15. The Project Company will ensure on-going engagement (e.g. at least monthly) with the vulnerable PAP throughout the first year of operation. The monitoring results will be evaluated on a monthly basis and corrective measures will be developed and implemented progressively at the end of each monthly monitoring campaign (implementation of corrective measures will be completed within 3 months following the monthly monitoring). The complete set of the monitoring results (consisting of monthly monitoring data collected throughout the first year of operation) will be evaluated collectively at the end of the first year of operation. Based on the evaluation of monthly monitoring results to be obtained throughout the first year of operation and outcomes of the on-going engagement to be conducted with the vulnerable PAP, corrective measures will be developed in consultation with the vulnerable PAP and the owner of the building and implemented with a mutually agreed method that will be approved by Lenders (implementation of corrective measures will be completed | |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance | |
|--------------------|---------------|----------|------------------|------------|----------------------|-----------|------------|--|---|------------------------------|--|-------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | | | | | Overall Magnitude |
| | | | | | | | | | | | <div>within 3 months after the end of the first year of operation, whenever technically feasible). These measures will include the following:<ul style="list-style-type: none">○ Provision of proper insulation for the relevant elements of the building (including façade, windows, walls and roof structure) resided by vulnerable PAP.○ At T15, blades will be equipped with serrated trailing edges to reduce maximum sound level at this turbine.○ Adjusting turbine noise as a function of reducing power output.</div> <div><ul style="list-style-type: none">• Throughout the second and third years of operation, the residual noise impact, after the implementation of corrective actions, will be monitored through quarterly measurements to be conducted at N-01 by an accredited laboratory for 48 hours.• The Project Company will continue engagement with the vulnerable PAP through face to face meetings to be undertaken semi-annually after the third year of operation until the end of financing period.• Project Grievance Mechanism will be implemented throughout the operation to address any noise-related grievance and plan/take corrective actions, where necessary (e.g. adjustment of turbine operation modes at certain periods such as high wind speeds).</div> | |
| | | N-02 | Wide | Negligible | Long term reversible | Long-term | Continuous | Negligible | High | Minor | <div><ul style="list-style-type: none">• Project-specific Stakeholder Engagement Plan will be implemented to address any noise-related grievance and plan/take corrective actions, where necessary (e.g. adjustment of turbine operation modes at certain periods such as high wind speeds).</div> | Minor |

7. AIR QUALITY AND GREENHOUSE GAS EMISSIONS

This Chapter provides information on the background air quality levels at the receptors selected in and around the License Area, assesses potential impacts of the Project-related air emissions on the sensitive receptors and describes the mitigation measures to be taken for the management of potential impacts.

The Project related air emissions will take place during the construction phase and will mainly include dust emissions (PM10, PM2.5) due to earthworks, construction of internal site access roads, turbine platforms and other auxiliary Project facilities. The exhaust emissions from construction equipment and vehicles will be limited due to the nature of Project activities and the total number of vehicles/equipment that will be used during construction phase (in total 10 trucks, 5 excavators, and 2 per each for grader, roller and street sweeper).

Installation and operation of grid-connected wind power plant facilities generate zero-emission electricity from wind energy and reduce combustion greenhouse gas (GHG) emissions from grid-connected power plants. GHG emissions will be sourced from the on-site construction works due to road transport and non-road mobile sources and machinery and the transportation of turbines and their components to the Project site.

7.1. Project Standards

The national legislative requirements and applicable international standards for PM2.5 and PM10 are summarized in Table 7-1.

Table 7-1. Air Quality Standards

| Parameter | Averaging Period | Turkish Limit Values ⁽¹⁾ (µg/m ³) | EU Limit Values ⁽²⁾ (µg/m ³) | WHO/IFC Limit (Guideline) Values ⁽³⁾ (µg/m ³) | Project Standards |
|-----------|------------------|--|--|--|-------------------|
| PM 10 | 24 hours | 50 (not to be exceeded more than 35 times a year) | 50 (not to be exceeded more than 35 times a year) | 50 | 50 |
| | Annual | 40 | 40 | 20 | 20 |
| PM 2.5 | 24 hours | - | - | 25 | 25 |
| | Annual | - | 20 | 10 | 10 |

⁽¹⁾ Ambient air quality limit values as given in the Industrial Air Pollution Control Regulation for the period 2019-2023 and 2024 and beyond.
⁽²⁾ Directive 2008/50/EC on Ambient Air Quality.
⁽³⁾ WHO Ambient Air Quality Guidelines, IFC General EHS Guidelines: Environmental – Air Emissions and Ambient Air Quality.

7.2. Baseline Conditions

Baseline air quality sampling and measurement for dust emissions (PM10 and PM2.5) was conducted by an accredited laboratory at selected receptors as given in Figure 7-1. At each location, sampling was carried out for 24 hours using low-volume samplers.

The baseline air quality (dust) measurement results are given in Table 7-2.

Table 7-2. Baseline Air Quality (Dust) Measurement Results

| Measurement Location | Description of the Receptor | PM10 ($\mu\text{g}/\text{m}^3$) | PM2.5 ($\mu\text{g}/\text{m}^3$) |
|----------------------|---|-----------------------------------|------------------------------------|
| A-01 | Residential Receptor ²¹ | 14 | 10 |
| A-02 | Residential Receptor | 25 | 17 |
| A-03 | Residential Receptor (on the main access road) | 38 | 27 |
| A-04 | Unused/unoccupied coastline outside the License Area Border | 8 | 6 |
| A-05 | Residential Receptor (on the main road to Kiyikoy) | 56 | 40 |

The baseline air quality measurement results of PM10 and PM2.5 at A-05 and PM2.5 at A-03 are above the Project Standards. It should be noted that measurement location A-05 corresponds to a highly dense traffic spot due to the ongoing construction works of the terminal of the TurkStream Project as well as being on the main road to Kiyikoy town and touristic centre. Measurement location A-03 corresponds to residential receptor on the main access road to the Kiyikoy WPP and the TurkStream Construction Camp Site.

In addition to dust measurements, VOC, NO₂ and SO₂ measurements were conducted by an accredited laboratory by using passive sampling method. The laboratory result forms are presented in Appendix B.

7.3. Impact Assessment and Management

Project related emissions will take place during the construction phase of the Project due to earthworks including excavation, loading and unloading of excavated material, construction of the new internal site access roads and emissions from vehicles used during the construction works. As per the construction schedule, the land preparation and construction activities will be completed in 11 months. Activities at each turbine platform site are planned to be completed in 2 months, while activities at different sites will progress in parallel to each other.

The impact on air quality due to Project activities will take place during the land preparation and construction phase and be short-term.

Residential receptors have been taken into consideration in the assessment of the Project related impacts due to dust emissions. The sensitivity of all residential receptors considered in the assessment have been accepted as high. The criteria for the magnitude of change component of the overall magnitude is presented in Table 7-3.

²¹ The legal owner of the building lives at the centre of Kislacik. The legal owner of the building allowed a man living on his own to use this building for accommodation.

Table 7-3. Criteria for Magnitude of Change

| High | Medium | Low | Negligible |
|---|---|---|--|
| Exceedance of the Project Standards at the residential receptors (in cases where background pollutant levels are below the Project Standards) <u>or</u> significant increase (i.e. more than 50%) of the background air quality levels at the residential receptors even if the Project Standards are met | Project Standards are not exceeded at the residential receptors <u>and</u> the increase of background air quality levels at the receptors is 25% to 50% | Project Standards are not exceeded at the residential receptors <u>and</u> the increase of background air quality levels at the receptors is 10% to 25% | Project Standards are not exceeded at the residential receptors <u>and</u> the increase of background air quality levels at the receptors is less than 10% |

7.3.1. Land Preparation and Construction Phase

The main emission sources for the land preparation and construction phase of the Project will be the construction of turbine platforms and internal site access roads. The emission factors used for these activities are given in Table 7-4 with the calculated hourly emissions.

Table 7-4. Emission Factors and Emission Calculations

| Emission Source | Emissions Factor | | Emission (kg/h) | |
|--|-------------------------------|--------------------------------|-----------------------|-----------------------|
| | PM10 | PM2.5 | PM10 | PM2.5 |
| Turbine platform construction ⁽¹⁾ | 2.69 mg/ ha/month of activity | 0.269 mg/ ha/month of activity | 5.82×10^{-5} | 5.82×10^{-6} |
| Road construction ⁽²⁾ | 2.3 kg/(m ² ·yr) | 0.23 kg/(m ² ·yr) | 26.2 | 2.6 |

⁽¹⁾ Turbine platform construction emission factors are derived from US EPA AP-42 C13-S2.3 Heavy Cons. Op. The document states that all emission from construction activities is smaller than 10 µm. Since there is no data for PM 2.5, it is assumed as 10% of total PM10 (as is the case for the road con. emission factors).

⁽²⁾ Road construction emission factors are taken from EMEP/EEA Air Pollutant Emission Inventory Guidebook 2016-2.A.5.b-Construction and Demolition- Tier 1 Emission Factors.

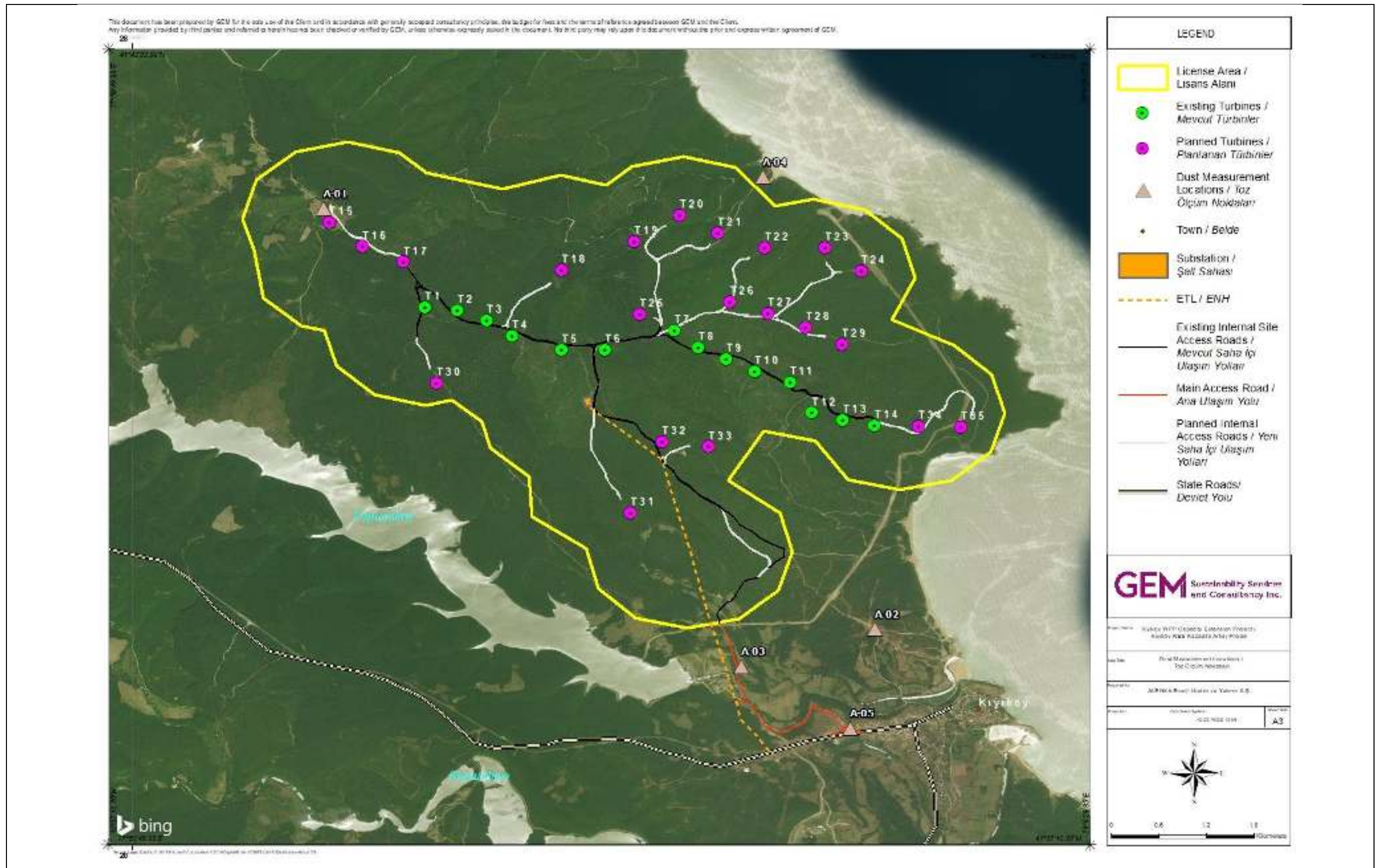


Figure 7-1. Baseline Air Quality Measurement Locations

An air quality modelling study was carried out by using AERMOD View – Gaussian Plume Air Dispersion Model software for the construction phase dust emissions of the Project. An impact area of 7.5 km x 7.5 km was selected for the modelling study as shown in Figure 7-2.

The closest meteorological station is located in Cerkezkoý (at more than 45 km distance). Cerkezkoý does not have long-term data and is not a spatially representative station due to elevation, surrounding land cover type (Kiyikoy is located within forestry and by the seaside, whilst Cerkezkoý is located within urban/agricultural setting at relatively rural side). Thus, the site data has been evaluated as the most representative data available for the Project. The site data from 2012-2013 (data from 2012 to 2018 have been reviewed) has been used in the model. Emission dispersions are calculated by using hourly meteorological data which covers all hours of one year meaning all best and worst meteorological conditions are considered in the modelling study.



Figure 7-2. Impact Area Selected for the Air Quality Modelling Study

The air quality modelling results for the construction phase of the Project are given in Table 7-5. The maximum daily average emissions for PM10 and PM2.5 are plotted in Figure 7-3 and Figure 7-4, respectively.

Table 7-5. Air Quality Modelling Results

| Measurement Location | Background Concentration | | Air Emission due to Project Activities | | Cumulative Value at the Measurement Point | |
|--|--------------------------|---------------|--|---------------|---|---------------|
| | PM10 (µg/m³) | PM2.5 (µg/m³) | PM10 (µg/m³) | PM2.5 (µg/m³) | PM10 (µg/m³) | PM2.5 (µg/m³) |
| A-01 | 14.00 | 10.00 | 3.29 | 1.40 | 17.29 | 11.40 |
| A-02 | 25.00 | 17.00 | 0.73 | 0.55 | 25.73 | 17.55 |
| A-03 | 38.00 | 27.00 | 0.65 | 0.44 | 38.65 | 27.44 |
| A-04 | 8.00 | 6.00 | 2.41 | 1.11 | 10.41 | 7.11 |
| A-05 | 56.00 | 40.00 | 0.66 | 0.46 | 56.66 | 40.46 |
| Project Standard (24 hours) (µg/m³) | 50.00 | 25.00 | 50.00 | 25.00 | 50.00 | 25.00 |

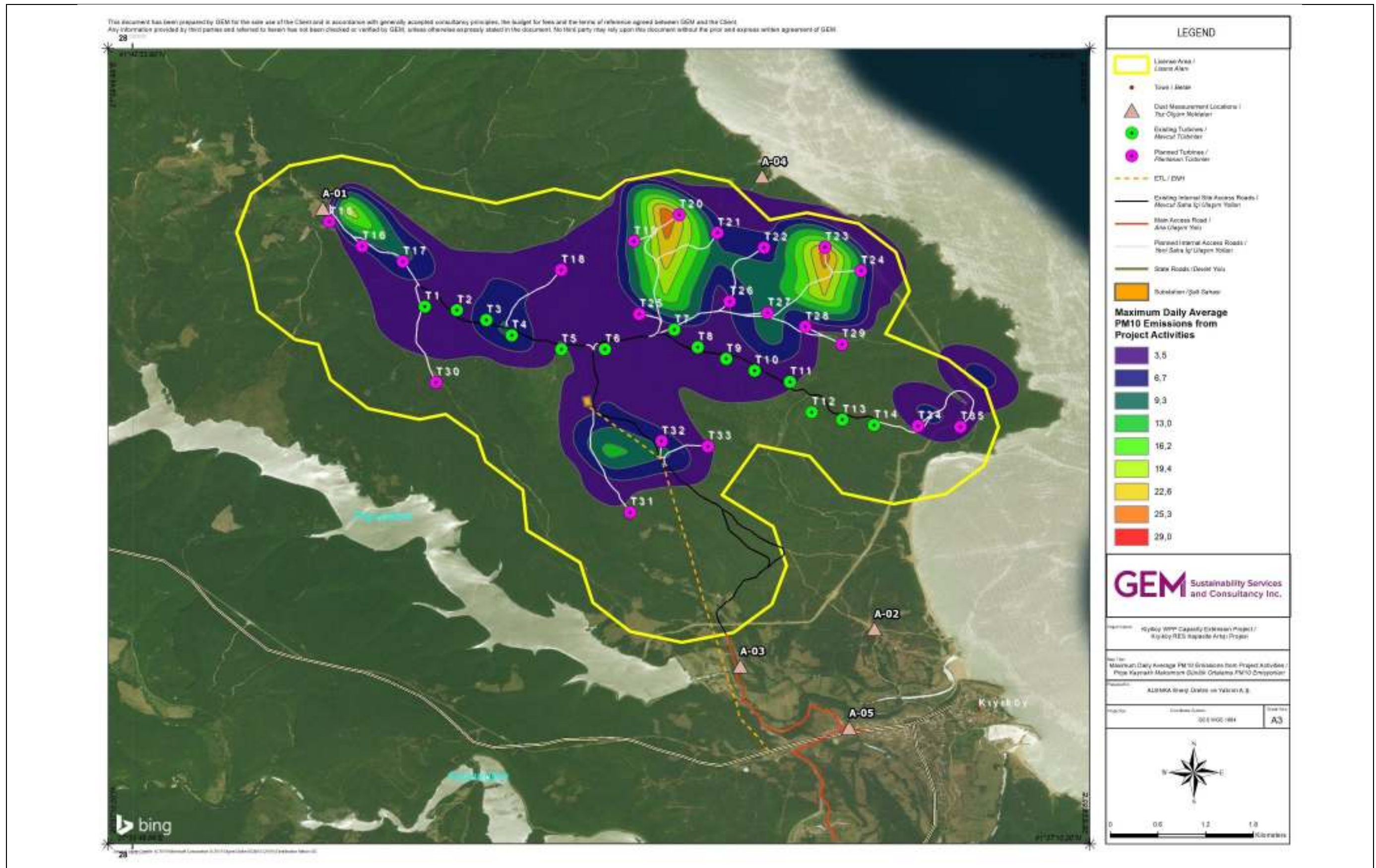


Figure 7-3. Maximum Daily Average PM10 Emissions from Project Activities

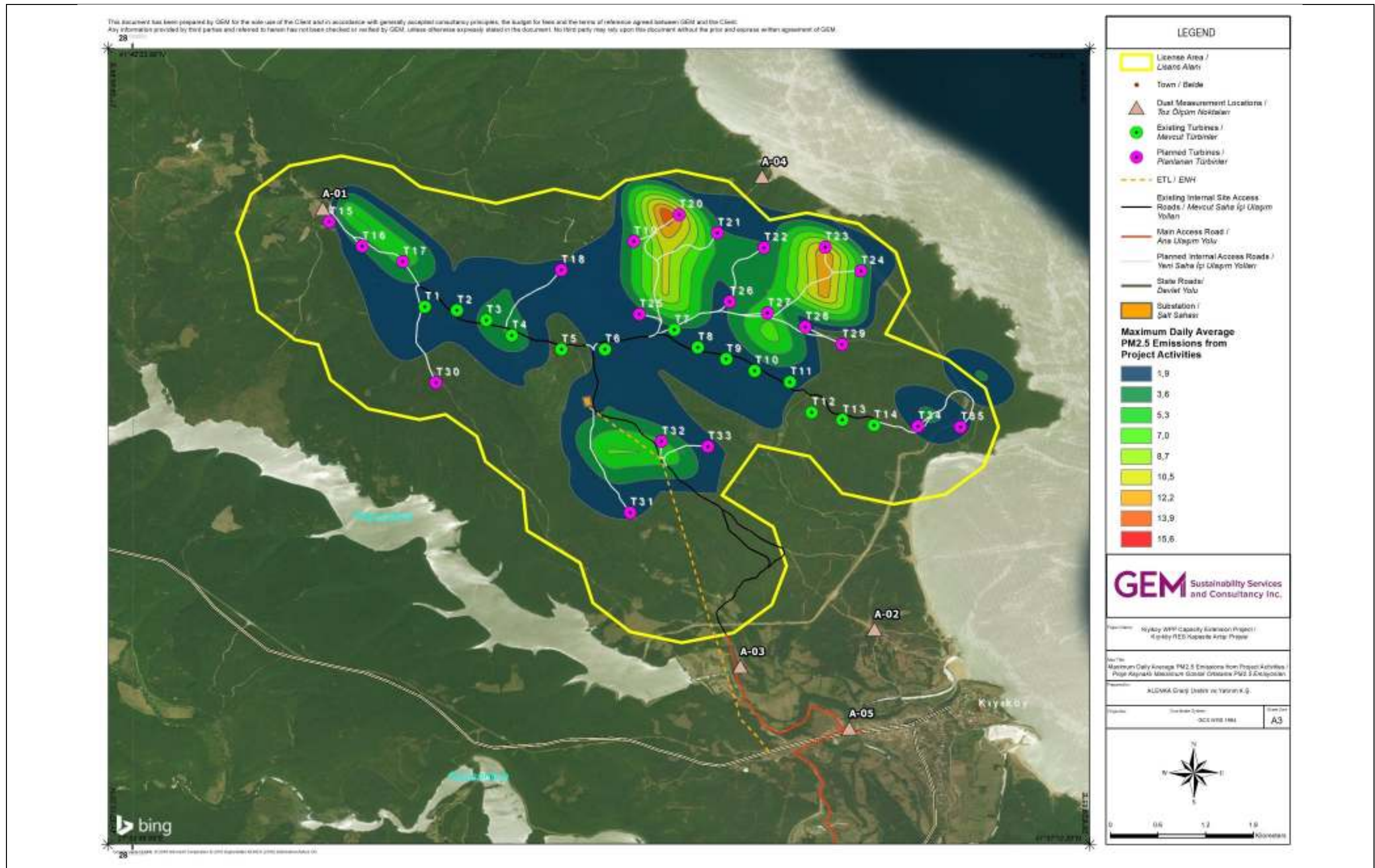


Figure 7-4. Maximum Daily Average PM2.5 Emissions from Project Activities

7.3.2. Operation Phase

The operation phase of the Project will not have any emissions to air apart from the potential emissions due to the diesel generator (one) which will be in place in blackout situations. Thus, the operation phase will not have any significant impact on air quality.

7.3.3. Closure Phase

During the closure phase, the potential sources of emissions will be similar to those of the construction phase. Dust will be generated during the decommissioning works and transportation of the demolition waste off site will result in greenhouse gas emissions. Measures will be put in place to minimise the impact on receptors and the grievance mechanism will continue to be implemented, until the end of closure activities. The closure phase is not anticipated to have a significant adverse impact on local air quality.

7.4. Greenhouse Gas Emissions

GHG emissions are categorised into three different scopes. Using the definitions adopted by the GHG Protocol of the World Business Council on Sustainable Development (WBCSD) and World Resources Institute (WRI);

- direct emissions are called 'Scope 1';
- emissions from grid electricity used are 'Scope 2'; and
- other upstream and downstream emissions are 'Scope 3'.

The quantification of Scope 1 and Scope 2 emissions is considered mandatory by the GHG Protocol, whilst quantification of Scope 3 emissions is considered optional.

Majority of the renewable energy power generation projects, by nature of their role, are assumed to displace the emissions associated with other electricity generation on the grid (*EBRD Protocol for Assessment of Greenhouse Gas Emissions, 2017*). The "IFI Approach to GHG Accounting for Renewable Energy Projects (*World Bank, 2015*)" also states that, energy generated from renewable sources will avoid emissions that would otherwise be generated wholly or partly from more carbon-intensive sources. It is also noted that the construction phase emissions for renewable energy projects may be excluded from GHG accounting. This said, Scope 1 and Scope 2 emission estimations for the construction phase of the Project have been calculated below.

As per the Guidelines for Quantifying GHG Reductions from Grid-Connected Electricity Projects (*WRI, 2007*), installation and operation of grid-connected wind power plant facilities generate zero-emission electricity from wind energy and reduce combustion GHG emissions from grid-connected power plants.

The grid electricity emission factor for Turkey is reported as 0.497 tCO₂e/MWh (*Country Specific Electricity Factors, Carbon Footprint, August 2018*). The annual average electricity generation targeted after the commissioning of Kiyikoy WPP Capacity Extension Project is 200.6 GWh. Assuming that the electricity generation from the Capacity Extension Project would have come from an alternative type of source, on an annual basis, the Capacity Extension Project will displace 99,700 tCO₂e.

The potential sources of GHG emissions during the operation phase of the Project are the switchgear equipment, circuit breakers and similar high voltage equipment that use sulphur hexafluoride (SF₆) gas. According to Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (IPCC, 2001) approximately 1% of the existing SF₆ contained in the high voltage equipment is lost each year. Considering the Project's contribution to displacement of GHGs (i.e. 99,700 tCO₂e/annum), the impact of potential SF₆ leakages on the Project operation phase GHGs is considered to be negligible.

The GHG emissions will be sourced from the use of vehicles and machinery during the construction works. This will include not only the on-site land preparation, construction and turbine erection works but also the transportation of the turbines and their components to the Project site.

The Scope 1 emissions will include the following sources:

- (1) Emissions due to on-site construction works
 - a. Emissions due to road transport
 - b. Emissions due to non-road mobile sources and machinery
- (2) Emissions due to the transportation of turbines and their components
 - a. Emissions due to road transport

The basis for the calculation of Scope 1 emissions is given below.

Emissions due to Road Transport

Emissions of ultimate CO₂ originate from three sources (*EMEP/EEA Air Pollutant Emission Inventory Guidebook 2016 – Update July 2018; Passenger cars, light commercial trucks, heavy-duty vehicles including buses and motorcycles*):

- Combustion of fuel
- Combustion of lubricant oil
- Addition of carbon-containing additives in the exhaust

Ultimate in this case means that the carbon contained in either for the three sources is fully oxidised into CO₂.

CO₂ due to Fuel Consumption

The CO₂ emission factor for diesel fuel is 3.169 kg CO₂ per kg of fuel consumed (*EMEP/EEA Air Pollutant Emission Inventory Guidebook 2016 – Update July 2018; Passenger cars, light commercial trucks, heavy-duty vehicles including buses and motorcycles*).

CO₂ due to Lubricant Oil

Average consumption of lubricant oil for heavy-duty vehicle (of any age) consuming diesel fuel is 1.56 kg per 10,000 km (*EMEP/EEA Air Pollutant Emission Inventory Guidebook 2016 – Update July 2018; Passenger cars, light commercial trucks, heavy-duty vehicles including buses and motorcycles*). Thus, the CO₂ emission is calculated as 4.87 kg per 10,000 km (*Equation 16 of EMEP/EEA Air Pollutant Emission Inventory Guidebook 2016 – Update July 2018*).

CO₂ due to Exhaust Additives

Aftertreatment systems used to reduce NO_x emissions utilize an aqueous solution of urea as a reducing agent. These are common in Euro V and Euro VI heavy duty vehicles.

The total CO₂ emissions due to the use of urea additive is calculated as (*EMEP/EEA Air Pollutant Emission Inventory Guidebook 2016 – Update July 2018*):

$$\begin{aligned}
 \text{CO}_2 \text{ emission} &= 0.26 \text{ kg CO}_2/\text{L urea solution} \times \text{Urea Consumption (L)} \\
 &= 0.238 \text{ kg CO}_2/\text{kg urea solution} \times \text{Urea Consumption (kg)}
 \end{aligned}$$

Emissions due to Non-road Mobile Sources and Machinery

As per the EMEP/EEA Air Pollutant Emission Inventory Guidebook 2016 – Update May 2017 the emission factors from non-road mobile sources and machinery for the “mobile combustion in manufacturing industries and construction” category using diesel fuel are given in Table 7-6.

Table 7-6. Pollutant Emission Factors for Non-road Mobile Sources and Machinery (Diesel Fuel)

| Pollutant | Emission Factor |
|------------------|------------------------|
| CO ₂ | 3,160 kg/tonnes fuel |
| CH ₄ | 83 g/tonnes fuel |
| N ₂ O | 135 g/tonnes fuel |

The detailed calculation of Scope 1 and Scope 2 emissions are given in Table 7-7 for 11 months of construction period

7.5. Impact Significance, Management and Residual Impacts

The potential Project impacts, proposed mitigation measures and residual impact significances are summarized in Table 7-8.

Table 7-7. Scope 1 and Scope 2 GHG Emission Calculations for the Construction Phase of the Project

| Item | Value | Unit | | | |
|--|----------------------|---------------------------------------|--------|------------------------------------|----------------|
| Construction Period | 11 | months | | | |
| Daily construction work | 8 | hours per day | | | |
| Number of Heavy Duty Vehicles (for on-site construction) | 15 | HGV | | | |
| Number of Machinery (for on-site construction) | 22 | | | | |
| Number of Turbines to be installed | 21 | | | | |
| Number of HGV per Turbine to be installed | 11 | | | | |
| Total Number of HGVs (for transportation of turbines and components) | 220 | | | | |
| Typical Diesel Fuel Consumption for Heavy Duty Vehicles | 240 | g/km | | | |
| Daily mileage per HGV for on-site construction works | 20 | km per HGV per day | | | |
| Net calorific value of diesel oil | 43 | TJ per Gg | | | |
| 1 Gg | 1000000 | kg | | | |
| Number of Hours of Concrete Works for Turbine Foundations | 9 | hours per turbine | | | |
| Length of Turbine Transportation Alternative Route 1 | 356 | km per HGV | | | |
| Length of Turbine Transportation Alternative Route 2 | 148 | km per HGV | | | |
| Fuel Consumption by non-road mobile sources | 10 | tonnes | | | |
| Purchased Electricity (for on-site construction works) | 0 | kWh | | | |
| Scope 1 Emissions | Emission Factor (EF) | EF Unit | kg GHG | IPCC 2014 Global Warming Potential | kg CO2 |
| 1.1. On-site Construction Works | | | | | |
| CO2 Emissions due to Road Transport | | | | | |
| CO2 due to fuel combustion | 3.169 | kg CO2 per kg of diesel fuel consumed | 75,295 | 1 | 75,295 |
| CO2 due to lubricant oil | 4.87 | kg CO2 per 10,000 km | 48 | 1 | 48 |
| CO2 due to exhaust additives | 0.26 | kg CO2/L urea solution | 0 | 1 | 0 |
| | 0.238 | kg CO2/kg urea solution | 0 | 1 | 0 |
| CH4 (fuel type: gas/diesel oil) | 3.9 | kg CH4 per TJ | 4 | 28 | 112 |
| N2O (fuel type: gas/diesel oil) | 3.9 | kg N2O per TJ | 4 | 285 | 1,056 |
| Emissions due to Non-road Mobile Sources and Machinery | | | | | |
| CO2 | 3160 | kg CO2 per tonnes fuel | 31,600 | 1 | 31,600 |
| CH4 | 83 | g CH4 per tonnes fuel | 830 | 28 | 23,240 |
| N2O | 135 | g N2O per tonnes fuel | 1,350 | 285 | 357,750 |
| 1.2. Transportation of Turbines and Components | | | | | |
| CO2 Emissions due to Road Transport | | | | | |
| CO2 due to fuel combustion | 3.169 | kg CO2 per kg of diesel fuel consumed | 59,587 | 1 | 59,587 |
| CO2 due to lubricant oil | 4.87 | kg CO2 per 10,000 km | 38 | 1 | 38 |
| CO2 due to exhaust additives | 0.26 | kg CO2/L urea solution | 0 | 1 | 0 |
| | 0.238 | kg CO2/kg urea solution | 0 | 1 | 0 |
| CH4 (fuel type: gas/diesel oil) | 3.9 | kg CH4 per TJ | 3 | 28 | 89 |
| N2O (fuel type: gas/diesel oil) | 3.9 | kg N2O per TJ | 3 | 285 | 835 |
| TOTAL Scope 1 Emissions | | | | | 549,630 |
| Scope 2 Emissions | | | | | |
| Purchased Electricity (for on-site construction works) | 0.5 | tonnes CO2 per MWh | 0 | 1 | 0 |

Table 7-8. Impacts, Proposed Mitigation Measures and Residual Impacts (Air Quality and GHG Emissions)

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|---|-----------------------------------|--|---------------------|------------|-----------------------|------------|--------------|---|--|------------------------------|---|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | |
| Emissions to air due to construction activities | Land preparation and construction | Residential Receptor (measurement location A-01) | Restricted to Local | Negligible | Short term Reversible | Short-term | Intermittent | Negligible | High | Minor | <ul style="list-style-type: none"> Project-specific Air Quality and GHG Management Plan will be implemented by the Project Company and the contractors (through contractual requirements). All Project personnel including direct and contracted workers will be trained on the implementation of Air Quality and GHG Management Plan. The Project Company will enforce speed limits for the Project vehicles that will transport construction materials/equipment along the existing main access road. Loading and unloading of material will be carried out without scattering. Excavated soils will be stockpiled (as necessary) at designated areas. Loose materials will be properly covered, or top layers will be kept moist on dry periods. Vehicles carrying excavated materials will be covered. Dust suppression methods such as water spraying will be applied at dust generating areas especially during dry weather conditions. Access roads and internal roads will be covered with plant mix. Speed limitations will be applied for vehicles. Upper layers of the excavated material stored will be kept at a humidity level of about 10%. Construction vehicles/equipment will be prevented from idling and running unnecessarily. Regular maintenance of vehicles/equipment. Project-specific Stakeholder Engagement Plan will be implemented to address any air quality-related grievance and plan/take corrective actions, where necessary. To verify compliance with Project standards, air quality (PM10 and PM2.5) monitoring will be conducted one-off at receptors A-01, A-02 and A-03 at the peak period of construction works and also in case of receipt of noise-related grievances. |
| | | Residential Receptor (measurement location A-02) | Restricted to Local | Negligible | Short term Reversible | Short-term | Intermittent | Negligible | High | Minor | |
| | | Residential Receptor on the main access road (measurement location A-03) | Restricted to Local | Negligible | Short term Reversible | Short-term | Intermittent | Negligible | High | Minor | |
| | | Unused/ unoccupied coastline outside the License Area Border (measurement location A-04) | Restricted | Negligible | Short term Reversible | Short-term | Intermittent | Negligible | Low | Negligible | |
| | | Residential Receptor on the main road to Kiyikoy (measurement location A-05) | Restricted to Local | Negligible | Short term Reversible | Short-term | Intermittent | Negligible | High | Minor | |

8. WATER AND WASTEWATER MANAGEMENT

This Chapter discusses the water supply and management of wastewater during the Project land preparation, construction, operation and closure phase activities. The water use at the existing operational Kiyikoy WPP is limited to domestic purposes. Sanitary wastewater generated in limited amounts as a result of site activities of the existing workforce is managed at the current non-leaking septic tank present at site, which is regularly emptied by the vacuum trucks of the Kiyikoy Municipality.

The amount of water to be required and thus wastewater generated will temporarily increase during the construction phase of the Project and reduce to current levels with the demobilisation of construction workforce. During the construction phase, the construction contractor will provide the necessary facilities (package domestic wastewater treatment unit or a non-leaking septic tank depending on the number of site personnel) for the management of sanitary wastewater to be produced as per the requirements of the national legislation.

For the operation phase, a new non-leaking septic tank will be provided at the new control building for the management of the sanitary wastewater to be produced by the operation personnel. The operation activities do not involve use of process water or generation of process wastewater.

This Chapter will identify the mitigation measures to be taken to ensure sound management of the potential impacts on water resources as summarised above.

The key data sources used to define the baseline conditions and assess the potential impacts of the Project are listed below:

- Critical performance indicator of the Kiyikoy WPP (2018)
- Kırklareli Provincial Environmental Status Report, Ministry of Environment and Urbanization (2018)
- National EIA Report of Kiyikoy WPP Capacity Increase Project (2017)
- Thrace Region Development Project, Ministry of Forestry and Water Affairs (2016)
- Marmara River Catchment Protection Action Plan, Ministry of Environment and Forestry (2010)
- Kırklareli Province Flood Database, Disaster and Emergency Management Authority of Turkey
- Database of the Turkish State Hydraulic Works (DSİ) and Istanbul Sewerage Administration (İSKİ)
- Others (websites of the MoEU, Kırklareli PDoEU and the related municipalities)

8.1. Project Standards

The Project standards will apply for the supply of domestic water to be used by the construction workforce and management of sanitary wastewater to be generated as a result of the Project.

The Project will comply with the requirements of the following applicable national legislation:

- Regulation on the Protection of Groundwater Due to Pollution and Degradation
- Regulation on Waters Intended for Human Consumption (RWIHC)
- Regulation on Quality and Treatment of Surface Water Used to Obtain Drinking Water
- Regulation on Protection of Drinking and Potable Water Catchment Area

- Regulation on the Septic Pits to be Opened at Locations where Sewer Construction is not Feasible
- Surface Water Quality Regulation (SWQR)
- Water Pollution Control Regulation (WPCR)

The following special provisions and regulations related to the Project site will also be complied with:

- Special Provisions on Kazandere Dam and Pabucdere Dam Catchment Areas (entered into force on September 28, 2017)
- Regulation Concerning Drinking Water Catchment Areas of ISKI

The applicable requirements of the following international standards and GIP will also be complied with:

- IFC General EHS Guidelines
- World Health Organization (WHO) Guidelines for Drinking Water Quality

Project Standards for drinking water quality, based on the applicable national and international standards, are provided in Table 8-1 below.

Table 8-1. Project Standards for Drinking Water

| Parameter | Unit | Turkish RWIHC | WHO Drinking Water Guidelines | Project Standards |
|----------------------------|-------|---------------|-------------------------------|-------------------|
| Antimony | mg/L | 0.005 | 0.020 | 0.005 |
| Arsenic | mg/L | 0.01 | 0.01 | 0.01 |
| Barium | mg/L | - | 0.7 | 0.7 |
| Benzene | mg/L | 0.001 | 0.01 | 0.001 |
| Boron | mg/L | 1 | 2.4 | 1 |
| Cadmium | mg/L | 0.005 | 0.003 | 0.003 |
| Chromium | mg/L | 0.05 | 0.05 | 0.05 |
| Copper | mg/L | 2 | 2 | 2 |
| Cyanide | mg/L | 0.05 | - | 0.05 |
| Fluoride | mg/L | 1.5 | 1.5 | 1.5 |
| Lead | mg/L | 0.01 | 0.01 | 0.01 |
| Mercury | mg/L | 0.001 | 0.006 | 0.001 |
| Nickel | mg/L | 0.02 | 0.07 | 0.02 |
| Nitrate | mg/L | 50 | 50 | 50 |
| Nitrite | mg/L | 0.5 | 3 | 0.5 |
| Selenium | mg/L | 0.01 | 0.04 | 0.01 |
| Aluminum | mg/L | 0.2 | - | 0.2 |
| Ammonium | mg/L | 0.5 | - | 0.5 |
| Chloride | mg/L | 250 | - | 250 |
| Conductivity | µS/cm | 2500 | - | 2500 |
| pH | - | 6.5≤pH≤9.5 | - | 6.5≤pH≤9.5 |
| Iron | mg/L | 0.2 | - | 0.2 |
| Manganese | mg/L | 0.05 | - | 0.05 |
| Sulfate as SO ₄ | mg/L | 250 | - | 250 |
| Sodium | mg/L | 200 | - | 200 |
| Uranium | mg/L | - | 0.03 | 0.03 |

The national WPCR requires industrial facilities with personnel number less than 84 to collect their sanitary (domestic) wastewaters in non-leaking septic tanks, which will be disposed of by means of sewage trucks. The

non-leaking septic tanks are to be constructed in line with the specifications defined in the Regulation on the Septic Pits to be Opened at Locations where Sewer Construction is not Feasible. The WPCR requires industrial facilities to meet the discharge limits defined in Table 21.1 (Equivalent population: 84-2000).

The IFC EHS Guidelines, Section 1.3 “Wastewater and Ambient Water Quality” specifies the indicative values for treated sanitary sewage discharges.

The Project complies with the requirements of the Septic Pits to be Opened at Locations where Sewer Construction is not Feasible for the management of sanitary wastewater produced at the current operational Kiyikoy WPP. The stringent limits will be taken into consideration in the management of sanitary wastewater to be produced by the temporary construction workforce (see Table 8-2).

Table 8-2. Project Standards for the Treated Sanitary Wastewater Discharges

| Parameter | WPCR Table 21.1 | | IFC General EHS Guidelines (Table 1.3.1) | Project Standards (24 hours composite*) |
|---|-----------------------------|-----------------------------|--|---|
| | 2 hr Composite Sample Limit | 4 hr Composite Sample Limit | | |
| BOD (mg/L) | 50 | 45 | 30 | 30 |
| COD (mg/L) | 180 | 120 | 125 | 120 |
| Total Suspended Solids (mg/L) | 70 | 45 | 50 | 45 |
| pH | 6-9 | 6-9 | 6-9 | 6-9 |
| Total Nitrogen (mg/L) | - | - | 10 | 10 |
| Total Phosphorus (mg/L) | - | - | 2 | 2 |
| Oil and Grease (mg/L) | - | - | 10 | 10 |
| Total Coliform Bacteria (Most Probable Number/100 ml) | - | - | 400 | 400 |

* Effluents from highly variable processes may need to be sampled more frequently or through composite methods. Grab samples or, if automated equipment permits, composite samples may offer more insight on average concentrations of pollutants over a 24-hour period. Composite samplers may not be appropriate where analytes of concern are short-lived (e.g., quickly degraded or volatile) (IFC, General EHS, 2012).

The regulation requires industrial plants having a worker population between 84-2,000 to manage their domestic wastewaters through treatment and/or other disposal methods to be approved by the Provincial Directorate of Environment and Urbanization.

8.2. Baseline Conditions

The Project License Area is located within the Marmara River Catchment, which covers an area of approximately 24,000 km². Kiyikoy town and Demirkoy district (together with Igneada town) of Kırklareli province fall within the catchment area as given in Figure 8-1.

8.2.1. Surface Water Resources

The nearest lake to the Project License Area is Saka Lake with a distance of approximately 11 km. The dams and ponds located in the vicinity of the Project are given in Figure 8-1. Lakes, dams and ponds within the vicinity of the Project are shown in Figure 8-2.

Table 8-3. Dams and Ponds in the Vicinity (within 30 km) of the Project Area

| Name of the Water Resource | Province | Storage Volume (hm ³) | Distance to Closest Turbine (km) | Purpose |
|--|------------|-----------------------------------|----------------------------------|-----------------------------|
| Dams and Ponds (in operation) | | | | |
| Pabucdere Dam | Kırklareli | 60.0 | 1.4 | Drinking (operated by İSKİ) |
| Kazandere Dam | Kırklareli | 100.0 | 3.0 | Drinking (operated by İSKİ) |
| Sultanbahcedere (Bahcivandere) Dam | Tekirdag | 19.4 | 8.3 | Drinking (operated by İSKİ) |
| Elmalidere Dam | Tekirdag | 11.6 | 10.8 | Drinking (operated by İSKİ) |
| Saray Ayvacık Pond | Tekirdag | 16.2 | 18.0 | Irrigation/Drinking |
| Vize Sergen Dam | Kırklareli | 1.0 | 25.0 | Irrigation |
| Dams and Ponds (under construction) | | | | |
| Demirkoy Sivrilir Pond | Kırklareli | 2.4 | 20 | Irrigation |

Source: Trakya Development Project, Ministry of Forestry and Water Affairs (2016); 11th (Edirne) Regional Directorate of DSI (<http://bolge11.dsi.gov.tr/anasayfa>); Kırklareli Provincial Environmental Status Report, MoEU, 2018; GIS Application of MoAF (<http://geodata.ormansu.gov.tr/>); Istanbul Water and Sewerage Administration (İSKİ) website (<http://www.iski.istanbul/web>).



Figure 8-1. Project License Area within Marmara River Catchment

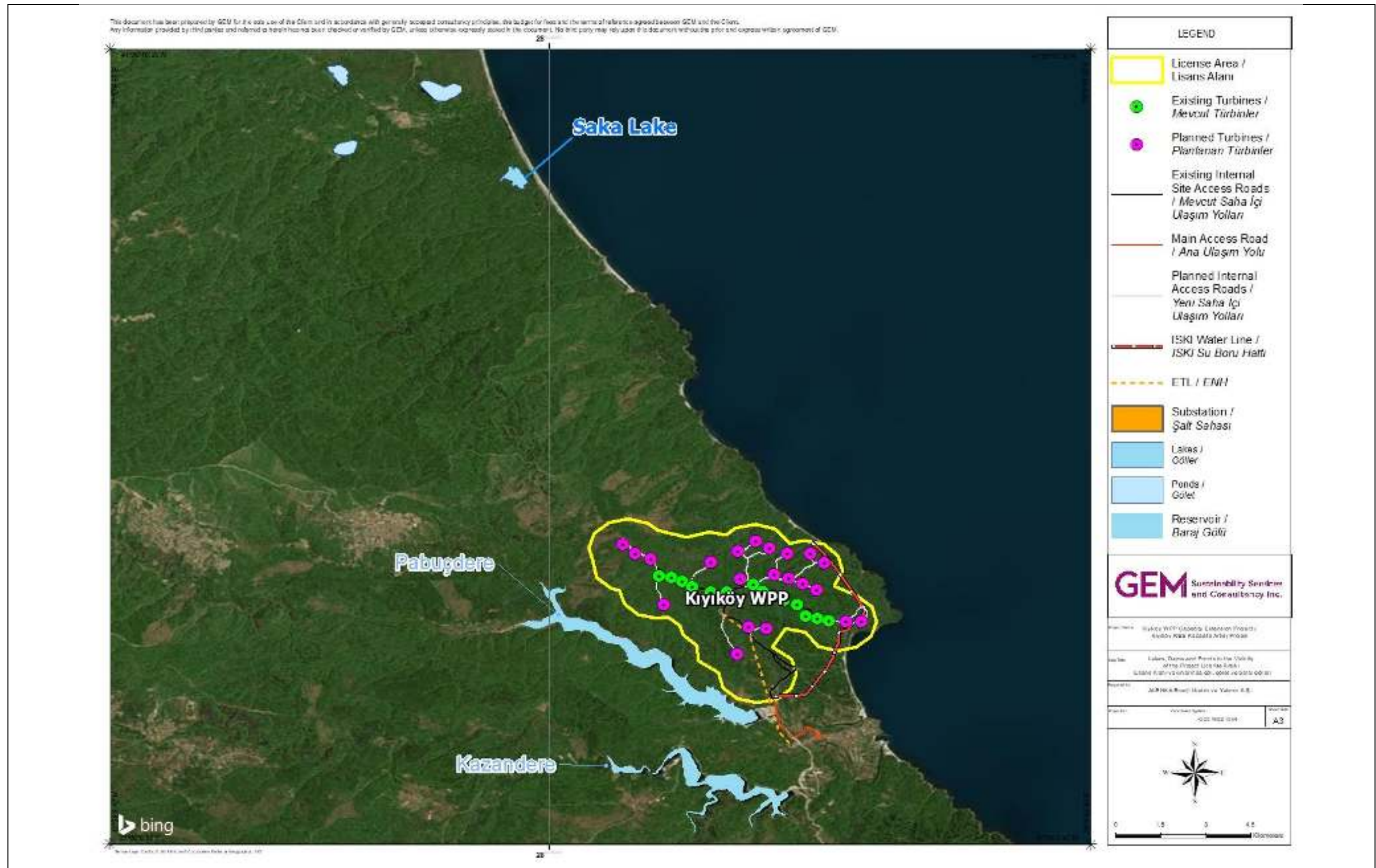


Figure 8-2. Lakes, Dams and Ponds in the Vicinity of the Project License Area

As shown in Figure 8-3, there are streams/creeks flowing within Pabucdere Dam Reservoir Catchment Area, amongst which the Pabuc River and Kazan River located in the south of the License Area are major surface water resources in relevance to the Project. There is no perennial stream located within the License Area.

As the Pabucdere and Kazandere Dam Reservoirs are used for drinking water supply, “Special Provisions” have been put into force by the former Ministry of Forestry and Water Affairs (Currently acting as the Ministry of Agriculture and Forestry) on September 28, 2017, in order to define the legal and technical procedures and principles that are to be followed for the activities being conducted in the “Dam Catchment Areas”. The Special Provisions have been prepared on the basis of the Water Pollution Control Regulation with the aim of ensuring protection and improvement of water quality and sustainable use of both reservoirs.

According to the “Special Provisions on Kazandere Dam and Pabucdere Dam Catchment Areas” which was published by the former Ministry of Forestry and Water Affairs (Currently acting as the Ministry of Agriculture and Forestry) and entered into force on September 28, 2017:

- Absolute Protection Zone is the 300 m wide zone beginning from the maximum water level of the drinking water reservoir (which is 28 m) for Pabucdere Dam and Kazandere Dam.
- Short-Distance Protection Zone is the 700 m wide zone beginning from the boundaries of absolute protection zone.
- Medium-Distance Protection Zone is a 1,000 m wide zone beginning from the boundaries of short-distance protection zone.
- Long-Distance Protection Zone extends from the boundaries of medium distance protection zone to the catchment boundary of water collection.

The turbines T30 and T31 planned to be erected and operated as part of the Capacity Extension Project fall within the “Medium Distance Protection Zone”. None of the Capacity Extension turbines are located within the “Short Distance Protection Zone” of the Pabucdere Dam Reservoir Catchment Area, whilst part of the existing ETL and part of the existing main access road (which is also used to access the TurkStream Project construction camp site and facilities) fall within this zone. As per the abovementioned Special Provisions, the activities that will be carried out within the short-distance protection zone are subject to the approval of the Ministry of Agriculture and Forestry and the General Directorate of ISKI.

The Project obtained the positive opinions of the Ministry of Agriculture and Forestry, DSI and ISKI. In February 2018, ISKI provided its official opinion and highlighted that the works related to turbines T20, T21, T22, T23, T24 and T35 shall not interfere with the existing drinking water pipeline and the planned tunnel and that there shall be at least 30 m distance between the planned turbines and the drinking water pipelines and no works shall be carried in between. The current design of the Project fulfils the requirements of ISKI (see Figure 8-3).

The Project Area is located on a mountainous region which does not include any flood plains. Based on the data reported by the Turkish Disaster and Emergency Management Authority, a total of 5 (five) flood events have been reported in Kırklareli province since 1998 (<https://tabb-analiz.afad.gov.tr/Genel/Raporlar.aspx>). None of these flood events took place in Vize district. It has been reported that the flood event recorded in 1998 in other districts of the province resulted in damages on agricultural lands and residential areas. The other recorded flood events have no record of loss of life or property. The official letter of the Kırklareli Provincial Directorate of Disaster and Emergency (issued on 13 June 2016 as part of the national EIA process) also confirms that the License Area does not have flood risk.

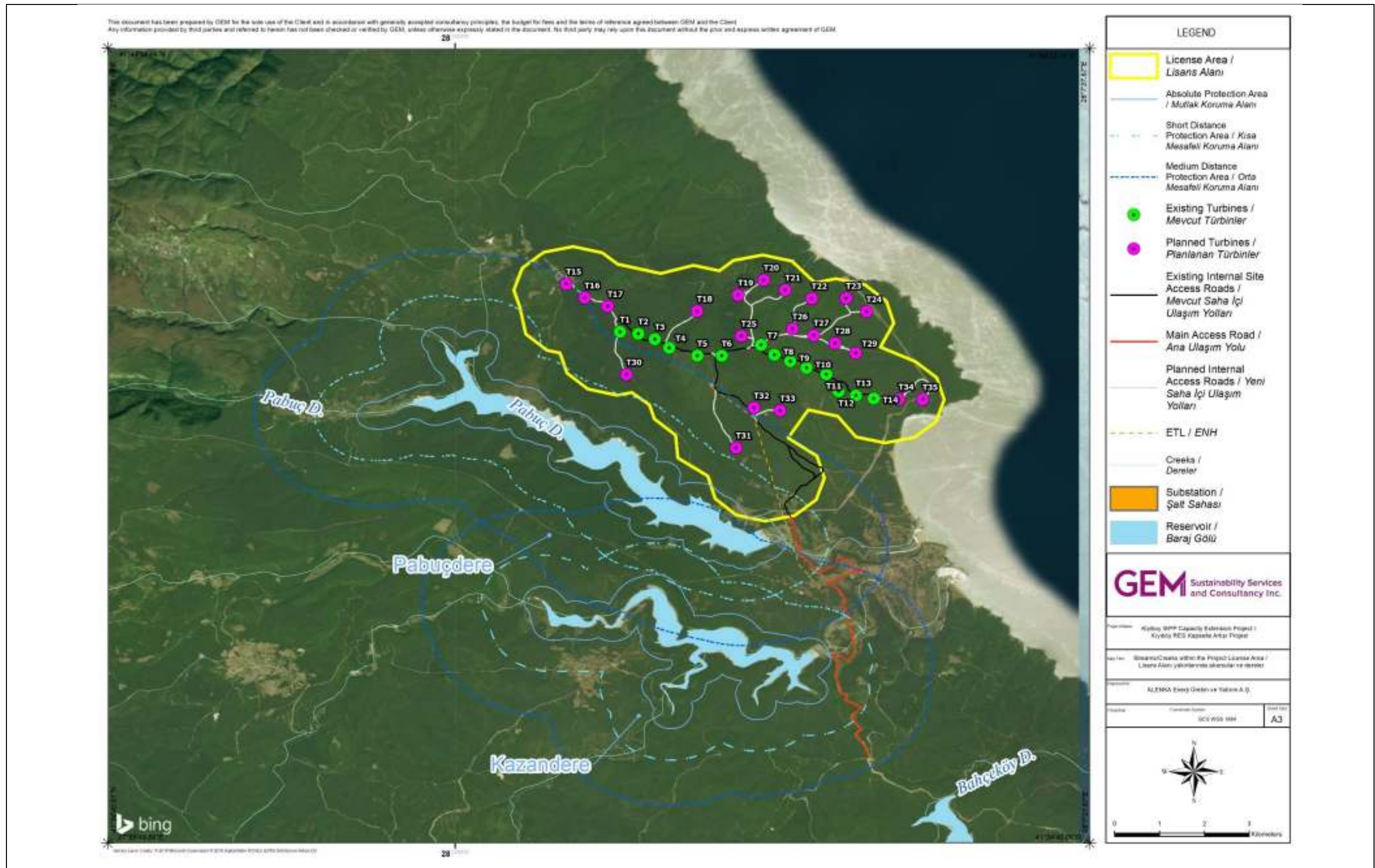


Figure 8-3. Streams/creeks within the Project

8.2.2. Groundwater Resources

According to the Marmara River Catchment Protection Action Plan (2010), the groundwater operating reserve of the Catchment is estimated as 297 hm³/year; whilst the groundwater potential of the Catchment is estimated as 396 hm³/year.

A total of 15 boreholes (including one borehole for the switchyard), each with a depth of 15 m, were drilled within the scope of the geological surveys conducted as part of the site geotechnical surveys. Groundwater was not encountered in any of the boreholes.

8.3. Impact Assessment and Management

The baseline information on the surface and groundwater resources in and around the License Areas is provided in the previous section. This section assesses the potential impacts of the Project on the water resources during the land preparation, construction, operation and closure phases.

8.3.1. Land Preparation and Construction Phase

The Pabucdere Dam Reservoir is located approximately 1.4 km south-southwest of the closest turbine (T31) to be constructed as part of the Capacity Extension Project. The Project does not require construction of a new main access road, limiting the construction activities in the southern-southeastern part of the License Area. Construction of Capacity Extension Project units is not anticipated to cause any significant impact on the water quality of the Pabucdere Dam Reservoir

A total of 15 boreholes (including one borehole for the switchyard), each with a depth of 15 m, were drilled within the scope of the geological surveys conducted as part of the site geotechnical surveys. Groundwater was not encountered in any of the boreholes. Depth of the foundations is estimated to be approximately 3.5 meters from the ground level, while the final depths will be determined after the finalisation of design and engineering studies. Therefore, no groundwater interference is expected during the construction of wind turbines and excavations are not anticipated to affect groundwater resources.

Water will be required mainly for the following activities during the land preparation and construction phase of the Project:

- Domestic (drinking and utility) water consumption by the Project personnel
- Dust suppression during earthworks and construction activities

As concrete is planned to be supplied from local licensed providers as ready-mixed concrete, water use for concrete batching activities is not anticipated in the scope of the Project.

The construction activities and the on-going operations will involve limited use of hazardous substances. All necessary measures will be in place to avoid potential spills/leakages and associated impacts on the water resources.

Domestic Water Use and Wastewater Generation

Currently 16 personnel are employed for the operation of the existing 14 turbines, 12 of them are permanently working at the site operations. The number of construction workforce is anticipated to reach 100 at the peak period of the construction phase. There is no on-site accommodation at the current plant and there will be no on-site accommodation during the construction phase of the Capacity Extension Project. The current plant supplies water from Kiyikoy town by means of water tankers and stores the supplied water at the water tank (having a capacity of 5 tons) located at the substation site. Bottled water is used to meet the drinking water requirements of the existing personnel. During the construction phase of the Capacity Extension Project, water will be supplied from Kiyikoy town and as bottled water. Groundwater is not planned to be used to meet the water use requirements of the Project.

The monthly water supply at the current plant is recorded as approximately 10 m³ such that the water tank is refilled two times per month. The monthly domestic water use at the current plant and the estimated domestic water use for the construction workforce is provided in Table 8-4.

Table 8-4. Estimated Daily Domestic Water Use and Wastewater Generation

| Personnel | Number of Personnel | Total Monthly Amount of Domestic Water Use (m ³ /month) |
|---|---------------------|--|
| Existing operations workforce at site | 12 | 10.0 |
| Construction workforce (at peak) | 100 | 85.0 |
| Cumulative Water Use and Wastewater Generation | 112 | 95.0 |

It is assumed that all the water to be used by the personnel is converted to domestic wastewater. Thus, the amount of cumulative domestic wastewater anticipated to be generated during the construction phase is maximum 95 m³/month.

Domestic wastewater generated at the existing plant is stored in a non-leaking septic tank and removed by means of the vacuum trucks of the Kiyikoy Municipality in line with the agreement made. A new non-leaking septic tank will be installed as part of the refurbishment and construction works to be conducted at the new control building.

Domestic wastewater to be generated by the construction workforce will be treated at the package domestic wastewater treatment unit to be installed at the substation site by the construction contractor (if the number of construction personnel exceeds 84 as anticipated in this ESIA) or collected in a non-leaking septic tank and removed by means of vacuum trucks of the Kiyikoy Municipality (if the number of construction personnel is below 84). The permitting requirements in the scope of the relevant national regulation will be fulfilled for the management of domestic wastewaters to be generated during the construction phase of the Capacity Extension Project. As such, environmental permit for the treated wastewater discharges will be obtained from the Ministry of Environment and Urbanization in case a package domestic wastewater treatment unit is installed or a protocol with the Kiyikoy Municipality will be required from the contractor for the removal of domestic wastewater in case a non-leaking septic tank is used.

Dust Suppression

Water will be used for dust suppression during dry periods. It is assumed that the daily amount of water to be used for dust suppression by two water tankers will be maximum 20 m³ on the dry periods. Water for dust suppression will be supplied from Kiyikoy town.

8.3.2. Operation Phase

After the commissioning of the Capacity Extension Project units, the existing workforce will continue operating the Kiyikoy WPP. Thus, the water use and wastewater generation amounts are anticipated to reduce to the levels recorded at the current plant (a total of 10 m³ per month) during the operation phase of the Capacity Extension Project. The Project Company plans to continue supplying water from Kiyikoy town by means of water tankers and as bottled water for drinking purposes. The conditions at the existing water tank at the substation site is planned to be improved to ensure that the quality of water to be used by the operation personnel meets the Project standards. Domestic wastewater to be generated during the construction phase will be stored at the existing non-leaking septic tank located at the substation site and removed by means of vacuum trucks of the Kiyikoy Municipality.

All necessary measures will be in place to avoid impacts on water resources due to potential spills/leakages of hazardous substances as a result of the maintenance activities to be carried out in the operation phase of the Project.

8.3.3. Closure Phase

The closure phase of the Project will involve dismantling and decommissioning of the Project components and activities to rehabilitate the site back to its original state. As the number of personnel to be involved in the closure activities is likely to be relatively higher than the operation phase, amount of water use and wastewater generation would temporarily increase. Measures identified for land preparation and construction phase are also applicable for the closure phase.

8.3.4. Impact Significance, Management and Residual Impacts

The potential impacts of the Project, significance of the impacts prior to mitigation, proposed mitigation measures and the significance of residual impact are summarised in Table 8-5.

Table 8-5. Impacts, Proposed Mitigation Measures and Residual Impacts (Water and Wastewater Management)

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | Overall Magnitude | Sensitivity/Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--|---|----------------------------|------------------|-----------|-----------------------|------------|--------------|-------------------|---|---|---|------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | | | | | |
| Impact on the quality and quantity of nearby water resources | <ul style="list-style-type: none"> Land Preparation and Construction Operation Closure | Surface water/ Groundwater | Local | Low | Short term reversible | Short term | Intermittent | Low | Low | Minor | <ul style="list-style-type: none"> Project-specific Waste Management Plan, Hazardous Materials Management Plan, Emergency Preparedness and Response Plan will be implemented by the Project Company and the contractors (through contractual requirements) to ensure efficient water use and avoid improper management of wastewaters. Domestic wastewater to be generated by the construction workforce will be treated at the package domestic wastewater treatment unit to be installed at the substation site by the construction contractor (if the number of construction personnel exceeds 84 as anticipated in this ESIA) or collected in a non-leaking septic tank and removed by means of vacuum trucks of the Kiyikoy Municipality (if the number of construction personnel is below 84). The permitting requirements in the scope of the relevant national regulation (e.g. environmental permit where applicable) will be fulfilled for the management of domestic wastewaters to be generated during the construction phase of the Capacity Extension Project. Domestic wastewater produced by operations workforce will be managed through non-leaking septic tank that will be regularly emptied by vacuum trucks of the Kiyikoy Municipality. Hazardous materials will be managed (e.g. stored in designated areas as per MSDS requirements, provision of spill kits, absorbent pads/sands for management of accidental spillages etc.) in line with the provisions of the Hazardous Materials Management Plan. The existing temporary Waste Storage Area located at the substation site will be improved to ensure that waste management practices do not pose any risk on the quality of surface or groundwater resources. Routine visual checks of the hazardous materials storage and waste storage areas to ensure all provisions of the respective Management Plans are in place and that there is no spill/leakage to receiving environment. Necessary training will be provided to the site staff to ensure efficiency in Project-related water use and that the provisions of the respective Management Plans are followed at all times. The existing water storage tank at the substation will be improved to ensure that the water quality fulfills Project standards (as part of occupational health and safety management). | Negligible |

9. WASTE MANAGEMENT

This Chapter discusses the waste generation by the Project land preparation, construction, operation and closure phase activities and identifies the mitigation measures for the potential impacts stemming from on-site waste generation.

The following main data sources have been used to compile this chapter:

- Information on waste facilities in the vicinity of the Project, obtained from the websites of the MoEU, Kırklareli PDoEU and the related municipalities
- Kırklareli Provincial Environmental Status Report, Ministry of Environment and Urbanization, 2018
- Kırklareli Local Administrations Union on Establishing and Operating Solid Waste Facilities (KIRK-KAB-1 Union) (<http://kirkkab1.org/>)
- Waste generation and management data obtained from the existing operation team of the Kiyikoy WPP and BEE
- Waste statistics published by Turkstat (2016)

9.1. Project Standards

The Regulation on Waste Management is the implementing legislation providing comprehensive framework for waste management and is aligned with the European Union (EU) Waste Framework Directive (2008/98/EC). The Annex 4 of the Regulation is directly transposed from the European Waste Codes. Complementary to the Regulation on Waste Management, the main national regulations and communiques applicable to the waste management in the scope of the Kiyikoy WPP Project are as listed below:

- Regulation on the Control of Excavation, Construction and Demolition Waste
- Regulation on the Landfill of Wastes
- Regulation on the Control of Medical Wastes
- Regulation on Control of Packaging Wastes
- Regulation on the Control of Waste Batteries and Accumulators
- Regulation on the Control of Waste Electrical and Electronic Equipment
- Regulation on the Control of Waste Oils
- Regulation on the Control of Waste Tires
- Regulation on the Control of Waste Vegetable Oils
- Communique on Transportation of Wastes by Highway
- Communique on Recovery of Some Non-Hazardous Wastes

In addition to the national waste management legislation, the relevant requirement of the EBRD PR3 on Resource Efficiency and Pollution Prevention and Control and other available GIPs will also be applicable to the Project.

9.2. Baseline Conditions

In Kirklareli Province, there is one sanitary landfill for the disposal of municipal (domestic) solid wastes, which is in operation since 2010 and being operated by Kirklareli Local Administrations Union on Establishing and Operating Solid Waste Facilities (KIRK-KAB-1 Union). The sanitary landfill is located at a distance of approximately 84 km from the Kiyikoy Municipality town centre and 94 km from the existing Kiyikoy WPP.

The Union has been serving the member municipalities in Kirklareli since 2011 (*Kirklareli PDoEU, 2018*). Including Vize Municipality, there are currently 14 district/town municipalities member to the Union. Each municipality is responsible for the collection and transfer of the wastes generated within its boundaries to the sanitary landfill (*KIRK-KAB-1 Union website, <http://kirkkab1.org/>*). In 2017, approximately 181 tons/day of municipal waste was disposed of at the sanitary landfill (*Kirklareli PDoEU, 2018*).

Sanitary landfills are designed as Class II landfills as per the provisions of the Regulation on the Landfill of Wastes. Thus, the landfills have in place systems that prevent surface water from entering the facility, proper impermeable liners, leachate collection systems and systems for treatment of collected leachate in line with the related legislation.

The existing waste management infrastructure of Kirklareli province is summarized below (*Kirklareli PDoEU, 2018*):

- Twenty-seven facilities permitted by Kirklareli PDoEU to collect and segregate non-hazardous waste within the scope of the Communiqué on Recovery of Some Non-Hazardous Wastes. Eight facilities are licensed by the MoEU for non-hazardous waste recycling/recovery, whereas four facilities are licensed for hazardous waste recovery.
- Six facilities licensed by the MoEU for the collection and segregation of packaging wastes.
- Five facilities licensed by the MoEU for the recovery of packaging wastes.
- One facility licensed by the MoEU for recovery of waste oil.
- One sterilisation/incineration facility for medical wastes.
- One disposal site for excavation, construction and demolition wastes operated by Kirklareli Municipality.
- One licensed temporary storage facility for end of life vehicles.

9.3. Impact Assessment and Management

The Kiyikoy WPP is in operation since August 2014. Thus, the ongoing operations generate different types of hazardous and non-hazardous wastes. The construction activities to be conducted for the Capacity Extension Project will result in additional amounts and types of wastes for a temporary period due to the involvement of construction workforce. Following the completion of construction phase and commissioning of the Capacity Extension units, the existing operation teams will continue operating the Kiyikoy WPP, thus the types and amounts of the wastes to be generated is anticipated to be comparable to the current levels. Closure activities would result in waste plant equipment in addition to the types of wastes similar to the construction phase.

The potential impacts as a result of on-site waste generation and their management are presented below for each phase of the Project separately.

9.3.1. Land Preparation and Construction Phase

The following types of waste are anticipated to be generated during the construction of the Capacity Extension units:

- Municipal solid wastes
- Packaging (recyclable) wastes (not contaminated with hazardous substances)
- Excavation and construction waste (e.g. portion of excavation material that will not be suitable for reuse in construction activities, scrap steel, timber, etc.)
- Hazardous and special wastes (e.g. materials contaminated with hazardous substances, waste oils, waste vegetable oils, end-of-life tires, waste batteries and accumulators, waste electric and electronic equipment, and medical waste,)

Municipal Solid Wastes

As of September 2019, there are 12 personnel permanently employed at the site operations (there is no on-site accommodation at the existing Kiyikoy WPP). The municipal solid waste records are kept at the existing facility. According to the waste records of 2018, the monthly average total municipal solid waste generation was 133 kg (corresponding to approximately 0.5 kg/day per person).

In addition to the existing operations personnel, it is anticipated that there will be 100 personnel working on site at the peak period of construction activities. It is assumed that the same monthly municipal waste generation rates apply to the construction personnel (there will be no on-site accommodation for the construction workforce). The monthly municipal solid waste generation amounts for the existing WPP and the estimated amounts for construction phase personnel are provided in Table 9-1.

Table 9-1. Monthly Municipal Solid Waste Generation Amounts

| Personnel | Number of Personnel | Total Monthly Amount of Municipal Solid Waste Generation* |
|---|---------------------|---|
| Existing operations workforce at site | 12 | 130.0 kg |
| Construction workforce (at peak) | 100 | 1,100.0 kg |
| Cumulative Mun. Waste Generation | 112 | 1,230.0 kg |

* The average municipal solid waste generation rate per person for Kırklareli has been taken into account.

As the average daily waste disposal at KIRK-KAB1 sanitary landfill is 181 tons (approximately 5,450 tons per month), the additional load of the Project on the capacity of the existing infrastructure will be negligible (approximately 0.02% at peak construction phase).

It should be noted that, any amount of landfilled domestic waste has a potential to contribute to GHG emissions from landfills. However, as the Project related landfill impact is assessed to be negligible, this impact is also considered as negligible.

Recyclable (Packaging) Wastes

The monthly average recyclable waste amounts at the existing Kiyikoy WPP are kept at the current plant. It is assumed that the same monthly municipal recyclable waste generation rates apply to the construction personnel (there will be no on-site accommodation for the construction workforce). The monthly recyclable solid waste generation amounts for the existing WPP and the estimated amounts for construction phase are provided in Table 9-2.

Table 9-2. Monthly Recyclable Waste Generation Amounts

| Type of Recyclable Waste | Average Monthly Generation by the Existing Operation Workforce (based on 2018 waste records) | Estimated Monthly Generation by the Construction Workforce (at peak) | Cumulative Monthly Generation by Existing Operation and Construction Workforce (at peak) |
|--------------------------|--|--|--|
| Waste paper | 1.8 kg | 15.0 | 16.8 kg |
| Waste plastic | 1.3 kg | 10.8 | 12.1 kg |
| Waste metal | 1.0 kg | 8.3 | 9.3 kg |
| Waste glass | 2.0 kg | 16.7 | 18.7 kg |

Excavation and Construction Waste

Following the stripping of topsoil, the excavation works will be conducted for the construction of the additional turbines and internal site access roads required for the Capacity Extension Project. There will be no substation and no ETL construction as part of the Project. Most of the internal site access roads that will provide access to the new Project units will follow the existing forest roads that are to be improved as part of the construction works. Excavated materials are planned to be reused on site as fill material for road construction works (as subbase and foundation material) and at turbine platforms or for landscaping purposes. The estimated excavation and fill volumes are presented in Table 9-3.

Table 9-3. Estimated Excavation and Fill Volumes for the Turbine Platform and Site Access Road Construction

| Project Unit | Approximate Excavation Volume (m ³) | Approximate Fill Volume (m ³) |
|--------------------|---|---|
| Site access roads* | 37,000.00 | 25,000.00 |
| Turbine platforms | 145,000.00 | 56,000.00 |
| Total | 182,000.00 | 81,000.00 |

**A major part of the new site access roads will be followed the existing forest roads that will be improved, and a slight portion will be newly constructed.*

The construction wastes to be generated may include temporary fences, barriers, and recyclable materials including cement bags, metal scraps, wooden pallets, timber, etc. These will be segregated, stored at the temporary waste storage area on site and disposed of via agreements to be made by licensed recycling facilities.

Hazardous and Special Wastes

The types of hazardous and special wastes anticipated to be generated during the construction of Capacity Extension Projects units include materials contaminated with hazardous substances (e.g. cables, personal protective equipment (PPE), packages, etc.), waste oils, waste vegetable oils (in case the contractors establish their own kitchens and canteens at the construction site), waste tires, used batteries and accumulator, electronic waste, fluorescents, and medical wastes in limited amounts and for a temporary period.

9.3.2. Operation Phase

After the commissioning of Capacity Extension Project units, the existing workforce will continue operating the Kiyikoy WPP. In addition to the limited amount of municipal solid wastes generated by the existing operations team, operation and routine/non-routine maintenance of additional turbines will result in generation of additional amounts of hazardous and non-hazardous wastes.

The existing WPP has an Industrial Waste Management Plan approved by the Kırklareli Provincial Directorate of Environment and Urbanization on 4 April 2018 (valid until 31 December 2020). Potential types of wastes identified in the approved Industrial Waste Management Plan are listed in Table 9-4.

Table 9-4. Types of Wastes Identified in the Existing Approved Industrial Waste Management Plan of the Kiyikoy WPP

| Location | Types of Wastes |
|---|--|
| Administrative Building | Recyclable wastes (paper, glass, plastic) Fluorescent lamps, cartridges Medical wastes |
| Maintenance Activities at the Turbine Sites | Waste oils (including motor oils, lubrication oils) Materials contaminated with hazardous substances (e.g. contaminated packaging materials) Waste filters Waste accumulators Anti-freeze liquids containing hazardous substances Silicagel |

Key indicators for the waste generation at the existing Kiyikoy WPP are kept by the Project Company. The average figures from the waste records of 2018 are presented in Table 9-5. After the commissioning of the Capacity Extension Project, no significant change is anticipated for the amount of municipal solid wastes and recyclable wastes as the existing site personnel will continue operations. As the number of turbines will increase from 14 to 34 in total, there would be a proportional increase in the amount of waste oils and hazardous wastes due to the operation and maintenance activities to be conducted. Other types of wastes (e.g. medical wastes, paints, pesticides) would only be produced in negligible quantities.

Table 9-5. Monthly Waste Generation Amounts in 2018 at the Existing Kiyikoy WPP

| Waste Types | Monthly Amounts at the Existing WPP |
|--|-------------------------------------|
| Municipal Solid Waste | 130.0 kg/month |
| Recyclable Wastes | |
| Waste paper | 1.8 kg/month |
| Waste plastic | 1.3 kg/month |
| Waste metal | 1.0 kg/month |
| Waste glass | 2.0 kg/month |
| Waste oil | 0.7 kg/month |
| Hazardous Wastes | |
| Materials contaminated with hazardous substances | 77.0 kg/month |
| Waste filters | 4.0 kg/month |
| Hazardous liquids | 1.0 litres/month |
| Fluorescents | 11 pieces/month |

9.3.3. Closure Phase

Waste generation during the closure phase of the Project are anticipated to be similar to the construction phase. As the number of personnel to be involved in the closure activities is likely to be relatively higher than the operation phase, amount of municipal solid waste generation would temporarily increase.

The design life of the turbines is foreseen as at least 20 years according to the current technology. As the License Duration is 49 years starting from the License Date (4 April 2007), the Project Company would seek to extend the lifetime of the Project components with proper maintenance to be done as per the state-of-the-art technologies. Turbine components, ETL components (if required depending on the relevant authorities' decisions), electrical equipment, scrap steel, waste oils, waste cables, demolition wastes, recyclables and other hazardous and non-hazardous wastes are the types of wastes that would be generated if the turbines are to be dismantled at the end of the operation phase, depending on the future technological advancements.

9.3.4. Impact Significance, Management and Residual Impacts

The potential impacts of the Project, significance of the impacts prior to mitigation, proposed mitigation measures and the significance of residual impact are summarised in Table 9-6.

Management of wastes to be generated as a result of Project activities will follow the mitigation hierarchy to ensure that the hazardous and non-hazardous waste materials are avoided or minimised where avoidance is not possible. Unavoidable but minimised wastes will be reused, recycled or recovered and disposal will be the last resort in the Project's waste management approach. The Project will comply with the requirements of the national waste management legislation as well as international standards including EBRD PR3 and applicable GIPs.

BEE has a corporate Waste Control Procedure (published in April 2016) defining the framework for the management of hazardous and non-hazardous wastes at the power plants owned and operated by Borusan EnBW. The existing Kiyikoy WPP also has an Industrial Waste Management Plan prepared as per the requirements of the national Regulation on Waste Management and approved by the Provincial Directorate of Environment and Urbanization on 4 April 2018 (valid until 31 December 2020). This Industrial Waste Management Plan sets out the framework of the current waste management applications. There is a temporary Waste Storage Area established at the existing substation site (see Figure 9-1). This area provides top cover and concrete floor allowing storage of wastes in separate locked containments. There are waste reuse, recovery and disposal agreements made with the Kiyikoy Municipality and the licensed companies for the management of wastes generated as a result of the existing operations.

Based on the existing corporate Waste Control Procedure and the Industrial Waste Management Plan prepared in line with the national legislation, a Project-specific Waste Management Plan has been developed as part of the ESIA process. The Project Company will require the construction contractors to implement the Project-specific Waste Management Plan and provide temporary Waste Storage Areas meeting the requirements of the corporate Waste Control Procedure, national waste management legislation as well as EBRD PR3 and applicable GIPs. In accordance with its corporate Waste Management Procedure, BEE plans to improve the existing Waste Storage Area (e.g. provision of proper drainage, labelling) to ensure that the relevant requirements of the international standards are met in the Project related waste management activities.

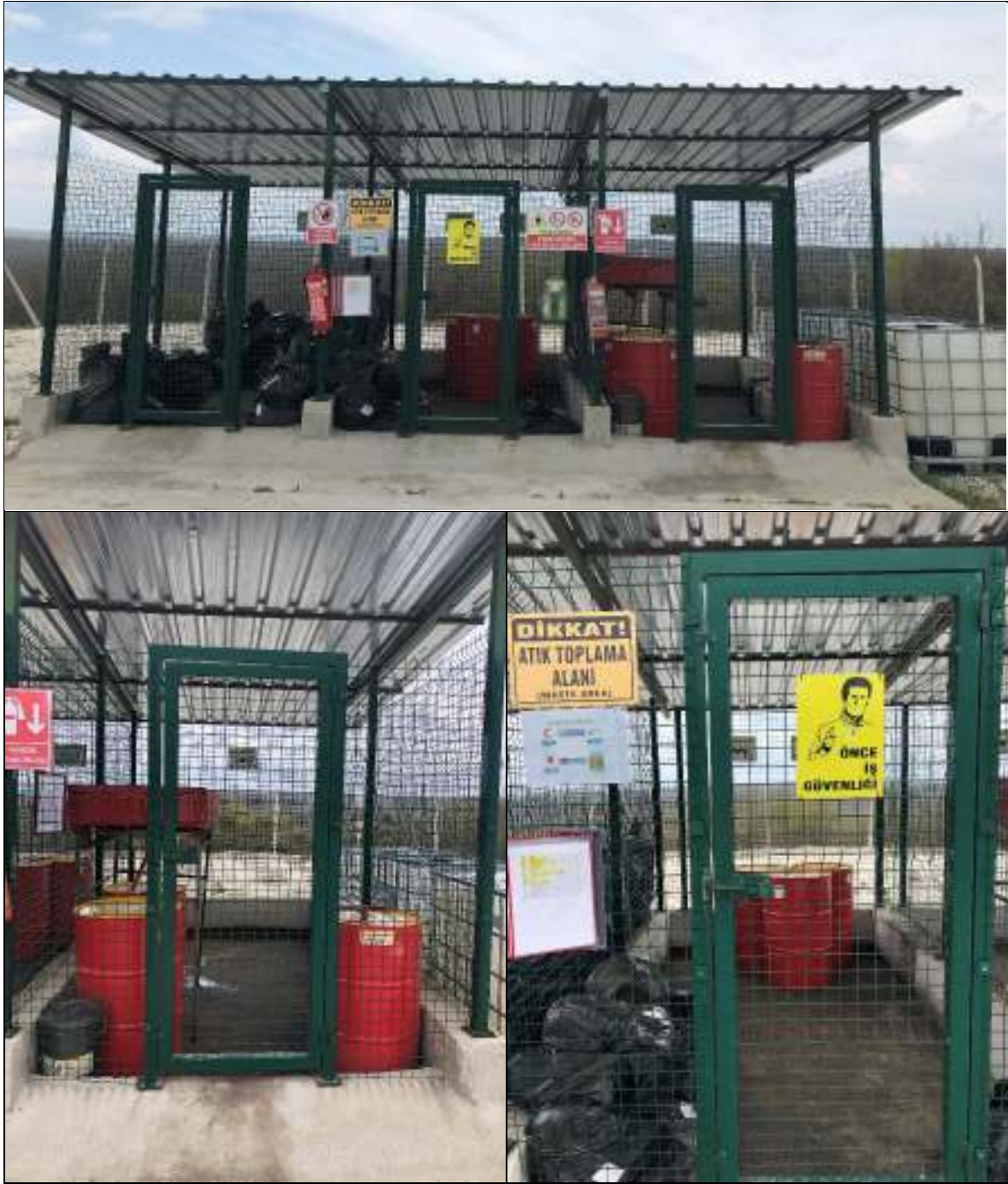


Figure 9-1. Temporary Waste Storage Area at the Existing Kiyikoy WPP

Table 9-6. Impacts, Proposed Mitigation Measures and Residual Impacts (Waste Management)

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|---|---|--|------------------|------------|-----------------------|--------------------|--------------|----------------------|---|--|---|------------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| Additional load on the local/regional infrastructure for the management of hazardous and non-hazardous wastes (e.g. sanitary landfills, excavated material storage areas, licensed reuse/recovery facilities, etc.) | • Land Preparation and Construction | • Local/regional waste management infrastructure | Wide Wide | Negligible | Irreversible | Short term | Continuous | Negligible | Low | Negligible | • Project-specific Waste Management Plan prepared as part of the ESIA will be implemented by the Project Company and the contractors (through contractual requirements) to avoid or minimise (when avoidance is not possible) the amount of waste to be generated as a result of the Project activities. • Waste reuse/recycling/recovery/disposal agreements with the Municipality and licensed recovery/disposal firms will be executed for the management of hazardous and non-hazardous waste. | Negligible |
| | • Operation | | | | | Long term | | | | | | |
| | • Closure | | | High | | Short to long term | One-off | High | | Moderate | • The decommissioning contractor will be required to develop a detailed plan prior to start of closure activities for maximising reuse/recycling/recovery and management of turbines towers, nacelles, blades, substation, cables, electrical equipment and other plant components to be dismantled based on the state-of-the-art technologies. • Waste disposal agreements will be executed with licensed transportation, reuse, recycling, recovery and disposal companies. • The Project Company will consult with the related authorities and follow their decisions regarding the ETL. | Minor |
| Potential impacts of on-site hazardous and non-hazardous waste on environmental resources, ecosystem, personnel H&S, visual amenity, if not managed properly | • Land Preparation and Construction • Operation • Closure | • Soil, surface water and groundwater environments • Ecosystem • Personnel | Local | Low | Short term reversible | Short to long term | Intermittent | Medium | Low | Minor | • Project-specific Waste Management Plan will be implemented by the Project Company and the contractors (through contractual requirements) • The construction contractors will be contractually required to implement the Project-specific Waste Management Plan and provide adequate temporary on-site Waste Storage Areas (e.g. adequate capacity, concrete floor, secondary containment, top cover, separate waste specific containers with appropriate labelling, drainage, fire-fighting equipment, gate locks, etc.). • The existing temporary Waste Storage Area located at the substation site will be improved to ensure that the relevant requirements of the EBRD PR3 and applicable GIPs are met for the management of the wastes sourced from the operation and maintenance activities. • Regular monitoring of the waste management practices of the direct and contracted Project employees will be conducted by means of document review (e.g. permits, waste reuse/recycling/disposal agreements) and visual checks at the turbine locations, access roads and substation site. • Trainings on the implementation of the Project-specific Waste Management Plan will be provided to all direct and contracted Project employees. • Project-specific Waste Management Plan will be reviewed annually and updated as necessary. | Negligible |

10. BIODIVERSITY

This Chapter provides description of the biodiversity features of the Project Area including identification and assessment of priority biodiversity features and critical habitat as per EBRD PR6.

As part of the Environmental and Social Due Diligence (ESDD) study carried out in line with EBRD PRs, the Lender's advisor identified the scope of the baseline biodiversity field surveys. The baseline surveys have been carried out for terrestrial flora and fauna, avifauna and bats including carcass study for the operational turbines.

10.1. Project Standards

The legal framework on biodiversity conservation and assessment applicable to the Project is given below.

| Framework | Legislation, Guidelines and Standards |
|--|--|
| International Conventions and Protocols (ratified by Turkey) | <ul style="list-style-type: none"> UN Convention on Biological Diversity (CBD) and the Cartagena Protocol on Biosafety (ratified in 1997) The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) (ratified in 1984) The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (ratified in 1996) The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) (ratified in 1994) The Convention Concerning the Protection of World Cultural and Natural Heritage (UNESCO World Heritage Convention) (ratified in 1983) Convention to Combat Desertification (ratified in 1998) International Treaty on Plant Genetic Resources for Food and Agriculture (ratified in 2007) European Landscape Convention (ratified in 2003) Convention on the Conservation of Migratory Species of Wild Animals (CMS) / Agreement on the Conservation of Populations of European Bats (EUROBATS) (<i>Turkey is not a party</i>) CBD – Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets |
| Main National Laws and Regulations | <ul style="list-style-type: none"> Law on National Parks (No. 2873, dated 9 August 1983) Law on Environment (No. 2872, dated 9 August 1983) Law on Terrestrial Hunting (No. 4915, dated 1 July 2003) Law on Forests (No. 6831, dated 31 August 1956) Law on Protection of Animals (No. 5199, dated 24 June 2004) Law on Water Products (No. 1380, dated 22 March 1971) Law on Agriculture (No. 5488, dated 18 April 2006) Law on Veterinary Services, Plant Health, Food and Feed (No. 5996, dated 11 June 2010) Law on the Protection of Breeder's Rights for New Plant Varieties (No. 5042, dated 8 January 2004) Seed Law (No. 5553, dated 31 October 2006) Law on the Conservation of Cultural and Natural Assets (No. 2863, dated 21 July 1983) Law on Biosafety (No. 5977, dated 18 March 2010) Regulation on the Implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Official Gazette No. 24623, dated 27 December 2001) Regulation on the Preservation of Wetlands (Official Gazette No. 28962, dated 4 April 2014) Bylaw on Fisheries (Official Gazette No. 22223, dated 10 March 1995) Regulation on the Collection, Storage and Use of Plant Genetic Resources (Official Gazette No. 21316, dated 15 August 1992) 2019-2020 Hunting Season Decision No. 18 of Central Hunting Commission dated 23 May 2019 (Official Gazette No. 30808, dated 21 June 2019) |
| Main National Strategy Documents | <ul style="list-style-type: none"> 11th Development Plan (2019-2023) National Biodiversity Action Plan (2018-2028) EU Integrated Environment Strategy (2007-2023) |
| National Guidelines | <p><u>Protected Areas</u></p> <ul style="list-style-type: none"> Important Bird Areas (IBAs) of Turkey (Magnin and Yazar, 1997) Key Biodiversity Areas (KBAs) of Turkey (Eken et al., 2006) 122 Important Plant Areas (IPA) of Turkey (Ozhatay et al., 2008) <p><u>Flora</u></p> <ul style="list-style-type: none"> Flora of Turkey and East Aegean Islands (Davis, 1965-1988) |

| Framework | Legislation, Guidelines and Standards |
|--|---|
| | <ul style="list-style-type: none"> Turkish Plant Names (Baytop, 1994) Red Data Book of Turkish Plants (Ekim et al., 2000) |
| | Fauna <ul style="list-style-type: none"> Pocket Book of Birds of Turkey General and Turkish Zoogeography (Demirsoy, 2002) |
| International Standards and Guidelines | <ul style="list-style-type: none"> EBRD PR 6 (2014) on Biodiversity Conservation and Sustainable Management of Living Natural Resources EBRD PR6 Guidance Note on Biodiversity Conservation and Sustainable Management of Living Natural Resources EU Habitats Directive (92/43/EEC) EU Birds Directive (2009/147/EC) EUROBATS Publication Series No. 6 Guidelines for consideration of bats in wind farm projects (Revision 2014) |

10.2. Baseline Conditions

The baseline biodiversity features of the Project Area including habitat and vegetation composition, terrestrial flora and fauna, avifauna and bat species are described in detail in this section.

10.2.1. Legally Protected and Internationally Recognised Areas

EBRD PR6 is guided by the International Union for Conservation of Nature (IUCN) definition of “Protected Area” and Protected Area is “a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values”.

Internationally recognized areas are sites identified under international conventions or agreements, including, but not limited to, UNESCO Natural World Heritage Sites, UNESCO Man-and-Biosphere Reserves and the Ramsar List of Wetlands of International Importance.

The Project License Area does not coincide with any legally protected areas. The legally protected areas in the vicinity of the Project License Area are given in Table 10-1 and shown in Figure 10-1.

Table 10-1. Legally Protected Areas in the vicinity of the Project

| Name | Category | Level of Conservation | Distance to the Project License Area (km) |
|--|-------------------------------|-----------------------|---|
| Legally Protected Areas | | | |
| Pabuccdere 1 st Degree Natural Protection Area (*) | Natural Protection Area (SIT) | National | 0.3 |
| Natural Protection Area | Natural Protection Area (SIT) | National | 3 |
| Kasatura Bay | Nature Protection Area | National | 4.8 |
| Igneada Longoz Forests | National Park | National | 8.0 |
| Camlikoy Nature Park | Nature Park | National | 8.0 |
| Istanbul Catalca YHGS | Wildlife Development Area | National | 9.2 |
| Saka Lake | Nature Protection Area | National | 12.0 |
| Cilingoz Nature Park | Nature Park | National | 18.0 |
| (*) As per the official letter issued by the Provincial Directorate of Environment and Urbanization dated 4 December 2015, the Project License Area does not fall within any natural protection area (SIT) and nature assets. In 11 April 2017, Edirne Conservation of Nature Assets Regional Commission confirmed that the Project License Area does not fall within the Pabuccdere 1 st Degree Natural Protection Area. | | | |

Key Biodiversity Areas (KBA) are “sites contributing significantly to the global persistence of biodiversity”, in terrestrial, freshwater and marine ecosystems. The Global Standard for the Identification of KBAs (IUCN 2016) sets out globally agreed criteria for the identification of KBAs worldwide. The KBA Standard establishes a consultative, science-based process for KBA identification, founded on the consistent application of global criteria with quantitative thresholds that have been developed through an extensive consultation exercise spanning several years.

Sites qualify as global KBAs if they meet one or more of 11 criteria, clustered into five categories: threatened biodiversity; geographically restricted biodiversity; ecological integrity; biological processes; and, irreplaceability. The KBA criteria can be applied to species and ecosystems in terrestrial, inland water and marine environments. Although not all KBA criteria may be relevant to all elements of biodiversity, the thresholds associated with each of the criteria may be applied across all taxonomic groups (other than micro-organisms) and ecosystems.

The KBAs in the vicinity of the Project License Area are shown in Figure 10-2. The Project License Area falls within the boundaries of Istranca Mountains KBA. Both Igneada Forests KBA, IBA, IPA and Terkos Basin KBA, IBA and IPA are in the vicinity of the Project License Area.

Igneada Forests KBA, IBA and IPA is a complex of seasonally flooded forests, swamps, freshwater lakes and sand-dunes on the Black Sea coast near the Turkish-Bulgarian border. The site is also a migratory bottleneck, where more than 8,000 *Ciconia ciconia* regularly pass in autumn. Although no comprehensive counts have been undertaken, available data suggest that the IBA is also a bottleneck for migrating raptors. Both *Ciconia ciconia* (White Stork) and *Ciconia nigra* (Black Stork) are amongst IBA trigger species. The potential pressure/threats on Igneada Forests KBA are listed as: Istanbul Water and Sewerage Administration plans to divert water from the nearby Istranca mountains by damming the five major streams feeding the flooded forests. Additional threats include the proposed Bulgaria-Turkey coastal highway, tourism development, deforestation to allow replanting with *Populus*, illegal sand extraction and reed-cutting regimes that reduce nesting site availability²².

Terkos Basin KBA, IBA and IPA, which includes the Terkos Lake designated as Wetlands of International Importance (Ramsar), is one of Istanbul's oldest water resources. The Basin is located to the north of Catalca Peninsula which is mostly within the boundaries of the province of İstanbul. The KBA continues north within the boundaries of the Kırklareli province, until the Kiyikoy coasts. The Basin is surrounded by the Istranca Mountains to the west and the Terkos Lake to the east. The majority of the area is covered with forests. The IBA trigger species are: *Branta ruficollis* (Red-breasted Goose), *Aythya nyroca* (Ferruginous Duck), *Ciconia nigra* (Black Stork), *Microcarbo pygmaeus* (Pygmy Cormorant) and *Chlidonias hybrida* (Whiskered Tern)²³.

The Project License Area falls within the boundaries of Istranca Mountains KBA according to the “KBAs of Turkey” and as given in the World Database of KBAs. This said, at the time of compiling this chapter of the ESIA Report in 2019, the KBA is not yet shown within the database of Integrated Biodiversity Assessment Tool (IBAT). GEM requested clarification on this issue from the KBA Regional Focal Points for Mediterranean and Eastern Europe and Asia. The focal points confirmed that the existing data gap of Istranca Mountains KBA will be addressed in late 2019.

The flora and fauna species qualifying Istranca Mountains KBA are given in Table 10-2. As discussed in details under the avi-fauna section below, although the Project Area is located on Via Pontica migration corridor along the west coast of the Black Sea which is a major route for raptors in the region, there are no migratory soaring birds that qualify the Istranca Mountains KBA.

²² BirdLife International (2019) Important Bird Areas factsheet: Igneada Forests.

²³ BirdLife International (2019) Important Bird Areas factsheet: Terkos Basin.

Table 10-2. KBA Qualifying Species of Istranca Mountains KBA

| Taxon Name | IUCN Red List of Threatened Species (*) | National Red List |
|---|---|-------------------|
| Flora | | |
| <i>Symphytum pseudobulbosum</i> | - | CR |
| <i>Veronica turrilliana</i> | DD | VU |
| Birds | | |
| <i>Bubo bubo</i> (Eurasian Eagle-owl) | LC | LC |
| <i>Caprimulgus europaeus</i> (European Nightjar) | LC | LC |
| <i>Circaetus gallicus</i> – Europe (Short-toed Snake-eagle) | LC | LC |
| <i>Dendrocopos medius</i> (Middle Spotted Woodpecker) | LC | LC |
| <i>Dendrocopos syriacus</i> (Syrian Woodpecker) | LC | LC |
| <i>Emberiza hortulana</i> (Ortolan Bunting) | LC | LC |
| <i>Ficedula semitorquata</i> (Semi-collared Flycatcher) | LC | LC |
| <i>Lanius minor</i> (Lesser Grey Shrike) | LC | LC |
| <i>Lullula arborea</i> (Woodlark) | LC | LC |
| Mammals | | |
| <i>Barbastella barbastellus</i> (Western Barbastelle Bat) | NT* | VU |
| <i>Lutra lutra</i> (Eurasian Otter) | NT | - |
| <i>Miniopterus schreibersii</i> (Schreiber's Bent-winged Bat) | NT* | NT |
| <i>Myotis bechsteini</i> (Bechstein's Myotis) | NT* | VU |
| <i>Myotis blythii</i> (Lesser Mouse-eared Myotis) | LC | LC |
| <i>Myotis capaccinii</i> (Long-fingered Bat) | VU | LC |
| <i>Myotis emarginatus</i> (Geoffroy's Bat) | LC* | VU |
| <i>Myotis myotis</i> (Greater Mouse-eared Bat) | LC* | LC |
| <i>Rhinolophus blasii</i> (Blasius's Horseshoe Bat) | LC* | VU |
| <i>Rhinolophus blasii</i> – Southeastern Europe (Blasius's Horseshoe Bat) | LC* | VU |
| <i>Rhinolophus Euryale</i> (Mediterranean Horseshoe Bat) | NT* | VU |
| <i>Rhinolophus ferrumequinum</i> (Greater Horseshoe Bat) | LC* | NT |
| <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) | LC | NT |
| <i>Rhinolophus mehelyi</i> (Mehely's Horseshoe Bat) | VU | VU |
| <i>Sorex araneus</i> – Istranca | LC | - |
| <i>Sorex minutus</i> – Istranca (Eurasian Pygmy Shrew) | LC | - |
| <i>Talpa levantis</i> – Thrace (Levantine Mole) | LC | LC |
| Amphibians | | |
| <i>Triturus karelinii</i> | LC | LC |
| Reptiles | | |
| <i>Testudo graeca</i> (Common Tortoise) | VU | NT |
| <i>Testudo hermanni</i> | NT | NT |
| Dragonfly | | |
| <i>Somatochlora borisi</i> (Bulgarian Emerald) | VU* | - |

(*) Conservation status updates made from the IUCN Red List of Threatened Species at <https://www.iucnredlist.org/>.

Source: Yalçın, G. 2006. *Istranca Dağları* (MAR011), 101-111 (Cilt 1). *Türkiye'nin Önemli Doğa Alanları. Doğa Demeği*, Ankara (<https://www.dogadermegi.org/istranca-daglari/>).



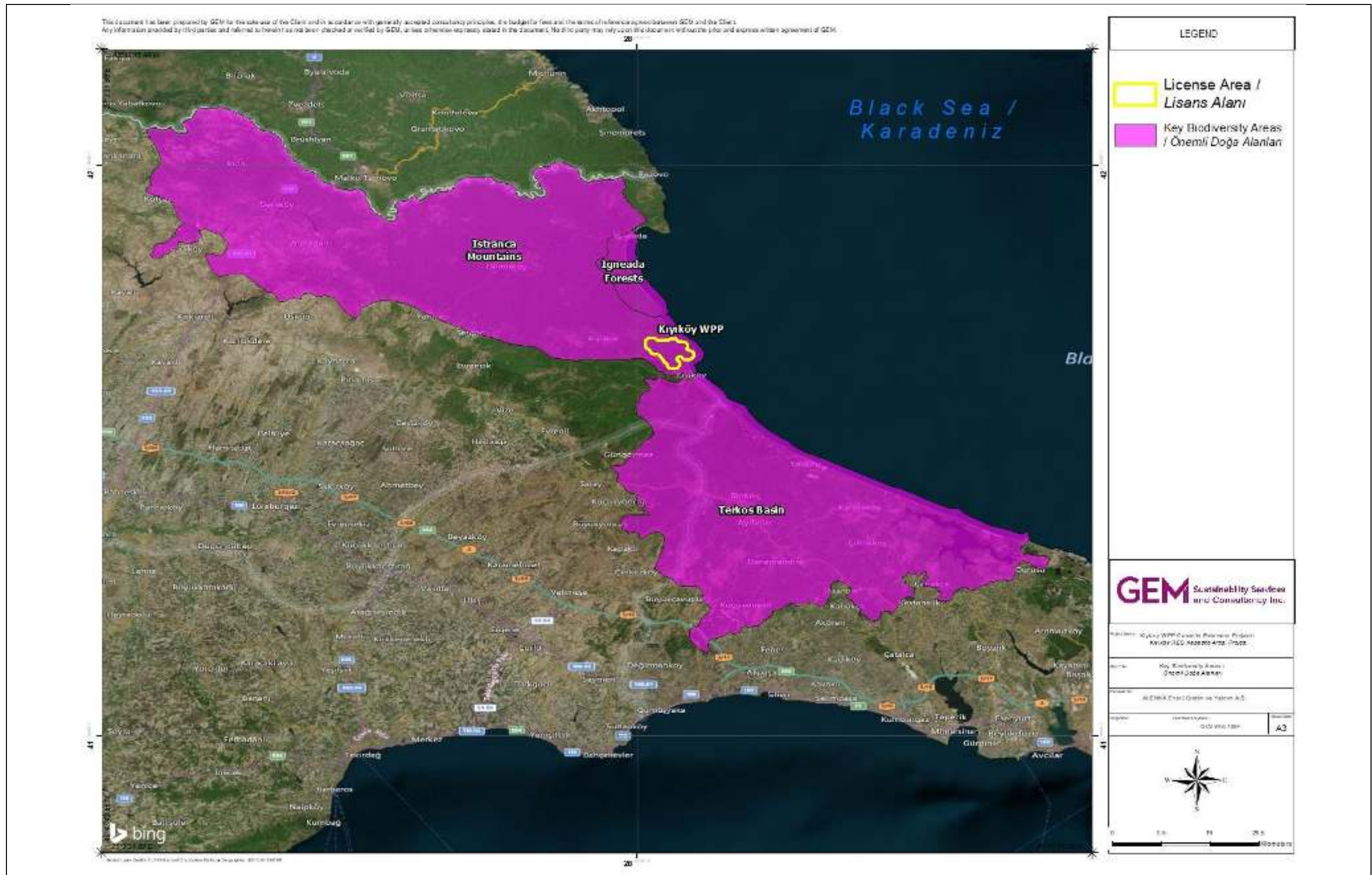


Figure 10-2. Key Biodiversity Areas in the Vicinity of the Project License Area

10.2.2. Biodiversity Study Area

The biodiversity study area for flora and fauna species have been selected as the Project License Area and its vicinity. Due to the nature of the Project activities, the direct impacts are to take place within the Project License Area and thus is considered as the impact area. The biodiversity field surveys within the License Area have been in place since April 2019 as detailed in respective sections below. Previous observations of the biodiversity experts within the vicinity of the Project License Area have also been included within the description of the baseline conditions. As the Project License Area overlaps with Istranca Mountains KBA, status of the flora and fauna species identified during the biodiversity field surveys have been checked whether they are amongst KBA qualifying species to ensure potential impacts at the wider extent beyond the License Area are appropriately managed.

The Project Area is located on Via Pontica migration corridor along the west coast of the Black Sea which is a major route for raptors in the region. This said, there are no migratory soaring birds that qualify the Istranca Mountains KBA. Defining a study area for migratory birds is challenging as mapping precise boundaries to flyways depend on varying routes of individual migratory birds from year-to-year. The bird activity across the Project License Area is under assessment since March 2019 to understand the bird distribution and bird abundance. Both Vantage Point surveys and breeding bird surveys are being carried out to assess both the collision risks leading to mortality and displacement from foraging areas (breeding/non-breeding) and breeding/roosting areas.

The bat activity across the Project License Area is under assessment since Spring 2019 through static acoustic and transect acoustic surveys. There are 12 bat species that qualify Istranca Mountains KBA. Migratory behavior of bats is not well understood as those for the birds. This said, some bats are known to migrate over more than 1,000 km such as all *Nyctalus* species and *P. nathusii*. Spatial behavior of bats (long distance, regional and sedentary) have been taken into consideration for the overall assessment of the results.

10.2.3. Flora Studies

Four field surveys have been conducted by Prof. Dr. Hayri Duman to identify the terrestrial flora species and define the habitat and vegetation characteristics of the Project Area. The flora field surveys were conducted in the following seasons:

- Early Spring: 1-2 April 2019
- Spring: 29-30 April 2019
- Early Summer: 16-17 June 2019
- Late Summer: 8-9 July 2019

The field surveys were carried out mainly in areas where the new wind turbines and new access roads will be constructed and areas that will be directly affected by the Project Activities including existing access roads, substation, existing offices. Considering the area of impact of the turbines, surveys were conducted around each wind turbine encompassing an area of 200 m x 200 m.

As a result of the field surveys, through direct observation, 275 flora species have been identified falling under 59 different families as given in Table 10-3. The identification of the flora species was carried out by using "Flora of Turkey and the East Aegean Islands (Davis, 1965-1988)" as the reference. The table also provides the categories as per the CITES and Bern Conventions and the IUCN Red List categories as reassessed according to the Red Data Book of Turkish Plants (Ekim *et al.*, 2000).

Although the Thrace Region of Turkey is known to have low endemism, the following species have been identified as species of conservation importance during the field surveys:

- Four (4) regional endemic species: *Centaurea hermannii*, *Cirsium baytopae*, *Euphorbia amygdaloides* var. *robbiae*, *Crocus olivieri* subsp. *istanbulensis*

- Two (2) not endemic but rare species: *Ferulago confusa*, *Symphytum tuberosum* subsp. *nodosum*

The relative abundances of the species are given in Table 10-3 as assessed by Prof. Dr. Hayri Duman.

The photos of the above species as taken at the Project Area are given in Figure 10-6 and Figure 10-7. The exact locations where the above species have been identified together with the number of individuals as recorded within 200mx200m around the observed turbines are given in Table 10-4 (together with the favourable seed/korm collection periods) and shown in Figure 10-3.

The distribution maps of the abovementioned flora species of importance are given in Figure 10-4 and Figure 10-5.

The collection of seeds was carried out by Prof. Dr. Hayri Duman in August 2019 and the collected samples were sent to the Turkey Seed Gene Bank by Prof. Dr. Duman. It should be noted, the identified regional endemic species do not have global evaluations as per the IUCN Red List of Threatened Species.

Table 10-3. Flora Species Identified at the Project License Area

| Family | NO | Taxon | Phytogeographic Region | Endemism | | Red Data Book of Turkey | BERN | CITES | Habitat Type (*) | | Relative Abundance (*) | | | | |
|----------------------|----|---|------------------------|----------|------------|-------------------------|------|-------|------------------|----------|------------------------|---|---|---|---|
| | | | | Regional | Widespread | | | | 1 (G1.A) | 2 (E2.1) | 1 | 2 | 3 | 4 | 5 |
| PTERIDOPHYTA | | | | | | | | | | | | | | | |
| HYPOLEPIDACEAE | 1 | <i>Pteridium aquilinum</i> (L.) Kuhn | Widespread | | | | | | X | | | X | | | |
| ASPLENIACEAE | 2 | <i>Asplenium trichomanes</i> L. | Widespread | | | | | | X | | | X | | | |
| SPERMATOPHYTA | | | | | | | | | | | | | | | |
| GYMNOSPERMAE | | | | | | | | | | | | | | | |
| CUPRESSACEAE | 3 | <i>Juniperus oxycedrus</i> L.subsp. <i>oxycedrus</i> | Widespread | | | | | | X | | | X | | | |
| ANGIOSPERMAE | | | | | | | | | | | | | | | |
| DICOTYLEDONES | | | | | | | | | | | | | | | |
| RANUNCULACEAE | 4 | <i>Ranunculus arvensis</i> L. | Mediterranean | | | | | | X | X | X | | | | |
| | 5 | <i>Ranunculus ficaria</i> L. subsp. <i>ficariiformis</i> Rouy & Fouc | Widespread | | | | | | X | X | | X | | | |
| | 6 | <i>Ranunculus constantinopolitanus</i> (DC.) d'Urv. | Widespread | | | | | | X | X | | X | | | |
| | 7 | <i>Ranunculus repens</i> L. | Widespread | | | | | | X | X | | X | | | |
| | 8 | <i>Helleborus orientalis</i> Lam. | European-Siberian | | | | | | X | | | X | | | |
| | 9 | <i>Anemone blanda</i> Schott & Kotschy | Widespread | | | | | | X | | | | X | | |
| | 10 | <i>Anemone pavonia</i> Lam. | Widespread | | | | | | X | | | | X | | |
| | 11 | <i>Clematis vitalba</i> L. | Widespread | | | | | | X | | | X | | | |
| BERBERIDACEAE | 12 | <i>Epimedium pubigerum</i> (DC.) Moren&Decaisne | European-Siberian | | | | | | X | | | | X | | |
| BRASSICACEAE | 13 | <i>Thlaspi perfoliatum</i> L. | Widespread | | | | | | X | | X | | | | |
| | 14 | <i>Alyssum minutum</i> (L.) Rothm.var. <i>minutum</i> | Widespread | | | | | | X | | | X | | | |
| | 15 | <i>Arabis verna</i> (L.) DC. | Mediterranean | | | | | | X | | | X | | | |
| | 16 | <i>Neslia apiculata</i> Fisch. | Widespread | | | | | | X | | | X | | | |
| | 17 | <i>Capsella bursa-pastoris</i> (L.) Medik. | Widespread | | | | | | X | | | X | | | |
| | 18 | <i>Sisymbrium officinale</i> (L.) Scop. | Widespread | | | | | | X | | | X | | | |
| | 19 | <i>Cardamine bulbifera</i> (L.) Crantz | European-Siberian | | | | | | X | | | X | | | |
| | 20 | <i>Hirschfeldia incana</i> (L.) Lag.-Foss. | Widespread | | | | | | X | | | X | | | |
| CISTACEAE | 21 | <i>Cistus creticus</i> L. | Widespread | | | | | | X | | | | X | | |
| | 22 | <i>Cistus salviifolius</i> L. | Widespread | | | | | | X | | | | X | | |
| | 23 | <i>Helianthemum nummulariifolium</i> (L.) Miller subsp. <i>nummulariifolium</i> | Widespread | | | | | | X | | | X | | | |
| | 24 | <i>Tuberaria guttata</i> (L.) Fourr. Var. <i>plantaginea</i> (Willd.) Gross. | Widespread | | | | | | X | | | X | | | |
| VIOLACEAE | 25 | <i>Viola odorata</i> L. | Widespread | | | | | | X | | | | X | | |
| | 26 | <i>Viola sieheana</i> Becker | Widespread | | | | | | X | | | X | | | |
| POLYGALACEAE | 27 | <i>Polygala anatolica</i> Boiss. & Heldr. | Widespread | | | | | | X | | | X | | | |
| CARYOPHYLLACEAE | 28 | <i>Minuartia hamata</i> (Hauskn.) Mattf. | Widespread | | | | | | X | | X | | | | |
| | 29 | <i>Cerastium gracile</i> Dufour | Widespread | | | | | | X | | | X | | | |
| | 30 | <i>Lychnis coronaria</i> (L.) Desr. | European-Siberian | | | | | | X | | X | | | | |
| | 31 | <i>Dianthus calocephalus</i> Boiss. | Widespread | | | | | | X | | X | | | | |
| | 32 | <i>Moenchia mantica</i> (L.) Bartl. Subsp. <i>mantica</i> | Widespread | | | | | | X | | | X | | | |
| | 33 | <i>Spergularia media</i> (L.) C. Presl | Widespread | | | | | | X | | X | | | | |
| | 34 | <i>Petrorhagia velutina</i> (Guss.) Ball & Heywood. | Widespread | | | | | | X | | | X | | | |
| | 35 | <i>Holosteum umbellatum</i> L. var. <i>Umbellatum</i> | Widespread | | | | | | X | | | X | | | |
| | 36 | <i>Silene gallica</i> L. | Widespread | | | | | | X | | | X | | | |
| | 37 | <i>Silene vulgaris</i> (Moenc) Garcke var. <i>vulgaris</i> | Widespread | | | | | | X | X | | X | | | |

| Family | NO | Taxon | Phytogeographic Region | Endemism | | Red Data Book of Turkey | BERN | CITES | Habitat Type (*) | | Relative Abundance (*) | | | | |
|----------------|----|---|------------------------|----------|------------|-------------------------|------|-------|------------------|----------|------------------------|---|---|---|---|
| | | | | Regional | Widespread | | | | 1 (G1.A) | 2 (E2.1) | 1 | 2 | 3 | 4 | 5 |
| | 38 | <i>Silene dichotoma</i> Ehrh. subsp. <i>dichotoma</i> | Mediterranean | | | | | | X | | X | | | | |
| | 30 | <i>Stellaria holostea</i> L. | European-Siberian | | | | | | X | | | X | | | |
| ILLECEBRACEAE | 40 | <i>Herniaria incana</i> Lam. | Widespread | | | | | | X | | X | | | | |
| HYPERICACEAE | 41 | <i>Hypericum calycinum</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 43 | <i>Hypericum perforatum</i> L. | Widespread | | | | | | X | | | X | | | |
| MALVACEAE | 44 | <i>Malva sylvestris</i> L. | Widespread | | | | | | | X | | X | | | |
| LINACEAE | 45 | <i>Linum bienne</i> Miller | Mediterranean | | | | | | X | | | X | | | |
| | 46 | <i>Linum trigynum</i> L. | Mediterranean | | | | | | X | | | X | | | |
| ACERACEAE | 47 | <i>Acer campestre</i> L. subsp. <i>campestre</i> | Widespread | | | | | | X | | | | X | | |
| GERANIACEAE | 48 | <i>Erodium cicutarium</i> (L.) L. Herit subsp. <i>cutarium</i> | Widespread | | | | | | | X | X | | | | |
| | 49 | <i>Geranium dissectum</i> L. | Widespread | | | | | | X | | | X | | | |
| | 50 | <i>Geranium rotundifolium</i> L. | Widespread | | | | | | X | | | X | | | |
| | 51 | <i>Geranium asphodeloides</i> Burm. Fil. Subsp. <i>asphodeloides</i> | European-Siberian | | | | | | X | | | X | | | |
| POLYGONACEAE | 52 | <i>Rumex scutatus</i> L. | Widespread | | | | | | X | | X | | | | |
| | 53 | <i>Rumex acetosella</i> L. | Widespread | | | | | | X | | | X | | | |
| | 54 | <i>Rumex tuberosus</i> L. subsp. <i>tuberosus</i> | Widespread | | | | | | X | | X | | | | |
| | 55 | <i>Polygonum arenastrum</i> Bor. | Widespread | | | | | | | X | X | | | | |
| PHYTOLACCACEAE | 56 | <i>Phytolacca americana</i> L. | Widespread | | | | | | X | | X | | | | |
| RHAMNACEAE | 57 | <i>Paliurus spina-christii</i> Miller | Widespread | | | | | | X | | | X | | | |
| FABACEAE | 58 | <i>Medicago sativa</i> L. | Widespread | | | | | | X | | | X | | | |
| | 59 | <i>Medicago minima</i> (L.) Bart. Var. <i>minima</i> | Widespread | | | | | | X | | | X | | | |
| | 60 | <i>Chamaecytisus hirsutus</i> (L.) Link | Widespread | | | | | | X | | | | X | | |
| | 61 | <i>Chamaecytisus supinus</i> (L.) Link | European-Siberian | | | | | | X | | | X | | | |
| | 62 | <i>Robinia pseudoacacia</i> L. | Plantation | | | | | | X | | | X | | | |
| | 63 | <i>Teline monspessulana</i> (L.) C. Koch | Mediterranean | | | | | | X | | | X | | | |
| | 64 | <i>Genista carinalis</i> Gris. | Widespread | | | | | | X | | | X | | | |
| | 65 | <i>Genista tinctoria</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 66 | <i>Vicia cracca</i> L. Subsp. <i>stenophylla</i> Vel. | Widespread | | | | | | X | | | X | | | |
| | 67 | <i>Vicia sativa</i> L. subsp. <i>sativa</i> | Widespread | | | | | | X | | | X | | | |
| | 68 | <i>Trifolium angustifolium</i> L. var. <i>angustifolium</i> L. | Widespread | | | | | | X | | | X | | | |
| | 69 | <i>Trifolium stellatum</i> L. var. <i>stellatum</i> | Widespread | | | | | | X | | | X | | | |
| | 70 | <i>Trifolium campestre</i> Schreb. | Widespread | | | | | | X | | | X | | | |
| | 71 | <i>Trifolium arvense</i> L. subsp. <i>arvense</i> | Widespread | | | | | | X | | | X | | | |
| | 72 | <i>Trifolium repens</i> L. var. <i>repens</i> | Widespread | | | | | | X | | | X | | | |
| | 73 | <i>Trifolium resupinatum</i> L. Var. <i>resupinatum</i> | Widespread | | | | | | X | | | X | | | |
| | 74 | <i>Coronilla varia</i> L. subsp. <i>varia</i> | Widespread | | | | | | X | | | X | | | |
| | 75 | <i>Melilotus alba</i> Desr. | Widespread | | | | | | | X | | X | | | |
| | 76 | <i>Psoralea bituminosa</i> L. | Mediterranean | | | | | | X | | X | | | | |
| | 77 | <i>Ononis spinosa</i> L. Subsp. <i>leiosperma</i> | Widespread | | | | | | | X | | X | | | |
| | 78 | <i>Lathyrus digitatus</i> (Bieb.) Fiori | Mediterranean | | | | | | X | | | X | | | |
| | 79 | <i>Lathyrus aphaca</i> L. var. <i>aphaca</i> | Widespread | | | | | | | X | X | | | | |
| | 80 | <i>Lathyrus laxiflorus</i> (Desf.) O.Kuntze subsp. <i>laxiflorus</i> | Widespread | | | | | | X | | | X | | | |
| | 81 | <i>Lotus corniculatus</i> L. var. <i>tenuifolius</i> | Widespread | | | | | | | X | X | | | | |
| | 82 | <i>Dorycnium pentaphyllum</i> Scop. subsp. <i>herbaceum</i> (Vill.) Rouy. | Widespread | | | | | | X | | | X | | | |

| Family | NO | Taxon | Phytogeographic Region | Endemism | | Red Data Book of Turkey | BERN | CITES | Habitat Type (*) | | Relative Abundance (*) | | | | |
|----------------|-----|--|--------------------------|----------|------------|-------------------------|------|-------|------------------|----------|------------------------|----------|---|---|---|
| | | | | Regional | Widespread | | | | 1 (G1.A) | 2 (E2.1) | 1 | 2 | 3 | 4 | 5 |
| ROSACEAE | 83 | <i>Pyrus bulgarica</i> Kuthath. & Sachok | European-Siberian | | | | | | X | | | X | | | |
| | 84 | <i>Pyracantha coccinea</i> Roemer | Widespread | | | | | | X | | | X | | | |
| | 85 | <i>Agrimonia eupatoria</i> L. | Widespread | | | | | | X | | X | | | | |
| | 86 | <i>Fragaria vesca</i> L. | Widespread | | | | | | X | | | X | | | |
| | 87 | <i>Potentilla recta</i> L. | Widespread | | | | | | X | | X | | | | |
| | 88 | <i>Potentilla micrantha</i> Ramond ex DC. | Widespread | | | | | | X | | X | | | | |
| | 89 | <i>Filipendula vulgaris</i> Moench | European-Siberian | | | | | | X | | | X | | | |
| | 90 | <i>Malus sylvestris</i> Miller subsp. <i>orientalis</i> var. <i>orientalis</i> | Widespread | | | | | | X | | | X | | | |
| | 91 | <i>Mespilus germanica</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 92 | <i>Sanguisorba minor</i> Scop. Subsp. <i>muricata</i> (Spach)Brig | Widespread | | | | | | X | | X | | | | |
| | 93 | <i>Crataegus monogyna</i> Jacq. Subsp. <i>monogyna</i> | Widespread | | | | | | X | | | X | | | |
| | 94 | <i>Prunus divaricata</i> Ledeb. Subsp. <i>divaricata</i> | Widespread | | | | | | X | | | X | | | |
| | 95 | <i>Prunus spinosa</i> L.subsp. <i>dasyphylla</i> (Schur) Domin | European-Siberian | | | | | | X | | | X | | | |
| | 96 | <i>Sorbus aucuparia</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 97 | <i>Sorbus torminalis</i> (L.) Crantz var. <i>torminalis</i> | European-Siberian | | | | | | X | | | X | | | |
| | 98 | <i>Fragaria vesca</i> L. | Widespread | | | | | | X | | | X | | | |
| | 99 | <i>Rubus sanctus</i> Schreber | Widespread | | | | | | X | | | X | | | |
| | 100 | <i>Rubus hirtus</i> Waldst.&Kit. | European-Siberian | | | | | | X | | | X | | | |
| | 101 | <i>Rosa horrida</i> Fischer | Widespread | | | | | | X | | | X | | | |
| | 102 | <i>Rosa canina</i> L. | Widespread | | | | | | X | | X | | | | |
| LYTHRACEAE | 103 | <i>Lythrum hyssopifolia</i> L. | Widespread | | | | | | | X | | X | | | |
| APIACEAE | 104 | <i>Torilis leptophylla</i> (L.) Reichb. | Widespread | | | | | | X | X | X | | | | |
| | 105 | <i>Eryngium campestre</i> L. Var. <i>virens</i> Link | Widespread | | | | | | X | X | | X | | | |
| | 106 | <i>Ferulago confusa</i> Velen | European-Siberian | | | VU | | | X | | | X | | | |
| | 107 | <i>Bupleurum tenuissimum</i> L. | Widespread | | | | | | X | | X | | | | |
| | 108 | <i>Laser trilobum</i> (L.) Borkh. | Widespread | | | | | | X | | | X | | | |
| | 109 | <i>Scandix iberica</i> Bieb. | Widespread | | | | | | X | | X | | | | |
| | 110 | <i>Daucus carota</i> L. | Widespread | | | | | | X | | | X | | | |
| | 111 | <i>Oenanthe silaifolia</i> Bieb. | Widespread | | | | | | X | | | | X | | |
| | 112 | <i>Oenanthe millefolia</i> Janka | European-Siberian | | | | | | X | | | X | | | |
| ARALIACEAE | 113 | <i>Hedera helix</i> L. | Widespread | | | | | | X | | | | X | | |
| CRASSULACEAE | 114 | <i>Sedum pallidum</i> Bieb. Var. <i>pallidum</i> | Widespread | | | | | | X | | | X | | | |
| CAPRIFOLIACEAE | 115 | <i>Sambucus ebulus</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 116 | <i>Sambucus nigra</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 117 | <i>Lonicera etrusca</i> Santi var. <i>etrusca</i> | Mediterranean | | | | | | X | | | X | | | |
| CORNACEAE | 118 | <i>Cornus mas</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 119 | <i>Cornus sanguinea</i> L.subsp. <i>australis</i> (C.A. Meyer) Jav. | European-Siberian | | | | | | X | | | X | | | |
| DIPSACACEAE | 120 | <i>Scabiosa argentea</i> L. | Widespread | | | | | | X | | | X | | | |
| ASTERACEAE | 121 | <i>Senecio vernalis</i> Waldst. et Kit | Widespread | | | | | | X | | | X | | | |
| | 122 | <i>Tussilago farfara</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 123 | <i>Aster subulatus</i> Michaux | Widespread | | | | | | | X | | X | | | |
| | 124 | <i>Doronicum orientale</i> Hoffm. | Widespread | | | | | | X | | | X | | | |
| | 125 | <i>Pulicaria odora</i> (L.) Reichb. | Widespread | | | | | | X | X | | X | | | |
| | 126 | <i>Pulicaria dysenterica</i> (L.) Bernh. | Widespread | | | | | | X | | | X | | | |

| Family | NO | Taxon | Phytogeographic Region | Endemism | | Red Data Book of Turkey | BERN | CITES | Habitat Type (*) | | Relative Abundance (*) | | | | |
|---------------|-----|--|------------------------|----------|------------|-------------------------|------|-------------|------------------|----------|------------------------|---|---|---|---|
| | | | | Regional | Widespread | | | | 1 (G1.A) | 2 (E2.1) | 1 | 2 | 3 | 4 | 5 |
| | 127 | <i>Pallenis spinosa</i> (L.) Cass. | Mediterranean | | | | | | X | | | X | | | |
| | 128 | <i>Silybum marianum</i> (L.) Gaertner | Mediterranean | | | | | | X | | | X | | | |
| | 129 | <i>Anthemis cretica</i> L. subsp. <i>pontica</i> (Willd.) Grierson | Widespread | | | | | | X | | | X | | | |
| | 130 | <i>Hypochoeris radicata</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 131 | <i>Leontodon tuberosus</i> L. | Mediterranean | | | | | | X | | | X | | | |
| | 132 | <i>Anthemis tinctoria</i> L. Var. <i>tinctoria</i> | Widespread | | | | | | X | | | X | | | |
| | 133 | <i>Anthemis tinctoria</i> L. var. <i>pallida</i> DC. | Widespread | | | | | | X | | X | | | | |
| | 134 | <i>Bellis perennis</i> L. | European-Siberian | | | | | | X | X | | X | | | |
| | 135 | <i>Achillea setacea</i> Waldst. & Kit | European-Siberian | | | | | | X | | | X | | | |
| | 136 | <i>Centaurea cuneifolia</i> Sm. | Widespread | | | | | | X | | | X | | | |
| | 137 | <i>Centaurea iberica</i> Trev. Ex Sprengel | Widespread | | | | | | X | | | X | | | |
| | 138 | <i>Centaurea hermannii</i> F. Hermann | European-Siberian | X | | EN | | | X | | | X | | | |
| | 139 | <i>Carduus pycnocephalus</i> L. subsp. <i>albidus</i> (M.Bieb.) Kazmi | Widespread | | | | | | X | | | X | | | |
| | 140 | <i>Lapsana communis</i> L. subsp. <i>intermedia</i> (Bieb.) Hayek | Widespread | | | | | | X | | X | | | | |
| | 141 | <i>Carlina lanata</i> L. | Mediterranean | | | | | | X | | X | | | | |
| | 142 | <i>Cirsium vulgare</i> (Savi) Ten. | Widespread | | | | | | X | | X | | | | |
| | 143 | <i>Cirsium baytopae</i> P.H. Davis & Parris | European-Siberian | X | | VU | | | X | | X | | | | |
| | 144 | <i>Chondrilla juncea</i> L. var. <i>juncea</i> | Widespread | | | | | | X | | X | | | | |
| | 145 | <i>Sonchus asper</i> (L.) Hill subsp. <i>glaucescens</i> (Jordon) Ball | Widespread | | | | | | X | | | X | | | |
| | 146 | <i>Crepis sancta</i> (L.) Babcock | Widespread | | | | | | X | | X | | | | |
| | 147 | <i>Crepis foetida</i> L. subsp. <i>foetida</i> | Widespread | | | | | | X | | | X | | | |
| | 148 | <i>Helminthotheca echioides</i> (L.) Holub. | Widespread | | | | | | X | X | X | | | | |
| | 149 | <i>Pilosella hoppeana</i> (Schultes) C.H.& F. W Schultz subsp. <i>pilisquama</i> (Nägeli&Peter) P.D. Sell & C.West | Widespread | | | | | | X | X | | X | | | |
| | 150 | <i>Pilosella piloselloides</i> (Vill.) Soják subsp. <i>megalomastix</i> (NP.) Sell & West | Widespread | | | | | | X | X | | X | | | |
| CAMPANULACEAE | 151 | <i>Campanula lingulata</i> Waldst. & Kit. | European-Siberian | | | | | | X | | | X | | | |
| | 152 | <i>Campanula rapunculus</i> L. Var. <i>rapunculus</i> | European-Siberian | | | | | | X | | | X | | | |
| ERICACEAE | 153 | <i>Arbutus unedo</i> L. | Widespread | | | | | | X | | | X | | | |
| | 154 | <i>Erica arborea</i> L. | Widespread | | | | | | X | | | | X | | |
| | 155 | <i>Erica manipuliflora</i> Salisb. | Mediterranean | | | | | | X | | | | X | | |
| | 156 | <i>Calluna vulgaris</i> (L.) Hull | European-Siberian | | | | | | X | | | X | | | |
| PRIMULACEAE | 157 | <i>Primula vulgaris</i> Huds. Subsp. <i>sibthorpii</i> (Hoffmans) W.W. Sm & Forrest | European-Siberian | | | | | | X | | | | X | | |
| | 158 | <i>Anagallis arvensis</i> L. var. <i>caerulea</i> (L.) Gouan | Widespread | | | | | | X | | | X | | | |
| | 159 | <i>Cyclamen coum</i> Miller var. <i>coum</i> | Widespread | | | | | Appendix II | X | | X | | | | |
| OLEACEAE | 160 | <i>Jasminum fruticans</i> L. | Mediterranean | | | | | | X | | | X | | | |
| | 161 | <i>Fraxinus ornus</i> L. subsp. <i>ornus</i> | European-Siberian | | | | | | X | | | X | | | |
| | 162 | <i>Fraxinus angustifolia</i> Vahl. Subsp. <i>oxycarpa</i> (Bieb. Ex Willd.) Franco & Rocho Afonso | European-Siberian | | | | | | X | | | X | | | |
| | 163 | <i>Ligustrum vulgare</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 164 | <i>Phillyrea latifolia</i> L. | Mediterranean | | | | | | X | | | X | | | |
| GENTIANACEAE | 165 | <i>Centaurium tenuiflorum</i> (Hoffmans. & Link) Fritsch subsp. <i>tenuiflorum</i> | Mediterranean | | | | | | X | | | X | | | |

| Family | NO | Taxon | Phytogeographic Region | Endemism | | Red Data Book of Turkey | BERN | CITES | Habitat Type (*) | | Relative Abundance (*) | | | | |
|------------------|-----|--|------------------------|----------|------------|-------------------------|------|-------|------------------|----------|------------------------|---|---|---|---|
| | | | | Regional | Widespread | | | | 1 (G1.A) | 2 (E2.1) | 1 | 2 | 3 | 4 | 5 |
| | 166 | <i>Blackstonia perfolata</i> (L.) Hudson subsp. <i>perfoliata</i> | Widespread | | | | | | X | | | X | | | |
| CONVOLVULACEAE | 167 | <i>Calystegia sepium</i> (L.) R.Br. Subsp. <i>sepium</i> | Widespread | | | | | | X | | | X | | | |
| | 168 | <i>Convolvulus arvensis</i> L. | Widespread | | | | | | X | | | X | | | |
| BORAGINACEAE | 169 | <i>Echium italicum</i> L. | Mediterranean | | | | | | X | | | X | | | |
| | 170 | <i>Cerinthe minor</i> L. Subsp. <i>auriculata</i> (Ten.) Domac. | Widespread | | | | | | X | | | X | | | |
| | 171 | <i>Cynoglossum officinale</i> L. | European-Siberian | | | | | | X | X | | X | | | |
| | 172 | <i>Myosotis lithospermifolia</i> (Willd.) Hornem. | Widespread | | | | | | X | | | X | | | |
| | 173 | <i>Buglossoides arvensis</i> (L.) Johnston | Mediterranean | | | | | | X | | | X | | | |
| | 174 | <i>Lithospermum officinale</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 175 | <i>Trachystemon orientalis</i> (L.) G. Don | European-Siberian | | | | | | X | | | X | | | |
| | 176 | <i>Symphytum tuberosum</i> L. Subsp. <i>nodosum</i> (Schur) Soo | European-Siberian | | | VU | | | X | | | X | | | |
| SCROPHULARIACEAE | 177 | <i>Verbascum bugulifolium</i> Lam. | European-Siberian | | | | | | X | | | X | | | |
| | 178 | <i>Verbascum xanthophoeniceum</i> Griseb. | Mediterranean | | | | | | X | | | X | | | |
| | 179 | <i>Verbascum gnaphalodes</i> Bieb. | European-Siberian | | | | | | X | | | X | | | |
| | 180 | <i>Verbascum densiflorum</i> Bertol | European-Siberian | | | | | | X | | | X | | | |
| | 181 | <i>Linaria pelisserina</i> (L.) Miller | Mediterranean | | | | | | X | | | X | | | |
| | 182 | <i>Scrophularia scopolii</i> (Hoppe ex) Pers var. <i>scopolii</i> | Widespread | | | | | | X | | | X | | | |
| | 183 | <i>Kickxia commutata</i> (Bernh. Ex Reichb.) Fritsch subsp. <i>commutata</i> | Mediterranean | | | | | | X | X | | X | | | |
| | 184 | <i>Parentucellia latifolia</i> (L.) Caruel subsp. <i>latifolia</i> | Mediterranean | | | | | | X | X | | X | | | |
| | 185 | <i>Veronica chamaedrys</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 186 | <i>Veronica officinalis</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 187 | <i>Veronica pectinata</i> L. Var. <i>pectinata</i> | Widespread | | | | | | X | | | X | | | |
| | 188 | <i>Veronica seryplifolia</i> L. | Widespread | | | | | | X | | | X | | | |
| GLOBULARIACEAE | 189 | <i>Globularia trichosanthes</i> Fisch. & Mey. | Widespread | | | | | | X | X | | X | | | |
| LAMIACEAE | 190 | <i>Lamium amplexicaule</i> L. | Widespread | | | | | | X | X | | X | | | |
| | 191 | <i>Lamium purpureum</i> L. var. <i>purpureum</i> | Widespread | | | | | | X | | | X | | | |
| | 192 | <i>Teucrium chamaedrys</i> L. subsp. <i>chamaedrys</i> | European-Siberian | | | | | | X | | | X | | | |
| | 193 | <i>Teucrium polium</i> L. | Widespread | | | | | | X | | | X | | | |
| | 194 | <i>Ajuga reptans</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 195 | <i>Ajuga laxmannii</i> (L.) Benth | European-Siberian | | | | | | X | | | X | | | |
| | 196 | <i>Ajuga orientalis</i> L. | Widespread | | | | | | X | X | | X | | | |
| | 197 | <i>Stachys germanica</i> L. Subsp. <i>bithynica</i> (Boiss.) Bhattarjee | Widespread | | | | | | X | | | X | | | |
| | 198 | <i>Sideritis montana</i> L. Subsp. <i>montana</i> | Mediterranean | | | | | | X | | | X | | | |
| | 199 | <i>Thymus longicaulis</i> C. Presl. Subsp. <i>longicaulis</i> | Widespread | | | | | | X | | | X | | | |
| | 200 | <i>Acinos arvensis</i> (Lam.) Dandy | European-Siberian | | | | | | X | | | X | | | |
| | 201 | <i>Mentha pulegium</i> L. | Widespread | | | | | | X | | | X | | | |
| | 202 | <i>Prunella laciniata</i> (L.) L. | European-Siberian | | | | | | X | X | | X | | | |
| | 203 | <i>Prunella vulgaris</i> L. | European-Siberian | | | | | | X | X | | X | | | |
| | 204 | <i>Clinopodium vulgare</i> L. subsp. <i>vulgare</i> | Widespread | | | | | | X | | | X | | | |
| | 205 | <i>Salvia virgata</i> Jacq. | Iran-Turan | | | | | | X | | | X | | | |

| Family | NO | Taxon | Phytogeographic Region | Endemism | | Red Data Book of Turkey | BERN | CITES | Habitat Type (*) | | Relative Abundance (*) | | | | |
|-----------------|-----|---|------------------------|----------|------------|-------------------------|------|-------|------------------|----------|------------------------|---|---|---|---|
| | | | | Regional | Widespread | | | | 1 (G1.A) | 2 (E2.1) | 1 | 2 | 3 | 4 | 5 |
| | 206 | <i>Salvia forskahlei</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 207 | <i>Salvia viridis</i> L. | Mediterranean | | | | | | X | | | X | | | |
| PLANTAGINACEAE | 208 | <i>Plantago lanceolata</i> L. | Widespread | | | | | | X | | | X | | | |
| | 209 | <i>Plantago coronopus</i> L. Subsp. <i>coronopus</i> | European-Siberian | | | | | | X | | | X | | | |
| | 210 | <i>Plantago major</i> L. Subsp. <i>major</i> | Widespread | | | | | | X | | | X | | | |
| THYMELAEACEAE | 211 | <i>Daphne pontica</i> L. | Auxin | | | | | | X | | | X | | | |
| SANTALACEAE | 212 | <i>Osyris alba</i> L. | Mediterranean | | | | | | X | | | X | | | |
| EUPHORBIACEAE | 213 | <i>Mercurialis perennis</i> L. | European-Siberian | | | | | | X | | | | X | | |
| | 214 | <i>Euphorbia amygdaloides</i> L. var. <i>robbiae</i> (Turrill) Radcliffe-Smith | European-Siberian | X | | NT | | | X | | | X | | | |
| | 215 | <i>Euphorbia seguieriana</i> Necker subsp. <i>niciciana</i> (Borbas ex Novak) Rech. Fil. | Widespread | | | | | | X | | | X | | | |
| | 216 | <i>Euphorbia villosa</i> Waldst& Kit. ex Willd. | European-Siberian | | | | | | X | | | X | | | |
| CORYLACEAE | 217 | <i>Corylus avellana</i> L.var. <i>avellana</i> | European-Siberian | | | | | | X | | | X | | | |
| | 218 | <i>Carpinus betulus</i> L. | European-Siberian | | | | | | X | | | | X | | |
| | 219 | <i>Carpinus orientalis</i> Miller subsp. <i>orientalis</i> | Widespread | | | | | | X | | | | X | | |
| SALICACEAE | 220 | <i>Salix alba</i> L. | Widespread | | | | | | X | | | X | | | |
| | 221 | <i>Salix caprea</i> L. | European-Siberian | | | | | | X | | | X | | | |
| ULMACEAE | 222 | <i>Ulmus minor</i> Miller. subsp. <i>minor</i> | East Mediterranean | | | | | | X | | | X | | | |
| URTICACEAE | 223 | <i>Urtica dioica</i> L. | European-Siberian | | | | | | X | | | X | | | |
| FAGACEAE | 224 | <i>Quercus frainetto</i> Ten. | European-Siberian | | | | | | X | | | | | X | |
| | 225 | <i>Quercus cerris</i> L. var. <i>cerris</i> | Widespread | | | | | | X | | | | | X | |
| | 226 | <i>Quercus petraea</i> (Mattuschka) Liebl. Var. <i>iberica</i> (Steven ex Bieb.) Krassiln | Widespread | | | | | | X | | | | | X | |
| BETULACEAE | 227 | <i>Alnus glutinosa</i> (L.) Gaertner subsp. <i>glutinosa</i> | European-Siberian | | | | | | X | | | X | | | |
| LORANTHACEAE | 228 | <i>Viscum album</i> L. subsp. <i>album</i> | Widespread | | | | | | X | | | X | | | |
| RUBIACEAE | 229 | <i>Galium fissurense</i> Ehrend.& Schönb. -Tem. | Iran-Turan | | | | | | X | X | | X | | | |
| | 230 | <i>Galium verum</i> L. subsp. <i>verum</i> | European-Siberian | | | | | | X | X | | X | | | |
| | 231 | <i>Rubia peregrina</i> L. | Mediterranean | | | | | | X | | | X | | | |
| | 232 | <i>Asperula involucrata</i> Wahlenb. | European-Siberian | | | | | | X | | X | X | | | |
| MONOCOTYLEDONES | | | | | | | | | | | | | | | |
| LILIACEAE | 233 | <i>Ruscus aculeatus</i> L. subsp. <i>angustifolius</i> Boiss. | Widespread | | | | | | X | | | | | X | |
| | 234 | <i>Ruscus hypoglossum</i> L. | European-Siberian | | | | | | X | | | | X | | |
| | 235 | <i>Smilax excelsa</i> L. | European-Siberian | | | | | | X | | | X | | | |
| | 236 | <i>Asparagus acutifolius</i> L. | Mediterranean | | | | | | X | | | X | | | |
| | 237 | <i>Fritillaria pontica</i> Nahlenb. | European-Siberian | | | | | | X | | | X | | | |
| | 238 | <i>Muscari neglectum</i> Guss. | Widespread | | | | | | X | | | X | | | |
| | 239 | <i>Ornithogalum sigmoideum</i> Freyn & Sint. | European-Siberian | | | | | | X | | | X | | | |
| IRIDACEAE | 240 | <i>Iris sintenisii</i> Janka | European-Siberian | | | | | | X | | | X | | | |
| | 241 | <i>Crocus olivieri</i> Gay. Subsp. <i>istanbulensis</i> Mathew | European-Siberian | X | | EN | | | X | | X | | | | |
| ORCHIDACEAE | 242 | <i>Platanthera chlorantha</i> (Custer) Reichb. | Widespread | | | | | | X | | | X | | | |
| | 243 | <i>Orchis laxiflora</i> Lam. | Mediterranean | | | | | | X | | | X | | | |
| | 244 | <i>Orchis purpurea</i> Hudson | European-Siberian | | | | | | X | | | X | | | |
| | 245 | <i>Spiranthes spiralis</i> (L.) Chevall | Mediterranean | | | | | | X | | | X | | | |
| | 246 | <i>Ophrys oestrifera</i> Bieb. Subsp. <i>oestrifera</i> | Widespread | | | | | | X | | X | | | | |
| | 247 | <i>Cephalanthera longifolia</i> (L.) Fritsch. | European-Siberian | | | | | | X | | | X | | | |
| DIOSCOREACEAE | 248 | <i>Tamus communis</i> L. Subsp. <i>cretica</i> (L.) Kit Tan | Widespread | | | | | | X | | | X | | | |

| Family | NO | Taxon | Phytogeographic Region | Endemism | | Red Data Book of Turkey | BERN | CITES | Habitat Type (*) | | Relative Abundance (*) | | | | |
|------------|-----|---|------------------------|----------|------------|-------------------------|------|-------|------------------|----------|------------------------|---|---|---|---|
| | | | | Regional | Widespread | | | | 1 (G1.A) | 2 (E2.1) | 1 | 2 | 3 | 4 | 5 |
| TYPHACEAE | 249 | <i>Thypha domingensis</i> Pers. | Widespread | | | | | | | X | | X | | | |
| JUNCACEAE | 250 | <i>Juncus acutus</i> L. | Widespread | | | | | | | X | | X | | | |
| | 251 | <i>Juncus effusus</i> L. | Widespread | | | | | | | X | | X | | | |
| | 252 | <i>Juncus capitatus</i> Weigel | Widespread | | | | | | | X | | X | | | |
| | 253 | <i>Juncus bufonius</i> L. | Widespread | | | | | | | X | | X | | | |
| | 254 | <i>Luzula forsteri</i> (Sm.) DC. | European-Siberian | | | | | | X | | | X | | | |
| CYPERACEAE | 255 | <i>Carex distachya</i> Desf. var. <i>distachya</i> | Mediterranean | | | | | | X | | | X | | | |
| | 256 | <i>Cyperus longus</i> L. | Widespread | | | | | | X | | | X | | | |
| POACEAE | 257 | <i>Poa bulbosa</i> L. | Widespread | | | | | | X | | | X | | | |
| | 258 | <i>Bromus japonicus</i> Thunb. subsp. <i>japonicus</i> | Widespread | | | | | | X | | | X | | | |
| | 259 | <i>Bromus hordeaceus</i> L. subsp. <i>hordeaceus</i> | Widespread | | | | | | X | | | X | | | |
| | 260 | <i>Aegilops biuncialis</i> Vis. | Iran-Turan | | | | | | X | | | X | | | |
| | 261 | <i>Avena wiestii</i> Steudel. | Widespread | | | | | | X | | | X | | | |
| | 262 | <i>Anthoxanthum odoratum</i> L. Subsp. <i>odoratum</i> | European-Siberian | | | | | | X | | | X | | | |
| | 263 | <i>Chrysopogon gryllus</i> (L.) Trin. Subsp. <i>gryllus</i> | Widespread | | | | | | X | | | X | | | |
| | 264 | <i>Calamagrostis epigejos</i> (L.) Roth | European-Siberian | | | | | | X | | | X | | | |
| | 265 | <i>Dactylis glomerata</i> L. subsp. <i>hispanica</i> (Roth) Nyman | Mediterranean | | | | | | X | | | X | | | |
| | 266 | <i>Psilurus incurvus</i> (Gouan) Schinz & Thell | Widespread | | | | | | X | | | X | | | |
| | 267 | <i>Briza minor</i> L. | Mediterranean | | | | | | X | | | X | | | |
| | 268 | <i>Hordeum bulbosum</i> L. | Widespread | | | | | | X | X | | X | | | |
| | 269 | <i>Phleum phleoides</i> (L.) Karsten | European-Siberian | | | | | | X | | | X | | | |
| | 270 | <i>Hordeum murinum</i> L. | Widespread | | | | | | X | | | X | | | |
| | 271 | <i>Echinaria capitata</i> (L.) Desf. | Widespread | | | | | | X | | | X | | | |
| | 272 | <i>Piptatherum coerulescens</i> (Desf.) P. Beauv. | Widespread | | | | | | X | | | X | | | |
| | 273 | <i>Brachypodium sylvaticum</i> (Hudson) P. Beauv. | Widespread | | | | | | X | | | | X | | |
| | 274 | <i>Lolium perenne</i> L. | Widespread | | | | | | X | X | | X | | | |
| | 275 | <i>Cynodon dactylon</i> (L.) Pers. var. <i>dactylon</i> | Widespread | | | | | | X | X | | X | | | |

(*) Habitat Type: (1) EUNIS Habitat G1.A: Meso- and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland

(2) EUNIS Habitat E2.1: Permanent mesotrophic pastures and aftermath-grazed meadows

Relative Abundance: (1) Very rare, (2) Rare, (3) Moderately rare, (4) Abundant, (5) Very abundant

Table 10-4. Flora Species of Importance Identified at the Project Area (*)

| Taxon | IUCN Threat Category (as per Red Data Book of Turkish Plants) | IUCN Red List of Threatened Species | Coordinates (at which the Species Observed to be Spread) | Turbine Locations and Number of Individuals Recorded (**) | Seed/korm Collection Period |
|--|--|--|---|---|-----------------------------|
| Regional Endemic Species | | | | | |
| <i>Centaurea hermannii</i> | EN | DD | (1) 35 T 0588670N 4613060 D; (2) 35 T 0588245 N 4613172 D; (3) 35 T 0589570 N 4614526 D; (4) 35 T 0589893 N 4614392 D | T33 (22 individuals) T32 (2 individuals) T28 (20 individuals) T29 (15 individuals) | July (seed) |
| <i>Cirsium baytopae</i> | VU | - | (1) 35 T 0585780 N 4615344 D; (2) 35 T 0585080 N 4615851 D | T17 (15 individuals) T15 (10 individuals) | August (seed) |
| <i>Euphorbia amygdaloides</i> var. <i>robbiae</i> | NT | - | (1) 35 T 0588360 N 4616961 D; (2) 35 T 0588769 N 4615749 D; (3) 35 T 0588189 N 4614637D; (4) 35 T 0588851 N 4614907D; (5) 35 T 0589720 N 4615574D; (6) 35 T 0588245 N 4613172 D; (7) 35 T 0589174 N 4614671 D; (8) 35 T 0589570 N 4614526 D; (9) 35 T 0589893 N 4614392 D | T20 (5 individuals) T21 (5 individuals) T25 (8 individuals) T26 (4 individuals) T23 (4 individuals) T32 (4 individuals) T27 (5 individuals) T28 (50 individuals) T29 (5 individuals) | June (seed) |
| <i>Crocus olivieri</i> subsp. <i>istanbulensis</i> | EN | - | (1) 35 T 0585780 N 4615344 D; (2) 35 T 0585432 N 4615591 D | T17 (10 individuals) T16 (8 individuals) | April (korm) |
| Not Endemic but Rare | | | | | |
| <i>Ferulago confusa</i> | VU | - | (1) 35 T 0588054 N 4615594 D; (2) 35 T 0588769 N 4615749 D; (3) 35 T 0590460 N 4613331D; (4) 35 T 0588670N 4613060 D; (5) 35 T 0589893 N 4614392 D | T19 (5 individuals) T21 (4 individuals) T34 (8 individuals) T33 (10 individuals) T29 (2 individuals) | July (seed) |
| <i>Symphytum tuberosum</i> subsp. <i>nodosum</i> | VU | - | (1) 35 T 0585432 N 4615591 D; (2) 35 T 0588054 N 4615594 D; (3) 35 T 0588769 N 4615749 D; (4) 35 T 0588189 N 4614637D; (5) 35 T 0588851 N 4614907D; (6) 35 T 0588670N 4613060 D; (7) 35 T 0588245 N 4613172 D; (8) 35 T 0589570 N 4614526 D; (9) 35 T 0589893 N 4614392 D | T16 (2 individuals) T19 (4 individuals) T21 (2 individuals) T25 (3 individuals) T26 (5 individuals) T33 (10 individuals) T32 (4 individuals) T28 (20 individuals) T29 (5 individuals) | June (seed) |

(*) None of these flora species are listed amongst Istranca Mountains KBA qualifying species.

(**) The individual flora species recorded within 200mx200m around the turbines.

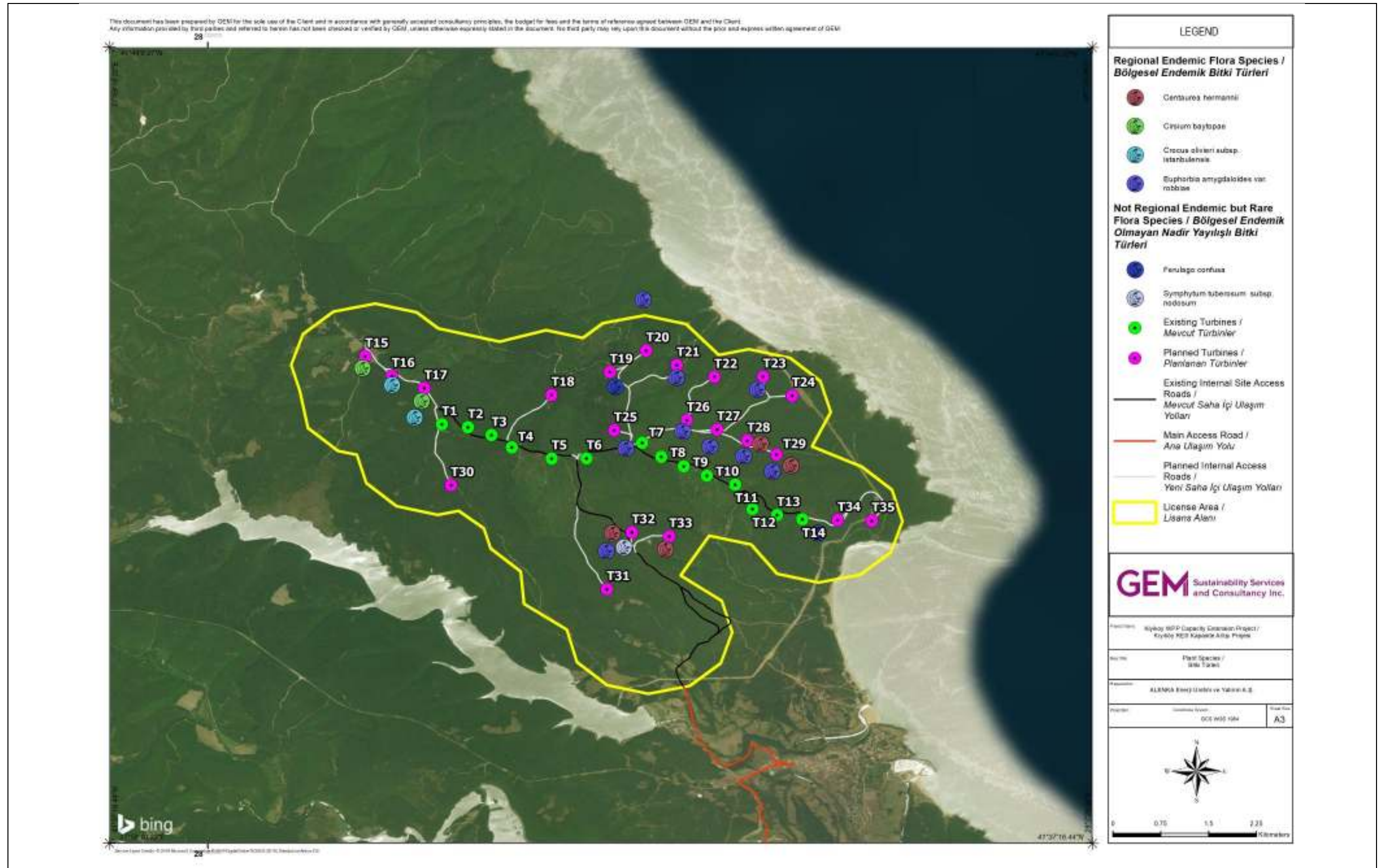


Figure 10-3. Flora Species of Importance Identified at the Project Area

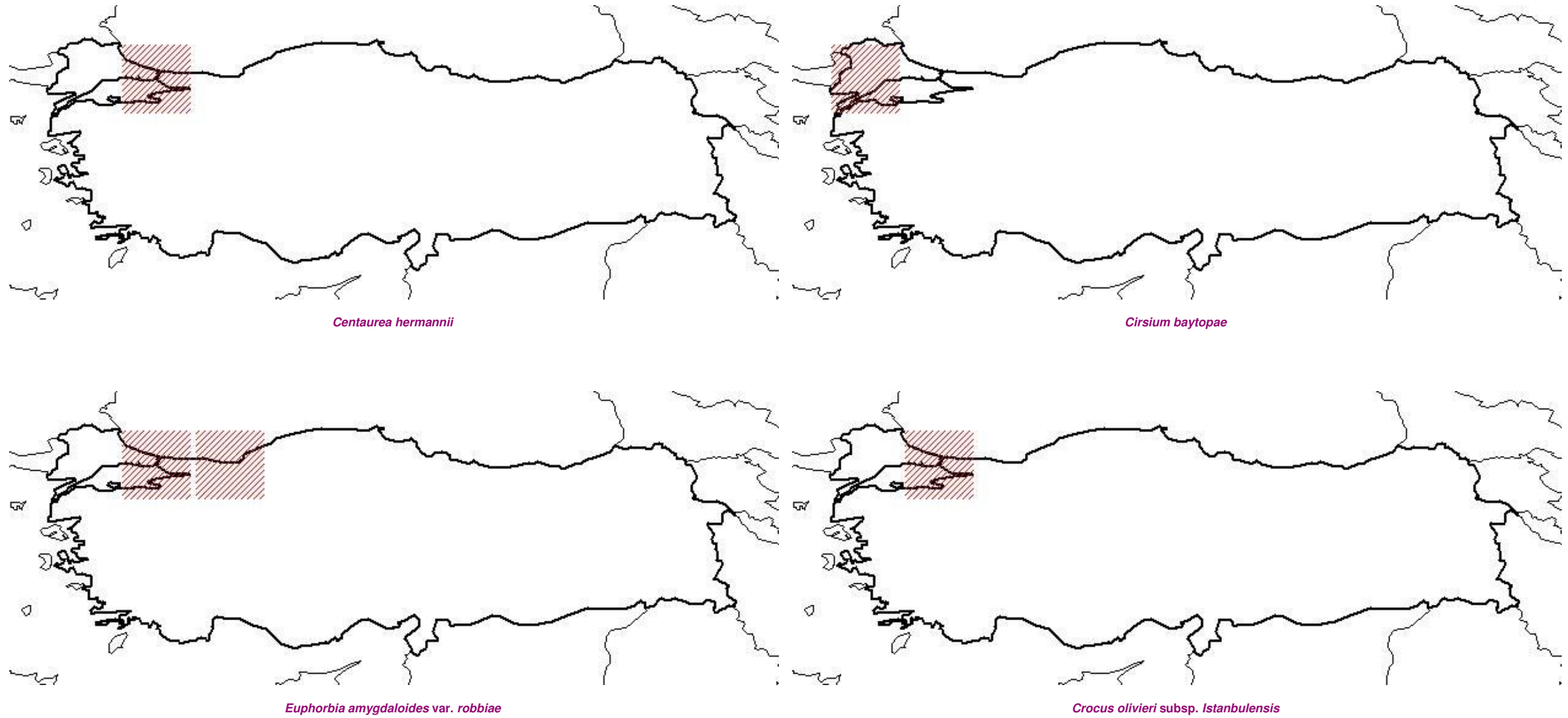


Figure 10-4. Distribution Maps of Regional Endemic Species (as listed in Table 10-4)²⁴

²⁴ Source: Turkish Plants Data Service (TUBIVES) (<http://www.tubives.com/>)

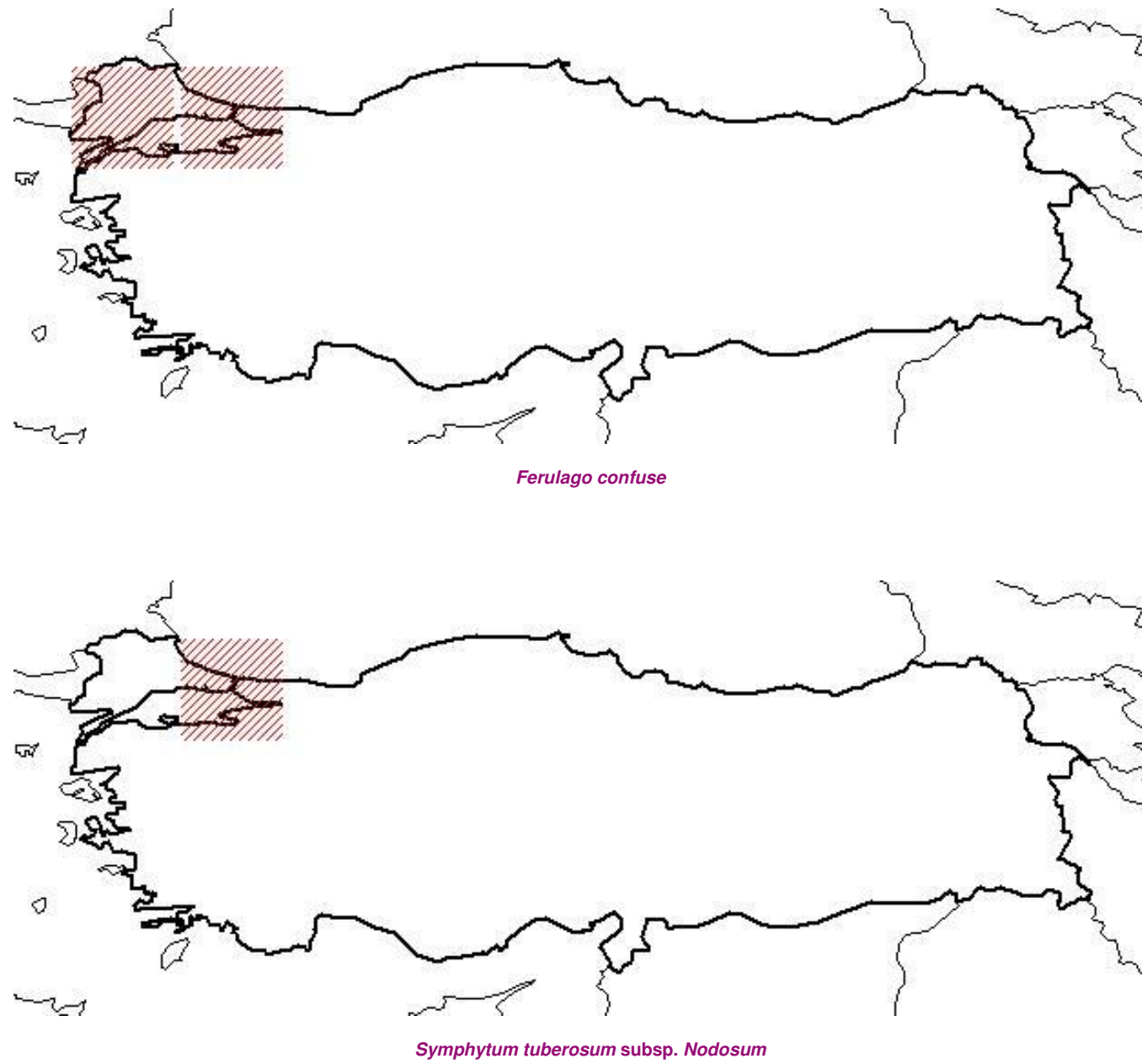


Figure 10-5. Distribution Maps of Rare Species (as listed in Table 10-4)²⁵

²⁵ Source: Turkish Plants Data Service (TUBIVES) (<http://www.tubives.com/>)



Symphytum tuberosum subsp. *nodosum*



Ferulago confusa

Figure 10-6. Rare but not Endemic Flora Species Identified at the Project License Area



Centaurea hermannii (Regional Endemic)



Euphorbia amygdaloides var. *robbiae* (Regional Endemic)



Crocus olivieri subsp. *istanbulensis* (leaf, Regional Endemic)



Cirsium baytopae (Regional Endemic)

Figure 10-7. Regional Endemic Flora Species Identified at the Project License Area

10.2.4. Habitat Classification and Vegetation Characteristics

The Project License Area is defined by the following EUNIS habitats as detailed in Table 10-5:

- EUNIS Habitat G1.A: Meso- and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland
- EUNIS Habitat E2.1: Permanent mesotrophic pastures and aftermath-grazed meadows



Figure 10-8. Meso and Eutrophic Mixed Deciduous Forests at the Project License Area



Figure 10-9. Permanent Mesotrophic Pastures at the Project License Area

Table 10-5. Habitat Classification and Vegetation Characteristics of the Project License Area

| EUNIS Habitat Code and Name | Habitat Description | EU Habitats Directive Annex I Code | CORINE Land Cover | Characteristics of the Project License Area |
|---|---|------------------------------------|--|--|
| G1.A Meso- and eutrophic <i>Quercus</i> , <i>Carpinus</i> , <i>Fraxinus</i> , <i>Acer</i> , <i>Tilia</i> , <i>Ulmus</i> and related woodland Meso- and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland | Woods, typically with mixed canopy composition, on rich and moderately rich soils. Includes woods dominated by [<i>Acer</i>], [<i>Carpinus</i>], [<i>Fraxinus</i>], [<i>Quercus</i>] (especially [<i>Quercus petraea</i>] and [<i>Quercus robur</i>]), [<i>Tilia</i>] and [<i>Ulmus</i>]. Excludes acid [<i>Quercus</i>] woodland (G1.8) and woodland with a large representation of southern species such as [<i>Fraxinus ornus</i>] or [<i>Quercus pubescens</i>] (G1.7). | - | 3.1.1 – Broad-leaved forest | <p>The dominant vegetation type at the Project License Area is meso and eutrophic mixed deciduous forests (see Figure 10-8). These woodlands are widespread in Marmara and Black Sea Regions of Turkey.</p> <p>These forests within the Project License Area are not in climax phase. <i>Erica arborea</i> and <i>Erica manipuliflora</i> are dominant in forest openings. The characteristic species of the habitat are deciduous oaks and dominant tree species are <i>Quercus frainetto</i>, <i>Quercus cerris</i>, <i>Quercus petraea</i> subsp. <i>iberica</i>, <i>Carpinus betulus</i>, <i>Carpinus orientalis</i> and <i>Fraxinus ornus</i>.</p> <p>The forest coverage is around 80-90% and the height of the trees above ground varies between 2 to 6 meters.</p> <p>Less dominant tree species within the habitat are <i>Erica arborea</i>, <i>Arbutus unedo</i>, <i>Chamaecytisus hirsutus</i>, <i>Rosa canina</i>, <i>Phillyrea latifolia</i>, <i>Ruscus aculeatus</i> var. <i>aculeatus</i>, <i>Osyris alba</i>, <i>Hypericum calycinum</i>, <i>Prunus divaricata</i> subsp. <i>divaricata</i>, <i>Pyrus bulgarica</i> and shrub.</p> <p>The ground cover flora of this habitat has high level of species richness; herbs and ferns (annual herbaceous plants) generally create a dense layer below the canopy. Shade-tolerant herbaceous plants such as <i>Brachypodium sylvaticum</i>, <i>Pilosella piloselloides</i> subsp. <i>megalomastix</i>, <i>Dactylis glomerata</i> subsp. <i>hispanica</i>, <i>Verbascum bugulifolium</i>, <i>Salvia virgata</i>, <i>Primula vulgaris</i>, <i>Daphne pontica</i>, <i>Anemone pavonia</i>, <i>Anemone blanda</i>, <i>Helleborus orientalis</i>, <i>Ornithogalum sigmoideum</i>, <i>Orchis pupurea</i>, <i>Fritillaria pontica</i>, <i>Teline monspessulana</i>, <i>Ophrys oestriifera</i>, <i>Cistus salviifolius</i>, <i>Lithospermum officinale</i>, <i>Cephalanthera longifolia</i> and <i>Oenanthe silaifolia</i> (Figure 10-11, Figure 10-12 and Figure 10-13).</p> <p>The endemic species <i>Centaurea hermannii</i>, <i>Cirsium baytopae</i> and <i>Euphorbia amygdaloides</i> var. <i>robbiae</i> are spread in this habitat together with the rare flora species <i>Ferulago confusa</i> and <i>Symphytum tuberosum</i> subsp. <i>nodosum</i>.</p> |
| E2.1 Permanent mesotrophic pastures and aftermath-grazed meadows | Regularly grazed mesotrophic pastures of Europe, fertilised and on well-drained soils, with [<i>Lolium perenne</i>], [<i>Cynosurus cristatus</i>], [<i>Poa</i>] spp., [<i>Festuca</i>] spp., [<i>Trifolium repens</i>], [<i>Leontodon autumnalis</i>], [<i>Bellis perennis</i>], [<i>Ranunculus repens</i>], [<i>Ranunculus acris</i>], [<i>Cardamine pratensis</i>], [<i>Deschampsia cespitosa</i>]; they are most characteristic of the nemoral and boreonemoral zones Europe, but extend to the Cordillera Central, the Apennines and the supra-Mediterranean zone of the Balkan peninsula and Greece. | - | 2.3.1 – Pastures | <p>Pastures (see Figure 10-9) are present at limited scale within the Project License Area as given in Figure 10-10. They develop in forest openings and are feeding areas of the livestock. The dominant flora species of this habitat are <i>Thymus longicaulis</i>, <i>Sanguisorba minor</i>, <i>Cynodon dactylon</i>, <i>Dactylis glomerata</i>, <i>Poa bulbosa</i>, <i>Lolium perenne</i>, <i>Medicago sativa</i>, <i>Lotus corniculatus</i>, <i>Ononis spinosa</i>, <i>Trifolium stellatum</i>, and <i>Trifolium campestre</i>.</p> |
| J4.2 Road networks | Road surfaces and car parks, together with the immediate highly disturbed environment adjacent to roads, which may consist of roadside banks or verges. | - | 1.2.2 – Road and rail networks and associated land | Road networks within the Project License Area. |

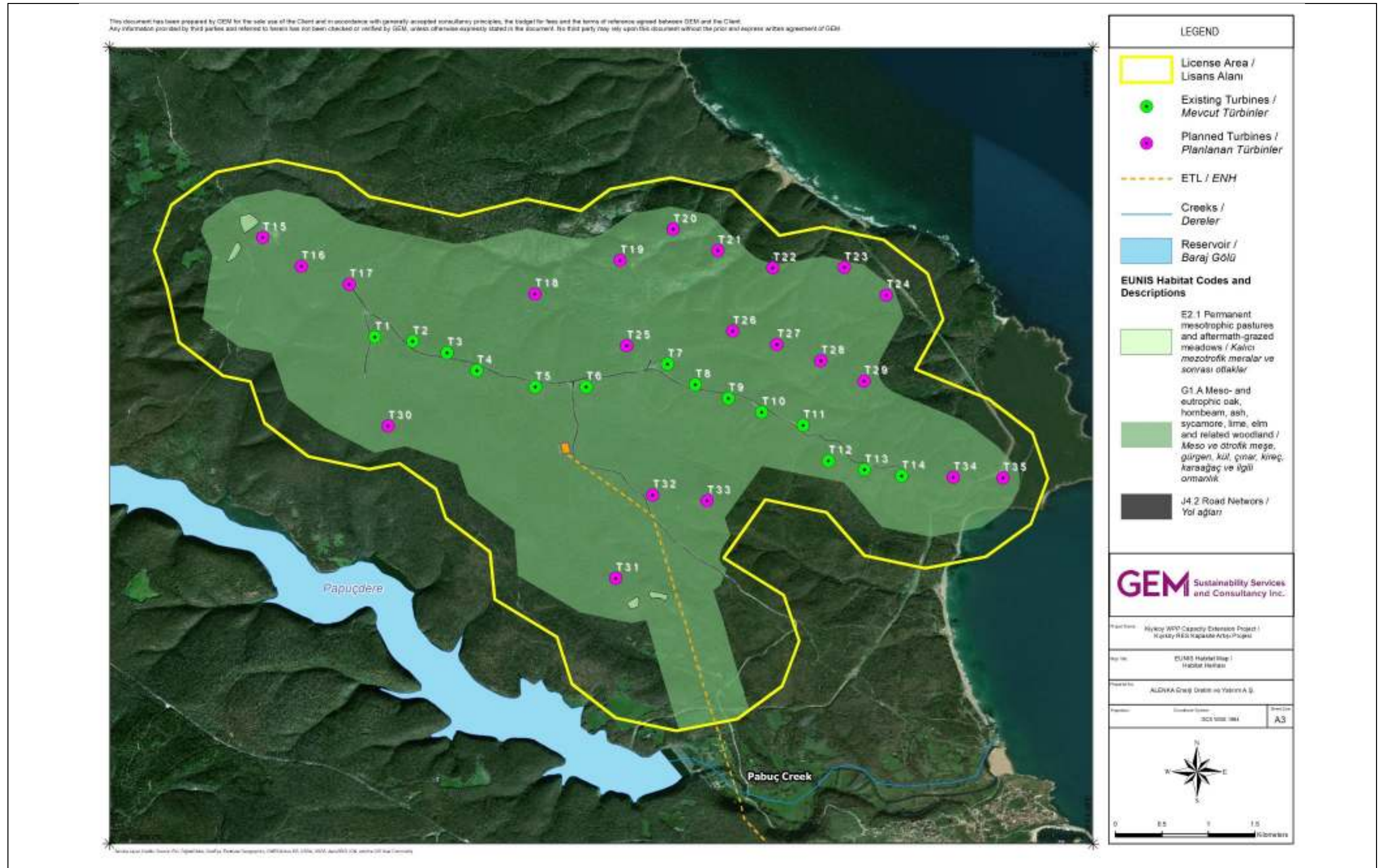


Figure 10-10. EUNIS Habitat Map of the Project License Area



Ornithogalum sigmoideum



Primula vulgaris subsp. *sibthorpii*



Anemone blanda



Anemone pavonia



Daphne pontica



Cephalanthera longifolia

Figure 10-11. Sub-Flora Species at Habitat G1.A



Erica arborea



Helleborus orientalis



Cistus salviifolius



Lithospermum officinale



Hypericum calycinum



Fritillaria pontica

Figure 10-12. Sub-Flora Species at Habitat G1.A



Ophrys oestrifera subsp. *oestrifera*



Orchis purpurea



Teline monspessulana

Figure 10-13. Sub-Flora Species at Habitat G1.A

10.2.5. Fauna Studies

Six field surveys have been conducted by Prof. Dr. Mustafa Sözen to identify the fauna species within the Project License Area. The fauna field surveys were conducted in the following seasons:

- 1-2 April 2019
- 29-30 April 2019
- 17-18 May 2019
- 17-18 June 2019
- 8-9 July 2019
- 9-10 August 2019

All the turbine locations were visited by Prof. Dr. Sözen within the scope of the 2019 fauna field survey program. At each turbine location 30 min of transect survey was conducted at and around each turbine.

Back in 2015-2017 period, within the scope of TurkStream Project, Prof. Dr. Sözen and his research team studied the faunal composition of the area using Sherman traps and photo traps.

The directly observed fauna species at the Project License Area and its vicinity are given below according to their taxonomic rank.

10.2.5.1. Butterflies (Lepidoptera)

During the fauna field studies conducted by Prof. Dr. Sözen between 2015-2017 (for the TurkStream project) a total of 35 butterfly species were identified. Within the scope of 2019 fauna surveys, 2 additional species were identified: *Hamearis lucina* (Duke of Burgundy Fritillary) and *Zerynthia polyxena* (Southern festoon). *Hamearis lucina* (Duke of Burgundy Fritillary) was observed on the way to T22 adjacent to the existing forest road and *Zerynthia polyxena* (Southern festoon) was observed on the way to T31 adjacent to the existing forest road.

The list of 37 butterfly species are given in Table 10-6. None of the observed butterfly species fall under threatened categories as per the Red Book of Turkish Butterflies (Karaçetin and Welch, 2011) and IUCN Europe list as well as none are amongst Istranca Mountains KBA qualifying species. Based on the site observations, the butterfly density is reported to be low at the Project Area.

The newly identified butterfly species are given in Figure 10-14.

Table 10-6. Butterflies (Lepidoptera) Observed at the Project Area

| No | Species Observed | Red Book of Turkish Butterflies | IUCN | Bern Convention | EU Habitats Directive | Istranca Mountains KBA |
|-----|--|---------------------------------|------|-----------------|-----------------------|------------------------|
| 1. | <i>Anthocharis cardamines</i> (Orange-tip) | LC | LC | - | - | - |
| 2. | <i>Argynnis adippe</i> (High brown fritillary) | LC | LC | - | - | - |
| 3. | <i>Argynnis paphia</i> (Silver-washed fritillary) | LC | LC | - | - | - |
| 4. | <i>Boloria euphrosyne</i> (Pearl-bordered fritillary) | LC | LC | - | - | - |
| 5. | <i>Carcharodus orientalis</i> (Oriental marbled skipper) | LC | LC | - | - | - |
| 6. | <i>Celastrina argiolus</i> (Holly blue) | LC | LC | - | - | - |
| 7. | <i>Coenonympha arcania</i> (Pearly heath) | LC | LC | - | - | - |
| 8. | <i>Coenonympha pamphilus</i> (Small heath) | LC | LC | - | - | - |
| 9. | <i>Colias crocea</i> (Clouded yellow) | LC | LC | - | - | - |
| 10. | <i>Erynnis tages</i> (Dingy skipper) | LC | LC | - | - | - |
| 11. | <i>Hamearis lucina</i> (Duke of Burgundy Fritillary) | LC | LC | - | - | - |
| 12. | <i>Heteropterus morpheus</i> (Large chequered skipper) | LC | LC | - | - | - |
| 13. | <i>Aglaia io</i> (Peacock butterfly) | LC | LC | - | - | - |
| 14. | <i>Kirinia roxelana</i> (Lattice Brown) | LC | LC | - | - | - |
| 15. | <i>Leptidae sinapis</i> (Wood white) | LC | LC | - | - | - |
| 16. | <i>Leptotes pirithous</i> (Lang's short-tailed blue) | LC | LC | - | - | - |
| 17. | <i>Limenitis reducta</i> (Southern white admiral) | LC | LC | - | - | - |
| 18. | <i>Lycaena phlaeas</i> (Small copper) | LC | LC | - | - | - |
| 19. | <i>Maniola jurtina</i> (Meadow brown) | LC | LC | - | - | - |
| 20. | <i>Melanargia galathea</i> (Marbled white) | LC | LC | - | - | - |
| 21. | <i>Melitaea athalia</i> (Heath fritillary) | LC | LC | - | - | - |
| 22. | <i>Melitaea cinxia</i> (Glanville fritillary) | LC | LC | - | - | - |
| 23. | <i>Melitaea didyma</i> (Spotted fritillary) | LC | LC | - | - | - |
| 24. | <i>Minois dryas</i> (Dryad) | LC | LC | - | - | - |
| 25. | <i>Ochlodes venatus</i> (Large skipper) | LC | LC | - | - | - |
| 26. | <i>Pararge aegeria</i> (Speckled wood) | LC | LC | - | - | - |
| 27. | <i>Pieris brassicae</i> (Large white) | LC | LC | - | - | - |
| 28. | <i>Plebejus argus</i> (Silver-studded blue) | LC | LC | - | - | - |
| 29. | <i>Polygonia c-album</i> (Comma butterfly) | LC | LC | - | - | - |
| 30. | <i>Polyommatus agestis</i> (Brown argus) | LC | LC | - | - | - |
| 31. | <i>Polyommatus icarus</i> (Common blue) | LC | LC | - | - | - |
| 32. | <i>Satyrus ilicis</i> (Ilex hairstreak) | LC | LC | - | - | - |
| 33. | <i>Spialia orbifer</i> (Red underwing skipper) | LC | LC | - | - | - |
| 34. | <i>Thymelicus sylvestris</i> (Small skipper) | LC | LC | - | - | - |
| 35. | <i>Vanessa atalanta</i> (Red admiral) | LC | LC | - | - | - |
| 36. | <i>Vanessa cardui</i> (Painted lady) | LC | LC | - | - | - |
| 37. | <i>Zerynthia polyxena</i> (Southern festoon) | LC | LC | - | - | - |



Hamearis lucina (Duke of Burgundy Fritillary)



Zerynthia polyxena (Southern festoon)

Figure 10-14. Butterfly Species Identified in 2019 Fauna Survey

10.2.5.2. Damselflies and Dragonflies (Odonata)

Odonata order is divided into two suborders as Isoptera (Damselflies) and Anisoptera (Dragonflies).

During the fauna field studies conducted by Prof. Dr. Sözen between 2015-2017 (for the TurkStream project), 15 dragonfly and 8 damselfly species were identified in the vicinity of Project License Area. Within the scope of 2019 fauna surveys, no additional species were identified. The list of odonata species is given in Table 10-7.

Amongst the dragonfly species, *Somatochlora borisi* (Bulgarian emerald) is listed as Vulnerable (VU), and both *Libellula pontica* (Red chaser) and *Caliaeschna microstigma* (Eastern spectre) are assigned as Near Threatened (NT) by the IUCN. Bulgarian emerald is also a KBA qualifying species. None of the damselfly species fall under threatened categories.

Somatochlora borisi (Bulgarian Emerald) (Figure 10-15) was identified during 2015-2017 fauna surveys in the vicinity of Pabuc Stream. During 2019 field surveys, this species was not observed at the Project Area. As reported by the IUCN, it is a strict endemic of the eastern Balkans occurring in the area that crosses the borders of Greece, Bulgaria and Turkey. All 17 known inhabited stream systems fall within a 13,750 km² area within both the Eastern Rhodopes and the northern and southern foot-slopes of the Istranca range, the latter being an eastern continuity of the Rhodopes range. The IUCN lists the major threats for this species as residential and commercial development, agriculture and aquaculture, dams and water management, domestic/industrial wastewater effluents.

Table 10-7. Damselflies and Dragonflies (Odonata) Observed at the Project Area

| No | Species Observed | IUCN | Bern Convention | EU Habitats Directive | Istranca Mountains KBA |
|---------------------------------|--|------|-----------------|-----------------------|------------------------|
| ANISOPTERA (Dragonflies) | | | | | |
| 1. | <i>Aeshna isosceles</i> (Green-eyed hawk) | LC | - | - | - |
| 2. | <i>Anax imperator</i> (Blue emperor) | LC | - | - | - |
| 3. | <i>Anax parthenope</i> (Lesser emperor) | LC | - | - | - |
| 4. | <i>Caliaeschna microstigma</i> (Eastern spectre) | LC | - | - | - |
| 5. | <i>Crocothemis erythraea</i> (Broad scarlet) | LC | - | - | - |
| 6. | <i>Libellula depressa</i> (Broad-bodied chaser) | LC | - | - | - |
| 7. | <i>Libellula fulva</i> (Blue chaser) | LC | - | - | - |
| 8. | <i>Libellula pontica</i> (Red chaser) | NT | - | - | - |
| 9. | <i>Orthetrum cancellatum</i> (Black-tailed skimmer) | LC | - | - | - |
| 10. | <i>Orthetrum coerulescens</i> (Keeled skimmer) | LC | - | - | - |
| 11. | <i>Selysiothemis nigra</i> (Black pennant) | LC | - | - | - |
| 12. | <i>Sympetrum fonscolombii</i> (Red-veined Darter) | LC | - | - | - |
| 13. | <i>Sympetrum striolatum</i> (Common darter) | LC | - | - | - |
| 14. | <i>Somatochlora borisi</i> (Bulgarian Emerald) | VU | - | - | YES |
| 15. | <i>Somatochlora meridionalis</i> (Balkan emerald) | LC | - | - | - |
| ISOPTERA (Damselflies) | | | | | |
| 16. | <i>Calopteryx virgo</i> (Beautiful demoiselle) | LC | - | - | - |
| 17. | <i>Coenagrion hastulatum</i> (Northern damselfly) | LC | - | - | - |
| 18. | <i>Coenagrion puella</i> (Azure damselfly) | LC | - | - | - |
| 19. | <i>Coenagrion scitulum</i> (Dainty bluet) | LC | - | - | - |
| 20. | <i>Ischnura elegans</i> (Blue-tailed damselfly) | LC | - | - | - |
| 21. | <i>Ischnura pumilio</i> (Small bluetail) | LC | - | - | - |
| 22. | <i>Lestes dryas</i> (Emerald spreadwing) | LC | - | - | - |
| 23. | <i>Platycnemis pennipes</i> (White-legged damselfly) | LC | - | - | - |



Figure 10-15. *Somatochlora borisi* (Bulgarian emerald)

10.2.5.3. Amphibians and Reptiles (Herpetofauna)

A total of 18 herpetofauna species (4 amphibians and 14 reptiles) were directly observed at the Project License Area and its vicinity as listed in Table 10-8.

None of the amphibians fall under threat categories specified by the IUCN; however, one of them fall under Bern Convention Appendix II (Strictly protected fauna species) and three falls under Appendix III (Protected fauna species). *Pelophylax ridibundus* (Marsh frog) species were observed within a small water body temporarily formed at the Project Area on the way to T28 and T29 (Figure 10-16). Similar temporary water bodies were observed within the Project Area. These water bodies were observed to be dry during the 2019 summer fauna surveys. *Rana dalmatina* (Agile frog) species were observed within the forest areas (Figure 10-17).

Amongst the observed 14 reptile species, both *Emys orbicularis* (European pond turtle) and *Testudo hermanni* (Hermann's tortoise) are assigned as Near Threatened (NT) and *Testudo graeca* (Common tortoise) is listed as Vulnerable (VU) by the IUCN. Moreover, 10 of the reptile species are listed in Bern Convention Appendix II (Strictly protected fauna species) and 2 of the reptile species fall under Appendix III (Protected fauna species). As listed below, 11 of the directly observed reptile species are listed in the EU Habitats Directive Annex IV and three of them in Annex II. It is also worth to mention that *Testudo graeca* and *Testudo hermanni* are Istranca Mountains KBA qualifying reptile species.

During the 2019 fauna surveys the following reptile species were directly observed:

- *Testudo graeca* (Common tortoise) on the way to T19 and T32 near the forest roads
- *Testudo hermanni* (Hermann's tortoise) on the way to T31 near the forest roads
- *Dolichophis caspius* (Large whip snake) in the vicinity of T25
- *Anguis fragilis* (Slow worm) in the vicinity of T27
- *Podarcis tauricus* (Balkan Wall Lizard) in the vicinity of T31 on open areas
- *Lacerta viridis* (Green lizard) nearby the main road to the turbines

Table 10-8. Amphibians and Reptiles (Herpetofauna) Observed at the Project Area

| No | Species Observed | IUCN | Bern Convention | EU Habitats Directive | Istranca Mountains KBA |
|--------------------|---|-----------|-----------------|-----------------------|------------------------|
| AMPHIBIANS | | | | | |
| ANURA | | | | | |
| 1. | <i>Bufo bufo</i> (Common toad) | LC | App III | - | - |
| 2. | <i>Bufo variabilis</i> (Varying toad) | DD | App III | Ann IV | - |
| 3. | <i>Pelophylax ridibundus</i> (Marsh frog) | LC | App III | Ann V | - |
| 4. | <i>Rana dalmatina</i> (Agile frog) | LC | App II | Ann IV | - |
| REPTILES | | | | | |
| TESTUDINATA | | | | | |
| 1. | <i>Emys orbicularis</i> (European pond turtle) | NT | App II | Ann II, Ann IV | - |
| 2. | <i>Mauremys rivulata</i> (Western Caspian turtle) | LC | - | - | - |
| 3. | <i>Testudo graeca</i> (Common tortoise) | VU | App II | Ann II, Ann IV | YES |
| 4. | <i>Testudo hermanni</i> (Hermann's tortoise) | NT | App II | Ann II, Ann IV | YES |
| LACERTILIA | | | | | |
| 5. | <i>Pseudopus apodus</i> (Pallas's glass lizard) | LC | App II | Ann IV | - |
| 6. | <i>Ablepharus kitaibelli</i> (Juniper Skink) | LC | App II | Ann IV | - |
| 7. | <i>Anguis fragilis</i> (Slow worm) | LC | - | - | - |
| 8. | <i>Lacerta viridis</i> (Green lizard) | LC | App II | Ann IV | - |
| 9. | <i>Podarcis muralis</i> (Common wall lizard) | LC | App II | Ann IV | - |
| 10. | <i>Podarcis tauricus</i> (Balkan Wall Lizard) | LC | App II | - | - |
| OPHIDIA | | | | | |
| 11. | <i>Dolichophis caspius</i> (Large whip snake) | LC | App III | Ann IV | - |
| 12. | <i>Natrix natrix</i> (Grass snake) | LC | App III | Ann IV | - |
| 13. | <i>Natrix tessellate</i> (Dice snake) | LC | App II | Ann IV | - |
| 14. | <i>Vipera ammodytes</i> (Nose-horned Viper) | LC | App II | Ann IV | - |



Figure 10-16. *Pelophylax ridibundus* (Marsh frog)



Figure 10-17. *Rana dalmatina* (Agile frog)

10.2.5.4. Mammals

A total of 17 mammal species were directly observed at the Project License Area and its vicinity as listed in Table 10-11. Amongst the directly observed species, 13 of them are given in Figure 10-21. The bat studies conducted within the scope of this ESIA Report is separately given in Section 10.2.7.

Sherman traps were distributed across the Project License Area to identify the small mammals as summarized in Table 10-9 and shown in Figure 10-18. Traps were distributed 10-20 m apart.

Table 10-9. Location of Sherman Traps

| Area No | Coordinates | No of Traps | Elevation (m) |
|----------------------|---------------------------|-------------|---------------|
| S1 (south of T31) | 35 T 588433 D / 4611356 K | 50 | 25 |
| S2 (between T1-T30) | 35 T 585996 D / 4614188 K | 50 | 120 |
| S3 (between T15-T16) | 35 T 585187 D / 4615780 K | 50 | 140 |
| S4 (between T19-T25) | 35 T 588147 D / 4614941 K | 50 | 110 |
| S5 (between T27-T28) | 35 T 589476 D / 4614547 K | 50 | 120 |



Figure 10-18. Sherman Traps across the Project License Area

Photo traps were used to identify the big mammal species at and around the Project License Area. For this purpose, 10 photo traps were located as given in Table 10-10 and shown in Figure 10-19 and Figure 10-20.

Table 10-10. Location of Photo traps

| Photo trap No | Coordinates | Photo trap days |
|---------------|-------------------------|-----------------|
| PT-1 | 35 T 471241 E/4439316 N | 77 |
| PT-2 | 35 T 471227 E/4438157 N | 77 |
| PT-3 | 35 T 480121 E/4435178 N | 85 |
| PT-4 | 35 T 480884 E/4431612 N | 106 |
| PT-5 | 35 T 486672 E/4434196 N | 128 |
| PT-6 | 35 T 488584 E/4437527 N | 127 |
| PT-7 | 35 T 475857 E/4432716 N | 96 |
| PT-8 | 35 T 475857 E/4432716 N | 128 |
| PT-9 | 35 T 475857 E/4432716 N | 128 |
| PT-10 | 35 T 475857 E/4432716 N | 128 |



Figure 10-19. Location of Photo traps



Figure 10-20. A Photo trap at the Project License Area

Amongst the identified mammal species, *Lutra lutra* (Eurasian otter) which is observed outside the Project License Area is listed as Near Threatened (NT) by the IUCN and is also a KBA qualifying species. Three of the directly observed mammal species are listed in Bern Convention Appendix II (Strictly protected fauna species) and 7 of them fall under Appendix III (Protected fauna species). Three of the mammal species fall under Annex IV of the EU Habitats Directive and one species is listed in Annex V. Two of the mammal species are amongst Istranca Mountains KBA qualifying species.

Amongst the identified mammal species, *Talpa levantis* (Levantine mole) which is a KBA qualifying species and *Apodemus* species nest inside the soil. Nests of *Talpa levantis* (Levantine mole) were observed on the way to T32 and T33.

Table 10-11. Mammals Observed at the Project Area between 2015-2017

| No | Species Observed | IUCN | Bern Convention | EU Habitats Directive | Istranca Mountains KBA |
|-----------------------|--|------|-----------------|-----------------------|------------------------|
| ERINACEOMORPHA | | | | | |
| 1. | <i>Erinaceus roumanicus</i> (Northern White-breasted Hedgehog) | LC | App III | - | - |
| SORICOMORPHA | | | | | |
| 2. | <i>Talpa levantis</i> (Levantine mole) | LC | - | - | YES |
| LAGOMORPHA | | | | | |
| 3. | <i>Lepus europaeus</i> (European hare) | LC | App III | - | - |
| RODENTIA | | | | | |
| 4. | <i>Sciurus vulgaris</i> (Eurasian red squirrel) | LC | App III | - | - |
| 5. | <i>Apodemus agrarius</i> (Striped field mouse) | LC | - | - | - |
| 6. | <i>Apodemus flavicollis</i> (Yellow-necked field mouse) | LC | - | - | - |
| 7. | <i>Apodemus sylvaticus</i> (Long-tailed field mouse) | LC | - | - | - |
| 8. | <i>Glis glis</i> (Edible dormouse) | LC | App III | - | - |
| CARNIVORA | | | | | |
| 9. | <i>Canis aureus</i> (Golden jackal) | LC | - | Ann V | - |
| 10. | <i>Canis lupus</i> (Grey wolf) | LC | App II | Ann IV | - |
| 11. | <i>Vulpes vulpes</i> (Red fox) | LC | - | - | - |
| 12. | <i>Felis silvestris</i> (Wild cat) | LC | App II | Ann IV | - |
| 13. | <i>Martes foina</i> (Beech marten) | LC | App III | - | - |
| 14. | <i>Meles meles</i> (Eurasian badger) | LC | App III | - | - |
| 15. | <i>Lutra lutra</i> (Eurasian otter) | NT | App II | Ann IV | YES |
| ARTIODACTYLA | | | | | |
| 16. | <i>Capreolus capreolus</i> (European roe deer) | LC | App III | - | - |
| 17. | <i>Sus scrofa</i> (Wild boar) | LC | - | - | - |



Figure 10-21. Mammal Species Identified at the Project Area²⁶

²⁶ **Mammal Species:** a. *Dryomys nitedula*, b. *Sciurus vulgaris*, c. *Talpa levantis*, d. *Apodemus agrarius*, e. *Apodemus flavicollis*, f. *Capreolus capreolus*, g. *Meles meles*, h. *Sus scrofa*, i. *Talpa levantis*, j. *Martes foina*, k. *Lepus europaeus*, l. *Canis aureus*, m. *Vulpes vulpes*

10.2.6. Avifauna Studies

The Project Area is located on the “Via Pontica” bird migration corridor along the west coast of the Black Sea. It is a major route for raptors in the region. The most important and the most studied bottleneck area on this migration route is the Bosphorus (Strait of Istanbul). There have been raptor counts since 1937 and comprehensive counts since 1967. A total of 500,000 storks and over 250,000 raptors are known to fly over the Bosphorus. On the country-wide scale, the avifauna of Turkey is represented by 400 regular species, including 39 species of birds of prey, 4 species of vultures, and 2 species of storks (Kirwan *et al.*, 2008). Moreover, Turkey lies on two main migration routes of the soaring birds (Newton, 2010).

The most documented impacts listed by the Guidelines for Assessing the Impact of Wind Farms on Birds and Bats (Atienza *et al.*, 2011) are as follows:

- Collision fatalities particularly with raptors (birds of prey): birds may be injured or killed by an encounter or collision with turbines or rotor blades.
- Disturbance and displacement: birds may partially or totally avoid a windfarm and hence be displaced from the underlying habitat.
- Barrier effect: birds may use more circuitous routes to fly between, for example, breeding and foraging grounds, and thus use up more energy to acquire food.
- Habitat loss and degradation: birds may be attracted or displaced by changes in marine habitats and prey abundance because of the windfarm.

The bird fauna of Turkey is represented by 400 regular species, including 39 species of birds of prey, 4 species of vulture, 2 species of storks (Kirwan *et al.* 2008). Moreover, Turkey lies on two main migration routes of the soaring birds (Newton 2010).

An ornithology study in line with international standards was designed and carried out by Kerem Ali Boyla and his survey team including spring (breeding) and autumn (post-breeding) migration periods. The survey target collision fatalities, particularly with raptors (birds of prey).

Vantage Point Surveys

The study is based on Vantage Point (VP) (on high ground) Methodology both for migratory and breeding/resident species as described in the Onshore Wind Farm Guidance published by Scottish Natural Heritage (SNH) as also referenced by the World Bank Groups EHS Guidelines for Wind Energy (WBG 2015).

The VP methodology includes observations at a fixed location from where the whole project area can be seen and all the birds flying through the rotors can be detected. For each season a minimum of 36 hours of observations are required. For this Project, a total of 72 hours of survey is planned for each season.

The study area encompasses the wind turbines which extend approximately 7 km along the west-east direction and 4 km along the north-south direction. The elevation of turbine sittings varies between 50 m and 120 m above sea level. The area is covered with heavily coppiced oak woodland of 7-12 m height.

The avifauna survey has focused mainly on migratory soaring birds and methodology of this study included stationary bird counts at 5 VPs for migrant and breeding migratory soaring birds. The location of VPs with respect to the turbines is given in Figure 10-22.

2019 surveys were carried out in 25 visits (the 26th has not yet been included in this version of the chapter), 13 during Spring 2019 and 12 (out of 13) during Autumn 2019 as indicated in Table 10-12 and, for each VP, 72 hours of observation was performed as provided in Table 10-13.

The VP methodology includes observations made at fixed locations from where the whole Project Area can be seen and all the birds flying through the rotors can be detected. Moreover, to achieve higher detectability, two teams consisting of three observers in total were present at all times. The third team member shifted from one observer to the other after the lunch break. The maximum duration of uninterrupted survey was four hours.

The observers scanned the area each 5 minutes at an angle of 180 degrees. When a bird is detected, the species is identified, the number is noted down, minimum and maximum height is estimated, first and last time of the sighting is noted to the standard field recording sheet. The height of each bird was noted during the entire flight period.

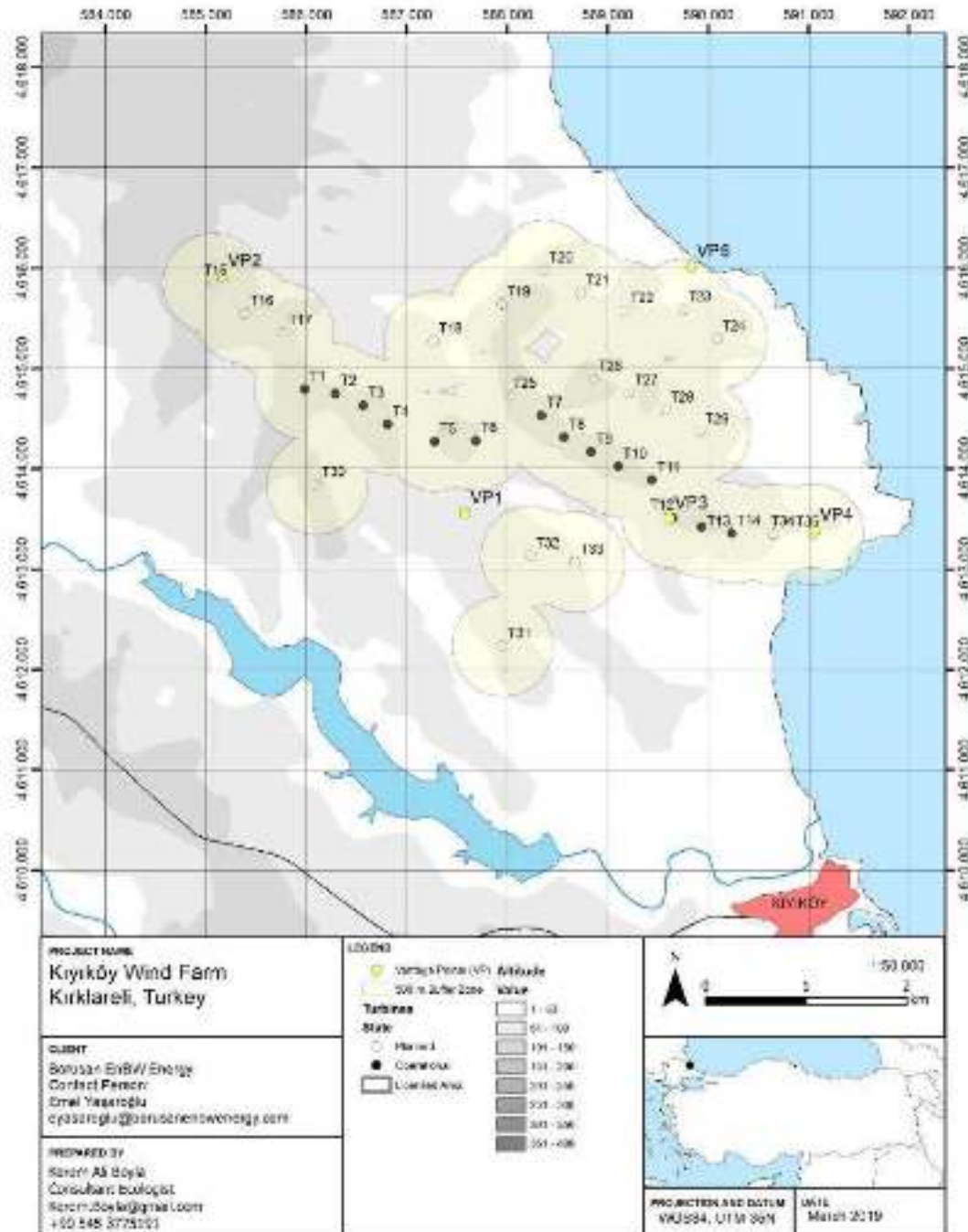


Figure 10-22. Location of Turbines and Vantage Points²⁷

²⁷ Boyla, K. A., Kiyikoy Wind Farm Bird Survey Report. Interim Report: Spring 2019, 21 June 2019.

Table 10-12. Baseline Avifauna Studies – 2019 Spring and Autumn Migration

| Survey Season | Date |
|---|-----------------------|
| Spring Migration (Breeding Season) | |
| Field Visit #1 | 12-19 March 2019 |
| Field Visit #2 | 19-21 March 2019 |
| Field Visit #3 | 26-28 March 2019 |
| Field Visit #4 | 2-4 April 2019 |
| Field Visit #5 | 9-11 April 2019 |
| Field Visit #6 | 16-18 April 2019 |
| Field Visit #7 | 23-25 April 2019 |
| Field Visit #8 | 30 April – 2 May 2019 |
| Field Visit #9 | 7-9 May 2019 |
| Field Visit #10 | 14-16 May 2019 |
| Field Visit #11 | 21-23 May 2019 |
| Field Visit #12 | 28-30 May 2019 |
| Field Visit #13 | 11-13 June 2019 |
| Autumn Migration (Post-breeding Season) – Surveys ongoing as of October 2019 | |
| Field Visit #1 | 13-15 August 2019 |
| Field Visit #2 | 20-22 August 2019 |
| Field Visit #3 | 27-29 August 2019 |
| Field Visit #4 | 3-5 September 2019 |
| Field Visit #5 | 10-12 September 2019 |
| Field Visit #6 | 17-19 September 2019 |
| Field Visit #7 | 24-26 September 2019 |
| Field Visit #8 | 1-3 October 2019 |
| Field Visit #9 | 8-10 October 2019 |
| Field Visit #10 | 15-17 October 2019 |
| Field Visit #11 | 22-24 October 2019 |
| Field Visit #12 | 29-31 October 2019 |
| Field Visit #13 (finalized, not yet reported) | 5-7 November 2019 |

The wind farm will consist three different types of turbines: existing 12 units of Gamesa G97 with 78 m hub height, existing 2 units of Gamesa G90 with 78 m hub height and 21 units of Vestas V136 with 112 m hub height will be constructed. The risk height is between 30 m and 127 m above ground for the existing turbines, and between 44 m and 180 m for the planned turbines.

The height levels are marked as:

- Below rotor height: 0-30 m
- At rotor height: 30-180 m
- Above rotor height: Higher than 180 m

When the birds possibly flew near the future blades, the flight line crossed the location of the turbine and the flight path map of each bird is drawn.

The limitations of the VP study can be summarized as below:

- The VP's chosen for the study were the best available options, and there have been no alternatives for the VP, as the forest cover was dense in those areas. Therefore, some birds flying low may fly through the project area without being detected by the observers.
- Access and a clear view of turbines T18, T19, T20 and T21 was very limited. Therefore, most of the bird activity went unnoticed. This issue was dealt with by adjusting the estimations after reading the calculations.

Breeding Bird Surveys

For breeding birds, one hour transect surveys were conducted along the available forest roads. The breeding survey focused on globally threatened species such as European Turtle Dove (*Streptopelia turtur*) which is a common and widespread species in Turkey but is classified as Vulnerable by the IUCN Global Red List, due to significant decrease of the population in general. The breeding bird survey follow the breeding codes of the European Breeding Bird Atlas.

Three transects were used as given in Figure 10-23:

- Between T1 and VP2
- Between T11 and VP4
- Between the junction after T 29 and VP5, along the straight track of water works

It consisted 1-hour walks on three transects. Each transect was walked two times during the breeding season. No distance sampling was done, and the breeding density was not estimated. The breeding bird survey only aim to reveal the presence of any species of conservation concern, such as globally threatened species as well as locally important species.

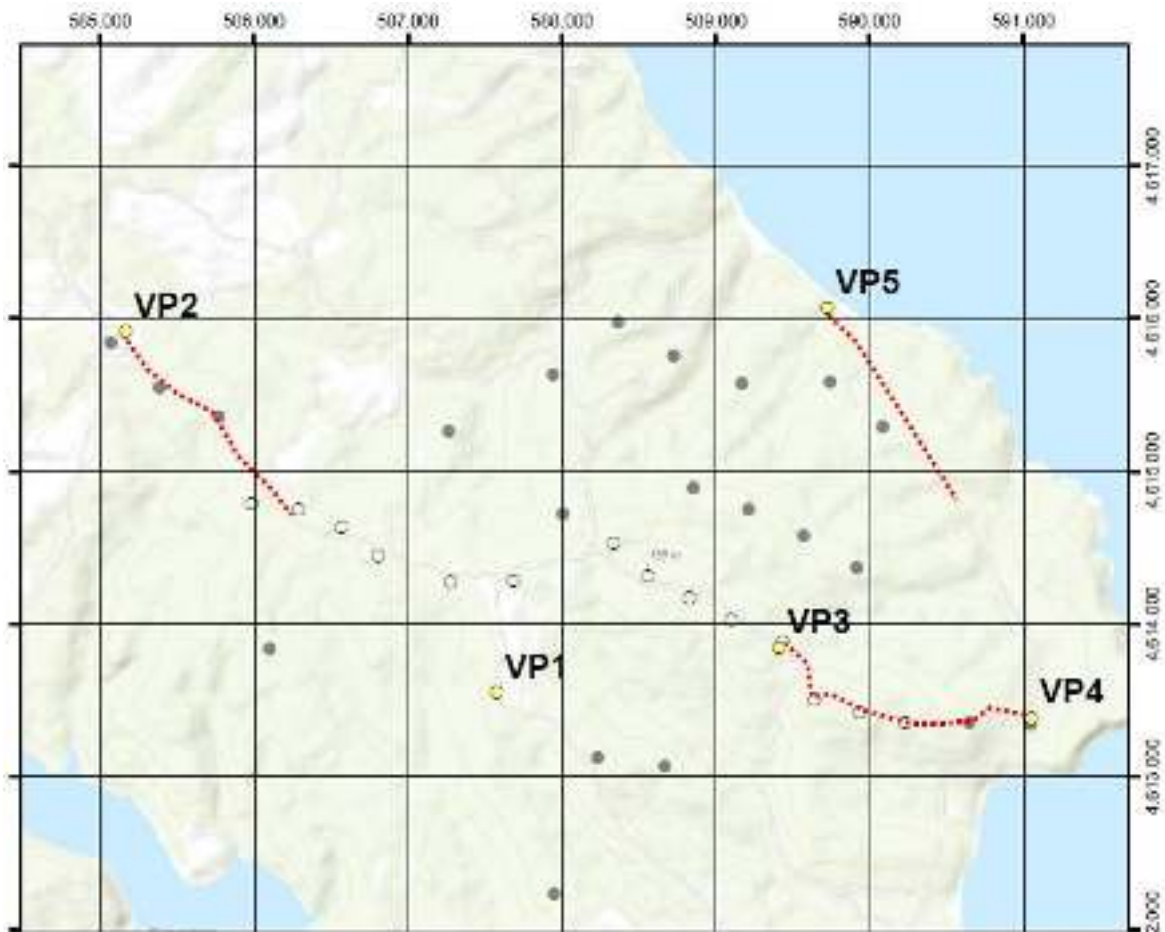


Figure 10-23. Location of the Transects for Breeding Bird Surveys

10.2.6.1. Spring 2019 VP Survey Results

A total of 362 hours of observation was made at 5 VPs as summarized in Table 10-13.

Table 10-13. Survey Effort at Vantage Points

| Survey Season | VP1 | VP2 | VP3 | VP4 | VP5 | Total |
|------------------------------------|----------|----------|----------|----------|----------|-----------|
| Spring Migration (13 field visits) | 73h17min | 72h01min | 69h52min | 71h55min | 74h43min | 361h48min |

The summary of Spring 2019 bird observations is given in Table 10-14. According to the results:

- A total of 12,756 birds were counted amongst which 12,577 birds were migratory.
- A total of 2,017 birds were recorded at risk height/zone (buffer zone), which encompasses the rotor height approximately 500 m within each dimension, amongst which 1,880 birds were migratory.

Amongst the observed avifauna species, *Buteo buteo* (Common buzzard), *Ciconia ciconia* (White stork), *Pernis apivorus* (European honey-buzzard) were recorded at the highest numbers as can be seen from Table 10-14.

As per the temporal distribution, the highest number of migratory birds were observed during Field Visit #8 (30 April-2 May) reaching above 5,000 bird observations. In general, the migration phenology observed is in accordance with full-season migration census studies at the Bosphorus conducted by IKG (2010) and Bilgin and Boyla (2011).

Table 10-14. Summary of Bird Observations in Spring 2019

| Common Name | Scientific Name | IUCN | EU Birds Dir. | Number of Birds Observed | | | Number of Bird Contacts at Risk Height/Zone (Buffer Zone) | | |
|------------------------|----------------------------|------|---------------|--------------------------|----------|-------|---|----------|-------|
| | | | | Migratory | Resident | Total | Migratory | Resident | Total |
| Black Stork | <i>Ciconia nigra</i> | LC | Ann I | 39 | 11 | 50 | 11 | 9 | 20 |
| White Stork | <i>Ciconia ciconia</i> | LC | Ann I | 7,459 | 0 | 7,459 | 684 | 0 | 684 |
| Dalmatian Pelican | <i>Pelecanus crispus</i> | LC | Ann I | 1 | 0 | 1 | 1 | 0 | 1 |
| Osprey | <i>Pandion haliaetus</i> | LC | Ann I | 3 | 0 | 3 | 2 | 0 | 2 |
| European Honey-buzzard | <i>Pernis apivorus</i> | LC | Ann I | 3,094 | 13 | 3,107 | 302 | 10 | 312 |
| Short-toed Snake-Eagle | <i>Circaetus gallicus</i> | LC | Ann I | 4 | 48 | 52 | 2 | 37 | 39 |
| Lesser Spotted Eagle | <i>Clanga pomarina</i> | LC | - | 126 | 1 | 127 | 24 | 1 | 25 |
| Booted Eagle | <i>Hieraaetus pennatus</i> | LC | Ann I | 9 | 0 | 9 | 5 | 0 | 5 |

| Common Name | Scientific Name | IUCN | EU Birds Dir. | Number of Birds Observed | | | Number of Bird Contacts at Risk Height/Zone (Buffer Zone) | | |
|------------------------|-----------------------------|------|---------------|--------------------------|------------|---------------|---|------------|--------------|
| | | | | Migratory | Resident | Total | Migratory | Resident | Total |
| Imperial Eagle | <i>Aquila heliaca</i> | VU | Ann I | 0 | 2 | 2 | 0 | 0 | 0 |
| Eurasian Marsh-Harrier | <i>Circus aeruginosus</i> | LC | Ann I | 30 | 0 | 30 | 16 | 0 | 16 |
| Hen Harrier | <i>Circus cyaneus</i> | LC | Ann I | 5 | 0 | 5 | 5 | 0 | 5 |
| Pallid Harrier | <i>Circus macrourus</i> | NT | Ann I | 1 | 0 | 1 | 1 | 0 | 1 |
| Unidentified Harrier | <i>Circus spec.</i> | LC | - | 2 | 0 | 2 | 2 | 0 | 2 |
| Montagu's Harrier | <i>Circus pygargus</i> | LC | Ann I | 1 | 0 | 1 | 0 | 0 | 0 |
| Levant Sparrowhawk | <i>Accipiter brevipes</i> | LC | Ann I | 2 | 0 | 2 | 2 | 0 | 2 |
| Eurasian Sparrowhawk | <i>Accipiter nisus</i> | LC | Ann I | 76 | 15 | 91 | 15 | 13 | 28 |
| Northern Goshawk | <i>Accipiter gentilis</i> | LC | Ann I | 1 | 5 | 6 | 0 | 3 | 3 |
| Black Kite | <i>Milvus migrans</i> | LC | Ann I | 56 | 1 | 57 | 34 | 1 | 35 |
| White-tailed Eagle | <i>Haliaeetus albicilla</i> | LC | Ann I | 0 | 3 | 3 | 0 | 1 | 1 |
| Common Buzzard | <i>Buteo buteo</i> | LC | - | 1,655 | 55 | 1,710 | 766 | 47 | 813 |
| Eurasian Kestrel | <i>Falco tinnunculus</i> | LC | - | 9 | 2 | 11 | 4 | 2 | 6 |
| Eurasian Hobby | <i>Falco subbuteo</i> | LC | - | 3 | 2 | 5 | 3 | 1 | 4 |
| Peregrine Falcon | <i>Falco peregrinus</i> | LC | Ann I | 0 | 21 | 21 | 0 | 12 | 12 |
| Unidentified Raptor | <i>Accipitridae xx</i> | LC | - | 1 | 0 | 1 | 1 | 0 | 1 |
| Total | | | | 12,577 | 179 | 12,756 | 1,880 | 137 | 2,017 |

The total duration of each contact at risk height has also been calculated. In the case of sightings of more than one individual, the duration has been multiplied for each species with the number of individuals observed within the zone. Many birds have been recorded as flying in or flying out of the 500 m buffer zone around each turbine. In such cases, the proportion of the flight path within the zone was multiplied by the total duration. Amongst the resident birds, a total of 11,475 seconds of individual bird observations were recorded as given in Table 10-15.

Table 10-15. Flight Duration of Resident Birds at Risk Height/Zone (Spring 2019)

| Common Name | Scientific Name | IUCN | Flight Duration (sec) |
|------------------------|-----------------------------|------|-----------------------|
| Black Stork | <i>Ciconia nigra</i> | LC | 810 |
| European Honey-buzzard | <i>Pernis apivorus</i> | LC | 705 |
| Short-toed Snake-Eagle | <i>Circaetus gallicus</i> | LC | 4,500 |
| Lesser Spotted Eagle | <i>Clanga pomarina</i> | LC | 300 |
| Eurasian Sparrowhawk | <i>Accipiter nisus</i> | LC | 405 |
| Northern Goshawk | <i>Accipiter gentilis</i> | LC | 210 |
| Black Kite | <i>Milvus migrans</i> | LC | 60 |
| White-tailed Eagle | <i>Haliaeetus albicilla</i> | LC | 15 |
| Common Buzzard | <i>Buteo buteo</i> | LC | 3,750 |
| Eurasian Kestrel | <i>Falco tinunculus</i> | LC | 105 |
| Peregrine Falcon | <i>Falco peregrinus</i> | LC | 615 |
| TOTAL | | | 11,475 |

10.2.6.2. Autumn 2019 VP Survey Results

A total of 364 hours of observation was made at 5 VPs (started in mid-August, for the completed 12 field visits till 8 November 2019, the 13th and last field visit was finalized in the first week of November 2019 but the data was not available at the time of updating this section) as summarized in Table 10-13.

Table 10-16. Survey Effort at Vantage Points

| Survey Season | VP1 | VP2 | VP3 | VP4 | VP5 | Total |
|--|----------|----------|----------|----------|----------|-----------|
| Autumn Migration (12 field visits completed; 13 th and last field visit will be further reported) | 57h34min | 82h02min | 84h09min | 68h40min | 71h45min | 364h10min |

The summary of Autumn 2019 bird observations is given in Table 10-17. According to the results:

- A total of 2,095 birds were counted amongst which 1,783 birds were migratory.
- A total of 1,412 birds were recorded within 500 m buffer zone and at/below rotor height (30-180 m), amongst which 1,130 birds were migratory.

Amongst the observed avifauna species, *Buteo buteo* (Common Buzzard) and *Accipiter nisus* (Eurasian Sparrowhawk), were recorded at the highest numbers as can be seen from Table 10-17.

As per the temporal distribution, the highest number of migratory birds were observed during 10-31 October 2019.

Table 10-17. Summary of Bird Observations in Autumn 2019

| Common Name | Scientific Name | IUCN | EU Birds Dir. | Number of Birds Observed | | | Number of Bird Contacts at Risk Height/Zone (Buffer Zone) | | |
|------------------------|-----------------------------|-----------|---------------|--------------------------|----------|-------|---|----------|-------|
| | | | | Migratory | Resident | Total | Migratory | Resident | Total |
| Black Stork | <i>Ciconia nigra</i> | LC | Ann I | 0 | 1 | 1 | 0 | 1 | 1 |
| White Stork | <i>Ciconia ciconia</i> | LC | Ann I | 2 | 0 | 2 | 2 | 0 | 2 |
| Dalmatian Pelican | <i>Pelecanus crispus</i> | LC | Ann I | 0 | 0 | 0 | 0 | 0 | 0 |
| Osprey | <i>Pandion haliaetus</i> | LC | Ann I | 1 | 9 | 10 | 1 | 8 | 9 |
| European Honey-buzzard | <i>Pernis apivorus</i> | LC | Ann I | 33 | 12 | 45 | 23 | 10 | 33 |
| Short-toed Snake-Eagle | <i>Circaetus gallicus</i> | LC | Ann I | 0 | 34 | 34 | 0 | 28 | 28 |
| Lesser Spotted Eagle | <i>Clanga pomarina</i> | LC | - | 121 | 0 | 121 | 55 | 0 | 55 |
| Booted Eagle | <i>Hieraaetus pennatus</i> | LC | Ann I | 0 | 7 | 7 | 0 | 7 | 7 |
| Imperial Eagle | <i>Aquila heliaca</i> | VU | Ann I | 0 | 0 | 0 | 0 | 0 | 0 |
| Eurasian Marsh-Harrier | <i>Circus aeruginosus</i> | LC | Ann I | 18 | 5 | 23 | 18 | 5 | 23 |
| Hen Harrier | <i>Circus cyaneus</i> | LC | Ann I | 2 | 0 | 2 | 2 | 0 | 2 |
| Pallid Harrier | <i>Circus macrourus</i> | NT | Ann I | 2 | 0 | 2 | 2 | 0 | 2 |
| Unidentified Harrier | <i>Circus spec.</i> | LC | - | 1 | 2 | 3 | 1 | 0 | 1 |
| Montagu's Harrier | <i>Circus pygargus</i> | LC | Ann I | 1 | 0 | 1 | 1 | 0 | 1 |
| Levant Sparrowhawk | <i>Accipiter brevipes</i> | LC | Ann I | 32 | 0 | 32 | 1 | 0 | 1 |
| Eurasian Sparrowhawk | <i>Accipiter nisus</i> | LC | Ann I | 147 | 33 | 180 | 119 | 33 | 152 |
| Northern Goshawk | <i>Accipiter gentilis</i> | LC | Ann I | 0 | 2 | 2 | 0 | 2 | 2 |
| Black Kite | <i>Milvus migrans</i> | LC | Ann I | 2 | 0 | 2 | 2 | 0 | 2 |
| White-tailed Eagle | <i>Haliaeetus albicilla</i> | LC | Ann I | 1 | 3 | 4 | 1 | 2 | 3 |

| Common Name | Scientific Name | IUCN | EU Birds Dir. | Number of Birds Observed | | | Number of Bird Contacts at Risk Height/Zone (Buffer Zone) | | |
|------------------|-------------------------|------|---------------|--------------------------|----------|-------|---|----------|-------|
| | | | | Migratory | Resident | Total | Migratory | Resident | Total |
| Common Buzzard | <i>Buteo buteo</i> | LC | - | 1,403 | 80 | 1,483 | 888 | 70 | 958 |
| Eurasian Kestrel | <i>Falco tinunculus</i> | LC | - | 0 | 0 | 0 | 0 | 0 | 0 |
| Eurasian Hobby | <i>Falco subbuteo</i> | LC | - | 14 | 102 | 116 | 11 | 95 | 106 |
| Peregrine Falcon | <i>Falco peregrinus</i> | LC | Ann I | 3 | 22 | 25 | 3 | 21 | 24 |
| TOTAL | | | | 1,783 | 312 | 2,095 | 1,130 | 282 | 1,412 |

The total duration of each contact at risk height has also been calculated. In the case of sightings of more than one individual, the duration has been multiplied for each species with the number of individuals observed within the zone. Many birds have been recorded as flying in or flying out of the 500 m buffer zone around each turbine. In such cases, the proportion of the flight path within the zone was multiplied by the total duration. Amongst the “resident” birds, a total of 19,314 seconds of individual bird observations were recorded as given in Table 10-18.

Table 10-18. Flight Duration of Resident Birds at Risk Height/Zone (Autumn 2019)

| Common Name | Scientific Name | IUCN | Flight Duration (sec) |
|--------------------------|----------------------------|------|-----------------------|
| Eurasian Hobby | <i>Falco subbuteo</i> | LC | 8,100 |
| Common Buzzard | <i>Buteo buteo</i> | LC | 4,035 |
| Short-toed Snake-Eagle | <i>Circaetus gallicus</i> | LC | 2,385 |
| Peregrine Falcon | <i>Falco peregrinus</i> | LC | 1,128 |
| European Honey-buzzard | <i>Pernis apivorus</i> | LC | 571 |
| Eurasian Sparrowhawk | <i>Accipiter nisus</i> | LC | 1,430 |
| Eurasian Marsh-Harrier | <i>Circus aeruginosus</i> | LC | 486 |
| Booted Eagle | <i>Hieraetus pennatus</i> | LC | 358 |
| Osprey | <i>Pandion haliaetus</i> | LC | 374 |
| Northern Goshawk | <i>Accipiter gentilis</i> | LC | 84 |
| Black Stork | <i>Ciconia nigra</i> | LC | 75 |
| White-tailed Eagle | <i>Haliaetus albicilla</i> | LC | 138 |
| Unidentified Sparrowhawk | <i>Accipiter spec.</i> | LC | 15 |
| Unidentified Falcon | <i>Falco spec.</i> | LC | 15 |
| Non-target Species | | | 120 |
| TOTAL | | | 19,314 |

10.2.6.3. Collision Risk Assessment

Collision risk analysis was performed for Spring 2019 and Autumn 2019 survey results by using the Scottish Natural Heritage (SNH) Guidance Note on “Windfarms and Birds: Calculating a Theoretical Collision Risk Assuming No Avoiding Action” to assess the potential impacts of the wind farm.

The methodology includes a two-stage process for the assessment of collision risk. The aim is to estimate the number of bird collisions over a period, such as a year, calculated in two stages as below:

Number of Birds Colliding per Annum

= Number Flying Through Rotor (Stage 1) x Probability of Bird Flying through Rotor being Hit (Stage 2)

Being a vital part of this avifauna study, Stage 1 of the analysis includes two standard approaches depending on the species and flight behaviour. The first approach is generally applied if bird population makes regular flights through the wind farm, and possibly in a reasonably defined direction. Hence, it is suitable for migratory species. The second approach, on the other hand, is appropriate for resident birds such as raptors which occupy a recognized territory and its mathematical model is based on the idea that the amount of time spent by a migrant bird is minimal as they try to advance as fast as possible on their long migration path unlike resident birds.

Approach 1 – Regular Flights through a Wind Farm

The first approach is where a bird population makes regular flights through the wind farm, possibly in a reasonably defined direction. This is usually applied for species that realize regular flights between the feeding and sleeping areas, such as wintering geese, gulls and cranes. This approach is used for the migrant birds.

The following steps are followed for the calculation of the collision risk for birds during regular flights:

Step 1 – A “risk window” is identified, i.e. a window of width equal to the width of the wind farm across the general flight direction of the birds, and of height equal to the maximum height of the highest turbine. The risk window is calculated as $W = \text{width} \times \text{height}$.

Step 2 – The number of birds “n” flying through this risk window per annum is estimated, i.e. flock size x frequency of flight. Allowance is made in the flock size for occasions on which birds may fly higher than this risk window and for the fact that the risk window may only straddle a proportion of the overall flight corridor used by the birds.

Step 3 – The area “A” presented by the wind farm rotors is calculated. Assume the rotors are aligned in the plane of the risk window as, to a first approximation, any reduction in cross-sectional area because the rotors are at an oblique angle is offset by the increased risk to birds which have to make a longer transit through the rotors. Where rotors overlap when viewed in cross section, allow for the full cross-sectional area of separate rotors as the risk to birds is doubled if passing through two successive rotors: $A = N \times \pi R^2$ where N is the number of rotors and R is the rotor radius.

Step 4 – Total area is expressed as a proportion of the risk window, i.e. A/W .

Step 5 – Number of birds passing through rotors is calculated as “Number of birds through risk window x proportion occupied by rotors” which is “ $n \times (A / W)$ ”

As reported by the SNH, most birds avoid turbines with a rate of 98%. Thus, the avoidance rate is calculated as 0.02 from the following formula:

$$\text{Avoidance Rate} = 1 - \frac{\text{No. of Observed Collision}}{\text{No. of Predicted Collision with No Avoidance}}$$

Spring 2019 Survey Results

A total of 1,880 migratory birds were observed at risk height/zone during Spring 2019 survey. Assuming that migration occurs 10 hours per day during the study period, a total of 21,672 migratory birds is estimated to fly through the Project Area during the study period as given in Table 10-19.

Table 10-19. Estimation of Total Number of Migratory Birds (Spring 2019)

| Variable | Value |
|--|---------------|
| Number of Migratory Birds Observed at Risk Height/Zone | 1,880 birds |
| Duration of Observation | 72 h |
| Study Period | 10 Mar-31 May |
| Total Duration of Migration (*) | 830 h |
| Estimated Number of Birds at Risk Height/Zone | 21,672 birds |
| (*) Assumed 10 hours of migration per day during the study period. | |

The mortality rate per year is calculated as 29 birds with an avoidance rate of 98% as summarized in Table 10-20.

Table 10-20. Regular Flights Through a Wind Farm (Migratory Bird Species, Spring 2019)

| Regular Flights Through a Wind Farm | | |
|---|--------------------|------------------------|
| Number of wind turbines | N | 35 (*) |
| | Width | 5,000 m |
| | Height | 180 m |
| Step 1. Identify the 'risk window' $W = \text{width} \times \text{height}$ | W | 900,000 m ² |
| Step 2. Estimate the number of birds n (see Table 10-19) | n | 21,672 birds |
| Step 3. Area presented by the wind farm rotors $A = N \times \pi R^2$ | A | 406,462 m ² |
| Step 4. Total rotor area as a proportion of the risk window | A/W | 45% |
| Step 5. Number of birds passing through rotors | $n \times (A / W)$ | 9,788 birds |
| Probability of bird being hit when flying through the rotor | | 15% |
| Mortality rate without avoidance | | 1,467 birds |
| (1-avoidance rate) | | 2% |
| Mortality estimation per Spring migration | | 29 birds |
| (*) Existing 12 G97 Gamesa turbines with a rotor diameter of 97 m, existing 2 G90 Gamesa turbines with a rotor diameter of 90 m and 21 new V136 Vestas turbines with a rotor diameter of 136 m. | | |

The theoretical mortality rate per migratory bird species is calculated as given in Table 10-21. As can be seen from the results, *Buteo buteo* (Common Buzzard) has the highest mortality rate.

Table 10-21. Theoretical Mortality Rate per Migratory Bird Species (Spring 2019)

| Species | Scientific Name | IUCN | Number of Birds | Number of Birds Passing Through Rotors | Mortality Rate (w/o avoidance) (*) | Mortality Rate (w/ avoidance) for Spring Migration |
|--|---------------------------|------|-----------------|--|------------------------------------|--|
| Common Buzzard | <i>Buteo buteo</i> | LC | 8,830 | 3,987 | 597.66 | 11.95 |
| White Stork | <i>Ciconia ciconia</i> | LC | 7,885 | 3,560 | 533.68 | 11.74 (**) |
| European Honey-buzzard | <i>Pernis apivorus</i> | LC | 3,481 | 1,572 | 235.63 | 4.71 |
| Black Kite | <i>Milvus migrans</i> | LC | 392 | 177 | 26.53 | 0.53 |
| Lesser Spotted Eagle | <i>Clanga pomarine</i> | LC | 277 | 125 | 18.73 | 0.37 |
| Eurasian Marsh-Harrier | <i>Circus aeruginosus</i> | LC | 184 | 83 | 12.48 | 0.25 |
| Eurasian Sparrowhawk | <i>Accipiter nisus</i> | LC | 173 | 78 | 11.70 | 0.23 |
| Black Stork | <i>Ciconia nigra</i> | LC | 127 | 57 | 8.58 | 0.19 (**) |
| Others | | | 323 | | | 0.57 |
| TOTAL | | | 21,672 | | | 30.54 |
| (*) Probability of bird being hit when flying through the rotor is taken as 15% as given in Table 10-20 . | | | | | | |
| (**) 10% increased for large birds. | | | | | | |

Autumn 2019 Survey Results

A total of 1,130 migratory birds were observed at risk height/zone during Autumn 2019 survey. Assuming that migration occurs 10 hours per day during the study period, a total of 13,026 migratory birds is estimated to fly through the Project Area during the study period as given in Table 10-22.

Table 10-22. Estimation of Total Number of Migratory Birds (Autumn 2019)

| Variable | Value |
|--|-----------------|
| Number of Migratory Birds Observed at Risk Height/Zone | 1,130 birds |
| Duration of Observation | 72 h |
| Study Period | 10 Aug – 31 Oct |
| Total Duration of Migration (*) | 830 h |
| Estimated Number of Birds at Risk Height/Zone | 13,026 birds |
| (*) Assumed 10 hours of migration per day during the study period. | |

The mortality rate per Autumn migration season is calculated as 18 birds with an avoidance rate of 98% as summarized in Table 10-23.

Table 10-23. Regular Flights Through a Wind Farm (Migratory Bird Species, Autumn 2019)

| Regular Flights Through a Wind Farm | | |
|---|--------------------|------------------------|
| Number of wind turbines | N | 35 (*) |
| | Width | 5,000 m |
| | Height | 180 m |
| Step 1. Identify the 'risk window' $W = \text{width} \times \text{height}$ | W | 900,000 m ² |
| Step 2. Estimate the number of birds n | n | 13,026 birds |
| Step 3. Area presented by the wind farm rotors $A = N \times \pi R^2$ | A | 406,462 m ² |
| Step 4. Total rotor area as a proportion of the risk window | A/W | 45% |
| Step 5. Number of birds passing through rotors | $n \times (A / W)$ | 5,883 birds |
| Probability of bird being hit when flying through the rotor | | 15% |
| Mortality rate without avoidance | | 882 birds |
| (1-avoidance rate) | | 2% |
| Mortality estimation per Autumn migration | | 18 birds |
| (*) Existing 12 G97 Gamesa turbines with a rotor diameter of 97 m, existing 2 G90 Gamesa turbines with a rotor diameter of 90 m and 21 new V136 Vestas turbines with a rotor diameter of 136 m. | | |

The theoretical mortality rate per migratory bird species is calculated as given in Table 10-24. As can be seen from the results, *Buteo buteo* (Common Buzzard) has the highest mortality rate.

Table 10-24. Theoretical Mortality Rate per Migratory Bird Species (Autumn 2019)

| Species | Scientific Name | IUCN | Number of Birds | Number of Birds Passing Through Rotors | Mortality Rate (w/o avoidance) (*) | Mortality Rate (w/ avoidance) for Autumn Migration |
|--|---------------------------|------|-----------------|--|------------------------------------|--|
| European Honey-buzzard | <i>Pernis apivorus</i> | LC | 265 | 120 | 18 | 0.36 |
| Common Buzzard | <i>Buteo buteo</i> | LC | 10,237 | 4,623 | 693 | 13.86 |
| Eurasian Marsh-Harrier | <i>Circus aeruginosus</i> | LC | 208 | 94 | 14 | 0.28 |
| Eurasian Hobby | <i>Falco subbuteo</i> | LC | 127 | 57 | 9 | 0.17 |
| Eurasian Sparrowhawk | <i>Accipiter nisus</i> | LC | 1,372 | 620 | 93 | 1.86 |
| Lesser Spotted Eagle | <i>Clanga pomarine</i> | LC | 634 | 286 | 43 | 0.86 |
| Peregrine Falcon | <i>Falco peregrinus</i> | LC | 35 | 16 | 2 | 0.05 |
| Other | | LC | 150 | 68 | 10 | 0 |
| TOTAL | | | 13,026 | 5,883 | 882 | 18 |
| (*) Probability of bird being hit when flying through the rotor is taken as 15% as given previously. | | | | | | |

Approach 2 – Birds Using the Wind Farm Airspace

As described by the SNH, the second approach is most appropriate for breeding individuals of raptors. This approach includes the identification of a “flight risk volume” which is the area of the wind farm multiplied by the height of the turbines.

The amount of time spent by migratory birds is minimal, as they try to advance as fast as possible on their long migration path. However, the amount of time spent by “resident” birds at the Project Area is much higher. Thus, this approach was used for resident birds, birds breeding at the site, or using the site for longer period, such as for resting, feeding or hunting (e.g. Common Buzzard, European Honey-Buzzard, Short-toed Snake Eagle, Eurasian Hobby).

The following steps are followed for the calculation of the collision risk:

Step 1 – A “flight risk volume (V_w)” is identified which is the area of the wind farm multiplied by the height of the turbines.

Step 2 – Combined volume swept out by the wind farm rotors is calculated as $V_r = N \times \pi R^2 \times (d + l)$ where N is the number of wind turbines, d is the depth of the rotor back to front, and l is the length of the bird.

Step 3 – Bird occupancy “n” within the flight risk volume is estimated. This is the number of birds present multiplied by the time spent flying in the flight risk volume, within the period (usually one year) for which the collision estimate is being made.

For good results the data available should be based on actual observations within the area of the wind farm alone (provided the observation is done without disturbance), and the best results will be based on observational data about flight heights, such as informed estimate of the proportion of flights at a level which may collide with the wind farm rotors. However, in the absence of such data, an estimate can be made knowing only the number of birds, and proportion of time flying, within the bird's territory, and using some knowledge of flight behaviour to gauge the proportion of flights at a height to be at risk.

Step 4 – Bird occupancy of the volume swept by the rotors is calculated as “n x (V_r / V_w) bird-secs”.

Step 5 – The time taken by a bird to make a transit through the rotor and completely clear the rotors is calculated as:

$$t = (d + l) / v \text{ where } v \text{ (m/sec) is the speed of the bird through the rotor}$$

Step 6 – The number of bird transits through the rotors is calculated via dividing the total occupancy of the volume swept by the rotors in bird-secs by the transit time “t” as follows:

$$\text{Number of birds passing through rotors} = n \times (V_r / V_w) / t$$

Spring 2019 Survey Results

The bird occupancy at risk height/zone is calculated as given in Table 10-25.

Table 10-25. Bird Occupancy at Risk Height/Zone (Spring 2019)

| Variable | Value |
|---|-------------------|
| Total duration of individual bird observations (from Table 10-15) | 11,475 sec |
| Total duration of observations | 72 hours |
| Study period | 10 March – 31 May |
| Total hours during survey period | 996 hours |
| Estimated total birds x seconds | 158,738 sec |

The collision risk for the resident species is calculated as 0.76 birds as given in Table 10-26. The theoretical mortality rates for each resident bird species is calculated as given in Table 10-27.

Table 10-26. Birds Using the Wind Farm Airspace (Resident Bird Species, Spring 2019)

| Birds Using the Wind Farm Airspace | | |
|---|---|------------------------------|
| Number of Wind Turbines | N | 35 |
| Buffer area of 500 m radius around turbine locations | A | 15,567,983 m ² |
| Turbine height | h | 180 m |
| Step 1. Identify a "flight risk volume" | $V_w = A \times h$ | 2,802,236,940 m ³ |
| Seeping area | | 406,462 m ² |
| Rotor radius | R | 68 m |
| Depth of the rotor from back to front | d | 2 m |
| Length of the bird (*) | l | 0.55 m |
| Step 2. Calculate the combined volume swept out by the wind farm rotors | $V_r = N \times \pi R^2 \times (d + l)$ | 1,036,479 m ³ |
| Step 3. Estimate the bird occupancy "n" (see Table 10-25) | n | 158,738 sec |
| Step 4. Bird occupancy of the volume swept by the rotors | $n \times (V_r / V_w)$ | 58.71 |
| Velocity of the bird | V | 11 m/s |
| Step 5. Time taken for a bird to make a transit through the rotor | $t = (d + l) / V$ | 0.23 sec |
| Step 6. Number of bird transits through the rotors | $n \times (V_r / V_w) / t$ | 253 birds |
| Probability of bird being hit when flying through the rotor | | 15% |
| Mortality rate without avoidance | | 38 birds |
| (1-avoidance rate) | | 2% |
| Mortality estimation per Spring migration | | 0.76 birds |
| (*) Morphological measurements of the most common raptor <i>Buteo buteo</i> (Common Buzzard) was used. The speed of soaring bird during straight flight through the rotors was taken as 11 m/s. | | |

Table 10-27. Theoretical Mortality Rate per Resident Bird Species (Spring 2019)

| Species | Scientific Name | Total (sec/year) | Step 3. Estimated Bird Occupancy | Estimated Number of Passages | Mortality Rate (w/o avoidance) | Mortality Rate (w/ avoidance) |
|------------------------|-----------------------------|------------------|----------------------------------|------------------------------|--------------------------------|-------------------------------|
| Short-toed Snake-Eagle | <i>Circaetus gallicus</i> | 124,500 | 23 | 95 | 14 | 0.29 |
| Common Buzzard | <i>Buteo buteo</i> | 103,750 | 19 | 82 | 12 | 0.25 |
| Black Stork | <i>Ciconia nigra</i> | 22,410 | 4 | 15 | 2 | 0.05 |
| European Honey-buzzard | <i>Pernis apivorus</i> | 19,505 | 4 | 16 | 2 | 0.05 |
| Peregrine Falcon | <i>Falco peregrinus</i> | 17,015 | 3 | 14 | 2 | 0.04 |
| Eurasian Sparrowhawk | <i>Accipiter nisus</i> | 11,205 | 2 | 10 | 1 | 0.03 |
| Lesser Spotted Eagle | <i>Clanga pomarine</i> | 8,300 | 2 | 6 | 1 | 0.02 |
| Northern Goshawk | <i>Accipiter gentilis</i> | 5,810 | 1 | 5 | 1 | 0.01 |
| Eurasian Kestrel | <i>Falco tinunculus</i> | 2,905 | 1 | 3 | 0 | 0.01 |
| Black Kite | <i>Milvus migrans</i> | 1,660 | 0 | 1 | 0 | 0.00 |
| White-tailed Eagle | <i>Haliaeetus albicilla</i> | 415 | 0 | 0 | 0 | 0.00 |
| Total | | 317,475 | 59 | 247 | 35 | 0.75 |

The theoretical mortality rate (with avoidance) for migratory bird species was calculated as 31 birds for the Spring 2019 survey period with *Buteo buteo* (Common Buzzard) and *Ciconia Ciconia* (White Stork) having the highest mortality rates followed by *Pernis apivorus* (European Honey-Buzzard).

The theoretical mortality rate (with avoidance) for resident bird species was calculated as 0.75 birds for the Spring 2019 survey period with *Circaetus gallicus* (Short-toed Snake-Eagle) and *Buteo buteo* (Common Buzzard) having the highest mortality rates.

During Spring 2019 survey, a *Circus macrourus* (Pallid Harrier) categorized as Near Threatened (NT) by the IUCN and a pair of *Aquila heliaca* (Eastern Imperial Eagle) categorized as Vulnerable (VU) by the IUCN were recorded.

The Project Area is covered with dense young oak (*Quercus spec*) woodland and does not seem to provide a good hunting ground for raptor species having high population abundances. The most abundant species during study the period were Short-toed Snake Eagle (*Circaetus gallicus*) and Common Buzzard (*Buteo buteo*). As reported, the calculated collision risk for resident bird species is low for Spring 2019 survey.

As a result of the bird and bat mortality studies carried out in Spring 2019 as detailed in Section 10.2.8 no single migratory soaring bird carcass was encountered. As reported by the SNH, the theoretical collision risks for migratory birds contrast greatly with the number of real collisions reported in the literature which is lower. Furthermore, most raptors avoid turbines successfully.

Autumn 2019 Survey Results

The bird occupancy at risk height/zone is calculated as given in Table 10-28.

Table 10-28. Bird Occupancy at Risk Height/Zone (Autumn 2019)

| Variable | Value |
|--|-----------------|
| Total duration of individual bird observations | 19,314 sec |
| Total duration of observations | 72 hours |
| Study period | 10 Aug – 31 Oct |
| Total hours during survey period | 996 hours |
| Estimated total birds x seconds | 267,181 sec |

The collision risk for resident bird species is calculated as 1.28 birds as given in Table 10-29. The theoretical mortality rates for each resident bird species is calculated as given in Table 10-30. Amongst the resident species, Eurasian Hobby (*Falco subbuteo*) and Common Buzzard (*Buteo buteo*) have the highest mortality rate.

Table 10-29. Birds Using the Wind Farm Airspace (Resident Bird Species, Autumn 2019)

| Birds Using the Wind Farm Airspace | | |
|---|---|------------------------------|
| Number of Wind Turbines | N | 35 |
| Buffer area of 500 m radius around turbine locations | A | 15,567,983 m ² |
| Turbine height | h | 180 m |
| Step 1. Identify a "flight risk volume" | $V_w = A \times h$ | 2,802,236,940 m ³ |
| Seeping area | | 406,462 m ² |
| Rotor radius | R | 68 m |
| Depth of the rotor from back to front | d | 2 m |
| Length of the bird (*) | l | 0.55 m |
| Step 2. Calculate the combined volume swept out by the wind farm rotors | $V_r = N \times \pi R^2 \times (d + l)$ | 1,036,479 m ³ |
| Step 3. Estimate the bird occupancy "n" | n | 267,181 sec |
| Step 4. Bird occupancy of the volume swept by the rotors | $n \times (V_r / V_w)$ | 98.82 |
| Velocity of the bird | V | 11 m/s |
| Step 5. Time taken for a bird to make a transit through the rotor | $t = (d + l) / V$ | 0.23 sec |
| Step 6. Number of bird transits through the rotors | $n \times (V_r / V_w) / t$ | 426 birds |
| Probability of bird being hit when flying through the rotor | | 15% |
| Mortality rate without avoidance | | 64 birds |
| (1-avoidance rate) | | 2% |
| Mortality estimation per Autumn migration | | 1.28 birds |
| (*) Morphological measurements of the most common raptor <i>Buteo buteo</i> (Common Buzzard) was used. The speed of soaring bird during straight flight through the rotors was taken as 11 m/s. | | |

Table 10-30. Theoretical Mortality Rate per Resident Bird Species (Autumn 2019)

| Species | Scientific Name | Total (sec/year) | Step 3. Estimated Bird Occupancy | Estimated Number of Passages | Mortality Rate (w/o avoidance) | Mortality Rate (w/ avoidance) |
|------------------------|----------------------------|------------------|----------------------------------|------------------------------|--------------------------------|-------------------------------|
| Eurasian Hobby | <i>Falco subbuteo</i> | 112,055 | 41 | 197 | 29 | 0.59 |
| Common Buzzard | <i>Buteo buteo</i> | 55,815 | 21 | 88 | 13 | 0.26 |
| Short-toed Snake-Eagle | <i>Circaetus gallicus</i> | 32,992 | 12 | 51 | 8 | 0.15 |
| Eurasian Sparrowhawk | <i>Accipiter nisus</i> | 19,778 | 7 | 34 | 5 | 0.10 |
| Peregrine Falcon | <i>Falco peregrinus</i> | 15,603 | 6 | 26 | 4 | 0.08 |
| European Honey-buzzard | <i>Pernis apivorus</i> | 7,904 | 3 | 13 | 2 | 0.04 |
| Eurasian Marsh-Harrier | <i>Circus aeruginosus</i> | 6,716 | 2 | 11 | 2 | 0.03 |
| Osprey | <i>Pandion haliaetus</i> | 5,176 | 2 | 11 | 2 | 0.02 |
| Booted Eagle | <i>Hieraaetus pennatus</i> | 4,949 | 2 | 8 | 1 | 0.02 |

| Species | Scientific Name | Total (sec/year) | Step 3. Estimated Bird Occupancy | Estimated Number of Passages | Mortality Rate (w/o avoidance) | Mortality Rate (w/ avoidance) |
|--------------------------|-----------------------------|------------------|----------------------------------|------------------------------|--------------------------------|-------------------------------|
| White-tailed Eagle | <i>Haliaeetus albicilla</i> | 1,911 | 1 | 3 | 0 | 0.01 |
| Northern Goshawk | <i>Accipiter gentilis</i> | 1,168 | 0 | 2 | 0 | 0.01 |
| Black Stork | <i>Ciconia nigra</i> | 1,037 | 0 | 1 | 0 | 0.00 |
| Unidentified Sparrowhawk | <i>Accipiter spec.</i> | 208 | 0 | 0 | 0 | 0.00 |
| Unidentified Falcon | <i>Falco spec.</i> | 208 | 0 | 0 | 0 | 0.00 |
| TOTAL | | 265,521 | 98 | 442 | 66 | 1.33 |

The theoretical mortality rate (with avoidance) for migratory bird species was calculated as 18 birds for the Autumn 2019 survey with *Buteo buteo* (Common Buzzard) having the highest mortality rate.

The theoretical mortality rate (with avoidance) for resident bird species was calculated as 1.33 birds for the Autumn 2019 survey with *Falco subbuteo* (Eurasian Hobby) and *Buteo buteo* (Common Buzzard) having the highest mortality rates. As Eurasian Hobby is a late breeder it was not recorded during Spring 2019 survey period.

A summary of Spring 2019 and Autumn 2019 theoretical mortality estimates are given below.

Table 10-31. Spring 2019 and Autumn 2019 Theoretical Mortality Rate per Migratory Bird Species

| Species | Scientific Name | IUCN | Spring 2019 Mortality Rate (w/ avoidance) | Autumn 2019 Mortality Rate (w/ avoidance) |
|------------------------|---------------------------|------|---|---|
| Common Buzzard | <i>Buteo buteo</i> | LC | 11.95 | 13.86 |
| White Stork | <i>Ciconia ciconia</i> | LC | 11.74 | ~0 |
| European Honey-buzzard | <i>Pernis apivorus</i> | LC | 4.71 | 0.36 |
| Black Kite | <i>Milvus migrans</i> | LC | 0.53 | ~0 |
| Lesser Spotted Eagle | <i>Clanga pomarine</i> | LC | 0.37 | 0.86 |
| Eurasian Marsh-Harrier | <i>Circus aeruginosus</i> | LC | 0.25 | 0.28 |
| Eurasian Sparrowhawk | <i>Accipiter nisus</i> | LC | 0.23 | 1.86 |
| Black Stork | <i>Ciconia nigra</i> | LC | 0.19 | ~0 |
| Eurasian Hobby | <i>Falco subbuteo</i> | LC | ~0 | 0.17 |
| Peregrine Falcon | <i>Falco peregrinus</i> | LC | ~0 | 0.05 |
| Other | | LC | 0.57 | ~0 |
| TOTAL | | | 30.54 | 18 |

10.2.6.4. Breeding Bird Survey Results

A total of seven transect walks have been conducted. The transect to VP2 was visited once on 13 March 2019, transect VP4 three times on 27 March 2019, 10 April 2019, and 17 April 2019, and transect VP5 three times on 26 March 2019, 16 April 2019 and 23 April 2019. A total of 24 species have been detected during the transect walks. The observation on breeding species continued during long VP observation sessions. A total of 41 species have been found at the Project Area as given below.

During VP surveys, some behaviour of the observed birds suggested breeding activity. The flight lines of the birds associated with breeding related behaviour was mapped, to draw the borders of breeding territories. Here, average territory size in literature was taken into account. For example, in the centre, four different territories were identified for the Common Buzzard whereas a single territory was defined for the European Honey-buzzard. Additional observations outside of the survey period was also taken into account.

Table 10-32. Breeding Bird Species Observed at the Project Area

| Common Name | Scientific Name | Trans ect | VP | Incidental (observed by chance find) |
|----------------------------|--------------------------------|--------------|----|--|
| Common Wood-Pigeon | <i>Columba palumbus</i> | X | X | X |
| European Turtle-Dove | <i>Streptopelia turtur</i> | | X | X |
| European Nightjar | <i>European Nightjar</i> | | | X |
| Common Cuckoo | <i>Cuculus canorus</i> | | X | X |
| Moorhen | <i>Gallinula chloropus</i> | | | X |
| Little Ringed Plover | <i>Charadrius dubius</i> | | | X |
| European Honey-Buzzard | <i>Pernis apivorus</i> | | X | X |
| Short-Toed Snake-Eagle | <i>Circaetus gallicus</i> | X | | X |
| Eurasian Sparrowhawk | <i>Accipiter nisus</i> | | X | |
| Common Buzzard | <i>Buteo buteo</i> | X | | X |
| Eurasian Hoopoe | <i>Upupa epops</i> | X | | X |
| European Bee-Eater | <i>Merops apiaster</i> | | X | X |
| Middle Spotted Woodpecker | <i>Dendrocoptes medius</i> | | X | |
| Great Spotted Woodpecker | <i>Dendrocopos major</i> | | X | X |
| Lesser Spotted Woodpecker | <i>Dryobates minor</i> | | X | |
| Gray-Headed Woodpecker | <i>Picus canus</i> | X | | |
| Eurasian Green Woodpecker | <i>Picus viridis</i> | | X | |
| Eurasian Hobby | <i>Falco subbuteo</i> | | X | |
| Peregrine Falcon | <i>Falco peregrinus</i> | X | X | X |
| Eurasian Golden Oriole | <i>Oriolus oriolus</i> | | | X |
| Red-Backed Shrike | <i>Lanius collurio</i> | | X | X |
| Lesser Gray Shrike | <i>Lanius minor</i> | | | X |
| Eurasian Jay | <i>Garrulus glandarius</i> | X | X | X |
| Hooded Crow | <i>Corvus cornix</i> | X | | X |
| Red-rumped Swallow | <i>Cecropis daurica</i> | | | X |
| Eurasian Blue Tit | <i>Cyanistes caeruleus</i> | X | | |
| Great Tit | <i>Parus major</i> | X | X | X |
| Marsh Tit | <i>Poecile palustris</i> | | | X |
| Sombre Tit | <i>Poecile lugubris</i> | | | X |
| Eastern Olivaceous Warbler | <i>Iduna pallida</i> | | X | |
| Common Chiffchaff | <i>Phylloscopus collybita</i> | X | X | X |
| Long-Tailed Tit | <i>Aegithalos audatus</i> | | X | |
| Eurasian Blackcap | <i>Sylvia atricapilla</i> | X | X | X |
| Lesser Whitethroat | <i>Sylvia curruca</i> | X | X | X |
| Sardinian Warbler | <i>Sylvia melanocephala</i> | X | X | X |
| Greater Whitethroat | <i>Sylvia communis</i> | | X | |
| Eurasian Wren | <i>Troglodytes troglodytes</i> | | | X |
| Short-toed Treecreeper | <i>Certhia brachydactyla</i> | | | X |
| European Nuthatch | <i>Sitta europaeus</i> | | | X |
| Song Thrush | <i>Turdus philomelos</i> | X | X | X |

| Common Name | Scientific Name | Trans ect | VP | Incidental (observed by chance find) |
|---------------------|------------------------------|--------------|----|--|
| Eurasian Blackbird | <i>Turdus merula</i> | X | X | X |
| European Robin | <i>Erithacus rubecula</i> | X | X | X |
| Common Nightingale | <i>Luscinia megarhynchos</i> | X | X | X |
| White Wagtail | <i>Motacilla alba</i> | X | X | X |
| Common Chaffinch | <i>Fringilla coelebs</i> | X | X | X |
| Hawfinch | <i>C. coccythraustes</i> | X | X | X |
| European Greenfinch | <i>Chloris chloris</i> | X | X | X |
| European Goldfinch | <i>Carduelis carduelis</i> | X | | |
| Cirl Bunting | <i>Emberiza cirlus</i> | X | X | X |

The breeding population of the raptors were estimated as given below. In addition, Northern Goshawk (*Accipiter gentilis*) and Booted Eagle (*Hieraaetus pennatus*) were suspected to breed. The predicted breeding territories of raptors are given in Figure 10-24 and Figure 10-25.

Table 10-33. Breeding Raptors at the Project Area

| Common Name | Scientific Name | Population Size |
|------------------------|---------------------------|-----------------|
| European Honey-Buzzard | <i>Pernis apivorus</i> | 2 pairs |
| Short-Toed Snake-Eagle | <i>Circaetus gallicus</i> | 1 pair |
| Eurasian Sparrowhawk | <i>Accipiter nisus</i> | 3 pairs |
| Common Buzzard | <i>Buteo buteo</i> | 4 pairs |
| Eurasian Hobby | <i>Falco subbuteo</i> | 3 pairs |
| Peregrine Falcon | <i>Falco peregrinus</i> | 1 pair |

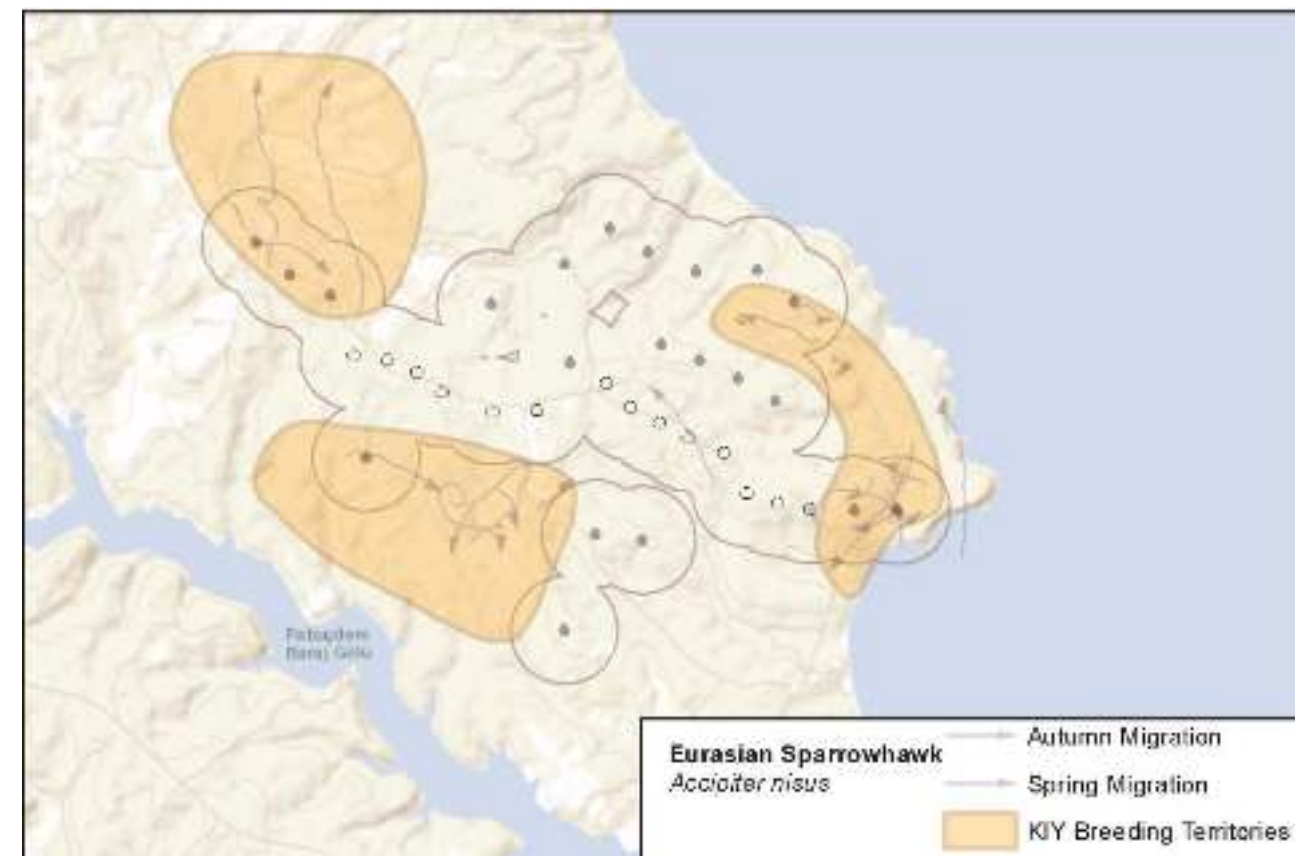
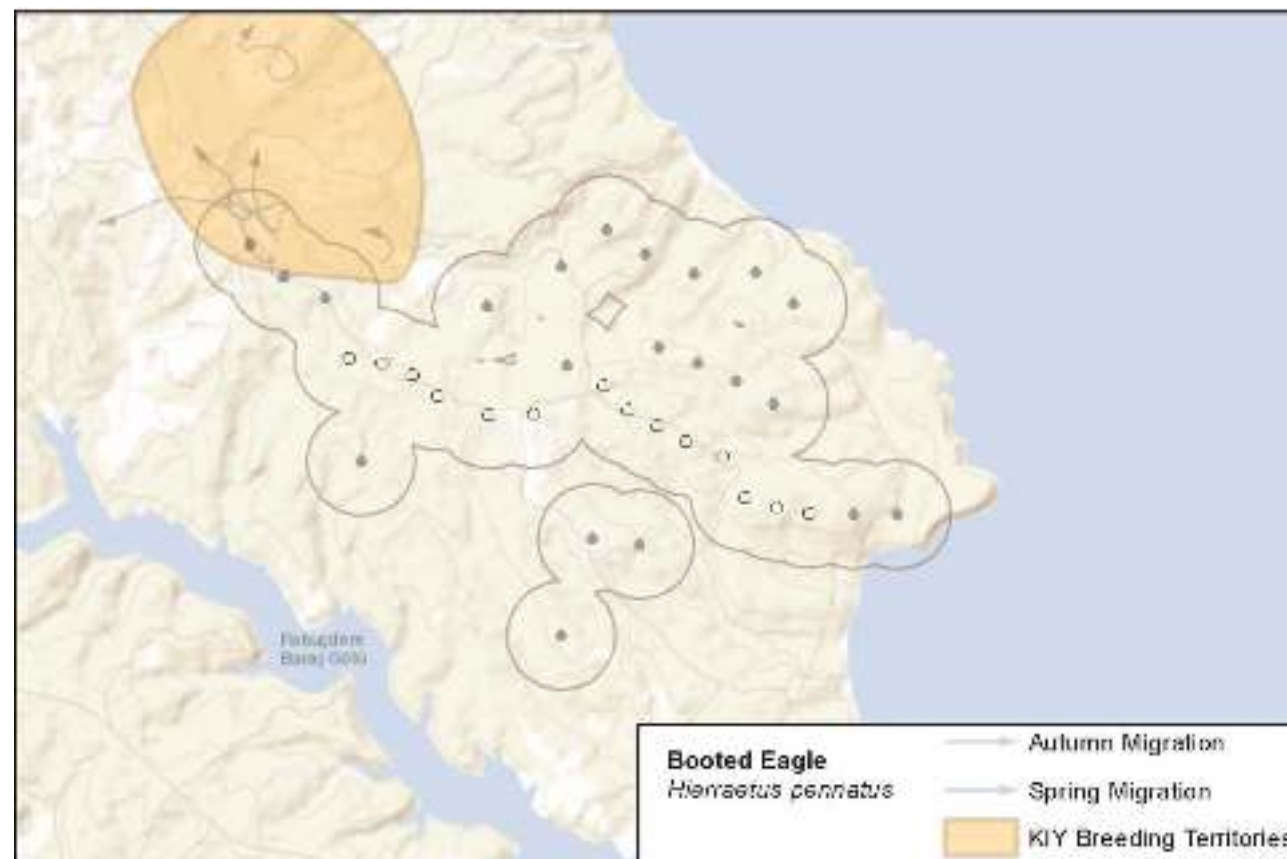
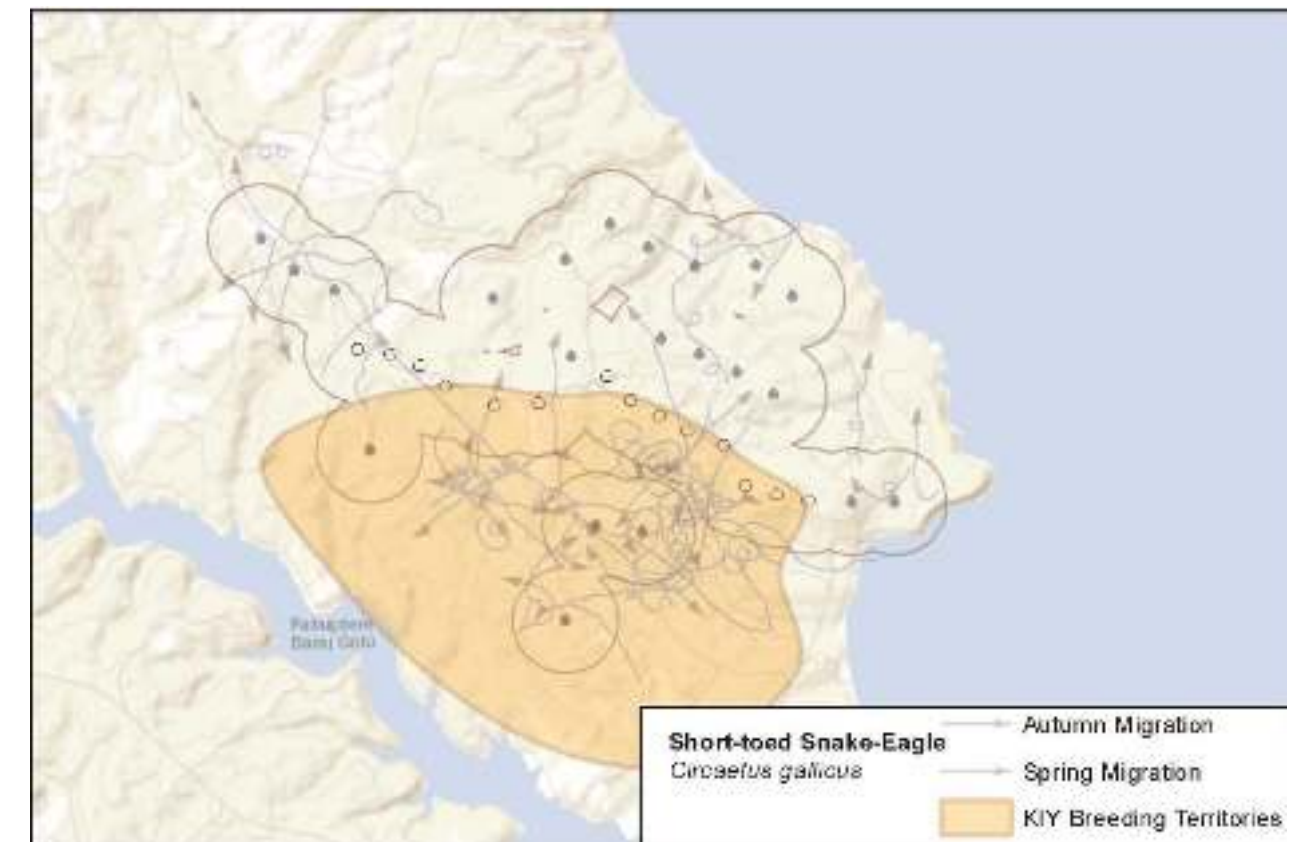
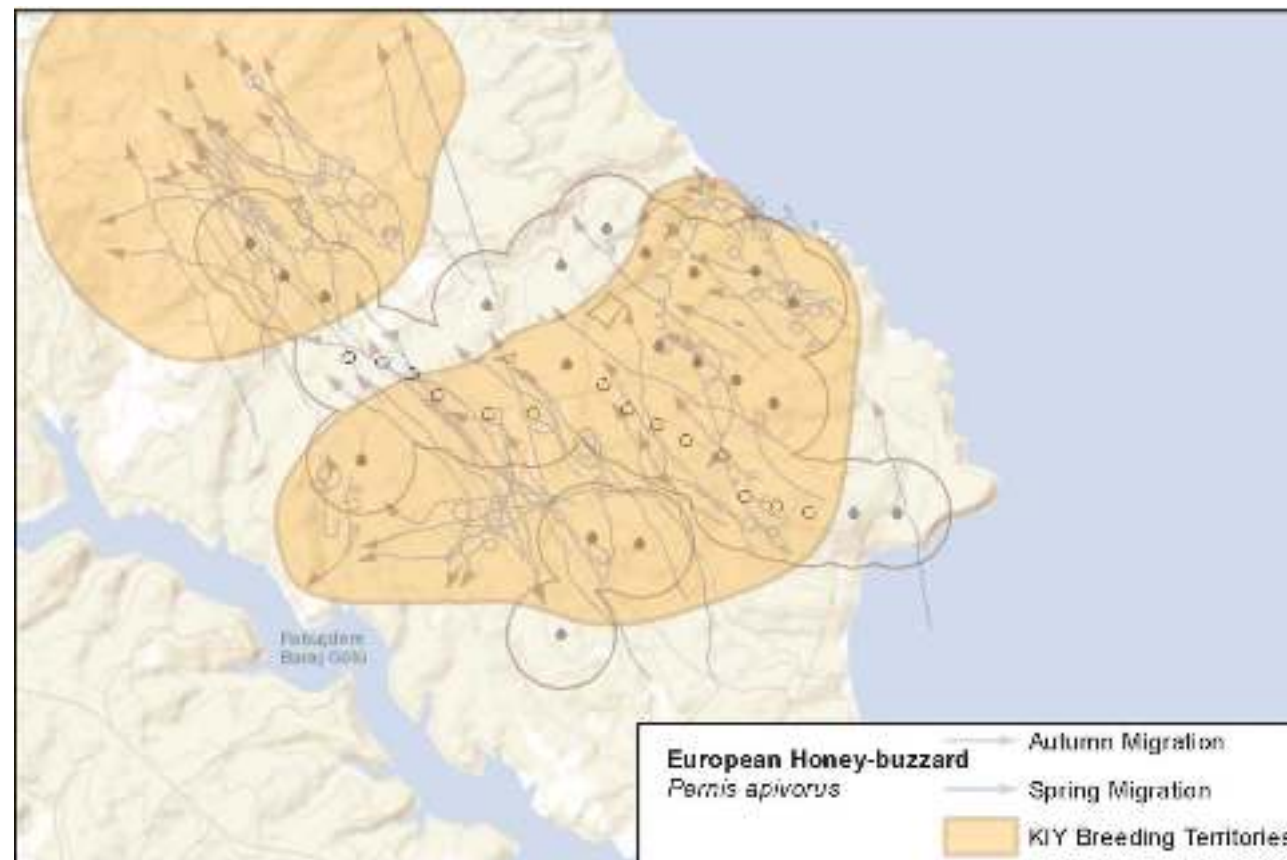


Figure 10-24. Predicted Breeding Territories of Raptors (1/2)

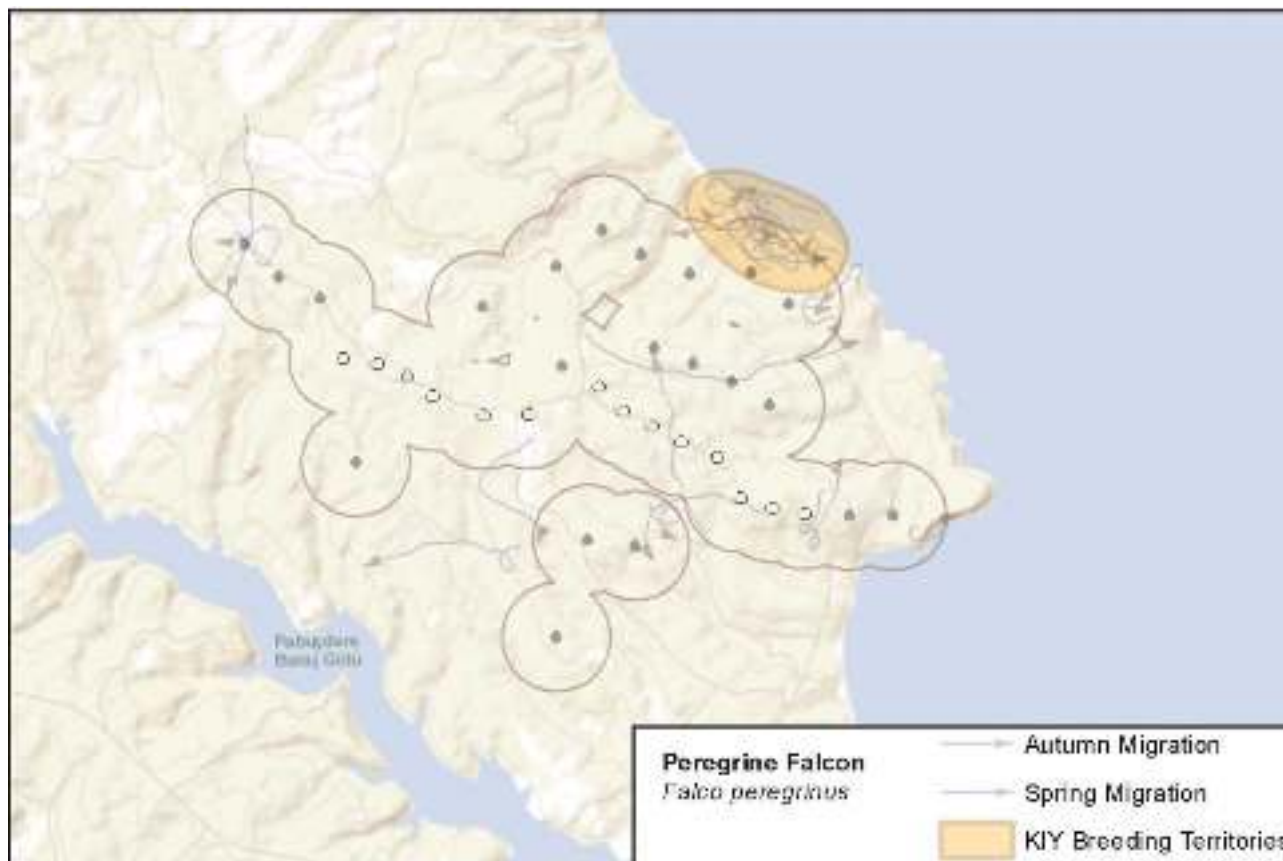
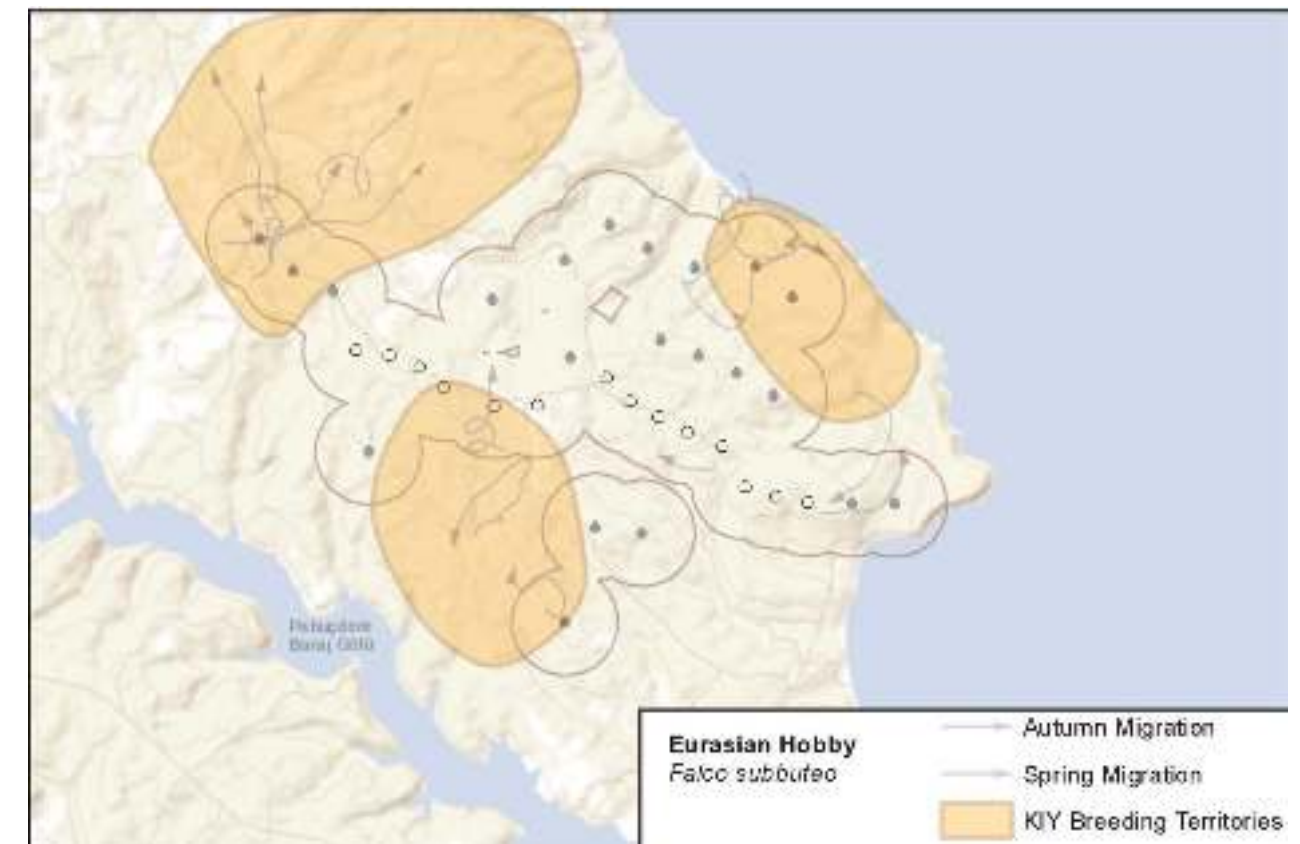
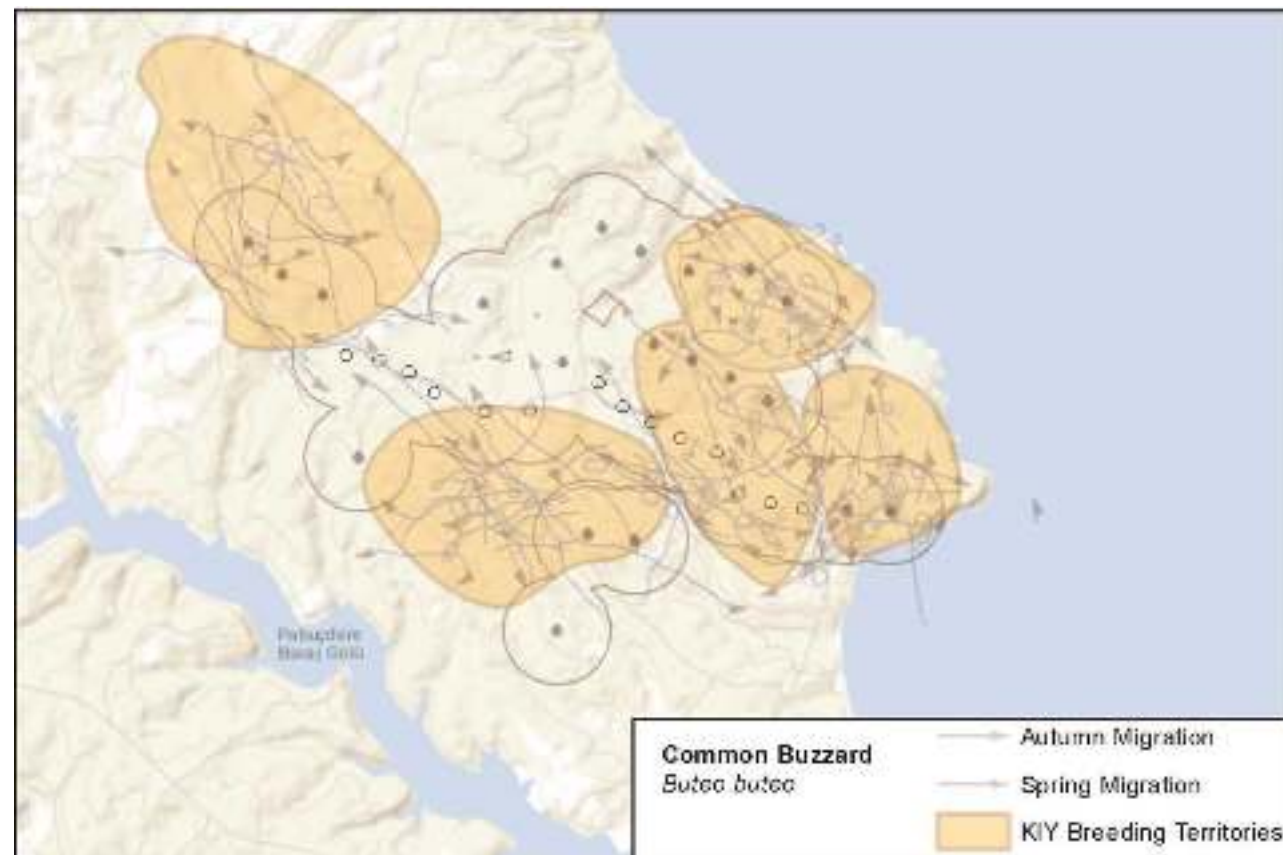


Figure 10-25. Predicted Breeding Territories of Raptors (2/2)

10.2.7. Bat Studies

The bat activity levels at the Project Area were studied based on acoustic surveys covering spring, summer and autumn seasons. In each survey season, two full nights of recording is conducted. The spring survey was carried out between 14 – 17 May 2019, the summer survey was carried out between 2 – 6 July 2019 and autumn survey between 27-30 August 2019 by Kerem Ali Boyla, Murat Biricik and Süleyman Ekşioğlu and the bat activity assessment and reporting was made by Dr. Emrah Çoraman and Kerem Ali Boyla. During each night of survey, one transect and three static acoustic surveys were conducted. Static surveys started 30 minutes before sunset and ended 30 minutes after sunrise. Each static detector recorded up to 12 hours on each survey night. For static acoustic surveys, six survey/sampling points (SP) have been selected as given in Figure 10-26.

The photographs of the selected SPs are given in Figure 10-27.

The field conditions during Spring 2019, Summer 2019 and Autumn 2019 surveys are given in Table 10-34.

Table 10-34. Field Conditions during Spring 2019, Summer 2019 and Autumn 2019 Surveys

| Date | Sampling Point (SP) | Temperature (°C) | | Wind Speed (m/s) | Cloud Coverage (%) |
|----------------|---------------------|------------------|-----|---------------------|--------------------------|
| | | Min | Max | | |
| 14 May 2019 | SP1, SP2, SP3 | 11 | 14 | 4 | 100 (*) |
| 15 May 2019 | SP1, SP2, SP3 | 12 | 16 | 2 | 60 |
| 16 May 2019 | SP4, SP5, SP6 | 9 | 14 | 1 | 0 |
| 17 May 2019 | SP4, SP5, SP6 | 11 | 15 | 2 | 60 |
| 2 July 2019 | SP4, SP5, SP6 | 16 | 23 | 3 | 0 |
| 3 July 2019 | SP4, SP5, SP6 | 20 | 24 | 5 | 50 |
| 4 July 2019 | SP1, SP2, SP3 | 19 | 22 | | 0 |
| 5 July 2019 | SP1, SP2, SP3 | 16 | 22 | | 0 |
| 27 August 2019 | SP4, SP5, SP6 | 23 | 24 | 8 | 0 (**) |
| 28 August 2019 | SP4, SP5, SP6 | 23 | 24 | 7 | 0 |
| 29 August 2019 | SP1, SP2, SP3 | 19 | 22 | 6 | 20 |
| 30 August 2019 | SP1, SP2, SP3 | 20 | 21 | 7 | 0 |

(*) Light rain till 21:00.

(**) Heavy passage of bats visible.

Four full spectrum bat detectors (Batlogger M, Elekon) with omni-directional microphones (FG Black, Elekon) were used during the surveys. The detectors were triggered by bat calls using the advance crest (CrestAdv) methodology. Recordings were made at 312,500 Hz sample rate and each of them logged time and temperature. In static acoustic surveys, the microphones were located at approximately 1.5 m above the ground. In transect acoustic surveys, recordings were also geo-tagged by using the built-in GPS of the detectors.

Bat recordings were analysed using BatSound v3.31 and BatExplorer v2.1.4 and species identifications were done by following the methodology described in Barataud (2015) including the parameters in Dietz and Kiefer (2014). As the “call parameters” of some species overlap, in such cases definitive species identification is difficult and thus their identification is reported as “possible”. Feeding buzzes and social calls were also noted.

A list of bat species expected to be encountered at the Project Area has been prepared by the survey team based on the findings of previous acoustic surveys conducted in the close vicinity of the Project License Area, the distribution maps of the IUCN Red List of Threatened Species and literature survey (Dietz and Kiefer, 2014; Çoraman *et al.*, 2013). The list includes 29 bat species (out of the total 40 species in Turkey) as given in Table 10-35. There are in total 12 bat species that qualify Istanca Mountains KBA which indicate that the area is

important for bat species. For each species the IUCN threat status, Istranca Mountains KBA qualifying status, collision risk levels (Rodrigues *et al.*, 2014) and spatial behavior is given.

Out of the 29 potential species, 14 species have been identified during the site surveys and an additional 10 species have been considered as “possible” as given in Table 10-36.

Table 10-35. Bat Species Expected at the Project Area

| No | Species | | | IUCN Red List of Threatened Species | EU Habitats Directive | Collision Risk | Istranca Mountains KBA Qualifying Species | Spatial Behaviour of Bats (*) | | |
|----|----------------------------------|-----------------------------|--------------|---|--------------------------|-------------------|---|-------------------------------|-------------------------|-----------------------|
| | Scientific Name | Common Name | Abbreviation | | | | | Long Distance (>100 km) | Regional (10-100 km) | Sedentary (<10 km) |
| 1 | <i>Rhinolophus blasii</i> | Blasius's Horseshoe Bat | Rbla | LC | Annex II, Annex IV | Low Risk | Yes | | | X |
| 2 | <i>Rhinolophus euryale</i> | Mediterranean Horseshoe Bat | Reur | NT | Annex II, Annex IV | Low Risk | Yes | | (X) | X |
| 3 | <i>Rhinolophus ferrumequinum</i> | Greater Horseshoe Bat | Rfer | LC | Annex II, Annex IV | Low Risk | Yes | | (X) | X |
| 4 | <i>Rhinolophus hipposideros</i> | Lesser Horseshoe Bat | Rhip | LC | Annex II, Annex IV | Low Risk | Yes | | (X) | X |
| 5 | <i>Rhinolophus mehelyi</i> | Mehely's Horseshoe Bat | Rmeh | VU | Annex II, Annex IV | Low Risk | Yes | | (X) | X |
| 6 | <i>Eptesicus serotinus</i> | Serotine Bat | Eser | LC | Annex IV | Medium Risk | No | | (X) | X |
| 7 | <i>Barbastella barbastellus</i> | Western Barbastelle Bat | Bbar | NT | Annex II, Annex IV | Medium Risk | Yes | | (X) | X |
| 8 | <i>Hypsugo savii</i> | Savi's Pipistrelle Bat | Hsav | LC | Annex IV | High Risk | No | (X) | X | |
| 9 | <i>Vespertilio murinus</i> | Particoloured Bat | Vmur | LC | Annex IV | High Risk | No | X | (X) | (X) |
| 10 | <i>Myotis alcathoe</i> | Alcathoe Whiskered Bat | Myo sp. | DD | Annex IV | Low Risk | No | | | X |
| 11 | <i>Myotis brandtii</i> | Brandt's Bat | Myo sp. | LC | Annex IV | Low Risk | No | | X | |
| 12 | <i>Myotis capaccinii</i> | Long-fingered Bat | Myo sp. | VU | Annex II, Annex IV | Low Risk | Yes | | X | |
| 13 | <i>Myotis daubentonii</i> | Daubenton's Bat | Myo sp. | LC | Annex IV | Low Risk | No | | X | |
| 14 | <i>Myotis emarginatus</i> | Geoffroy's Bat | Myo sp. | LC | Annex II, Annex IV | Low Risk | Yes | | (X) | X |
| 15 | <i>Myotis myotis</i> | Greater Mouse-eared Bat | Myola | LC | Annex II, Annex IV | Low Risk | Yes | | X | |

| No | Species | | | IUCN Red List of Threatened Species | EU Habitats Directive | Collision Risk | Istranca Mountains KBA Qualifying Species | Spatial Behaviour of Bats (*) | | |
|----|----------------------------------|-----------------------------|--------------|---|--------------------------|-------------------|---|-------------------------------|-------------------------|-----------------------|
| | Scientific Name | Common Name | Abbreviation | | | | | Long Distance (>100 km) | Regional (10-100 km) | Sedentary (<10 km) |
| 16 | <i>Myotis mystacinus</i> | Whiskered Bat | Myo sp. | LC | Annex IV | Low Risk | No | | X | |
| 17 | <i>Myotis nattereri</i> | Natterer's Bat | Myo sp. | LC | Annex IV | Low Risk | No | | (X) | X |
| 18 | <i>Myotis oxygnathus</i> | Lesser Mouse-eared Bat | Myola | LC | Annex IV | Low Risk | No | | | |
| 19 | <i>Nyctalus lasiopterus</i> | Greater Noctule Bat | Nlas | NT | Annex IV | High Risk | No | X? | X | X |
| 20 | <i>Nyctalus leisleri</i> | Leisler's Bat | Nlei | LC | Annex IV | High Risk | No | X | | |
| 21 | <i>Nyctalus noctula</i> | Noctule Bat | Nnoc | LC | Annex IV | High Risk | No | X | | |
| 22 | <i>Pipistrellus nathusii</i> | Nathusius' Pipistrelle | Pnat | LC | Annex IV | High Risk | No | X | | |
| 23 | <i>Pipistrellus kuhlii</i> | Kuhl's Pipistrelle Bat | Pkuh | LC | Annex IV | High Risk | No | | (X) | X |
| 24 | <i>Pipistrellus pipistrellus</i> | Common Pipistrelle | Ppip | LC | Annex IV | High Risk | No | X? | X | |
| 25 | <i>Pipistrellus pygmaeus</i> | Soprano Pipistrelle | Ppyg | LC | Annex IV | High Risk | No | X | X | |
| 26 | <i>Plecotus auritus</i> | Brown Long-eared Bat | Paur | LC | Annex IV | Low Risk | No | | | X |
| 27 | <i>Plecotus austriacus</i> | Grey Long-eared Bat | Paus | LC | Annex IV | Low Risk | No | | | X |
| 28 | <i>Miniopterus schreibersii</i> | Schreiber's Bent-winged Bat | Msch | NT | Annex II, Annex IV | High Risk | Yes | (X) | X | |
| 29 | <i>Tadarida teniotis</i> | European Free-tailed Bat | Tten | LC | Annex IV | High Risk | No | | | X |

(*) (X) means possible but not typical. Source: Action Plan for the Conservation of Bat Species in the European Union 2018-2024, October 2018 (https://ec.europa.eu/environment/nature/conservation/species/action_plans/pdf/EU%20Bats%20Action%20Plan.pdf)

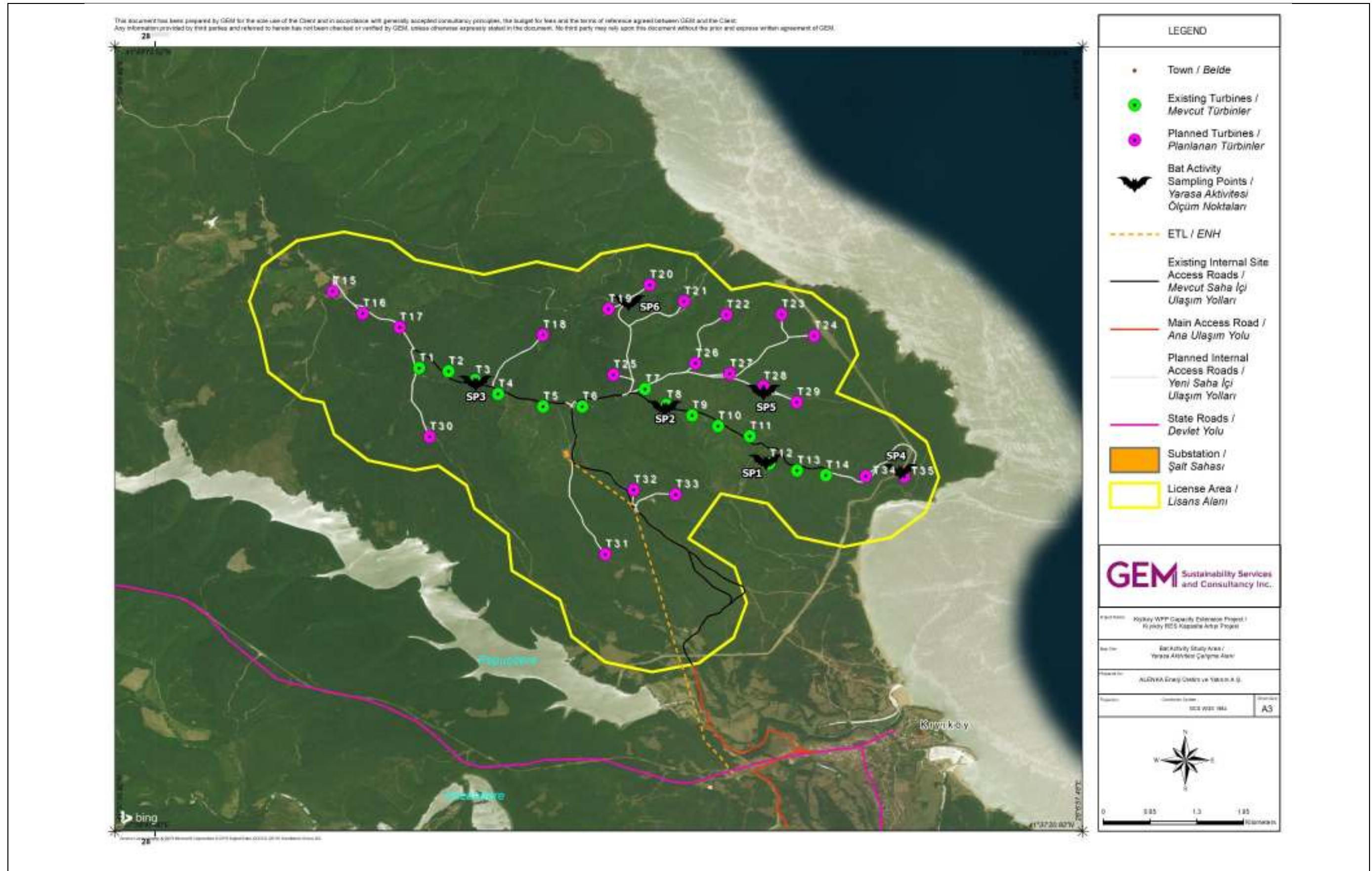


Figure 10-26. Bat Activity Study Area



SP1



SP2



SP3



SP4



SP5



SP6

Figure 10-27. Static Acoustic Survey Sampling Points (SP)

Table 10-36. Spring 2019 and Summer 2019 Survey Findings of Bat Species Expected at the Project Area

| No | Scientific Name | Species Common Name | Abbreviation | IUCN Red List of Threatened Species | EU Habitats Directive | Collision Risk | Istranca Mountains KBA Qualifying Species | Spring 2019 Survey Findings | Summer 2019 Survey Findings |
|----|----------------------------------|-----------------------------|--------------|---|--------------------------|----------------|--|-----------------------------------|-----------------------------------|
| 1 | <i>Rhinolophus blasii</i> | Blasius's Horseshoe Bat | Rbla | LC | Annex II, Annex IV | Low Risk | Yes | Yes | Yes |
| 2 | <i>Rhinolophus Euryale</i> | Mediterranean Horseshoe Bat | Reur | NT | Annex II, Annex IV | Low Risk | Yes | Yes | Yes |
| 3 | <i>Rhinolophus ferrumequinum</i> | Greater Horseshoe Bat | Rfer | LC | Annex II, Annex IV | Low Risk | Yes | - | Yes |
| 4 | <i>Rhinolophus hipposideros</i> | Lesser Horseshoe Bat | Rhip | LC | Annex II, Annex IV | Low Risk | Yes | - | Possible |
| 5 | <i>Rhinolophus mehelyi</i> | Mehely's Horseshoe Bat | Rmeh | VU | Annex II, Annex IV | Low Risk | Yes | - | Possible |
| 6 | <i>Eptesicus serotinus</i> | Serotine Bat | Eser | LC | Annex IV | Medium Risk | No | Yes | Yes |
| 7 | <i>Barbastella barbastellus</i> | Western Barbastelle Bat | Bbar | NT | Annex II, Annex IV | Medium Risk | Yes | - | Yes |
| 8 | <i>Hypsugo savii</i> | Savi's Pipistrelle Bat | Hsav | LC | Annex IV | High Risk | No | Yes | Yes |
| 9 | <i>Vespertilio murinus</i> | Particoloured Bat | Vmur | LC | Annex IV | High Risk | No | Yes | Yes |
| 10 | <i>Myotis alcathoe</i> | Alcathoe Whiskered Bat | Myo sp. | DD | Annex IV | Low Risk | No | Possible | Possible |
| 11 | <i>Myotis brandtii</i> | Brandt's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | Possible |
| 12 | <i>Myotis capaccinii</i> | Long-fingered Bat | Myo sp. | VU | Annex II, Annex IV | Low Risk | Yes | Possible | Possible |
| 13 | <i>Myotis daubentonii</i> | Daubenton's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | Possible |
| 14 | <i>Myotis emarginatus</i> | Geoffroy's Bat | Myo sp. | LC | Annex II, Annex IV | Low Risk | Yes | Possible | Possible |
| 15 | <i>Myotis myotis</i> | Greater Mouse-eared Bat | Myola | LC | Annex II, Annex IV | Low Risk | Yes | Possible | Possible |
| 16 | <i>Myotis mystacinus</i> | Whiskered Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | Possible |

| No | Scientific Name | Species Common Name | Abbreviation | IUCN Red List of Threatened Species | EU Habitats Directive | Collision Risk | Istranca Mountains KBA Qualifying Species | Spring 2019 Survey Findings | Summer 2019 Survey Findings |
|----|----------------------------------|-----------------------------|--------------|---|--------------------------|----------------|--|-----------------------------------|-----------------------------------|
| 17 | <i>Myotis nattereri</i> | Natterer's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | Possible |
| 18 | <i>Myotis oxygnathus</i> | Lesser Mouse-eared Bat | Myola | LC | Annex IV | Low Risk | No | Possible | Possible |
| 19 | <i>Nyctalus lasiopterus</i> | Greater Noctule Bat | Nlas | NT | Annex IV | High Risk | No | - | - |
| 20 | <i>Nyctalus leisleri</i> | Leisler's Bat | Nlei | LC | Annex IV | High Risk | No | Yes | Yes |
| 21 | <i>Nyctalus noctula</i> | Noctule Bat | Nnoc | LC | Annex IV | High Risk | No | Yes | Yes |
| 22 | <i>Pipistrellus nathusii</i> | Nathusius' Pipistrelle | Pnat | LC | Annex IV | High Risk | No | Yes | Yes |
| 23 | <i>Pipistrellus kuhlii</i> | Kuhl's Pipistrelle Bat | Pkuh | LC | Annex IV | High Risk | No | Possible | Possible |
| 24 | <i>Pipistrellus pipistrellus</i> | Common Pipistrelle | Ppip | LC | Annex IV | High Risk | No | Yes | Yes |
| 25 | <i>Pipistrellus pygmaeus</i> | Soprano Pipistrelle | Ppyg | LC | Annex IV | High Risk | No | Yes | Yes |
| 26 | <i>Plecotus auritus</i> | Brown Long-eared Bat | Paur | LC | Annex IV | Low Risk | No | - | Yes |
| 27 | <i>Plecotus austriacus</i> | Grey Long-eared Bat | Paus | LC | Annex IV | Low Risk | No | - | - |
| 28 | <i>Miniopterus schreibersii</i> | Schreiber's Bent-winged Bat | Msch | NT | Annex II, Annex IV | High Risk | Yes | - | Yes |
| 29 | <i>Tadarida teniotis</i> | European Free-tailed Bat | Tten | LC | Annex IV | High Risk | No | Yes | Yes |

10.2.7.1. Static Acoustic Survey Results

Spring 2019 Survey

A total of 2,306 bat passes were identified, representing a minimum of 14 bat species as given in Table 10-37. *Pipistrellus pipistrellus* was the most frequently recorded species representing more than 60% of the passes. Amongst the identified species, eight of them have high collision risk, one medium collision risk and the rest have low collision risk.

The highest bat activity was recorded at SP5. Overall the species composition was similar amongst the SPs as can be seen from Figure 10-28. The activity levels range between 61 and 745 bat passes per night.

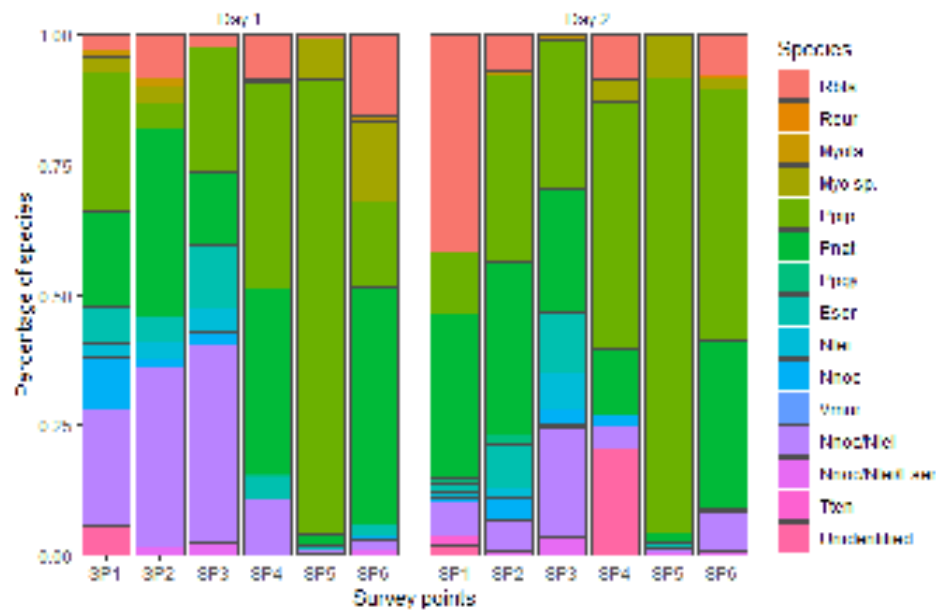


Figure 10-28. Species Composition at the SPs in Spring 2019

Table 10-37. Spring 2019 Static Acoustic Survey Results

| No | Scientific Name | Common Name | Abbreviation | IUCN Red List of Threatened Species | EU Habitats Dir. | Collision Risk | Istranca Mountains KBA Qualifying Species | Spring 2019 Survey Findings | 1 st Survey Night | | | | | | | 2 nd Survey Night | | | | | | | Grand Total |
|----|----------------------------------|-----------------------------|----------------|-------------------------------------|--------------------|----------------|---|-----------------------------|------------------------------|-----------|-----------|------------|------------|------------|--------------------------------------|------------------------------|------------|------------|-----------|------------|------------|--------------------------------------|--------------|
| | | | | | | | | | SP1 | SP2 | SP3 | SP4 | SP5 | SP6 | Total (1 st Survey Night) | SP1 | SP2 | SP3 | SP4 | SP5 | SP6 | Total (2 nd Survey Night) | |
| 1 | <i>Rhinolophus blasii</i> | Blasius's Horseshoe Bat | Rbla | LC | Annex II, Annex IV | Low Risk | Yes | Yes | 2 | 5 | 1 | 14 | 6 | 16 | 44 | 45 | 8 | - | 8 | 1 | 11 | 73 | 117 |
| 2 | <i>Rhinolophus Euryale</i> | Mediterranean Horseshoe Bat | Reur | NT | Annex II, Annex IV | Low Risk | Yes | Yes | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 |
| 6 | <i>Eptesicus serotinus</i> | Serotine Bat | Eser | LC | Annex IV | Medium Risk | No | Yes | 5 | 3 | 5 | 7 | 4 | 2 | 26 | 2 | 10 | 23 | - | 3 | 1 | 39 | 65 |
| 9 | <i>Vespertilio murinus</i> | Particoloured Bat | Vmur | LC | Annex IV | High Risk | No | Yes | - | - | - | - | - | - | - | - | - | 1 | - | - | - | 1 | 1 |
| 10 | <i>Myotis alcathoe</i> | Alcathoe Whiskered Bat | Myo sp. | DD | Annex IV | Low Risk | No | Possible | 2 | 2 | - | 1 | 57 | 16 | 78 | - | - | - | 4 | 36 | 3 | 43 | 121 |
| 11 | <i>Myotis brandtii</i> | Brandt's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | | | | | | | | | | | |
| 12 | <i>Myotis capaccinii</i> | Long-fingered Bat | Myo sp. | VU | Annex II, Annex IV | Low Risk | Yes | Possible | | | | | | | | | | | | | | | |
| 13 | <i>Myotis daubentonii</i> | Daubenton's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | | | | | | | | | | | |
| 14 | <i>Myotis emarginatus</i> | Geoffroy's Bat | Myo sp. | LC | Annex II, Annex IV | Low Risk | Yes | Possible | | | | | | | | | | | | | | | |
| 16 | <i>Myotis mystacinus</i> | Whiskered Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | | | | | | | | | | | |
| 17 | <i>Myotis nattereri</i> | Natterer's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | | | | | | | | | | | |
| 15 | <i>Myotis myotis</i> | Greater Mouse-eared Bat | Myola | LC | Annex II, Annex IV | Low Risk | Yes | Possible | 1 | 1 | - | - | - | 1 | 3 | - | 1 | 2 | - | - | - | 3 | 6 |
| 18 | <i>Myotis oxygnathus</i> | Lesser Mouse-eared Bat | Myola | LC | Annex IV | Low Risk | No | Possible | | | | | | | | | | | | | | | |
| 20 | <i>Nyctalus leisleri</i> | Leisler's Bat | Nlei | LC | Annex IV | High Risk | No | Yes | 2 | 2 | 2 | - | - | - | 6 | 1 | 2 | 14 | - | 1 | - | 18 | 24 |
| 21 | <i>Nyctalus noctula</i> | Noctule Bat | Nnoc | LC | Annex IV | High Risk | No | Yes | 7 | 1 | 1 | - | 1 | 1 | 11 | 1 | 5 | 6 | 2 | - | - | 14 | 25 |
| 22 | <i>Pipistrellus nathusii</i> | Nathusius' Pipistrelle | Pnat | LC | Annex IV | High Risk | No | Yes | 13 | 22 | 6 | 59 | 16 | 47 | 163 | 34 | 39 | 48 | 12 | 9 | 47 | 189 | 352 |
| 24 | <i>Pipistrellus pipistrellus</i> | Common Pipistrelle | Ppip | LC | Annex IV | High Risk | No | Yes | 19 | 3 | 10 | 66 | 652 | 17 | 767 | 13 | 42 | 58 | 44 | 395 | 70 | 622 | 1389 |
| 25 | <i>Pipistrellus pygmaeus</i> | Soprano Pipistrelle | Ppyg | LC | Annex IV | High Risk | No | Yes | - | - | - | 1 | 2 | - | 3 | 1 | 2 | 1 | - | 1 | - | 5 | 8 |
| 29 | <i>Tadarida teniotis</i> | European Free-tailed Bat | Tten | LC | Annex IV | High Risk | No | Yes | - | - | - | - | - | - | - | 2 | - | - | - | - | - | 2 | 2 |
| | | | Nloc/Nlei | | | | | | 16 | 21 | 16 | 18 | 5 | 2 | 78 | 7 | 7 | 43 | 4 | 4 | 11 | 76 | 154 |
| | | | Nloc/Nlei/Eser | | | | | | - | 1 | 1 | - | 2 | 1 | 5 | - | 1 | 7 | - | 2 | 1 | 11 | 16 |
| | | | Unidentified | | | | | | 4 | - | - | - | - | - | 4 | 2 | - | - | 19 | - | - | 21 | 25 |
| | | | TOTAL | | | | | | 71 | 61 | 42 | 166 | 745 | 103 | 1,188 | 108 | 117 | 203 | 93 | 452 | 145 | 1,118 | 2,306 |

Summer 2019 Survey

A total of 1,097 bat passes were identified, representing a minimum of 13 bat species as given in Table 10-38. Three new species – *Rhinolophus ferrumequinum*, *Barbastella barbastellus* and *Miniopterus schreibersii* – are added to the observed species list. *Pipistrellus pipistrellus* was again the most frequently recorded species representing more than 60% of the passes. *Rhinolophus ferrumequinum* and *Pipistrellus nathusii* are the other commonly observed species. Amongst the identified species, six of them have high collision risk, two medium collision risk and the rest have low collision risk.

The highest bat activity was recorded at SP4. Overall the species composition was similar amongst the SPs as can be seen from Figure 10-29. The activity levels range between 1 and 224 bat passes per night.

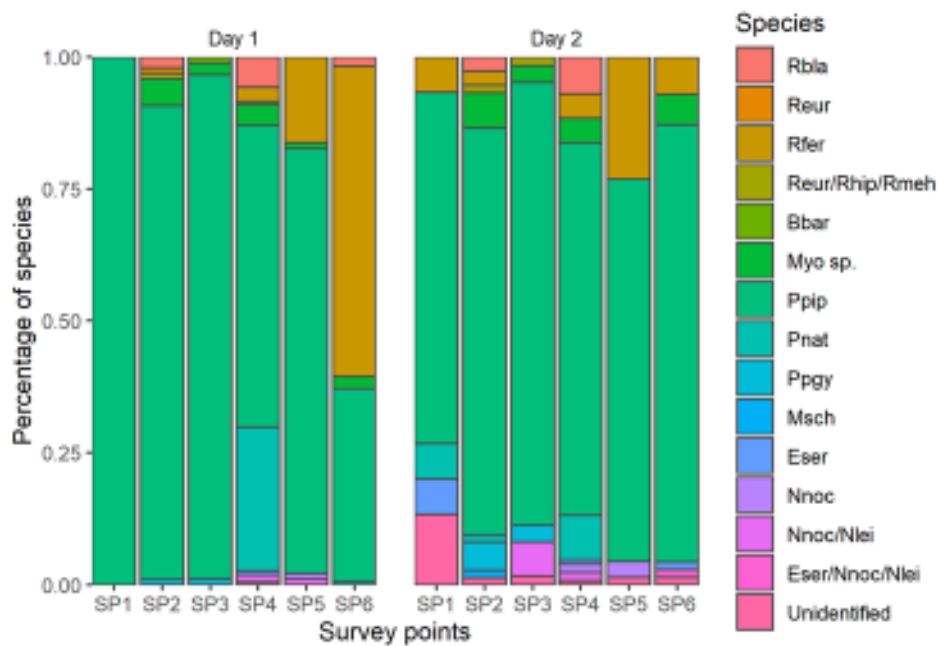


Figure 10-29. Species Composition at the SPs in Summer 2019

Spring 2019 and Summer 2019 bat recording results are provided in Figure 10-30.

Table 10-38. Summer 2019 Static Acoustic Survey Results

| No | Scientific Name | Common Name | Abbreviation | IUCN Red List of Threatened Species | EU Habitats Dir. | Collision Risk | Istranca Mountains KBA Qualifying Species | Summer 2019 Survey Findings | 1 st Survey Night | | | | | | | 2 nd Survey Night | | | | | | | Grand Total |
|----|----------------------------------|-----------------------------|----------------|-------------------------------------|--------------------|----------------|---|-----------------------------|------------------------------|-----|-----|-----|-----|-----|--------------------------------------|------------------------------|-----|-----|-----|-----|-----|--------------------------------------|-------------|
| | | | | | | | | | SP1 | SP2 | SP3 | SP4 | SP5 | SP6 | Total (1 st Survey Night) | SP1 | SP2 | SP3 | SP4 | SP5 | SP6 | Total (2 nd Survey Night) | |
| 1 | <i>Rhinolophus blasii</i> | Blasius's Horseshoe Bat | Rbla | LC | Annex II, Annex IV | Low Risk | Yes | Yes | - | 2 | - | 13 | - | 3 | 18 | - | 2 | - | 9 | - | - | 11 | 29 |
| 2 | <i>Rhinolophus euryale</i> | Mediterranean Horseshoe Bat | Reur | NT | Annex II, Annex IV | Low Risk | Yes | Yes | - | 1 | - | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 3 | <i>Rhinolophus ferrumequinum</i> | Greater Horseshoe Bat | Rfer | LC | Annex II, Annex IV | Low Risk | Yes | Yes | - | - | - | 6 | 15 | 103 | 124 | 1 | 2 | - | 6 | 16 | 5 | 30 | 154 |
| 6 | <i>Eptesicus serotinus</i> | Serotine Bat | Eser | LC | Annex IV | Medium Risk | No | Yes | - | - | - | 2 | - | - | 2 | 1 | - | - | 1 | - | 1 | 3 | 5 |
| 7 | <i>Barbastella barbastellus</i> | Western Barbastelle Bat | Bbar | NT | Annex II, Annex IV | Medium Risk | Yes | Yes | - | - | 1 | - | - | - | 1 | - | - | - | - | - | - | - | 1 |
| 10 | <i>Myotis alcathoe</i> | Alcathoe Whiskered Bat | Myo sp. | DD | Annex IV | Low Risk | No | Possible | - | 5 | 2 | 9 | 1 | 4 | 21 | - | 5 | 2 | 6 | | 4 | 17 | 38 |
| 11 | <i>Myotis brandtii</i> | Brandt's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | | | | | | | | | | | |
| 12 | <i>Myotis capaccinii</i> | Long-fingered Bat | Myo sp. | VU | Annex II, Annex IV | Low Risk | Yes | Possible | | | | | | | | | | | | | | | |
| 13 | <i>Myotis daubentonii</i> | Daubenton's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | | | | | | | | | | | |
| 14 | <i>Myotis emarginatus</i> | Geoffroy's Bat | Myo sp. | LC | Annex II, Annex IV | Low Risk | Yes | Possible | | | | | | | | | | | | | | | |
| 16 | <i>Myotis mystacinus</i> | Whiskered Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | | | | | | | | | | | |
| 17 | <i>Myotis nattereri</i> | Natterer's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | | | | | | | | | | | |
| 21 | <i>Nyctalus noctula</i> | Noctule Bat | Nnoc | LC | Annex IV | High Risk | No | Yes | - | - | - | - | 1 | - | 1 | - | - | - | 2 | 2 | - | 4 | 5 |
| 22 | <i>Pipistrellus nathusii</i> | Nathusius' Pipistrelle | Pnat | LC | Annex IV | High Risk | No | Yes | - | - | - | 61 | - | 1 | 62 | 1 | 1 | - | 11 | - | - | 13 | 75 |
| 24 | <i>Pipistrellus pipistrellus</i> | Common Pipistrelle | Ppip | LC | Annex IV | High Risk | No | Yes | 1 | 87 | 85 | 128 | 74 | 64 | 439 | 10 | 57 | 52 | 91 | 50 | 58 | 318 | 757 |
| 25 | <i>Pipistrellus pygmaeus</i> | Soprano Pipistrelle | Ppgy | LC | Annex IV | High Risk | No | Yes | - | 1 | 1 | - | - | - | 2 | - | 4 | 2 | - | - | - | 6 | 8 |
| 28 | <i>Miniopterus schreibersii</i> | Schreiber's Bent-winged Bat | Msch | NT | Annex II, Annex IV | High Risk | Yes | Yes | - | - | - | - | - | - | - | - | 1 | - | - | - | - | 1 | 1 |
| | | | Reur/Rhip/Rmeh | | | | | | - | 1 | - | 1 | - | - | 2 | - | 1 | 1 | - | - | - | 2 | 4 |
| | | | Nnoc/Nlei | | | | | | - | - | - | 3 | 1 | - | 4 | - | - | 4 | 2 | - | - | 6 | 10 |
| | | | Nnoc/Nlei/Eser | | | | | | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 | 1 |
| | | | Unidentified | | | | | | - | - | - | 1 | - | - | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 7 | 8 |

| No | Scientific Name | Common Name | Abbreviation | IUCN Red List of Threatened Species | EU Habitats Dir. | Collision Risk | Istranca Mountains KBA Qualifying Species | Summer 2019 Survey Findings | 1 st Survey Night | | | | | | | 2 nd Survey Night | | | | | | | Grand Total |
|----|-----------------|-------------|--------------|-------------------------------------|------------------|----------------|---|-----------------------------|------------------------------|-----|-----|-----|-----|-----|--------------------------------------|------------------------------|-----|-----|-----|-----|-----|--------------------------------------|-------------|
| | | | | | | | | | SP1 | SP2 | SP3 | SP4 | SP5 | SP6 | Total (1 st Survey Night) | SP1 | SP2 | SP3 | SP4 | SP5 | SP6 | Total (2 nd Survey Night) | |
| | | | TOTAL | | | | | | 1 | 97 | 89 | 224 | 92 | 175 | 678 | 15 | 74 | 62 | 129 | 69 | 70 | 419 | 1,097 |

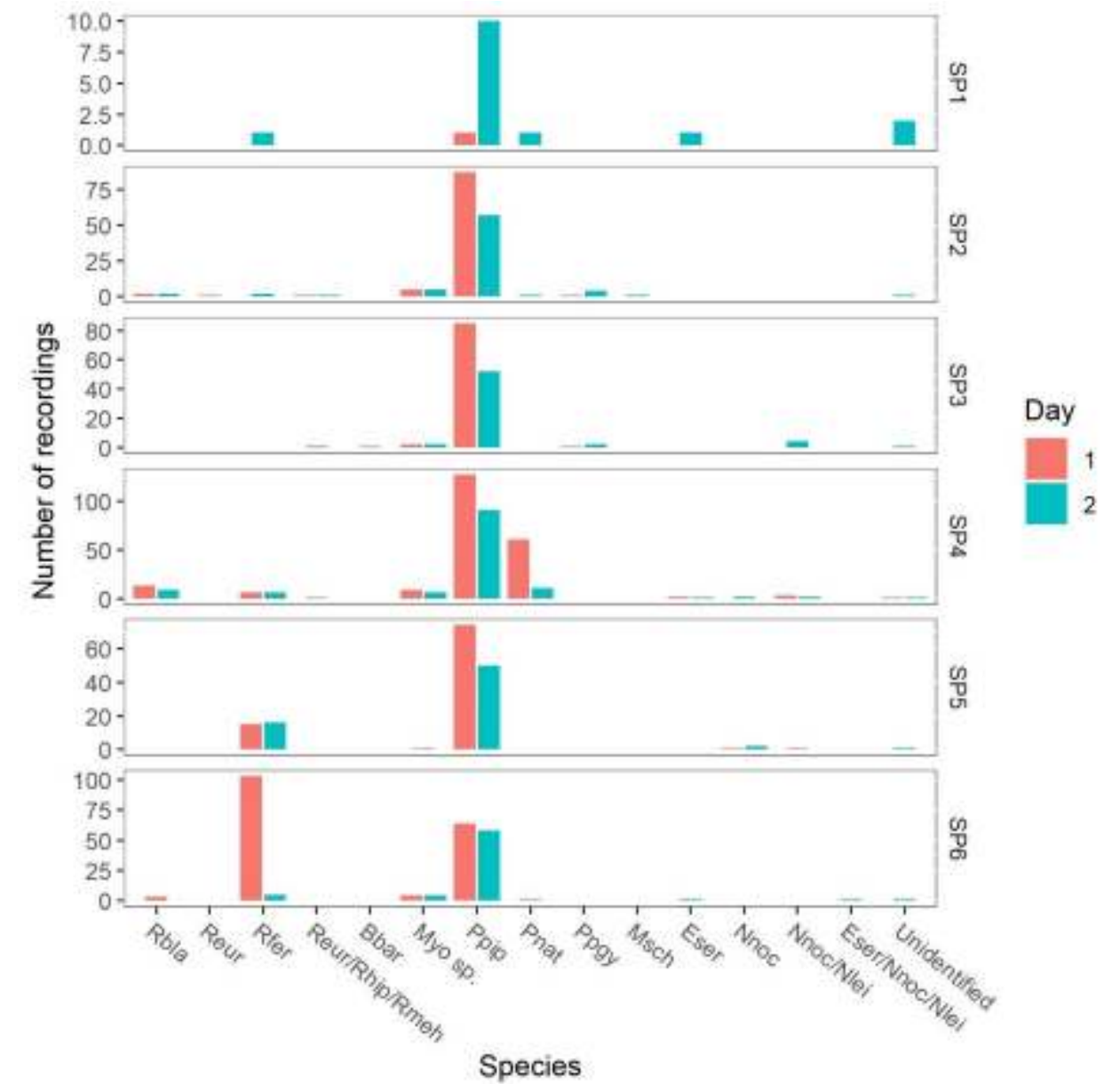
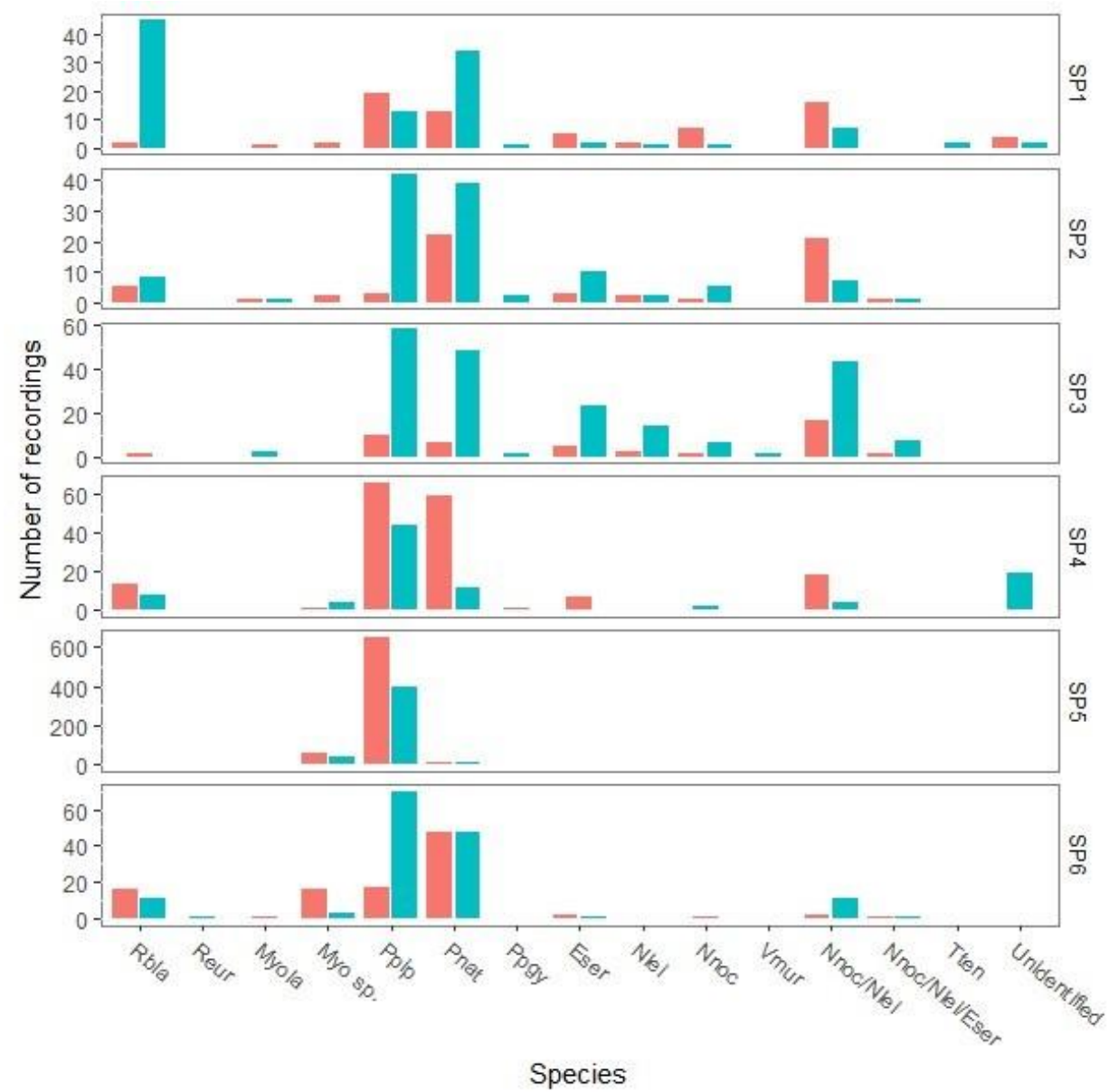


Figure 10-30. Bat Species Recorded at SPs in Spring 2019 and Summer 2019

The highest bat activity at the Project Area was observed in autumn survey. The total number of bat recordings at each SP is given in Table 10-39.

Table 10-39. Autumn 2019 Static Acoustic Survey Results

| SP | 1 st Survey Night | 2 nd Survey Night |
|-------|------------------------------|------------------------------|
| SP1 | 1,066 | 700 |
| SP2 | 1,100 | 2,000 |
| SP3 | 1,500 | 1,600 |
| SP4 | 1,500 | 1,200 |
| SP5 | 1,131 | 1,584 |
| SP6 | 1,404 | 1,200 |
| Total | 7,701 | 8,284 |

In Autumn 2019, Nathusius' Pipistrelle (*Pipistrellus nathusi*) was the most frequently recorded species representing more than 50% of the passes. An example is given for the 2nd nights of the survey at SP5 as below.

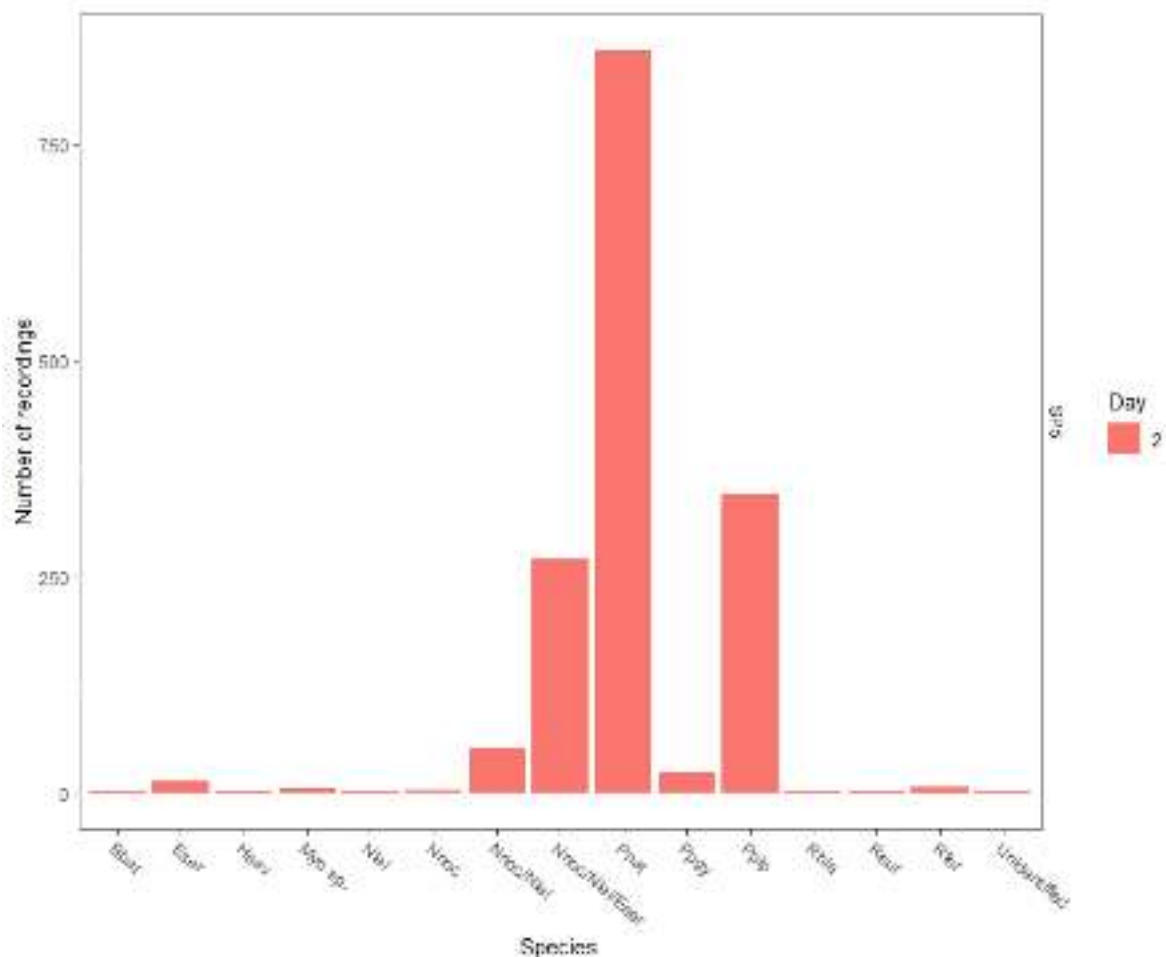


Figure 10-31. Species Composition on 2nd Night of the Survey at SP5 in Autumn 2019

The number of maximum seasonal bat recordings at each SP is given in Figure 10-32.

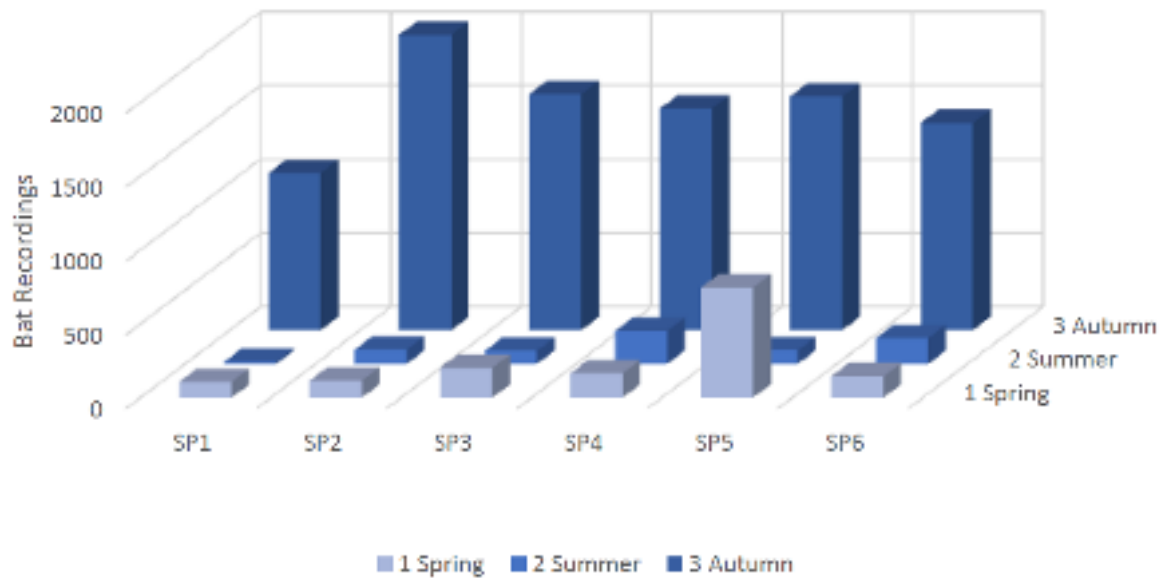


Figure 10-32. Maximum Seasonal Bat Recordings per SP

10.2.7.2. Transect Acoustic Survey Results

Spring 2019 Survey

A total of 643 bat passes were identified, representing a minimum of 14 bat species as given in Table 10-40.

Species composition was similar to the results of the static acoustic survey and no particular area with increased bat activity was identified. Figure 10-33 shows the results of the transect acoustic surveys where each identified bat is shown by a yellow dot on the map.

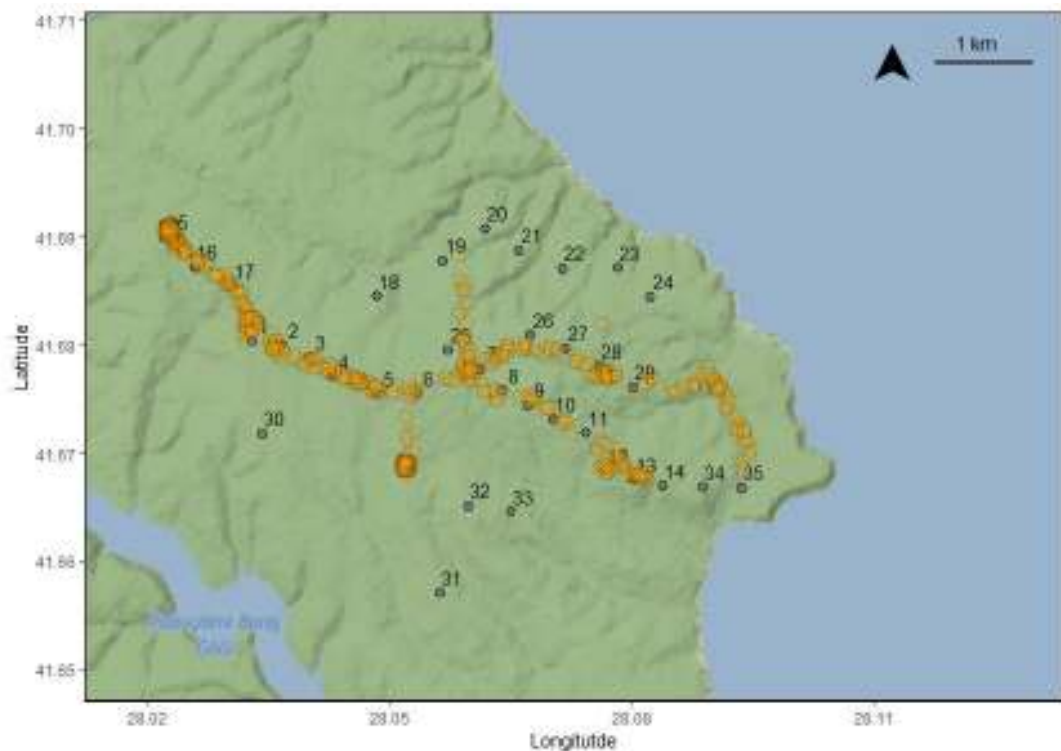


Figure 10-33. Transect Acoustic Surveys (Spring 2019)

Table 10-40. Spring 2019 Transect Acoustic Survey Results

| No | Species | | | IUCN Red List of Threatened Species | EU Habitats Directive | Collision Risk | Istranca Mountains KBA Qualifying Species | Spring 2019 Survey Findings | Survey Night | | | | TOTAL |
|----|----------------------------------|-----------------------------|----------------|-------------------------------------|-----------------------|----------------|---|-----------------------------|---------------------|---------------------|---------------------|---------------------|------------|
| | Scientific Name | Common Name | Abbreviation | | | | | | #1 (14 May 2019) | #2 (15 May 2019) | #3 (16 May 2019) | #4 (17 May 2019) | |
| 1 | <i>Rhinolophus blasii</i> | Blasius's Horseshoe Bat | Rbla | LC | Annex II, Annex IV | Low Risk | Yes | Yes | 1 | 4 | - | 2 | 7 |
| 2 | <i>Rhinolophus Euryale</i> | Mediterranean Horseshoe Bat | Reur | NT | Annex II, Annex IV | Low Risk | Yes | Yes | 1 | 1 | - | - | 2 |
| 3 | <i>Rhinolophus ferrumequinum</i> | Greater Horseshoe Bat | Rfer | LC | Annex II, Annex IV | Low Risk | Yes | Yes | - | 2 | - | - | 2 |
| 6 | <i>Eptesicus serotinus</i> | Serotine Bat | Eser | LC | Annex IV | Medium Risk | No | Yes | 8 | 27 | 1 | 1 | 37 |
| 8 | <i>Hypsugo savii</i> | Savi's Pipistrelle Bat | Hsav | LC | Annex IV | High Risk | No | Yes | - | 2 | - | - | 2 |
| 9 | <i>Vespertilio murinus</i> | Particoloured Bat | Vmur | LC | Annex IV | High Risk | No | Yes | 1 | - | - | - | 1 |
| 10 | <i>Myotis alcathoe</i> | Alcathoe Whiskered Bat | Myo sp. | DD | Annex IV | Low Risk | No | Possible | - | 1 | 2 | - | 3 |
| 11 | <i>Myotis brandtii</i> | Brandt's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | |
| 12 | <i>Myotis capaccinii</i> | Long-fingered Bat | Myo sp. | VU | Annex II, Annex IV | Low Risk | Yes | Possible | | | | | |
| 13 | <i>Myotis daubentonii</i> | Daubenton's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | |
| 14 | <i>Myotis emarginatus</i> | Geoffroy's Bat | Myo sp. | LC | Annex II, Annex IV | Low Risk | Yes | Possible | | | | | |
| 16 | <i>Myotis mystacinus</i> | Whiskered Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | |
| 17 | <i>Myotis nattereri</i> | Natterer's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | |
| 15 | <i>Myotis myotis</i> | Greater Mouse-eared Bat | Myola | LC | Annex II, Annex IV | Low Risk | Yes | Possible | 8 | 5 | 1 | - | 14 |
| 18 | <i>Myotis oxygnathus</i> | Lesser Mouse-eared Bat | Myola | LC | Annex IV | Low Risk | No | Possible | 1 | 8 | - | - | 9 |
| 20 | <i>Nyctalus leisleri</i> | Leisler's Bat | Nlei | LC | Annex IV | High Risk | No | Yes | | | | | |
| 21 | <i>Nyctalus noctula</i> | Noctule Bat | Nnoc | LC | Annex IV | High Risk | No | Yes | | | | | |
| 22 | <i>Pipistrellus nathusii</i> | Nathusius' Pipistrelle | Pnat | LC | Annex IV | High Risk | No | Yes | | | | | |
| 24 | <i>Pipistrellus pipistrellus</i> | Common Pipistrelle | Ppip | LC | Annex IV | High Risk | No | Yes | | | | | |
| 25 | <i>Pipistrellus pygmaeus</i> | Soprano Pipistrelle | Ppyg | LC | Annex IV | High Risk | No | Yes | | | | | |
| | | | Nloc/Nlei | | | | | | | | | | |
| | | | Nloc/Nlei/Eser | | | | | | 9 | 24 | 5 | 12 | 50 |
| | | | Unidentified | | | | | | 5 | 2 | - | 1 | 8 |
| | | | | | | | | | 3 | 5 | 1 | - | 9 |
| | | | TOTAL | | | | | | 93 | 422 | 81 | 47 | 643 |

Summer 2019 Survey

A total of 478 bat passes were identified, representing a minimum of 12 bat species as given in Table 10-41.

Species composition was similar to the results of the static acoustic survey and the coastal zone had slightly higher bat activity. Figure 10-34 shows the results of the transect acoustic surveys where each identified bat is shown by a yellow dot on the map.

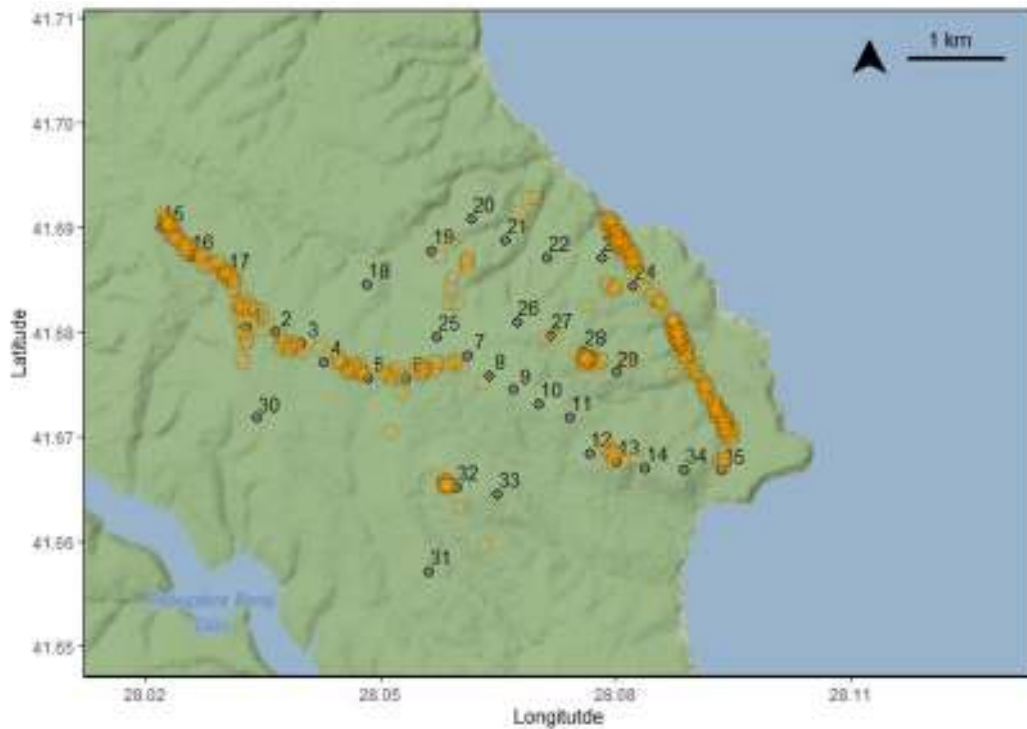


Figure 10-34. Transect Acoustic Surveys (Summer 2019)

Table 10-41. Summer 2019 Transect Acoustic Survey Results

| No | Species | | | IUCN Red List of Threatened Species | EU Habitats Directive | Collision Risk | Istranca Mountains KBA Qualifying Species | Summer 2019 Survey Findings | Survey Night | | | | TOTAL |
|----|----------------------------------|-----------------------------|----------------|---|--------------------------|----------------|--|-----------------------------------|---------------------|---------------------|---------------------|---------------------|-------|
| | Scientific Name | Common Name | Abbreviation | | | | | | #1 (2 July 2019) | #2 (3 July 2019) | #3 (4 July 2019) | #4 (5 July 2019) | |
| 1 | <i>Rhinolophus blasii</i> | Blasius's Horseshoe Bat | Rbla | LC | Annex II, Annex IV | Low Risk | Yes | Yes | 1 | 1 | - | - | 2 |
| 3 | <i>Rhinolophus ferrumequinum</i> | Greater Horseshoe Bat | Rfer | LC | Annex II, Annex IV | Low Risk | Yes | Yes | 1 | 9 | - | - | 10 |
| 6 | <i>Eptesicus serotinus</i> | Serotine Bat | Eser | LC | Annex IV | Medium Risk | No | Yes | 4 | 1 | 8 | 1 | 14 |
| 10 | <i>Myotis alcathoe</i> | Alcathoe Whiskered Bat | Myo sp. | DD | Annex IV | Low Risk | No | Possible | 1 | 1 | 2 | 4 | 8 |
| 11 | <i>Myotis brandtii</i> | Brandt's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | |
| 12 | <i>Myotis capaccinii</i> | Long-fingered Bat | Myo sp. | VU | Annex II, Annex IV | Low Risk | Yes | Possible | | | | | |
| 13 | <i>Myotis daubentonii</i> | Daubenton's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | |
| 14 | <i>Myotis emarginatus</i> | Geoffroy's Bat | Myo sp. | LC | Annex II, Annex IV | Low Risk | Yes | Possible | | | | | |
| 16 | <i>Myotis mystacinus</i> | Whiskered Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | |
| 17 | <i>Myotis nattereri</i> | Natterer's Bat | Myo sp. | LC | Annex IV | Low Risk | No | Possible | | | | | |
| 21 | <i>Nyctalus noctula</i> | Noctule Bat | Nnoc | LC | Annex IV | High Risk | No | Yes | 1 | - | - | - | 1 |
| 22 | <i>Pipistrellus nathusii</i> | Nathusius' Pipistrelle | Pnat | LC | Annex IV | High Risk | No | Yes | 1 | 5 | 1 | 1 | 8 |
| 24 | <i>Pipistrellus pipistrellus</i> | Common Pipistrelle | Ppip | LC | Annex IV | High Risk | No | Yes | 66 | 168 | 85 | 75 | 394 |
| 25 | <i>Pipistrellus pygmaeus</i> | Soprano Pipistrelle | Ppgy | LC | Annex IV | High Risk | No | Yes | - | - | 7 | 9 | 16 |
| 26 | <i>Plecotus auritus</i> | Brown Long-eared Bat | Paur | LC | Annex IV | Low Risk | No | Yes | - | - | 1 | - | 1 |
| 28 | <i>Miniopterus schreibersii</i> | Schreiber's Bent-winged Bat | Msch | NT | Annex II, Annex IV | High Risk | Yes | Yes | 1 | 2 | - | - | 3 |
| | | | Nloc/Nlei | | | | | | 3 | 2 | - | 3 | 8 |
| | | | Nloc/Nlei/Eser | | | | | | 5 | - | - | - | 5 |
| | | | Unidentified | | | | | | - | 3 | 2 | 3 | 8 |
| | | | TOTAL | | | | | | 84 | 192 | 106 | 96 | 478 |

10.2.8. Spring 2019 and Autumn 2019 Bird and Bat Mortality Monitoring Survey Results

Mortality is the greatest impact that wind turbines have on bird and bats populations. Bird and bat mortality study was carried out for the existing Kiyikoy WPP by Kerem Ali Boyla, Dr. Emrah Çoraman (bat identification), Dr. Murat Biricik (experimental design and application of GenEst R Package) and the field survey team during March-May 2019 (spring) and August-November 2019 (autumn) periods. The carcass report is separately submitted by the research team to the Project Company. This section is compiled by GEM to summarize the findings of the Spring 2019 carcass survey at the Project Area.

Only the road and open spaces (pad) below the existing turbines were surveyed. The turbine pads were quadrangular surfaces of approximately 40 m × 60 m. The surveyor walked straight transect with 5 m distance to each other at slow pace. The survey at each turbine ranged between 20 to 75 minutes per day and on average was 26 ± 9 minutes. The surrounding forested area was not surveyed, as it was almost inaccessible due to the dense vegetation.

Each turbine area is searched once a week. The surveys took place in the early hours of the morning, following the first hours of the sunlight. The Spring 2019 survey started on 12 March 2019 and continued until 30 May 2019. A total of 12 weeks of survey took place for spring and early summer. The surveys discontinued for 10 weeks. The Autumn 2019 survey started on 12 August 2019 and took place for 12 weeks until the first week of November 2019.

For the operational wind farms, the number of carcasses found does not equate to the real number of birds and bats that are killed as the count process is biased due to several factors such as removal of casualties by scavengers or predators; searcher efficiency and effort invested in the survey. In addition to this, some species fly away and die later due to internal injuries and this situation is not quantifiable.

Two guidelines extensively used in Europe for carcass studies were utilized in order to design a methodological framework while assessing potential impacts of wind turbines on birds and bats, namely, EUROBATS (Publication Series No. 6) Guidelines for Consideration of Bats in Wind Farm Projects Revision 2014 (Rodrigues *et al.*, 2015) and Guideline for Assessing the Impact of Wind Farms on Birds and Bats (Atienza *et al.*, 2014).

The mortality monitoring consists of three steps: carcass searches, trials to obtain correcting factors for the biased estimates, and estimation of true mortality rates (Rodrigues *et al.*, 2015) as summarized in Figure 10-35. There are computerized tools to estimate the real number of carcasses. The determined variables and the results of the carcass search are analyzed to produce the number of casualties.

GenEst (a generalized estimator of mortality) is a suite of statistical models and software tools for generalized mortality estimation. It was specifically designed for estimating the number of bird and bat fatalities at solar and wind power facilities. GenEst is used to estimate the real number of carcasses from the observed number.

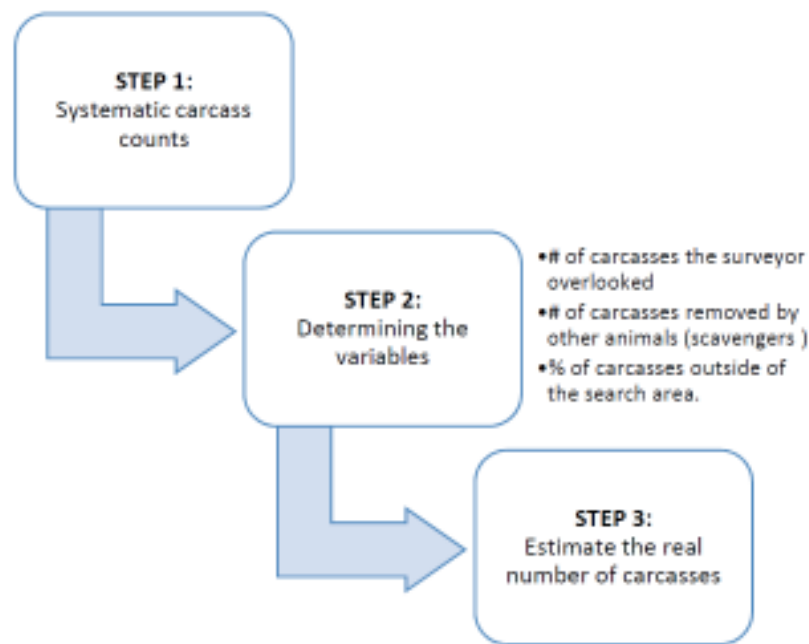


Figure 10-35. Methodological Steps of Carcass Surveys

GenEst requires the following variables to estimate the real number of carcasses:

- Searcher Efficiency (SE): The probability that a searcher will observe a carcass that is present in the searched area at the time of the search.
- Carcass Persistence (CP): The probability that a carcass arriving at time 0 will continue to persist until a time t days later.
- Search Schedule (SS): The carcass search dates, and the period on which searches are conducted.
- Density-Weighted Proportion (DWP): The expected proportion of total carcasses that arrive in the searched area within each unit.
- Carcass Observations (CO): The results obtained from carcass surveys.

To this end, carcasses of domestic house mouse (*Mus musculus*) dyed with brown food colouring were used to imitate bat carcasses to assess the searcher efficiency and the carcass persistence.

Four series of Searcher Efficiency (SE) trials were conducted as summarized in During each trial, a set of 60 experimental carcasses were randomly distributed by one surveyor (“conductor”) among 14 turbines, assuring 20 carcasses for each surveyor (“searcher”). The coordinates of each carcass were noted, along with unique field marks of the position of carcass for the recovery by the conductor. During the following four days, each surveyor dedicated its work to a fixed group of turbines. For example, surveyor #1 only searched turbines T1-T5, and surveyor #2 other turbines T6-T10, etc. After the visit of the “searcher”, the “conductor” checked each of the carcass to verify its actual presence and therefore to determine finding success of each searcher.

Of the 120 carcasses randomly deployed to the entire search area encompasses road and pad sections beneath the turbines, 115 mouse carcasses were available for the surveyors.

As a result, SE came out to be 82%, which means that surveyors were able to find 82 carcasses out of 100 carcasses on average.

Table 10-42.

During each trial, a set of 60 experimental carcasses were randomly distributed by one surveyor (“conductor”) among 14 turbines, assuring 20 carcasses for each surveyor (“searcher”). The coordinates of each carcass

were noted, along with unique field marks of the position of carcass for the recovery by the conductor. During the following four days, each surveyor dedicated its work to a fixed group of turbines. For example, surveyor #1 only searched turbines T1-T5, and surveyor #2 other turbines T6-T10, etc. After the visit of the “searcher”, the “conductor” checked each of the carcass to verify its actual presence and therefore to determine finding success of each searcher.

Of the 120 carcasses randomly deployed to the entire search area encompasses road and pad sections beneath the turbines, 115 mouse carcasses were available for the surveyors.

As a result, SE came out to be 82%, which means that surveyors were able to find 82 carcasses out of 100 carcasses on average.

Table 10-42. Searcher Efficiency Trials

| Surveyor | Number of Carcasses Available | Number of Carcasses Found by the Surveyor | Searcher Efficiency (%) |
|---|-------------------------------|---|-------------------------|
| Experimental Study #1 (18-22 April 2019) | | | |
| S1 | 17 | 17 | 100 |
| S2 | 19 | 14 | 74 |
| S3 | 20 | 19 | 95 |
| Total/Average | 56 | 50 | 89 |
| Experimental Study #2 (14-18 May 2019) | | | |
| S1 | 19 | 14 | 74 |
| S2 | 20 | 16 | 80 |
| S3 | 20 | 17 | 85 |
| Total/Average | 59 | 47 | 80 |
| Experimental Study #3 (28-31 August 2019) | | | |
| S1 | 20 | 14 | 70 |
| S2 | 20 | 14 | 70 |
| S3 | 20 | 15 | 75 |
| Total/Average | 60 | 43 | 72 |
| Experimental Study #4 (26-30 September 2019) | | | |
| S1 | 20 | 18 | 90 |
| S2 | 20 | 16 | 80 |
| S3 | 20 | 18 | 90 |
| Total/Average | 60 | 43 | 87 |
| Overall Total/Average | 235 | 192 | 82 |

Four Carcass Persistency (CP) trials (April, May, August and September) were conducted at the 14 turbines; the same 60 experimental carcasses were monitored for 8 consecutive days (daily from day 1 to day 7, then at day 14, 21, and 28). When all experimental carcasses had been removed by the scavengers, the study ceased.

The rates at which experimental carcasses were removed by scavengers are given in Figure 10-36. Data revealed that the average persistence of experimental carcasses was 5.26 ± 6.10 days in April 2019, 3.36 ± 2.81 days in May 2019, 0.97 ± 0.77 days in August 2019 and 1.54 ± 1.68 days in September 2019.

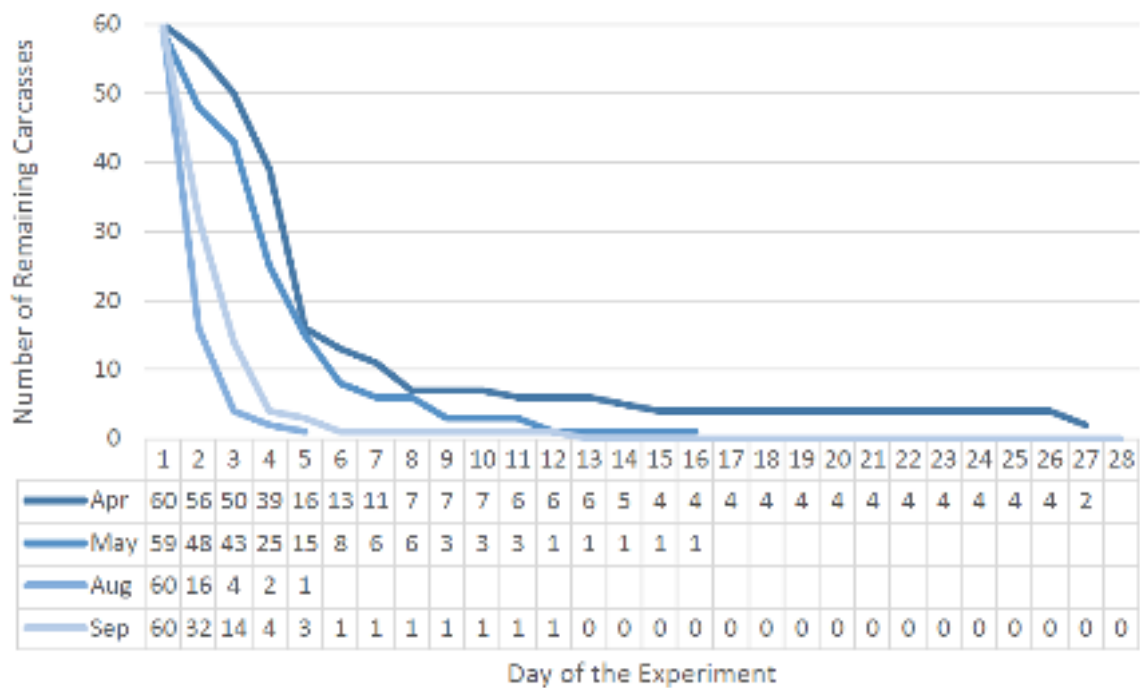


Figure 10-36. Carcass Persistency Trial

Bat Fatality Results

All 14 active turbines and the area under the ETL were surveyed.

Turbine Area

As a result of Spring 2019 survey, a total of 63 bat carcasses were encountered at the turbine area.

The weekly distribution of fatalities per turbine is given in Table 10-43. The highest number of fatalities were observed at T5 and T6 whilst no fatalities were encountered at T2. The highest number of fatalities was observed at week #8 (30 April-1 May).

Table 10-43. Weekly Distribution of Bat Fatalities per Turbine (Spring 2019)

| Week | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 | T11 | T12 | T13 | T14 | Total |
|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| 2 | - | - | - | - | - | 1 | 1 | - | - | 1 | 2 | 2 | - | 1 | 6 |
| 3 | - | - | - | - | 1 | - | 2 | - | - | - | - | - | 1 | - | 4 |
| 4 | - | - | - | - | 1 | 1 | - | - | - | 1 | - | 1 | - | - | 3 |
| 5 | - | - | - | 2 | 1 | 1 | 2 | 1 | - | - | - | 3 | 1 | 1 | 12 |
| 6 | - | - | - | 1 | - | - | - | - | - | - | - | 1 | 1 | 1 | 4 |
| 7 | - | - | - | - | 1 | - | - | - | 3 | - | 1 | - | - | - | 5 |
| 8 | 1 | - | - | 1 | 3 | 3 | 2 | - | 2 | - | - | 1 | 2 | 2 | 17 |
| 9 | - | - | - | 1 | - | 2 | - | - | - | - | - | - | - | 1 | 4 |
| 10 | 1 | - | 1 | - | 2 | 2 | - | - | - | - | - | - | 1 | - | 7 |
| 11 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| 12 | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 |
| Total | 2 | 0 | 1 | 5 | 9 | 9 | 7 | 1 | 5 | 2 | 2 | 7 | 6 | 7 | 63 |

As a result of Autumn 2019 survey, a total of 34 bat carcasses were encountered at the turbine area. The weekly distribution of fatalities per turbine is given in Table 10-44. In addition to the numbers reported below, during experimental surveys, an additional of 24 bats were found and not included to the weekly analysis below. The highest number of fatalities were observed at T11 whilst no fatalities were encountered at T2, T6, T8 and T14. The highest number of fatalities was observed at week #10 (15-16 October 2019).

Table 10-44. Weekly Distribution of Fatalities per Turbine (Autumn 2019)

| Week | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 | T11 | T12 | T13 | T14 | Total |
|--------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| 3 | - | - | - | - | - | - | - | - | - | - | 1 | - | - | - | 1 |
| 4 | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - | 2 |
| 5 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 0 |
| 6 | 1 | - | - | - | - | - | 1 | - | - | - | - | - | - | - | 2 |
| 7 | - | - | - | 2 | - | - | - | - | - | - | 2 | - | - | - | 4 |
| 8 | - | - | 1 | - | - | - | 1 | - | - | - | - | - | - | - | 2 |
| 9 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 |
| 10 | - | - | 2 | - | 3 | - | - | - | - | 1 | 1 | 3 | 1 | - | 11 |
| 11 | - | - | - | - | - | - | - | - | 1 | - | 2 | 2 | 1 | - | 6 |
| 12 | - | - | 2 | - | 1 | - | 1 | - | - | - | - | - | - | - | 4 |
| Total | 3 | 0 | 5 | 2 | 4 | 0 | 3 | 0 | 1 | 1 | 8 | 5 | 2 | 0 | 34 |

For the 14 operational turbines, a total of 12 weekly carcass searches were conducted during (i) Spring 2019 between 13 March and 12 June 2019 and (ii) Autumn 2019 between 13 August and 31 October. Search time in a day at each turbine ranged between 20 min and 75 min and in average was 26 ± 9 min.

Highest number of bat carcasses were found beginning of April, end of April and mid-October whilst no bat carcasses were encountered in mid-September. Most bat fatalities were detected at the turbines T5-T7 and T11-T13 (n=62) corresponding to 64% of all bat carcasses as summarized in Figure 10-37.

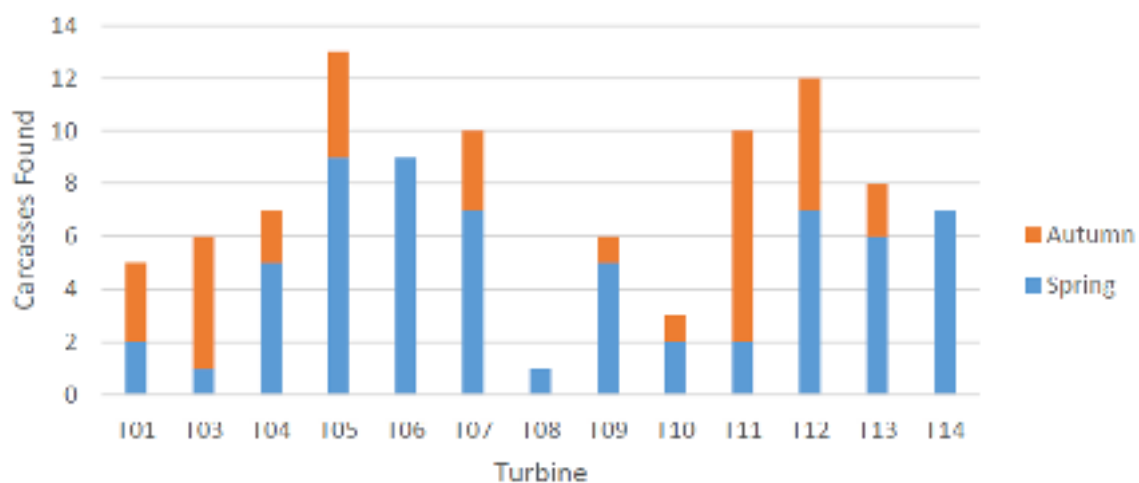


Figure 10-37. Bat Fatalities at Operational Turbines during Seasonal Carcass Study

ETL Area

The carcass search under the ETL followed the methodology suggested by Atienza *et al.* (2011). Two surveyors walked together along the transect in one direction (down the slope) for 4 km. Due to thick ground vegetation and vines, the last 1 km could not be finished. The length of the transect was 3,8 km and the transect was walked once a week. In total 19 searches were conducted at the ETL. Duration of carcass search in a day at the ETL ranged between 1 h 45 min and 3 h 11 min, and was 2 h 27 min \pm 27 min on average.

Findings

GenEst was run using the bat survey data for Spring 2019 and Autumn 2019 and the estimated variables. Accordingly, GenEst estimated the number of casualties per year as 1,380 bats (between 1,037 and 1,792) with a Confidence Interval (CI) of 90% for the existing turbines. With the proposed capacity expansion the predicted impact is estimated to be in the order of 3,500 bats per year.

A considerable number of carcasses that have been identified are the members of *Pipistrellus* genus, specifically Common Pipistrelle (*Pipistrellus pipistrellus*) and Nathusius's Pipistrelle (*Pipistrellus nathusii*) species are predominant based on both quantitative (wing length) and qualitative features (color, ear shape) of the carcasses. This finding is also supported by previous acoustic bat surveys conducted in order to determine bat activity levels within the Project Area. Both species are not listed as threatened by the IUCN, however, special effort should be given for the protection of Nathusius's Pipistrelle species because of its migratory nature as considering the significance of the impact. As per spring results, two bats were presumed to be Lesser Noctule (*Nyctalus leisleri*). Tissue samples of each carcass were sent to a laboratory for species identification through DNA profiling. The spring DNA results arrived on 15 November 2019 revealed that more than 50% of the carcasses belong to Nathusius's Pipistrelle (*Pipistrellus nathusii*) species and the rest to Common Pipistrelle (*Pipistrellus pipistrellus*).

Bird Fatality Results

In total, 5 bird fatalities at the turbine areas were encountered as summarized below. No single carcass of a migratory soaring bird species (such as storks and birds of prey) has been found during the surveys.

Table 10-45. Bird Fatalities at the Turbine Area

| Date | Time | Species | Turbine No | Condition |
|-----------------|-------|--|------------|---------------|
| 13 March 2019 | 09:11 | Large Bird (Gull of duck) | T01 | Feathers |
| 20 March 2019 | 09:59 | European Robin (<i>Erithacus rubecula</i>) | T12 | Complete |
| 2 April 2019 | 09:35 | Woodcock (<i>Scolopax rusticola</i>) | T06 | Complete |
| 30 August 2019 | 10:17 | Reed-Warbler? <i>Acrocephalus?</i> | T13 | Remaining leg |
| 15 October 2019 | 09:25 | Blackbird (<i>Turdus merula</i>) | T06 | Feathers |

It should be noted that forest cover should also be considered as a factor in detecting fatalities as the tree canopy may hide the carcasses.

Only three bird casualties were detected during the carcass search under the ETL as summarized below. No single carcass of a migratory soaring bird species (such as storks and birds of prey) has been found during the surveys.

Table 10-46. Bird Fatalities at the ETL Area

| Date | Time | Species | ID | Condition |
|-------------------|-------|---|------|-----------|
| 25 April 2019 | 12:03 | Common Moorhen (<i>Gallinula chloropus</i>) | Car2 | Complete |
| 9 May 2019 | 09:45 | Eurasian Blackcap (<i>Sylvia atricapilla</i>) | Car1 | Complete |
| 30 September 2019 | 11:13 | Corncrake (<i>Crex crex</i>) | Car3 | Feathers |

The location of the bird carcasses under the ETL is given in Figure 10-38.



Figure 10-38. Location of Bird Carcasses under the ETL

10.2.9. Invasive Alien Species

An alien species is a species introduced outside its natural past or present distribution; if this species becomes problematic, it is termed an invasive alien species (IAS). Non-native species that pose a risk of spreading quickly can create significant environmental and socio-economic impacts (for example, crop pests, disease vectors, new predators).

IAS are the most common threat to amphibians, reptiles and mammals on the IUCN Red List; they may lead to changes in the structure and composition of ecosystems detrimentally affecting ecosystem services, human economy and wellbeing. IAS are such a problem that Aichi Biodiversity Target 9 and one clause of UN Sustainable Development Goal 15 – Life on Land specifically address the issue.

The movement of people and goods around the world increases the opportunity for introduction of IAS.

The IUCN SSC Invasive Species Specialist Group (ISSG) aim to reduce threats to ecosystems and their native species by increasing awareness of ways to prevent, control or eradicate IAS.

The IUCN has developed knowledge platforms on invasive species:

- The Global Invasive Species Database (GISD)
- The Global Register of Introduced and Invasive Species (GRIIS)

The GRIIS platform (<http://www.griis.org>) includes 686 entries for species in Turkey and categorises the origin of the species as alien, native/alien or crypogenic/uncertain. It should be noted that not all species entered to GRIIS have been verified. This said, the academicians that undertook the 2019 field surveys do not see any potential risks in terms of alien species and confirmed that no spreading of IAS was observed at the Project Area.

Turkey is susceptible to invasions by alien species due to the fact that there is a maritime traffic between Bosphorus and Dardanel straits among commercial harbors. Based on the data collected by the General Directorate of Forestry, new taxa are frequently being established by the introduction of invasive alien species. Nevertheless, there is not any national database for determination of invasive alien species in Turkey and there is not sufficient data of invasive plant surveys conducted for each provinces of Turkey (Atasoy and Corbaci, 2018)²⁸.

10.2.10. Ecosystem Services

Ecosystem services are the benefits that people, including businesses, derive from ecosystems. Ecosystem services are organized into four types: (i) provisioning services, which are the products people obtain from ecosystems; (ii) regulating services, which are the benefits people obtain from the regulation of ecosystem processes; (iii) cultural services, which are the nonmaterial benefits people obtain from ecosystems; and (iv) supporting services, which are the natural processes that maintain the other services.

The boletus mushroom within the Project License Area is collected by local people and sold as discussed under chapter on socio-economy. During the flora field surveys medlar (*Mespilus germanica*), strawberry (*Arbutus unedo*, *Fragaria vesca*), nut (*Coryllus avellana*) was observed to be collected for consumption by the locals. On the limited pastureland within the Project License Area, grazing activities are being carried out by the locals. The forest is a diverse ecosystem for many flora and fauna species including nests/breeding/roosting areas. Bat species provide with ecosystem services when feeding from insects.

Kiyikoy WPP Capacity Extension Project activities will not have significant impact on any category of ecosystem services which in turn may adversely affect communities. The Project activities also do not directly depend on any category of ecosystem services for its operations.

10.2.11. Priority Biodiversity Features

As defined in EBRD PR6 (paragraph 12), priority biodiversity features (PBFs) have a high, but not the highest, degree of irreplaceability and/or vulnerability. Although a level below critical habitat in sensitivity, they still require careful consideration during project assessment and impact mitigation. As per EBRD PR6, appropriate mitigation measures are to be put in place in accordance with the mitigation hierarchy to ensure no net loss and preferably net gain of PBFs over the long term to achieve measurable conservation outcomes.

The priority biodiversity features as defined by the EBRD PR6 are identified as summarized in Table 10-48.

10.2.12. Critical Habitat Assessment

As defined in EBRD PR6 (paragraph 14), areas identified as critical habitat hold the highest tier of irreplaceable (existing in few places) and vulnerable (at high risk of being lost) biodiversity features. The criteria used by the EBRD's PR6 to define critical habitat build on and are closely aligned with those used by the International

²⁸ Atasoy, M. and Corbaci, O.L., 2018. The Invasive Alien Plants of Turkey: A Checklist and Environmental Hazards, *Journal of Applied Environmental and Biological Sciences*, 8(5)1-8.

Finance Corporation Performance Standard 6 (IFC PS6). PR6 also explicitly includes ecological functions that are vital for maintaining the viability of critical habitat features. Identification of such functions will vary between features and locations, so the involvement of credible external experts with relevant ecological experience is highly recommended.

As mentioned in the EBRD PR6 Guidance Note, a critical habitat assessment will be required where impacts on critical biodiversity features (Table 10-49) could occur or are suspected. EBRD PR6 Guidance Note highlights that IFC PS6 Guidance Note (GN6) provides detailed guidance on undertaking a critical habitat assessment and that definitions of and quantitative thresholds for critical habitat biodiversity follow those of GN6 until such a time as international consensus develops on more detailed guidance.

As per IFC PS6 Guidance Note (June 2019), projects that are located within internationally and/or nationally recognized areas of high biodiversity value, such as KBAs, may require a critical habitat assessment.

In light of the findings of the biodiversity baseline studies conducted at the Project License Area and its vicinity, critical habitat assessment is conducted as summarized in Table 10-49 using numerical thresholds identified as per IFC PS6 Guidance Note (June 2019) as given in table below.

Table 10-47. Critical Habitat Criteria as per IFC PS6 Guidance Note (2019)

| Critical Habitat Criteria | Explanation |
|--|---|
| Criterion 1. Critically Endangered and Endangered Species | |
| Scope 1 (GN70) | Species threatened with global extinction and listed as CR and EN on the IUCN Red List of Threatened Species |
| Scope 2 (GN71) | Species that are listed nationally/regionally as CR or EN in countries that adhere to IUCN guidance shall be determined on a project-by-project basis in consultation with competent professionals |
| Thresholds (GN72) | <p>(a) Areas that support globally important concentrations of an IUCN Red-listed EN or CR species ($\geq 0.5\%$ of the global population AND ≥ 5 reproductive units of a CR or EN species).</p> <p>(b) 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 in GN72(a).</p> <p>(c) As appropriate, areas containing important concentrations of a nationally or regionally listed EN or CR species.</p> |
| Criterion 2. Endemic and Restricted-range Species | |
| Scope (GN74) | <p>The term endemic is defined as restricted range. Restricted range refers to a limited extent of occurrence (EOO).</p> <ul style="list-style-type: none"> - For terrestrial vertebrates and plants, restricted-range species are defined as those species that have an EOO less than 50,000 square kilometers (km²). - For marine systems, restricted-range species are provisionally being considered those with an EOO of less than 100,000 km². - For coastal, riverine, and other aquatic species in habitats that do not exceed 200 km width at any point (for example, rivers), restricted range is defined as having a global range of less than or equal to 500 km linear geographic span (i.e., the distance between occupied locations furthest apart). |
| Threshold (GN75) | Areas that regularly hold $\geq 10\%$ of the global population size AND ≥ 10 reproductive units of a species. |
| Criterion 3. Migratory and Congregatory Species | |
| Scope 1 (GN 76) | Migratory species are defined as any species of which a significant proportion of its members cyclically and predictably move from one geographical area to another (including within the same ecosystem). |
| Scope 2 (GN 77) | <p>Congregatory species are defined as species whose individuals gather in large groups on a cyclical or otherwise regular and/or predictable basis. Examples include the following:</p> <ul style="list-style-type: none"> - Species that form colonies. - Species that form colonies for breeding purposes and/or where large numbers of individuals of a species gather at the same time for non-breeding purposes (for example, foraging and roosting). - Species that utilize a bottleneck site where significant numbers of individuals of a species occur in a concentrated period of time (for example, for migration). - Species with large but clumped distributions where a large number of individuals may be concentrated in a single or a few sites while the rest of the species is largely dispersed (for example, wildebeest distributions). - Source populations where certain sites hold populations of species that make an inordinate contribution to recruitment of the species elsewhere (especially important for marine species). |

| Critical Habitat Criteria | Explanation |
|--|---|
| Thresholds (GN78) | <p>(a) Areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.</p> <p>(b) Areas that predictably support ≥ 10 percent of the global population of a species during periods of environmental stress.</p> |
| Criterion 4. Highly Threatened or Unique Ecosystems | |
| Scope (GN79) | <p>Ecosystems listed in the IUCN Red List of Ecosystems.</p> <p>Where formal IUCN assessments have not been performed, assessments using systematic methods at the national/regional level, carried out by governmental bodies, recognized academic institutions and/or other relevant qualified organizations (including internationally recognized NGOs) may be used.</p> |
| Thresholds (GN80) | <p>(a) Areas representing $\geq 5\%$ of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN.</p> <p>(b) Other areas not yet assessed by IUCN but determined to be of high priority for conservation by regional or national systematic conservation planning.</p> |
| Criterion 5. Key Evolutionary Processes | |
| Scope (GN81, GN82, GN83) | <p>Potential examples of spatial features associated with evolutionary processes are as follows:</p> <ul style="list-style-type: none"> - 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." - Sites of demonstrated importance to climate change adaptation for either species or ecosystems are also included within this criterion. <p>The significance of structural attributes in a landscape that may influence evolutionary processes will be determined on a case-by-case basis, and the determination of critical habitat will be heavily reliant on scientific knowledge. In the majority of cases, this criterion will apply in areas that have been previously investigated and that are already known or suspected to be associated with unique evolutionary processes.</p> |
| Thresholds (GN57) | <p>For Criterion 5, there are no numerical thresholds. Best available scientific information and expert opinion should be used to guide decision-making with respect to the relative "criticality" of a habitat in these cases.</p> |

Table 10-48. Priority Biodiversity Features

| Priority Biodiversity Features as per EBRD PR6 (2014), para. 12 | Examples (as given by EBRD PR6 Guidance Note) | Kiyikoy WPP Project Area |
|---|---|--|
| Threatened Habitats | Habitats considered under pressure by national, regional or international assessments. These include natural and priority habitats identified under the EU Habitats Directive (Annex I). | There are no threatened habitats specified within the Project License Area. Please see Section 10.2.4 for habitat classification of the Project License Area. |
| Vulnerable Species | Species listed by the International Union for Conservation of Nature (IUCN) or any other national/regional lists (such as national Red Lists) as Vulnerable (VU) or equivalent. These include animal and plant species of community interest identified under the EU Habitats Directive (Annex II). Directive (Annex II). | <p>The flora and fauna species listed as VU by the IUCN and/or National Red List and/or species falling under Annex II of the EU Habitats Directive identified at the Project Area and its vicinity is given below. Further discussion is provided for each species listed below in Table 10-50 for the inclusion of the species under PBF list.</p> <p><u>Flora</u></p> <ul style="list-style-type: none"> - <i>Cirsium baytopae</i> (VU by National Red List, regional endemic) - <i>Ferulago confuse</i> (VU) - <i>Symphytum tuberosum</i> subsp. <i>Nodosum</i> (VU) <p><u>Reptiles</u></p> <ul style="list-style-type: none"> - <i>Testudo graeca</i> (Common tortoise) (VU by the IUCN, EU Habitats Directive Annex II) - <i>Testudo hermanni</i> (Hermann's tortoise) (EU Habitats Directive Annex II) - <i>Emys orbicularis</i> (European pond turtle) (EU Habitats Directive Annex II) <p><u>Birds</u></p> <ul style="list-style-type: none"> - <i>Aquila heliaca</i> (Imperial Eagle) (VU by the IUCN, 2 individuals recorded) <p><u>Bats:</u></p> <p>Five (5) bat species recorded at the Project Area fall under EU Habitats Directive Annex II, which are:</p> <ul style="list-style-type: none"> - <i>Rhinolophus blasii</i> (Blasius's Horseshoe Bat) - <i>Rhinolophus Euryale</i> (Mediterranean Horseshoe Bat) - <i>Rhinolophus ferrumequinum</i> (Greater Horseshoe Bat) - <i>Barbastella barbastellus</i> (Western Barbastelle Bat) - <i>Miniopterus schreibersii</i> (Schreiber's Bent-winged Bat) <p>Five (5) bat species identified as "possible" to exist at the Project Area fall under EU Habitats Directive Annex II, which are:</p> <ul style="list-style-type: none"> - <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) - <i>Rhinolophus mehelyi</i> (Mehely's Horseshoe Bat) - <i>Myotis capaccinii</i> (Long-fingered Bat) - <i>Myotis emarginatus</i> (Geoffroy's Bat) - <i>Myotis myotis</i> (Greater Mouse-eared Bat) <p><u>Mammals</u></p> <ul style="list-style-type: none"> - <i>Canis lupus</i> (Grey wolf) (LC by the IUCN, EU Habitats Directive Annex II) - <i>Lutra lutra</i> (Eurasian otter) (NT by the IUCN, EU Habitats Directive Annex II) <p><u>Dragonflies</u></p> <ul style="list-style-type: none"> - <i>Somatochlora borisi</i> (Bulgarian Emerald) (VU by the IUCN, KBA qualifying species) |

| Priority Biodiversity Features as per EBRD PR6 (2014), para. 12 | Examples (as given by EBRD PR6 Guidance Note) | Kiyikoy WPP Project Area |
|---|---|---|
| Significant biodiversity features identified by a broad set of stakeholders or governments | Key Biodiversity Areas and Important Bird and Biodiversity Areas; nationally and internationally important species or sites for conservation of biodiversity; many areas meeting natural habitat definitions of other international financial institutions. | The Project License Area falls within the boundaries of Istranca Mountains KBA as given in Section 10.2.1. All flora and fauna species identified at the Project Area have been screened against the KBA qualifying species as given in the species tables presented in Section 10.2. |
| Ecological structure and functions needed to maintain the viability of priority biodiversity features | Where essential for priority biodiversity features, riparian zones and rivers, dispersal or migration corridors, hydrological regimes, seasonal refuges or food sources, keystone or habitat-forming species. | The Project Area is located on the "Via Pontica" bird migration corridor along the west coast of the Black Sea. It is a major route for raptors in the region. The most important and the most studied bottleneck area on this migration route is the Bosphorus (Strait of Istanbul). |

Table 10-49. Critical Habitat Triggering Features

| Critical habitat as per EBRD PR6 (2014), para. 14 | Examples (as given by EBRD PR6 Guidance Note) | Kiyikoy WPP Project Area – Critical Habitat Triggering Biodiversity Features | Numerical Thresholds |
|--|---|--|---|
| (i) Highly threatened or unique ecosystems | <p>Ecosystems that are at risk of significantly decreasing in area or quality; have a small spatial extent; and/or contain concentrations of biome-restricted species. For example:</p> <ul style="list-style-type: none"> Ecosystems listed as, or meeting criteria for, Endangered or Critically Endangered by the IUCN Red List of Ecosystems Areas recognised as priorities in official regional or national plans, such as National Biodiversity Strategy and Action Plans Areas determined to be of high priority/significance based on systematic conservation planning carried out by government bodies, recognised academic institutions and/or other relevant qualified organisations (including internationally-recognised NGOs). | <p>The Project Area does not include ecosystems that are at risk of significantly decreasing in area or quality; have a small spatial extent; and/or contain concentrations of biome-restricted species as per the numerical threshold established.</p> | <p>As per IFC PS6 Guidance Note, paragraph GN80 (2019):</p> <ul style="list-style-type: none"> (a) Areas representing ≥5% of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN. (b) Other areas not yet assessed by IUCN but determined to be of high priority for conservation by regional or national systematic conservation planning. |
| (ii) Habitats of significant importance to endangered or critically endangered species | <p>Areas supporting species at high risk of extinction (Critically Endangered or Endangered) on the IUCN Red List of Threatened species (or equivalent national/regional systems). For example:</p> <ul style="list-style-type: none"> Alliance for Zero Extinction sites Animal and plant species of community interest in need of strict protection as listed in EU Habitats Directive (Annex IV). | <p>Two regional endemic flora species (<i>Centaurea hermannii</i> and <i>Crocus olivieri</i> subsp. <i>istanbulensis</i>) have been assessed as EN as per the re-assessment of Red Data Book of Turkish Plants in line with IUCN 2001 criteria. Both species are not listed amongst Istranca Mountains KBA qualifying species. <i>Centaurea hermannii</i> is spread only in Marmara Region of Turkey. The specific locations at which these species have been observed at the Project Area are given in Table 10-4.</p> <p>None of the fauna species are listed as CR or EN by the IUCN. This said, some amphibian and reptile species (see Table 10-8) and mammal species other than bats (observed during 2015-2017, see Table 10-11) are listed under Annex IV of the EU Habitats Directive as given below:</p> <ul style="list-style-type: none"> <i>Bufotes variabilis</i> (Varying toad) <i>Rana dalmatina</i> (Agile frog) <i>Emys orbicularis</i> (European pond turtle) <i>Testudo graeca</i> (Common tortoise) <i>Testudo hermanni</i> (Hermann's tortoise) <i>Ablepharus kitaibelii</i> (Juniper Skink) <i>Lacerta viridis</i> (Green lizard) <i>Podarcis muralis</i> (Common wall lizard) <i>Natrix natrix</i> (Grass snake) <i>Natrix tessellata</i> (Dice snake) <i>Vipera ammodytes</i> (Nose-horned Viper) <i>Canis lupus</i> (Grey wolf) <i>Felis silvestris</i> (Wild cat) <i>Lutra lutra</i> (Eurasian otter) <p>All bat species are listed under Annex IV of the EU Habitats Directive.</p> <p>Further discussion is provided for each species listed below in Table 10-50 for the inclusion of the species under the CH list.</p> | <p>As per IFC PS6 Guidance Note, paragraph GN72 (2019):</p> <ul style="list-style-type: none"> (a) 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). (b) 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 in GN72(a). (c) As appropriate, areas containing important concentrations of a nationally or regionally listed EN or CR species. |
| (iii) Habitats of significant importance to endemic or geographically restricted species | <p>Areas holding a significant proportion of the global range or population of species qualifying as restricted-range under Birdlife or IUCN criteria. For example:</p> <ul style="list-style-type: none"> Alliance for Zero Extinction sites Global-level Key Biodiversity Areas and Important Bird and Biodiversity Areas identified for restricted-range species. | <p>The regional endemic and/or geographically restricted flora species were identified at the Project Area (see Section 10.2.2). None of these species are listed amongst Istranca Mountains KBA qualifying species. Population data for these species is not available but the distribution maps in Turkey are available as given in Figure 10-4. Further discussion is provided for each flora species in Table 10-50 for their potential inclusion under the CH list.</p> <p>Amongst the fauna species, <i>Somatochlora borisi</i> (Bulgarian Emerald) (VU by the IUCN, KBA qualifying species) was identified during 2015-2017 fauna surveys conducted by the fauna expert (as part of TurkStream Project) in the vicinity of Pabuc Stream outside the Project License Area. During 2019 field surveys, this species was not observed at the Project impact area. As reported by the IUCN, it is a strict endemic of</p> | <p>As per IFC PS6 Guidance Note, paragraph GN75 (2019):</p> <p>Areas that regularly hold ≥10% of the global population size AND ≥10 reproductive units of a species.</p> |

| Critical habitat as per EBRD PR6 (2014), para. 14 | Examples (as given by EBRD PR6 Guidance Note) | Kiyikoy WPP Project Area – Critical Habitat Triggering Biodiversity Features | Numerical Thresholds |
|---|--|--|--|
| (iv) Habitats supporting globally significant (concentrations of) migratory or congregatory species | <p>Areas that support a significant proportion of a species' population, where that species cyclically and predictably moves from one geographical area to another (including within the same ecosystem), or areas that support large groups of a species' population that gather on a cyclical or otherwise regular and/or predictable basis. For example:</p> <ul style="list-style-type: none"> Global-level Key Biodiversity Areas and Important Bird and Biodiversity Areas identified for congregatory species Wetlands of International Importance designated under criteria 5 or 6 of the Ramsar Convention. | <p>the eastern Balkans occurring in the area that crosses the borders of Greece, Bulgaria and Turkey. Further discussion is provided for this species in Table 10-50 for its potential inclusion under the CH list.</p> <p>The Project Area is located within Istranca Mountains KBA and on the "Via Pontica" bird migration corridor along the west coast of the Black Sea. It is a major route for raptors in the region. The most important and the most studied bottleneck area on this migration route is the Bosphorus (Strait of Istanbul). There are no migratory soaring birds that qualify the Istranca Mountains KBA.</p> <p>Both Igneada Forests KBA, IBA, IPA and Terkos Basin KBA, IBA and IPA are in the vicinity of the Project License Area.</p> <p>Igneada Forests KBA, IBA and IPA is a complex of seasonally flooded forests, swamps, freshwater lakes and sand-dunes on the Black Sea coast near the Turkish-Bulgarian border. The site is also a migratory bottleneck, where more than 8,000 <i>Ciconia ciconia</i> regularly pass in autumn. Although no comprehensive counts have been undertaken, available data suggest that the IBA is also a bottleneck for migrating raptors. Both <i>Ciconia ciconia</i> (White Stork) and <i>Ciconia nigra</i> (Black Stork) are amongst IBA trigger species.</p> <p>Terkos Basin KBA, IBA and IPA includes the Terkos Lake designated as Wetlands of International Importance (Ramsar) and is one of Istanbul's oldest water resources. The IBA trigger species are: <i>Branta ruficollis</i> (Red-breasted Goose), <i>Aythya nyroca</i> (Ferruginous Duck), <i>Ciconia nigra</i> (Black Stork), <i>Microcarbo pygmaeus</i> (Pygmy Cormorant) and <i>Chlidonias hybrida</i> (Whiskered Tern)</p> <p>As per the Spring 2019 avifauna survey results, the following three migratory species were highly abundant:</p> <ol style="list-style-type: none"> <i>Ciconia Ciconia</i> (White Stork) listed as LC and 7,459 individuals were recorded as migrating <i>Pernis apivorus</i> (European Honey-Buzzard) listed as LC and 3,094 individuals were recorded as migrating <i>Buteo buteo</i> (Common Buzzard) listed as LC and 1,655 individuals were recorded as migrating <p>As per BirdLife International (2019) Species factsheet: <i>Ciconia ciconia</i>. (http://datazone.birdlife.org/species/factsheet/white-stork-ciconia-ciconia), the global population size of <i>Ciconia Ciconia</i> (White Stork) is estimated at 700,000-704,000 individuals. The overall population trend is increasing, although some populations are decreasing or stable. The population in Europe is estimated to have undergone a moderate increase between 1980 and 2013. <u>Associated IBAs in Turkey</u>: Amanos Mountains, Balıkdami, Bismil Plain, Bosphorus, Ceyhan Delta, Esmekaya Marshes, Goksu Delta, Igneada Forests, Sarıyar Reservoir. Distribution map of the species is given in Figure 10-39.</p> <p>The Spring 2019 survey results revealed more than 1% of the global population of <i>Ciconia ciconia</i> as recorded to fly over the Project Area.</p> <p>As per BirdLife International (2019) Species factsheet: <i>Pernis apivorus</i>. (http://datazone.birdlife.org/species/factsheet/european-honey-buzzard-pernis-apivorus), the global population of <i>Pernis apivorus</i> (European Honey-Buzzard) is estimated to number 280,000-420,000 mature individuals. The population is suspected to be decreasing. Amongst the threats listed, it is reported as very highly vulnerable to the effects of potential wind energy developments. <u>Associated IBAs in Turkey</u>: Kaz Mountains. Distribution map of the species is given in Figure 10-40.</p> <p>The Spring 2019 survey results revealed more than 1% of the global population of <i>Pernis apivorus</i> as recorded to fly over the Project Area.</p> <p>As per BirdLife International (2019) Species factsheet: <i>Buteo buteo</i>. (http://datazone.birdlife.org/species/factsheet/eurasian-buzzard-buteo-buteo), the global population of <i>Buteo buteo</i> (Common Buzzard) is estimated to number 2,100,000-3,700,000 mature individuals. The population is reported as stable. Amongst the threats listed, it is reported as very highly vulnerable to the effects of potential wind energy developments.</p> <p>The Spring 2019 survey results revealed less than 1% of the global population of <i>Buteo buteo</i> as recorded to fly over the Project Area.</p> <p>The Project Area is near two IBAs, Igneada Forests and Terkos Basin IBA. Igneada Forests IBA is a migratory bottleneck, where more than 8,000 White Storks regularly pass in autumn, and available data suggest it could be a migratory bottleneck for raptors (Birdlife Datazone BirdLife International (2019) Important Bird Areas factsheet: Igneada Forests. Downloaded from http://www.birdlife.org on 21/11/2019). The site contains suitable habitat to be used as a stop-over during migration for white stork and likely for raptors. The vegetation in the Project Area does not suggest that the area might be a stop-over area for the trigger species in normal circumstances, and there is also no evidence from the geographic and topographic features that the site it might be a particular bottleneck within an already-restricted flyway. There is therefore no indication that the Project Area meets the criteria for IBA designation for migratory soaring birds, and these birds do not appear</p> | <p>As per IFC PS6 Guidance Note, paragraph GN78 (2019):</p> <p>(a) Areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.</p> <p>(b) Areas that predictably support ≥10 percent of the global population of a species during periods of environmental stress.</p> |

| Critical habitat as per EBRD PR6 (2014), para. 14 | Examples (as given by EBRD PR6 Guidance Note) | Kiyikoy WPP Project Area – Critical Habitat Triggering Biodiversity Features | Numerical Thresholds |
|---|--|--|---|
| | | to have any regular significant interaction with features on the ground, and thus the planned Project. Given this, and that it is part of a more extensive flyway of similar importance for a substantial distance, it is not appropriate to consider the Project Area to be Critical Habitat for migratory soaring birds. Nonetheless, the study area is clearly of global importance to White Stork and European Honey Buzzard. Wind farm developments in this narrow migratory corridor present a risk to these species and should aim to mitigate potential impacts to at least no net loss. They may otherwise have disproportionate effects on the global population. | |
| (v) Areas associated with key evolutionary processes | <p>Areas with landscape features that might be associated with particular evolutionary processes or populations of species that are especially distinct and may be of special conservation concern given their distinct evolutionary history. For example:</p> <ul style="list-style-type: none"> Isolated lakes or mountaintops Populations of species listed as priorities by the Edge of Existence programme. | The Project License Area does not include any areas associated with key evolutionary processes. | No numerical threshold assigned for this criterion. |
| (vi) Ecological functions that are vital to maintaining the viability of biodiversity features described (as critical habitat features) | <p>Ecological functions without which critical biodiversity features could not persist. For example:</p> <ul style="list-style-type: none"> Where essential for critical biodiversity features, riparian zones and rivers, dispersal or migration corridors, hydrological regimes, seasonal refuges or food sources, keystone or habitat-forming species. | <p>The Project Area is located on the “Via Pontica” bird migration corridor along the west coast of the Black Sea. It is a major route for raptors in the region. The most important and the most studied bottleneck area on this migration route is the Bosphorus (Strait of Istanbul).</p> <p>Both Igneada Forests KBA, IBA, IPA and Terkos Basin KBA, IBA and IPA are in the vicinity of the Project License Area.</p> <p>Igneada Forests IBA site is reported as a migratory bottleneck, where more than 8,000 <i>Ciconia ciconia</i> regularly pass in autumn. Although no comprehensive counts have been undertaken, available data suggest that the Igneada Forests IBA is also a bottleneck for migrating raptors. Amongst the IBA trigger species of Igneada Forests, <i>Ciconia ciconia</i> (White Stork) is also recorded at numbers exceeding 1% of the global population during Spring 2019 survey.</p> | No numerical threshold assigned for this criterion. |

Distribution map



Figure 10-39. Distribution Map of *Ciconia ciconia* (White Stork)²⁹

²⁹ BirdLife International (2019) Species factsheet: *Ciconia ciconia*. (Downloaded from <http://www.birdlife.org> on 28/09/2019. <http://datazone.birdlife.org/species/factsheet/white-stork-ciconia-ciconia>)

Distribution map



Figure 10-40. Distribution Map of *Pernis apivorus* (European Honey-Buzzard)³⁰

³⁰ BirdLife International (2019) Species factsheet: *Pernis apivorus*. (Downloaded from <http://www.birdlife.org> on 28/09/2019. <http://datazone.birdlife.org/species/factsheet/european-honey-buzzard-pernis-apivorus>)

10.3. Impact Assessment and Management

This section of the ESIA Report assesses the potential impacts of the Project on biodiversity features in accordance with the methodology defined in Chapter 4 on ESIA Methodology.

The impact assessment is conducted with the available field data to date of compilation of this chapter. It should be noted that, the bird/bat surveys are ongoing at the Project Area and any new field information may change the conservation status of species and therefore change the overall assessment. This said, the Project Area being located within Istranca Mountains KBA and close to Igneada Forests KBA/IBA/IPA and Terkos Basin KBA/IBA/IPA and on Via Pontica migratory route is alone sufficient to demonstrate the overall biodiversity importance and the need to have in place well-informed and well-established measures in line with the mitigation hierarchy.

The flora and fauna Species of Conservation Importance have been identified through screening the conservation status of the species identified at the Project Area as given in Section 10.2. The species falling under at least one of the below categories are considered as Species of Conservation Importance as listed in Table 10-50:

- Regional endemic
- VU or EN or CR by the IUCN Red List (Global or National)
- Istranca Mountains KBA qualifying species
- Annex II and/or Annex IV of the EU Habitats Directive
- Annex I of the EU Birds Directive

The screened species are further evaluated as per the Priority Biodiversity Feature (PBF)/Critical Habitat (CH) thresholds set by IFC PS6 Guidance Note (2019) as given in Table 10-50. The ecology of the species that classify as to potentially trigger CH are provided separately in Table 10-51.

A Project Biodiversity Action Plan (BAP) will be in place throughout construction and operation phase of the Project and any new field data/information will be assessed and integrated to the BAP. Through implementation of BAP, the Project will achieve net gain for CH and no net loss, and if possible, net gain for PBF and demonstrate this through robust monitoring and adaptive management approach.

Table 10-50. Species of Conservation Importance

| Biodiversity Feature | Conservation Status | | | | Baseline Conditions | PBF/CH categorization as per IFC thresholds |
|---|---------------------|---|----------------|-------------|--|--|
| | IUCN Red List | Istranca Mountains KBA Qualifying Species | EU Habitats D. | EU Birds D. | | |
| Flora Species | | | | | | |
| <i>Centaurea hermannii</i> | • EN (National) | • No | - | N/A | <ul style="list-style-type: none"> Regional endemic Spread only in Marmara Region Species observed at T28, T29, T32, T33 The number of individuals recorded within 200mx200m around the turbines: <ul style="list-style-type: none"> T28 (20 individuals) T29 (15 individuals) T32 (2 individuals) T33 (22 individuals) | <ul style="list-style-type: none"> Potential CH trigger The species spread in Marmara Region of Turkey. The population data is not available at the regional level. Individuals of the species observed at 4 future turbine locations (within an area of 200mx200m around each turbine). The flora expert confirmed that the species exist within the Project license area other than the turbine footprints. The Project footprint area is not considered to hold globally significant concentrations of these species to trigger the CH criteria and thus considered as a potential CH trigger. Ex-situ (seed collection and submission to Turkey Seed Gene Bank) conservation measure completed. In-situ (flora salvaging and plantation to existing WPP area) conservation measure completed. The plantation of individuals collected from the turbine footprint to 4 different locations at the existing WPP took place on 30-31 October 2019. The species is also transferred to pots for the site staff to get acquainted and ensure accidental damage is avoided during site works. The Project construction activities are not anticipated to lead to a net reduction in the population of this species over a reasonable time period. Success of flora salvaging and plantation will be monitored in May-June 2020 as part of Project BAP. |
| <i>Crocus olivieri subsp. istanbulensis</i> | • EN (National) | • No | - | N/A | <ul style="list-style-type: none"> Regional endemic Species observed at T16, T17 The number of individuals recorded within 200mx200m around the turbines: <ul style="list-style-type: none"> T17 (10 individuals) T16 (8 individuals) | <ul style="list-style-type: none"> Potential CH trigger The species spread in Marmara Region of Turkey. The population data is not available at the regional level. Species observed at 2 future turbine locations (within an area of 200mx200m around each turbine). The flora expert confirmed that the species exist within the Project license area other than the turbine footprints. The Project footprint area is not considered to hold globally significant concentrations of these species to trigger the CH criteria and thus considered as a potential CH trigger. The bulbs will be removed together with the topsoil during stripping (the topsoil acts as a gene bank) at the identified locations for further storage and use during reinstatement. The flora expert will help manage the topsoil stripping and storage activities. The Project construction activities are not anticipated to lead to a net reduction in the population of this species over a reasonable time period. Topsoil storage area(s) and reinstatement activities will be monitored as part of the BAP. |
| <i>Ferulago confuse</i> | • VU (National) | • No | - | • N/A | <ul style="list-style-type: none"> Species observed at T19, T21, T29, T33, T34 The number of individuals recorded within 200mx200m around the turbines: <ul style="list-style-type: none"> T19 (5 individuals) T21 (4 individuals) T29 (2 individuals) T34 (8 individuals) T33 (10 individuals) | <ul style="list-style-type: none"> Priority biodiversity feature The Project activities are not anticipated to lead to significant, adverse and irreversible impacts on this species. This said, ex-situ (seed collection and submission to Turkey Seed Gene Bank) conservation measures will be in place. |
| <i>Symphytum tuberosum subsp. Nodosum</i> | • VU (National) | • No | - | • N/A | <ul style="list-style-type: none"> Species observed at T16, T19, T21, T25, T26, T28, T29, T32, T33 The number of individuals recorded within 200mx200m around the turbines: <ul style="list-style-type: none"> T16 (2 individuals) T19 (4 individuals) T21 (2 individuals) T25 (3 individuals) T26 (5 individuals) T33 (10 individuals) T32 (4 individuals) T28 (20 individuals) T29 (5 individuals) | <ul style="list-style-type: none"> Priority biodiversity feature The Project activities are not anticipated to lead to significant, adverse and irreversible impacts on this species. This said, ex-situ (seed collection and submission to Turkey Seed Gene Bank) conservation measures will be in place. |

| Biodiversity Feature | Conservation Status | | | | Baseline Conditions | PBF/CH categorization as per IFC thresholds |
|--|---------------------|---|----------------|-------------|---|--|
| | IUCN Red List | Istranca Mountains KBA Qualifying Species | EU Habitats D. | EU Birds D. | | |
| <i>Cirsium baytopae</i> | • VU (National) | • No | - | • N/A | <ul style="list-style-type: none"> Regional endemic Species observed at T15, T17 The number of individuals recorded within 200mx200m around the turbines: <ul style="list-style-type: none"> T17 (15 individuals) T15 (10 individuals) | <ul style="list-style-type: none"> Priority biodiversity feature The Project activities are not anticipated to lead to significant, adverse and irreversible impacts on this species. This said, ex-situ (seed collection and submission to Turkey Seed Gene Bank) conservation measures will be in place. |
| <i>Euphorbia amygdaloides var. robbiae</i> | • NT (National) | • No | - | • N/A | <ul style="list-style-type: none"> Species observed at T20, T21, T25, T26, T23, T32, T27, T28, T29 <ul style="list-style-type: none"> T20 (5 individuals) T21 (5 individuals) T25 (8 individuals) T26 (4 individuals) T23 (4 individuals) T32 (4 individuals) T27 (5 individuals) T28 (50 individuals) T29 (5 individuals) | <ul style="list-style-type: none"> Not qualify as CH or PBF but is considered amongst species of conservation importance Ex-situ (seed collection and submission to Turkey Seed Gene Bank) conservation measures will be in place. |
| Birds | | | | | | |
| <i>Ciconia ciconia</i> (White Stork) | • LC (Global) | • No | • N/A | • Annex I | <ul style="list-style-type: none"> 7,459 individuals (migrating) recorded in Spring 2019 survey 2 individuals recorded in Autumn 2019 Global population estimated at 700,000-704,000 individuals. Population trend is increasing. Extent of occurrence (breeding/resident) is 52.7 million km² (BirdLife International (2019) Species factsheet: Ciconia ciconia) Igneada Forests IBA to the North of the Project License Area and Bosphorus IBA are associated IBAs of the species (BirdLife International (2019) Species factsheet: Ciconia ciconia) Spring 2019 collision risk (with avoidance) is calculated as 11.74 (2nd highest) Species not recorded within the scope of the ongoing carcass study at the operating turbines. | <ul style="list-style-type: none"> The Spring 2019 survey results (7,459 migrating individuals) revealed more than 1% of the global population (700,000-704,000 individuals) of <i>Ciconia ciconia</i> as recorded to fly over the Project Area. Thus, the species is a CH trigger. Spring 2019 Collision Risk (with avoidance) is calculated as 11.74 (2nd highest). Autumn 2019 Collision Risk is calculated as 0. Throughout the construction phase, bird activity monitoring study will be in place. The collected data will be used to update the collision risk assessment and with the start of the operation phase active turbine management strategy will be implemented including development of shut-down on demand protocol for turbines leading to injury or mortality of bird species. The mitigation measures are provided in Table 10-54. To ensure no net loss of the species, measures as per mitigation hierarchy will be put in place and BAP will be implemented to ensure potential Project impacts are mitigated. |
| <i>Aquila heliaca</i> (Eastern Imperial Eagle) | • VU (Global) | • No | • N/A | • Annex I | <ul style="list-style-type: none"> 2 individuals recorded in Spring 2019 survey Global population estimated at 2,500-9,999 mature individuals. Population trend is decreasing. Extent of occurrence (breeding/resident) is 15.4 million km² (BirdLife International (2019) Species factsheet: Aquila heliaca). In Europe, the breeding population was estimated to number 1,300-1,900 breeding pairs, equating to 2,500-3,800 mature individuals. A smaller population of the species breeds in Turkey. In May 2018, a team of the LIFE project "LAND for LIFE" together with representatives of Doga Dernegi, the partner of BirdLife International Turkey, visited all known nests of Imperial Eagles in European Turkey. During the monitoring, 34 occupied territories were identified, and new nests were found in the area of Istanbul. With the newly identified ones, the known nests of the species in this part of Turkey have become 47. The population of the Imperial Eagle in Turkey is still growing. The total estimate of the species population in Turkey is currently about 60 pairs (http://landforlife.org/en/news/raste-populatsiyata-na-tsarskite-orli-v-turtsiya.html). | <ul style="list-style-type: none"> Priority biodiversity feature The Project activities are not anticipated to lead to significant, adverse and irreversible impacts on this species. This said, measures as per mitigation hierarchy will be put in place and BAP will be implemented to ensure potential Project impacts are mitigated. The mitigation measures are provided in Table 10-54. |

| Biodiversity Feature | Conservation Status | | | | Baseline Conditions | PBF/CH categorization as per IFC thresholds |
|---|---|--|---|---|--|---|
| | IUCN Red List | Istranca Mountains KBA Qualifying Species | EU Habitats D. | EU Birds D. | | |
| | | | | | <ul style="list-style-type: none"> Doga Dernegi, the partner of BirdLife International Turkey, and BSPB, the partner of BirdLife International Bulgaria, have been monitoring 44 breeding territories of the species in Thrace Region, which are likely to be more. Main threats to the species are reported as cutting of nesting trees, loss of foraging and feeding habitats, poisoning, electrocution, and collision mortality and the collapse of nests. Doga Dernegi conducted a socio-cultural study to identify interactions between local livelihoods and the Imperial Eagles in Thrace. As a result of the study, the number of regions such as Kofcaz is determined as outstanding locations for community-based conservation. Furthermore, with support from BSPB, Doga Dernegi installed artificial nests to increase available breeding grounds for the species. Doga Dernegi is working with the City Council of Kırklareli to prevent threats to eagles and other species. Along with direct conservation of Imperial Eagles of Thrace, Doga Dernegi works with academics for assessing the status of the wider Turkey population of the species to design and implement a comprehensive conservation strategy (https://www.dogadernegi.org/en/eastern-imperial-eagle/). | |
| <i>Pernis apivorus</i> (European Honey-Buzzard) | <ul style="list-style-type: none"> LC (Global) | <ul style="list-style-type: none"> No | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> Annex I | <ul style="list-style-type: none"> 3,094 migrating individuals (out of 3,107 in total) recorded in Spring 2019 survey 45 individuals recorded in Autumn 2019 survey Global population estimated at 280,000-420,000 mature individuals. Population trend is decreasing. Extent of occurrence (breeding/resident) is 18.2 million km² (BirdLife International (2019) Species factsheet: <i>Pernis apivorus</i>) Spring 2019 collision risk (with avoidance) is calculated as 4.71 (3rd highest) Autumn 2019 collision risk (with avoidance) is calculated as 0.36. Reported as very highly vulnerable to the effects of potential wind energy developments (BirdLife International (2019) Species factsheet: <i>Pernis apivorus</i>) Species not recorded within the scope of the ongoing carcass study at the operating turbines. | <ul style="list-style-type: none"> The Spring 2019 survey results (3,094 migrating individuals) revealed more than 1% of the global population (280,000-420,000 individuals) of <i>Pernis apivorus</i> as recorded to fly over the Project Area. Thus, the species is a CH trigger. Spring 2019 Collision Risk (with avoidance) is calculated as 4.71 (3rd highest). Autumn 2019 Collision Risk is calculated as 0.36. Throughout the construction phase, bird activity monitoring study will be in place. The collected data will be used to update the collision risk assessment and with the start of the operation phase active turbine management strategy will be implemented including development of shut-down on demand protocol for turbines leading to injury or mortality of bird species. The mitigation measures are provided in Table 10-54. To ensure no net loss of the species, measures as per mitigation hierarchy will be put in place and BAP will be implemented to ensure potential Project impacts are mitigated. |
| <i>Buteo buteo</i> (Common Buzzard) | <ul style="list-style-type: none"> LC (Global) | <ul style="list-style-type: none"> No | <ul style="list-style-type: none"> N/A | - | <ul style="list-style-type: none"> 1,655 migrating individuals (out of 1,710 in total) recorded in Spring 2019 survey 1,483 individuals recorded in Autumn 2019 survey Global population estimated at 2,100,000-3,700,000 mature individuals. Population trend is stable. Extent of occurrence (breeding/resident) is 33.9 million km² (BirdLife International (2019) Species factsheet: <i>Buteo buteo</i>) Spring 2019 collision risk (with avoidance) is calculated as 11.95 (highest of all species) Autumn 2019 collision risk (with avoidance) is calculated as 13.86 (highest of all species) Reported as highly vulnerable to the effects of potential wind energy developments (BirdLife International (2019) Species factsheet: <i>Buteo buteo</i>) Species not recorded within the scope of the ongoing carcass study at the operating turbines. | <p>Priority Biodiversity Feature</p> <ul style="list-style-type: none"> As per the conservation status and the population recorded to fly over the Project Area, the numerical thresholds for CH/PBF are not triggered. This said, the species has the highest risk of collision assessed for both spring and autumn migration seasons: <ul style="list-style-type: none"> Spring 2019 Collision Risk (with avoidance) is calculated as 11.95 (highest). Autumn 2019 Collision Risk is calculated as 13.86 (highest). Within the scope of the carcass study conducted, no single carcass of the species has been found. As per BirdLife species factsheet, the species is highly vulnerable to the effects of potential wind energy developments. Taking into account the high risk of collision calculated and the high vulnerability of the species, it is considered as a PBF. Throughout the construction phase, bird activity monitoring study will be in place. The collected data will be used to update the collision risk assessment and with the start of the operation phase active turbine management strategy will be implemented including development of shut-down on demand protocol for turbines leading to injury or mortality of bird species so as to ensure that the Project activities do not lead to significant, adverse and irreversible impacts on the species. The mitigation measures are provided in Table 10-54. |

| Biodiversity Feature | Conservation Status | | | | Baseline Conditions | PBF/CH categorization as per IFC thresholds |
|---|---|--|---|---|---|---|
| | IUCN Red List | Istranca Mountains KBA Qualifying Species | EU Habitats D. | EU Birds D. | | |
| | | | | | | <ul style="list-style-type: none"> Species will be monitored as part of avifauna studies and measures as per mitigation hierarchy will be put in place and BAP will be implemented to ensure potential Project impacts are mitigated. |
| <i>Ciconia nigra</i> (Black Stork) | <ul style="list-style-type: none"> LC (Global) | <ul style="list-style-type: none"> No | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> Annex I | <ul style="list-style-type: none"> 50 individuals observed in Spring 2019 of which 11 were recorded as at "risk height/zone" 1 individual recorded in Autumn 2019 Global population estimated at 24,000-44,000 mature individuals. The overall population trend is uncertain. The European population is estimated to be increasing. Extent of occurrence (breeding/resident) is 25.1 million km² (BirdLife International (2019) Species factsheet: <i>Ciconia nigra</i>) IBA trigger species for Igneada Forests IBA and Terkos Basin IBA | <ul style="list-style-type: none"> Not qualify as potential CH trigger or PBF but considered as species of conservation importance as listed under Annex I of the EU Birds Directive and IBA trigger species for Igneada Forests IBA to the north-east of the Project License Area. Species will be monitored as part of avifauna studies and measures as per mitigation hierarchy will be put in place and BAP will be implemented to ensure potential Project impacts are mitigated. The mitigation measures are provided in Table 10-54. |
| <i>Circus macrourus</i> (Pallid Harrier) | <ul style="list-style-type: none"> NT (Global) | <ul style="list-style-type: none"> No | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> Annex I | <ul style="list-style-type: none"> 1 individual recorded at risk height/zone in Spring 2019 survey 2 individuals recorded at risk height/zone in Autumn 2019 survey Global population estimated at 18,000-30,000 mature individuals. The population trend is decreasing. Extent of occurrence (breeding/resident) is 8.44 million km² (BirdLife International (2019) Species factsheet: <i>Pallid harrier</i>) This species breeds primarily in the steppes of Asiatic Russia, Kazakhstan and north-west China. Small populations breed in Azerbaijan, Romania, Turkey and Ukraine. A minority winter in south-east and central Europe, north Africa and the Middle East but most migrate to the Afrotropics and the Indian subcontinent. | <ul style="list-style-type: none"> Not qualify as potential CH trigger or PBF but considered as species of conservation importance as listed under Annex I of the EU Birds Directive and NT by the IUCN. Species will be monitored as part of avifauna studies and measures as per mitigation hierarchy will be put in place and BAP will be implemented to ensure potential Project impacts are mitigated. The mitigation measures are provided in Table 10-54. |
| EU Birds Directive Annex I species recorded at the Project License Area | <ul style="list-style-type: none"> LC (Global) | <ul style="list-style-type: none"> NO | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> Annex I | <p><u>Spring 2019 bird observation results</u> (as given in Table 10-14):</p> <ul style="list-style-type: none"> 91 individuals of Eurasian Sparrowhawk (collision risk = 0.23) 57 individuals of Black Kite (collision risk = 0.53) 52 individuals of Short-toed Snake-Eagle 30 individuals of Eurasian Marsh-Harrier (collision risk = 0.25) 21 individuals of Peregrine Falcon 9 individuals of Booted Eagle 6 individuals of Northern Goshawk 5 individuals of Hen Harrier 3 individuals of White-tailed Eagle 3 individuals of Osprey 2 individuals of Levant Sparrowhawk 1 individual of Dalmatian Pelican 1 individual of Montagu's Harrier <p>Highest collision risk is calculated as 0.53 for Black Kite for Spring 2019.</p> <p><u>Autumn 2019 bird observation results</u> (as given in Table 10-17):</p> <ul style="list-style-type: none"> 180 individuals of Eurasian Sparrowhawk (collision risk = 1.86) 34 individuals of Short-toed Snake-Eagle 32 individuals of Levant Sparrowhawk 25 individuals of Peregrine Falcon (collision risk = 0.05) 23 individuals of Eurasian Marsh-Harrier (collision risk = 0.28) 10 individuals of Osprey 7 individuals of Booted Eagle 4 individuals of White-tailed Eagle | <ul style="list-style-type: none"> As per the thresholds set by the IFC, the observed number of individuals do not qualify as potential CH trigger or PBF but considered as species of conservation importance as listed under Annex I of the EU Birds Directive. Species will be monitored as part of avifauna studies and measures as per mitigation hierarchy will be put in place and BAP will be implemented to ensure potential Project impacts are mitigated. The mitigation measures are provided in Table 10-54. |

| Biodiversity Feature | Conservation Status | | | | Baseline Conditions | PBF/CH categorization as per IFC thresholds |
|---|---------------------|---|----------------|-------------|--|--|
| | IUCN Red List | Istranca Mountains KBA Qualifying Species | EU Habitats D. | EU Birds D. | | |
| | | | | | <ul style="list-style-type: none"> 2 individuals of Hen Harrier 2 individuals of Black Kite 2 individuals of Northern Goshawk 1 individual of Montagu's Harrier <p>Highest collision risk is calculated as 1.86 for Eurasian Sparrowhawk for Autumn 2019.</p> | |
| Bats | | | | | | |
| <i>Pipistrellus pipistrellus</i> (Common Pipistrelle) | • LC | • No | • Annex II | • N/A | <ul style="list-style-type: none"> 1,389 bat passes recorded in Spring 2019 survey 757 bat passes recorded in Summer 2019 survey Spatial behavior: Regional (10-100 km) (<i>EU Action Plan, October 2018</i>) Height of flight (m): up to the rotor, >25, >40-50 in direct flight (<i>EUROBATS, 2014</i>) Max foraging distance (km): 5.1 (<i>EUROBATS, 2014</i>) High Risk of collision (<i>EUROBATS, 2014</i>) Bat mortality recorded as per the carcass results at the operating turbines. | <ul style="list-style-type: none"> Priority biodiversity feature As per the carcass study results, the Project activities are anticipated to lead to irreversible impacts on this species through mortality. Measures as per EUROBATS Guidelines will be put in place including increase of cut-in speed of turbine blades associated with bat injury or mortality to ensure risks are mitigated associated with the turbines leading to injury or mortality of bat species. Verify success of the implementation of the mitigation measures through field monitoring data. |
| <i>Pipistrellus nathusii</i> (Nathusius' Pipistrelle) | • LC | • No | • Annex II | • N/A | <ul style="list-style-type: none"> 352 bat passes recorded in Spring 2019 survey 75 bat passes recorded in Summer 2019 survey Spatial behavior: Long distance (>100 km) Height of flight (m): 1-20 (foraging); 30-50 (migration); >25, foraging above canopy and >40-50 in direct flight (<i>EUROBATS, 2014</i>) Max foraging distance (km): 12 (<i>EUROBATS, 2014</i>) High Risk of collision (<i>EUROBATS, 2014</i>) Bat mortality recorded as per the carcass results at the operating turbines. | <ul style="list-style-type: none"> Priority biodiversity feature As per the carcass study results, the Project activities are anticipated to lead to irreversible impacts on this species through mortality. Measures as per EUROBATS Guidelines will be put in place including increase of cut-in speed of turbine blades associated with bat injury or mortality to ensure risks are mitigated associated with the turbines leading to injury or mortality of bat species. Verify success of the implementation of the mitigation measures through field monitoring data. |
| EU Habitats Directive Annex II and/or KBA qualifying bat species recorded at the Project License Area | | • Yes/No | • Annex II | • N/A | • Istranca Mountains KBA qualifying species | <ul style="list-style-type: none"> Priority biodiversity feature As per the carcass study results, the Project activities are anticipated to lead to irreversible impacts on bat species through mortality. Measures as per EUROBATS Guidelines will be put in place including increase of cut-in speed of turbine blades associated with bat injury or mortality to ensure risks are mitigated associated with the turbines leading to injury or mortality of bat species. Verify success of the implementation of the mitigation measures through field monitoring data. |
| Other Fauna Species | | | | | | |
| <i>Somatochlora borisi</i> (Bulgarian Emerald) | • VU (Global) | • Yes | - | • N/A | <ul style="list-style-type: none"> This species was identified during 2015-2017 fauna surveys conducted by the fauna expert (as part of TurkStream Project) in the vicinity of Pabuc Stream outside the Project License Area. During 2019 field surveys, this species was not observed at the Project Area. As per the IUCN, based on current knowledge of the species it is a strict endemic of the eastern Balkans occurring in the area that crosses the borders of Greece, Bulgaria and Turkey. All 17 known inhabited stream systems fall within a 13,750 km² area within both the Eastern Rhodopes and the northern and southern foot-slopes of the Istranca range, the latter being an eastern continuity of the Rhodopes range. The number of mature individuals are reported as 9,000. The IUCN lists the major | <ul style="list-style-type: none"> The species was identified outside the Project impact area. As the Project activities are not anticipated to lead to significant, adverse and irreversible impacts on this species or to a net reduction in the population of this species over a reasonable time period, the species is not considered as potential CH trigger or PBF. |

| Biodiversity Feature | Conservation Status | | | | Baseline Conditions | PBF/CH categorization as per IFC thresholds |
|--|---------------------|---|----------------------|-------------|--|--|
| | IUCN Red List | Istranca Mountains KBA Qualifying Species | EU Habitats D. | EU Birds D. | | |
| | | | | | threats for this species as residential and commercial development, agriculture and aquaculture, dams and water management, domestic/industrial wastewater effluents. | |
| <i>Talpa levantis</i> (Levantine mole) | • LC (Global) | • Yes | - | • N/A | <ul style="list-style-type: none"> As per the IUCN, <i>Talpa levantis</i> is found along the southern edge of the Black Sea, from southeastern Bulgaria through Turkey through the Caucasus region to the Caspian sea countries of Azerbaijan and Iran. It is found from sea level to 2,400 m in the Caucasus. | <ul style="list-style-type: none"> Not qualify as potential CH trigger but considered as PBF as listed under Istranca Mountains KBA qualifying species. The Project activities are not anticipated to lead to significant, adverse and irreversible impacts on this species. This said, measures as per mitigation hierarchy will be put in place and BAP will be implemented to ensure potential Project impacts are mitigated. |
| <i>Bufo variabilis</i> (Varying toad) | • DD (Global) | • No | • Annex IV | • N/A | <ul style="list-style-type: none"> As per the IUCN, this species is mapped as ranging from Greece, eastwards through Turkey, Cyprus to Syria and Lebanon (and possibly south as fragmented populations through Israel and Jordan through western Saudi Arabia. | <ul style="list-style-type: none"> The global population data is not available to verify whether numerical thresholds of CH are triggered. This species is widespread, and the Project impact area is not considered to hold globally significant concentrations of these species. The Project activities are not anticipated to lead to a net reduction in the population of this species over a reasonable time period. Thus, this fauna species is not considered as potential CH trigger. This said, measures as per mitigation hierarchy will be put in place to ensure fauna elements are not impacted by the Project activities and Project BAP will be implemented to ensure management of the biodiversity features. |
| <i>Rana dalmatina</i> (Agile frog) | • LC (Global) | • No | • Annex IV | • N/A | <ul style="list-style-type: none"> Species observed within the forest areas at the Project Area. As per the IUCN, this species is widely distributed in much of Europe and northern Turkey. In Turkey this species is found in Turkish Thrace and northern parts of Anatolia; further studies are needed to determine the distributions of <i>Rana dalmatina</i> and <i>Rana macrocnemis</i> along the southern Black Sea coastline. It occurs from sea level to elevations approaching 1,700m asl. | <ul style="list-style-type: none"> The global population data is not available to verify whether numerical thresholds of CH are triggered. This species is widespread, and the Project impact area is not considered to hold globally significant concentrations of these species. The Project activities are not anticipated to lead to a net reduction in the population of this species over a reasonable time period. Thus, this fauna species is not considered as potential CH trigger. This said, measures as per mitigation hierarchy will be put in place to ensure fauna elements are not impacted by the Project activities and Project BAP will be implemented to ensure management of the biodiversity features. |
| <i>Emys orbicularis</i> (European pond turtle) | • NT (Global) | • No | • Annex II, Annex IV | • N/A | <ul style="list-style-type: none"> As per the IUCN, the current global population trend is unspecified. | <ul style="list-style-type: none"> Priority biodiversity feature The global population data is not available to verify whether numerical thresholds of CH are triggered. The Project impact area is not considered to hold globally significant concentrations of this species. The Project activities are not anticipated to lead to a net reduction in the population of this species over a reasonable time period. Thus, this fauna species is not considered as potential CH trigger. As per the EU HD Annex II listing classified as PBF. The Project activities are not anticipated to lead to significant, adverse and irreversible impacts on this species. This said, measures as per mitigation hierarchy will be put in place to ensure fauna elements are not impacted by the Project activities and Project BAP will be implemented to ensure management of the biodiversity features. |
| <i>Testudo graeca</i> (Common tortoise) | • VU (Global) | • Yes | • Annex II, Annex IV | • N/A | <ul style="list-style-type: none"> During the 2019 fauna surveys <i>Testudo graeca</i> (Common tortoise) was directly observed on the way to T19 and T32 near the forest roads. | <ul style="list-style-type: none"> Priority biodiversity feature The global population data is not available to verify whether numerical thresholds of CH are triggered. The Project impact area is not considered to hold globally significant concentrations of this species. The Project activities are not anticipated to lead to a net reduction in the population of this species over a reasonable time period. Thus, this fauna species is not considered as potential CH trigger. As per the IUCN category and the EU HD Annex II listing classified as PBF. The Project activities are not anticipated to lead to significant, adverse and irreversible impacts on this species. This said, measures as per mitigation hierarchy will be put in place to ensure fauna elements are not impacted by the Project activities and Project BAP will be implemented to ensure management of the biodiversity features. |
| <i>Testudo hermanni</i> (Hermann's tortoise) | • NT (Global) | • Yes | • Annex II, Annex IV | • N/A | <ul style="list-style-type: none"> During the 2019 fauna surveys <i>Testudo hermanni</i> (Hermann's tortoise) was directly observed on the way to T31 near the forest roads. As per the IUCN, this species occurs in patchily in Mediterranean Europe, from coastal northeastern Spain, through southeastern France, Mallorca (Spain), Menorca (Spain), Corsica (France), Sardinia (including Asinara Island) and Sicily (Italy), the coastal plains of peninsular Italy, coastal Croatia, coastal Bosnia-Herzegovina, coastal | <ul style="list-style-type: none"> Priority biodiversity feature The Project activities are not anticipated to lead to significant, adverse and irreversible impacts on this species. This said, measures as per mitigation hierarchy will be put in place to ensure fauna elements are not impacted by the Project activities and Project BAP will be implemented to ensure management of the biodiversity features. |

| Biodiversity Feature | Conservation Status | | | | Baseline Conditions | PBF/CH categorization as per IFC thresholds |
|--|---------------------|---|----------------|-------------|---|--|
| | IUCN Red List | Istranca Mountains KBA Qualifying Species | EU Habitats D. | EU Birds D. | | |
| | | | | | Montenegro, central and southern Serbia, inland to southwestern Romania, much of Bulgaria, Macedonia, nearly all of Albania, the Greek mainland plus islands from Corfu to Zakynthos, and European Turkey. | |
| <i>Ablepharus kitaibelii</i> (Juniper Skink) | • LC (Global) | • No | • Annex IV | • N/A | <ul style="list-style-type: none"> As per the IUCN, the current global population trend is stable. This species ranges from southern Slovakia and Hungary, through most of Serbia, the most eastern parts of continental Croatia, southern Romania, Bulgaria, Macedonia, Albania (lowland areas), Greece (including many Ionian and Aegean islands) and Turkey (western and central). It is found up to 2,000m asl (in Turkey). | <ul style="list-style-type: none"> The global population data is not available to verify whether numerical thresholds of CH are triggered. This species is widespread, and the Project impact area is not considered to hold globally significant concentrations of this species. The Project activities are not anticipated to lead to a net reduction in the population of this species over a reasonable time period. Thus, this fauna species is not considered as potential CH trigger. This said, measures as per mitigation hierarchy will be put in place to ensure fauna elements are not impacted by the Project activities and Project BAP will be implemented to ensure management of the biodiversity features. |
| <i>Lacerta viridis</i> (Green lizard) | • LC (Global) | • No | • Annex IV | • N/A | <ul style="list-style-type: none"> During the 2019 fauna surveys this species was directly observed nearby the main road to the turbines. As per the IUCN, the current global population trend is decreasing. This species ranges from extreme north-east Italy, eastern Germany, the Czech Republic, Slovakia, Hungary, eastern Austria, and Slovenia, east to Romania, Moldova and southern Ukraine, southwards into the Balkan Peninsula in Croatia (including some Adriatic islands), Bosnia-Herzegovina, Serbia, Montenegro, Macedonia, Albania and Greece (including some Aegean islands, and excluding the Peloponnese). It is also present in Turkey, where it is largely distributed in the area of Marmara and along the Black Sea coastal region. It is found from sea level up to 2,130m asl. | <ul style="list-style-type: none"> The global population data is not available to verify whether numerical thresholds of CH are triggered. This species is widespread, and the Project impact area is not considered to hold globally significant concentrations of this species. The Project activities are not anticipated to lead to a net reduction in the population of this species over a reasonable time period. Thus, this fauna species is not considered as potential CH trigger. This said, measures as per mitigation hierarchy will be put in place to ensure fauna elements are not impacted by the Project activities and Project BAP will be implemented to ensure management of the biodiversity features. |
| <i>Podarcis muralis</i> (Common wall lizard) | • LC (Global) | • No | • Annex IV | • N/A | <ul style="list-style-type: none"> As per the IUCN, the current global population trend is stable. This species is widely distributed in Europe. It ranges from northern Spain, northwards to northern France, southern Belgium, Luxembourg, west-central Germany, much of Austria, southwestern Czech Republic, central Slovakia and central Hungary, and eastwards to central Romania, Bulgaria, most of the Balkans (excluding most of the Aegean islands) and northwestern Anatolia, Turkey. It is found from sea level up to 2,500m asl. | <ul style="list-style-type: none"> The global population data is not available to verify whether numerical thresholds of CH are triggered. This species is widespread, and the Project impact area is not considered to hold globally significant concentrations of this species. The Project activities are not anticipated to lead to a net reduction in the population of this species over a reasonable time period. Thus, this fauna species is not considered as potential CH trigger. This said, measures as per mitigation hierarchy will be put in place to ensure fauna elements are not impacted by the Project activities and Project BAP will be implemented to ensure management of the biodiversity features. |
| <i>Natrix natrix</i> (Grass snake) | • LC (Global) | • No | • Annex IV | • N/A | <ul style="list-style-type: none"> As per the IUCN, the current global population trend is unspecified. | <ul style="list-style-type: none"> The global population data is not available to verify whether numerical thresholds of CH are triggered. This species is widespread, and the Project impact area is not considered to hold globally significant concentrations of this species. The Project activities are not anticipated to lead to a net reduction in the population of this species over a reasonable time period. Thus, this fauna species is not considered as potential CH trigger. This said, measures as per mitigation hierarchy will be put in place to ensure fauna elements are not impacted by the Project activities and Project BAP will be implemented to ensure management of the biodiversity features. |
| <i>Natrix tessellata</i> (Dice snake) | • LC (Global) | • No | • Annex IV | • N/A | <ul style="list-style-type: none"> As per the IUCN, the current global population trend is decreasing. In Europe this species ranges from southern Switzerland, and Germany, eastwards into eastern Austria, Italy (islands excluded), Slovenia, the Czech Republic, Slovakia, Hungary, Romania, Bulgaria, Ukraine and southern Russia, southwards into Croatia (including some Adriatic islands), Bosnia-Herzegovina, Serbia and Montenegro, Macedonia, Albania and Greece (including the islands of Lesbos, Crete, Rhodes and Samos). In Asia the species ranges from Turkey into Syria, Lebanon, Israel, Jordan and northern Egypt (Nile Delta and lower Nile Valley). It also ranges from the Caucasus Mountains of southern Russia, Georgia, Armenia and Azerbaijan eastwards into Iran, Iraq, Yemen, Afghanistan, northern Pakistan, Turkmenistan, Kazakhstan, Tajikistan, Uzbekistan, Kyrgyzstan and northwest China. | <ul style="list-style-type: none"> The global population data is not available to verify whether numerical thresholds of CH are triggered. This species is widespread, and the Project impact area is not considered to hold globally significant concentrations of this species. The Project activities are not anticipated to lead to a net reduction in the population of this species over a reasonable time period. Thus, this fauna species is not considered as potential CH trigger. This said, measures as per mitigation hierarchy will be put in place to ensure fauna elements are not impacted by the Project activities and Project BAP will be implemented to ensure management of the biodiversity features. |
| <i>Vipera ammodytes</i> (Nose-horned Viper) | • LC (Global) | • No | • Annex IV | • N/A | <ul style="list-style-type: none"> As per the IUCN, the current global population trend is decreasing. It is very common in much of its range. This species ranges eastwards from southern Austria and northeastern Italy into the Balkan region and southern and | <ul style="list-style-type: none"> The global population data is not available to verify whether numerical thresholds of CH are triggered. This species is widespread, and the Project impact area is not considered to hold globally significant concentrations of this species. The Project activities are not |

| Biodiversity Feature | Conservation Status | | | | Baseline Conditions | PBF/CH categorization as per IFC thresholds |
|-------------------------------------|---------------------|---|----------------------|-------------|--|---|
| | IUCN Red List | Istranca Mountains KBA Qualifying Species | EU Habitats D. | EU Birds D. | | |
| | | | | | southwestern Romania, Bulgaria, Slovenia, Croatia, Bosnia-Herzegovina, Serbia, Montenegro, Albania, Macedonia and Greece (including a number of the Cyclades Islands). In Turkey it ranges to the west of the Bosphorus. The species ranges from sea level up to 2,500 m asl. | <p>anticipated to lead to a net reduction in the population of this species over a reasonable time period. Thus, this fauna species is not considered as potential CH trigger.</p> <ul style="list-style-type: none"> This said, measures as per mitigation hierarchy will be put in place to ensure fauna elements are not impacted by the Project activities and Project BAP will be implemented to ensure management of the biodiversity features. |
| <i>Canis lupus</i> (Grey wolf) | • LC (Global) | • No | • Annex II, Annex IV | • N/A | <ul style="list-style-type: none"> As per the IUCN, the current global population trend is stable. Wolves occur primarily in wilderness and remote areas, especially in Canada, Alaska and northern USA, Europe, and Asia from about 75°N to 12°N, but they are found also in human-dominated landscapes where there is sufficient prey base and human-caused mortality is low. Distribution is highly dynamic as wolf populations are currently increasing in range and numbers in north-central and western United States and much of Europe. | <ul style="list-style-type: none"> The global population data is not available to verify whether numerical thresholds of CH are triggered. This species is widespread, and the Project impact area is not considered to hold globally significant concentrations of this species. The Project activities are not anticipated to lead to a net reduction in the population of this species over a reasonable time period. Thus, this fauna species is not considered as potential CH trigger. As per the EU HD Annex II listing classified as PBF. The Project activities are not anticipated to lead to significant, adverse and irreversible impacts on this species. This said, measures as per mitigation hierarchy will be put in place to ensure fauna elements are not impacted by the Project activities and Project BAP will be implemented to ensure management of the biodiversity features. |
| <i>Felis silvestris</i> (Wild cat) | • LC (Global) | • No | • Annex IV | • N/A | <ul style="list-style-type: none"> As per the IUCN, the current global population trend is decreasing. The Wild Cat has a very broad distribution, found throughout most of Africa, Europe, and southwest and central Asia into India, China, and Mongolia. | <ul style="list-style-type: none"> The global population data is not available to verify whether numerical thresholds of CH are triggered. This species is widespread, and the Project impact area is not considered to hold globally significant concentrations of this species. The Project activities are not anticipated to lead to a net reduction in the population of this species over a reasonable time period. Thus, this fauna species is not considered as potential CH trigger. This said, measures as per mitigation hierarchy will be put in place to ensure fauna elements are not impacted by the Project activities and Project BAP will be implemented to ensure management of the biodiversity features. |
| <i>Lutra lutra</i> (Eurasian otter) | • NT (Global) | • Yes | • Annex II, Annex IV | • N/A | <ul style="list-style-type: none"> As per the IUCN, the current global population trend is decreasing. | <ul style="list-style-type: none"> The species was identified outside the Project impact area. As the Project activities are not anticipated to lead to significant, adverse and irreversible impacts on this species or to a net reduction in the population of this species over a reasonable time period, the species is not considered as potential CH trigger or PBF. |

The species falling under at least one of the below categories are considered as Species of Conservation Importance as listed in Table 10-50:

- Regional endemic
- VU or EN or CR by the IUCN Red List (Global or National)
- Istranca Mountains KBA qualifying species
- Annex II and/or Annex IV of the EU Habitats Directive
- Annex I of the EU Birds Directive

The screened species are further evaluated as per the PBF/CH thresholds set by IFC PS6 Guidance Note (2019) as given in Table 10-50. The ecology of the species that classify as to potentially trigger CH are provided as given below.

Table 10-51. Ecology of the Confirmed and Potential CH Trigger Species

| Biodiversity Feature | Ecology of the Potential CH Trigger Species |
|---|--|
| Flora Species | |
| <i>Centaurea hermannii</i> | <ul style="list-style-type: none"> • Regional endemic species. Endemic to Turkey and Bulgaria. Distribution map of the species in Turkey is given in Figure 10-4. • Habitats: The species is spread in mixed deciduous forests. It prefers high organic material, Habitat preferences of <i>C. hermannii</i> are different from those other <i>Centaurea</i> species prefer and <i>C. hermannii</i> adapted itself to such clayey-loamy soils containing very low CaCO₃, low Na and high organic material amounts and requesting very low pHs. • Flowers yellow or orange, marginal not radiant. Flowering time is June- July. |
| <i>Crocus olivieri subsp. istanbulensis</i> | <ul style="list-style-type: none"> • Regional endemic. Distribution map of the species is given in Figure 10-4. • Habitats: The species is spread in mixed deciduous forests. It prefers clayey-loamy and clayey soils, neutral and slightly acidic soils which are rich in potassium, organic matter and phosphorus. Flowering time is spring. • <i>Crocus olivieri</i> ssp. <i>istanbulensis</i> is distinguished from other subspecies with leatherlike, wholly and coarsely fibrous corm tunic. |
| Birds | |
| <i>Ciconia ciconia</i> (White Stork) | <ul style="list-style-type: none"> • <u>Habitats</u>: The species inhabits open areas, generally avoiding regions with persistent cold, wet weather or large tracts of tall, dense vegetation such as reedbeds or forests, shallow marshes, lakesides, lagoons, flood-plains, rice-fields and arable land especially where there are scattered trees for roosting. • <u>Behavior</u>: This species is a Palearctic migrant that travels with the assistance of thermal updrafts, the occurrence of which restricts the migratory routes the species can take. For example, the species must avoid long stretches of open water such as the Mediterranean Sea and must therefore bypass it on narrow fronts to the west or east, after which it crosses the Sahara on a broad front. Once within Africa the species becomes considerably nomadic in response to changing abundances of food (e.g. locust swarms). It breeds from February to April in the Palearctic, whilst the tiny breeding population in South Africa breeds from September to November. It nests in loose colonies of up to 30 pairs or solitarily. The main departure from the European breeding grounds occurs in August with the species travelling in large flocks of many thousands of individuals, generally arriving in Africa by early-October. It forages singly, in small groups of 10-50 individuals, or in large flocks if prey is abundant and on its wintering grounds it may gather in large numbers (hundreds or thousands of individuals) at abundant food sources (e.g. locust swarms or grass fires). The species feeds diurnally and roosts communally at night in trees. • Distribution map of the species is given in Figure 10-39. |
| <i>Pernis apivorus</i> (European Honey-Buzzard) | <ul style="list-style-type: none"> • <u>Habitats</u>: It is a forest species, breeding in temperate and boreal woods; it is recorded up to 2,000 m. Nests are built in woods, preferentially in deciduous trees. • <u>Behaviour</u>: This is a migratory species, wintering in in tropical Africa. It leaves its breeding grounds in August and September, returning between April and June. Birds are mostly solitary except on migration, when they flock throughout, gathering in large numbers at preferred crossing points as well as roosting socially. They fly chiefly by soaring, although are able to cross wide stretches of water with flapping flight. The species is diurnal. • Distribution map of the species is given in Figure 10-40. |

The potential impacts of land preparation and construction and operation phases of a WPP project is summarized in Table 10-52.

Table 10-52. Potential Impacts of WPP Projects

| Activity | Potential Impacts |
|---|---|
| Land Preparation and Construction | |
| Removal of topsoil and clearance of vegetation | Habitat loss and fragmentation Damage to/loss of flora species Disturbance to and direct mortality of fauna species (including resident bird species) Disturbance to flora and fauna species due to dust emissions Disturbance to fauna species due to noise emissions Accidental introduction of invasive alien species |
| Movement of construction vehicles/machinery | Damage to/loss of flora species Disturbance to and direct mortality of fauna species Disturbance to flora and fauna species due to dust emissions Disturbance to fauna species due to noise emissions Accidental introduction of invasive alien species |
| Erection of turbines and construction of access roads | Habitat loss and fragmentation Damage to/loss of flora species Disturbance to and direct mortality of fauna species Disturbance to flora and fauna species due to dust emissions Disturbance to fauna species due to noise emissions Accidental introduction of invasive alien species |
| Operation | |
| Operation of turbines | Collision of birds/bats with turbines and blades leading to injury or mortality Bat mortality due to barotrauma caused by rapid air pressure reduction near moving turbine blades Barrier effect for preferred migratory routes/flight corridors of birds/bats Displacement from habitats used by birds/bats Fragmentation of landscape which can reduce the ability of an area to support bird/bat populations |

The sensitivity of the specific receptors is assigned as given in Table 10-53.

Table 10-53. Criteria for Sensitivity of Receptors

| Biodiversity Feature | Sensitivity | Rationale |
|--|-------------|---|
| Internationally Recognized Areas | | |
| Istranca Mountains KBA | High | Internationally recognized area where 12 bat species have been listed as qualifying the KBA |
| Habitats | | |
| EUNIS Habitat G1.A: Meso- and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland | Medium | Widespread in Marmara and Black Sea Regions of Turkey. Total of 25.9 ha will be directly affected by the construction of the turbines (13.4 ha) and the internal site access roads (12.5 ha). |
| EUNIS Habitat E2.1: Permanent mesotrophic pastures and aftermath-grazed meadows | Low | Limited within the Project License Area, not in the Project footprint. Develop in forest openings and are feeding areas of livestock. |

| Biodiversity Feature | Sensitivity | Rationale |
|--|-------------|---|
| Nests/breeding/roosting sites of small mammals, birds and bats within the Project License Area | High | Potential to impact high sensitivity fauna species |
| Temporary water bodies where amphibians can reside and breed within the Project License Area | Medium | Seasonally formed temporary water bodies All amphibians observed are LC by the IUCN |
| Flora Species | | |
| <i>Centaurea hermannii</i> <i>Crocus olivieri</i> subsp. <i>istanbulensis</i> | High | - Potential CH trigger (EN as per the IUCN) - Regional endemic |
| <i>Cirsium baytopae</i> | High | Priority Biodiversity Feature Regional endemic species |
| <i>Euphorbia amygdaloides</i> var. <i>robbiae</i> | High | Regional endemic species |
| <i>Ferulago confuse</i> <i>Symphytum tuberosum</i> subsp. <i>Nodosum</i> | Medium | Priority Biodiversity Feature |
| Other flora species identified at the Project impact area | Low | Widespread, no endemism, do not trigger PBF/CH |
| Fauna Species | | |
| <u>Reptiles</u> <i>Testudo graeca</i> (Common tortoise) <i>Testudo hermanni</i> (Hermann's tortoise) | High | Priority Biodiversity Feature Istranca Mountains KBA qualifying species |
| <u>Reptiles</u> <i>Emys orbicularis</i> (European pond turtle) | Medium | Priority Biodiversity Feature |
| <u>Mammals</u> <i>Talpa levantis</i> (Levantine mole) | High | Priority Biodiversity Feature Istranca Mountains KBA qualifying species Nest inside soil |
| Other terrestrial fauna species identified at the Project impact area | Low | Other species identified and that do not meet the above conditions |
| Birds | | |
| <i>Ciconia ciconia</i> (White Stork) | High | CH Criteria (iv) trigger (more than 1% of the global population is recorded to fly over the Project Area in Spring 2019) - 7,459 migrating individuals recorded in Spring 2019 - Global population estimated at 700,000-704,000 individuals (BirdLife International (2019) Species factsheet: <i>Ciconia ciconia</i>) - Spring 2019 Collision Risk (with avoidance) is calculated as 11.74 (2nd highest). Autumn 2019 Collision Risk is calculated as 0. Ignea Forests IBA to the North of the Project License Area and Bosphorus IBA are associated IBAs of the species (BirdLife International (2019) Species factsheet: <i>Ciconia ciconia</i>) Annex I of the EU Birds Directive |
| <i>Pernis apivorus</i> (European Honey-Buzzard) | High | CH Criteria (iv) trigger (more than 1% of the global population is recorded to fly over the Project Area in Spring 2019) |

| Biodiversity Feature | Sensitivity | Rationale |
|---|-------------|---|
| | | <ul style="list-style-type: none"> - 3,094 migrating individuals recorded in Spring 2019 - Global population estimated at 280,000-420,000 individuals (BirdLife International (2019) Species factsheet: <i>Pernis apivorus</i>) - Spring 2019 Collision Risk (with avoidance) is calculated as 4.71 (3rd highest). Autumn 2019 Collision Risk is calculated as 0.36. - Reported as very highly vulnerable to the effects of potential wind energy developments (BirdLife International (2019) Species factsheet: <i>Pernis apivorus</i>) |
| <i>Buteo buteo</i> (Common Buzzard) | High | <p>Priority Biodiversity Feature</p> <ul style="list-style-type: none"> - 1,655 migrating individuals recorded in Spring 2019 and 1,483 individuals recorded in Autumn 2019 survey - Global population estimated at 2,100,000-3,700,000 mature individuals. Population trend is stable. Extent of occurrence (breeding/resident) is 33.9 million km² (BirdLife International (2019) Species factsheet: <i>Buteo buteo</i>) - Spring 2019 Collision Risk (with avoidance) is calculated as 11.95 (highest). Autumn 2019 Collision Risk is calculated as 13.86 (highest). |
| <i>Aquila heliaca</i> (Imperial Eagle) | Medium | <p>Priority Biodiversity Feature</p> <ul style="list-style-type: none"> - VU by the IUCN - Annex I of the EU Birds Directive - 2 individuals recorded |
| <i>Ciconia nigra</i> (Black Stork) | Medium | <ul style="list-style-type: none"> - IBA trigger species for Igneada Forests KBA and Terkos Basin KBA - LC by the IUCN - Annex I of the EU Birds Directive - 39 migratory species observed in Spring 2019 of which 11 were at recorded as at risk height/zone |
| <i>Circus macrourus</i> (Pallid Harrier) | Medium | <ul style="list-style-type: none"> - NT by the IUCN - Annex I of the EU Birds Directive - 1 migratory species recorded at risk height/zone |
| Other migratory species recorded that fall under EU Birds Directive Annex I | Medium | <ul style="list-style-type: none"> - Annex I of the EU Birds Directive |
| Other recorded migratory and resident bird species | Low | <ul style="list-style-type: none"> - LC by the IUCN |
| Bats | | |
| <i>Pipistrellus pipistrellus</i> (Common Pipistrelle) | High | <ul style="list-style-type: none"> - LC by the IUCN - Annex II of the EU Habitats Directive - High Risk of collision - Not KBA qualifying - 1,389 bat passes in Spring 2019 - 757 bat passes in Summer 2019 - Spatial behavior: Regional (10-100 km) |
| <i>Pipistrellus nathusii</i> (Nathusius' Pipistrelle) | High | <ul style="list-style-type: none"> - LC by the IUCN - Annex II of the EU Habitats Directive - High Risk of collision - Not KBA qualifying - 352 bat passes in Spring 2019 - 75 bat passes in Summer 2019 |

| Biodiversity Feature | Sensitivity | Rationale |
|---|-------------|--|
| | | - Spatial behavior: Long distance (>100 km) |
| EU Habitats Directive Annex II and/or KBA qualifying bat species recorded at the Project License Area | High | - Istranca Mountains KBA qualifying species - Annex II and/or Annex IV of the EU Habitats Directive |

10.3.1. Land Preparation and Construction Phase

The total footprint of the Capacity Extension Project will be 25.9 ha including turbines and the internal site access roads as given below (the detailed calculation is given in Chapter 5 on Land Use).

| Project Units | Area of Capacity Extension Project Units (ha) | EUNIS Habitat Code |
|----------------------------|--|--------------------|
| Turbines | 13.4 | G1.A |
| Internal Site Access Roads | 12.5 | G1.A |
| Substation | 0.0 | - |
| Total | 25.9 | |

The potential impacts of the Project during land preparation and construction phase will stem from the following Project activities:

- Removal of topsoil and clearance of vegetation
- Movement of construction vehicles/machinery
- Erection of turbines and construction of access roads

These activities will lead to the following potential impacts:

- Habitat loss and fragmentation
- Loss of flora species
- Disturbance to and direct mortality of fauna species (including resident bird species)
- Disturbance to flora and fauna species due to dust emissions
- Disturbance to fauna species due to noise emissions
- Introduction of invasive alien species

The construction activities have the potential to disturb the nests/breeding/roosting sites of fauna species. Some small mammal species identified at the Project Area are nesting inside the soil. Thus, special care is to be taken during construction works to avoid impacts on these species.

Also, the seasonal and temporary water bodies observed during the wet season inhabit amphibian species and thus care should be taken not to disturb such areas during construction works. It should be noted that, during field surveys in summer of 2019 these temporary water bodies were observed to be dry.

The impact assessment and proposed mitigation measures as per the mitigation hierarchy (i.e. avoidance, minimization, rehabilitation/restoration, offset), for the management of potential impacts are summarized in Table 10-54.

10.3.2. Operation Phase

The potential impacts of the Project during the operation phase will be on bird and bat species. The specific location and the species associated with the site are important in evaluating the overall impacts.

The bird activity across the Project License Area is under assessment since March 2019 to understand the bird distribution and bird abundance. Both Vantage Point surveys and breeding bird surveys are being carried out to assess both the collision risks leading to mortality and displacement from foraging areas (breeding/non-breeding) and breeding/roosting areas. Bird activity study and collision risk assessment for Spring 2019 is finalized and reported in Section 10.2.6.

The bat activity across the Project License Area is under assessment since Spring 2019 through static acoustic and transect acoustic surveys. The results for Spring 2019 and Summer 2019 are presented in Section 10.2.7.

For the operational turbines of the existing Kiyikoy WPP bird and bat carcass study is completed for Spring 2019 and the results are reported in Section 10.2.8.

The potential impacts of WPP projects on bird/bat species include:

- Collision of birds/bats with turbines and blades leading to injury or mortality
- Bat mortality due to barotrauma caused by rapid air pressure reduction near moving turbine blades
- Barrier effect for preferred migratory routes/flight corridors of birds/bats
- Displacement from habitats used by birds/bats
- Fragmentation of landscape which can reduce the ability of an area to support bird/bat populations

Mitigation measures, as per the mitigation hierarchy (i.e. avoidance, minimization, rehabilitation/restoration, offset), for the management of potential impacts are summarized in Section 10.3.4. A project specific Biodiversity Action Plan (BAP) in line with EBRD PR6 will be in place applicable to all phases of the Project. BAP will include detailed biodiversity monitoring program and specific actions for the biodiversity features of conservation importance.

10.3.3. Closure Phase

During the closure phase, the Project units will be decommissioned and dismantled as per the state-of-the-art technologies and in line with the future legislative requirements in force. The footprints of the operational Project units (e.g. turbine foundations, access roads, substation site, etc.) will be rehabilitated in consultation with the governmental authorities and local communities. The timing of the closure phase activities is to be planned to ensure avoidance or minimization of disturbance and impacts on habitats of fauna species.

10.3.4. Impact Significance, Management and Residual Impacts

The potential Project impacts, proposed mitigation measures and residual impact significances are summarized in Table 10-54.

Table 10-54. Impacts, Proposed Mitigation Measures and Residual Impacts (Biodiversity)

| Impact Description | Receptor | Impact Identification (extent, reversibility, duration, frequency) | Impact Magnitude | Sensitivity/ Value of Receptor | Impact Significance (prior to mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--|---|--|------------------|--------------------------------|---|--|------------------------------|
| Land Preparation and Construction Phase | | | | | | | |
| (A) Habitat loss and fragmentation due to removal of topsoil and clearance of vegetation | EUNIS Code G1.A Habitat (total of 25.9 ha as the Project footprint) and vegetation | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | Medium | Moderate | <ul style="list-style-type: none"> Avoid destruction of vegetation for purposes other than planned Project activities Topsoil stripped will be stored and further used for reinstatement and rehabilitation to avoid loss of flora species of conservation importance will be managed through ex-situ and where required in-situ measures | Minor |
| | Nests/breeding/roosting sites of small mammals, birds and bats within the Project License Area | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | High | Major | <ul style="list-style-type: none"> Clear vegetation before nesting seasons of animals As per the breeding bird survey results, ensure resident birds are not impacted by construction activities through minimizing the area of construction to limit habitat loss and fragmentation, proper disposal of on-site waste, restore disturbed areas and apply other good construction techniques. Nests of small mammals identified during field surveys to be checked by biodiversity experts at pre-construction and experts to be involved if removal of nests/animals are required. Train on-site employees to be aware of nests, avoid any displacement without an expert opinion on the status of the nests | Moderate |
| | Temporary water bodies where amphibians can reside and breed within the Project License Area | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | Medium | Moderate | <ul style="list-style-type: none"> Temporary water bodies identified at the Project Area to be checked by biodiversity experts at pre-construction phase and depending on the construction program at or around such areas measures to avoid impacts on fauna elements to be put in place including carriage of susceptible fauna elements to suitable habitats or rescheduling works around such temporary water bodies. During construction phase care should be taken to avoid direct impact on temporary water bodies through disturbance/contamination Train on-site employees to avoid any impacts on the temporary water bodies | Minor |
| (B) Damage to/loss of flora species due to Project construction activities (as listed in Table 10-52) | Potential CH trigger (EN + Regional Endemic) <i>Centaurea hermannii</i> <i>Crocus olivieri subsp. Istanbulensis</i> | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | High | Major | <ul style="list-style-type: none"> Careful siting of temporary facilities to avoid direct impact As an ex-situ measure seed collection completed, seeds are sent to Turkey Seed Gene Bank. As an in-situ measure, in October-November 2019, flora salvaging will take place at areas directly affected by Project activities (around T28, T29, T32 and T33) by an expert botanist and be translocated to suitable habitats near the operating turbines to be identified by the expert botanist. The success of the translocation will further be monitored in May-June 2020 as part of the Project BAP. For the flora species (<i>Crocus olivieri subsp. Istanbulensis</i>) bulbs will be removed together with the topsoil during topsoil stripping (the topsoil acts as a gene bank) at the identified locations within the Project Area, properly store the topsoil and reinstate in line with the Project BAP. | Minor |
| | <u>Regional endemic species:</u> <i>Cirsium baytopae</i> <i>Euphorbia amygdaloides var. robbiae</i> | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | High | Major | <ul style="list-style-type: none"> Careful siting of temporary facilities to avoid direct impact As an ex-situ measure seed collection completed, seeds are sent to Turkey Seed Gene Bank. | Minor |
| | <u>Priority Biodiversity Features</u> <i>Ferulago confuse</i> <i>Symphytum tuberosum subsp. Nodosum</i> | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | Medium | Moderate | <ul style="list-style-type: none"> Careful siting of temporary facilities to avoid direct impact As an ex-situ measure seed collection completed for <i>Ferulago confuse</i> and seeds are sent to Turkey Seed Gene Bank. As the flowering period (May-June 2019) of <i>Symphytum tuberosum subsp. Nodosum</i> was very wet seed collection to be further conducted as per the Project BAP. | Minor |

| Impact Description | Receptor | Impact Identification (extent, reversibility, duration, frequency) | Impact Magnitude | Sensitivity/ Value of Receptor | Impact Significance (prior to mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--|---|---|------------------|--------------------------------|---|--|------------------------------|
| | Other flora species identified at the Project impact area | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | Low | Minor | <ul style="list-style-type: none"> Careful siting of temporary facilities to avoid direct impacts | Minor |
| (C) Disturbance to and direct mortality of fauna species due to Project construction activities (as listed in Table 10-52) | <u>Istranca Mountains KBA qualifying species + Priority Biodiversity Feature</u> | - Local (within License Area) - Reversible/Irreversible - Short-term (less than 1 year) - Intermittent | High | High | Major | <ul style="list-style-type: none"> Speed limits will be implemented for construction vehicles. Workers to be trained for avoidance of direct/indirect impacts on fauna elements Fauna species with low mobility to be relocated to suitable habitats by fauna experts | Minor |
| | <i>Testudo graeca</i> (Common tortoise) <i>Testudo hermanni</i> (Hermann's tortoise) <u>Priority Biodiversity Feature</u> | - Local (within License Area) - Reversible/Irreversible - Short-term (less than 1 year) - Intermittent | High | Medium | Major | | Minor |
| | <i>Emys orbicularis</i> (European pond turtle) | - Short-term (less than 1 year) - Intermittent | | | | | |
| | <u>Istranca Mountains KBA qualifying species + Nest inside soil</u> | - Local (within License Area) - Reversible/Irreversible - Short-term (less than 1 year) - Intermittent | High | High | Major | | Minor |
| | <u><i>Talpa levantis</i> (Levantine mole)</u> | - Intermittent | | | | | |
| | Other terrestrial fauna species identified at the Project impact area | - Local (within License Area) - Reversible/Irreversible - Short-term (less than 1 year) - Intermittent | High | Low | Moderate | | Minor |
| (D) Disturbance to flora/fauna species due to emissions of dust/noise from Project construction activities (as listed in Table 10-52) | <u>Potential CH trigger</u> (EN + Regional Endemic) | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | High | Major | <ul style="list-style-type: none"> Implement dust and noise mitigation measures to minimize impacts Implement species-specific ex-situ and in-situ measures for flora species at pre-construction phase as per Project BAP. | Minor |
| | <i>Centaurea hermannii</i> <i>Crocus olivieri</i> subsp. <i>istanbulensis</i> <u>Regional endemic species:</u> | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | High | Major | | Minor |
| | <i>Cirsium baytopae</i> <i>Euphorbia amygdaloides</i> var. <i>robbiae</i> | - Short-term (less than 1 year) - Intermittent | | | | | |
| | <u>Priority Biodiversity Features</u> | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | Medium | Moderate | | Minor |
| | <i>Ferulago confuse</i> <i>Symphytum tuberosum</i> subsp. <i>Nodosum</i> | - Short-term (less than 1 year) - Intermittent | | | | | |
| | Other flora species identified at the Project impact area | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | Low | Minor | <ul style="list-style-type: none"> Implement dust and noise mitigation measures to minimize impacts on fauna species At pre-construction phase areas potentially susceptible to construction impacts to be monitored and identified by fauna experts especially for fauna elements with low mobility to ensure their relocation to suitable habitats if needed Workers to be trained for avoidance of direct/indirect impacts on fauna elements | Minor |
| | <u>Istranca Mountains KBA qualifying species + Priority Biodiversity Feature</u> | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | High | Major | | Minor |
| | <i>Testudo graeca</i> (Common tortoise) <i>Testudo hermanni</i> (Hermann's tortoise) <u>Priority Biodiversity Feature</u> | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | Medium | Moderate | | Minor |
| | <i>Emys orbicularis</i> (European pond turtle) | - Short-term (less than 1 year) - Intermittent | | | | | |
| | | | | | | | |

| Impact Description | Receptor | Impact Identification (extent, reversibility, duration, frequency) | Impact Magnitude | Sensitivity/ Value of Receptor | Impact Significance (prior to mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--|--|---|------------------|--------------------------------|---|---|------------------------------|
| | <u>Istranca Mountains KBA qualifying species + Nest inside soil</u> | - Local (within License Area) - Reversible - Short-term (less than 1 year) | Medium | High | Major | | Minor |
| | <u>Talpa levantis</u> (Levantine mole) | - Intermittent | | | | | |
| | Other terrestrial fauna species identified at the Project impact area | - Local (within License Area) - Reversible - Short-term (less than 1 year) - Intermittent | Medium | Low | Minor | | Negligible |
| (E) Accidental introduction of invasive alien species | EUNIS Habitat G1.A: Meso- and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland | - Local (within License Area) - Reversible/irreversible - Short-term (less than 1 year) - One-off/rare | High | Medium | Major | Undertake a pathway analysis to identify existing and future potential pathways of IAS invasion relevant to the project. This would consider the project location, the likely sources of equipment or materials for the project and what species (both native and IAS) are present at those source sites which could become IAS at the project site. | Minor |
| | EUNIS Habitat E2.1: Permanent mesotrophic pastures and aftermath-grazed meadows | - Local (within License Area) - Reversible/irreversible - Short-term (less than 1 year) - One-off/rare | High | Low | Moderate | The presence and spread of invasive flora species will be monitored as part of BAP monitoring during the vegetative season, with attention to disturbed areas. If spreading of invasive species is observed, an appropriate eradication program will be developed and implemented | Minor |
| Operation Phase | | | | | | | |
| (A) Collision of birds/bats with turbines and blades leading to injury or mortality | <i>Ciconia ciconia</i> (White Stork) | - Local to wide (outside License Area) - Irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | High | High | Major | Implement habitat management and maintenance practices at the site level to reduce the risk of attracting collision-prone birds such as avoiding establishing ponds or waste sites within the development. Turbines and infrastructures will not offer perching or breeding opportunities for birds. | Minor/Negligible |
| | <i>Pernis apivorus</i> (European Honey-Buzzard) | - Local to wide (outside License Area) - Irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | High | High | Major | Continue bird activity monitoring throughout the construction phase of the Project including the first two years of operation, the monitoring would be continued by the Independent Ornithological Expert (IOE). Update the collision risk assessment for migratory and resident bird species as per the collected field data by end of 2020. | Minor/Negligible |
| | <i>Buteo buteo</i> (Common Buzzard) | - Local to wide (outside License Area) - Irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | High | High | Major | Continue carcass study at the existing WPP and extend it to the Capacity Extension Project the first two years of operation and then to be executed by the IOE throughout the loan duration of the Project. | Minor/Negligible |
| | <i>Aquila heliaca</i> (Imperial Eagle) | - Local to wide (outside License Area) - Irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | High | Medium | Major | In line with Before-After Impact Control approach, depending on the outcome of the field data and updated risk assessment at post-construction phase, implement active turbine management strategy including development of shut-down on demand protocol to ensure risks are mitigated associated with the turbines leading to injury or mortality of bird species, if necessary. Verify through field monitoring data the performance of active turbine management strategy. | Minor/Negligible |
| | <i>Ciconia nigra</i> (Black Stork) | - Local to wide (outside License Area) - Irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | High | Medium | Major | The monitoring programme should include an adaptive management component and inform the need for additional or modified mitigation measures to avoid and/or reduce, or at a last resort offset/compensate for, impacts to birds. | Minor/Negligible |
| | <i>Circus macrourus</i> (Pallid Harrier) | - Local to wide (outside License Area) - Irreversible | High | Medium | Major | | Minor/Negligible |
| | | | | | | | |

| Impact Description | Receptor | Impact Identification (extent, reversibility, duration, frequency) | Impact Magnitude | Sensitivity/ Value of Receptor | Impact Significance (prior to mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--|---|---|------------------|--------------------------------|---|--|------------------------------|
| | | - Long-term (more than 3 years) - Recurrent (seasonal) | | | | | |
| | Other migratory species recorded that fall under EU Birds Directive Annex I | - Local to wide (outside License Area) - Irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | High | Medium | Major | | Minor/Negligible |
| | Other recorded migratory and resident bird species | - Local to wide (outside License Area) - Irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | High | Low | Moderate | | Minor/Negligible |
| | <i>Pipistrellus pipistrellus</i> (Common Pipistrelle) | - Local to wide (outside License Area) - Irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | High | High | Major | Continue bat activity monitoring throughout construction phase of the Project including the first two years of operation, through the Independent Ornithological Expert (IOE). | Moderate/Minor |
| | <i>Pipistrellus nathusii</i> (Nathusius' Pipistrelle) | - Local to wide (outside License Area) - Irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | High | High | Major | Bat activity monitoring should be conducted between March and October and focus on monitoring at ground level and at height (if it is technically possible to attach it to the turbine) with appropriate automatic bat detectors in order to determine the use of the airspace by different bat species. Transects monitoring can be suspended as it does not provide data useful to inform the mitigation strategy. | Moderate/Minor |
| | EU Habitats Directive Annex II and/or KBA qualifying bat species recorded at the Project License Area | - Local to wide (outside License Area) - Irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | High | High | Major | <p>Cut-in wind speed will be set in the first instance at 5 m/s for the 10 existing wind turbines with highest bat mortality between April and October until the results of the monitoring studies will allow to define more specific measures in terms of turbines involved, periods and cut-in wind speed.</p> <p>The installation of bat deterrents on existing turbines will be assessed and decided based on a cost-benefit analysis. The bat studies will allow to understand the effectiveness of the bat detectors on the existing turbines and to determine if they are a suitable alternative to the implementation of cut-in wind speed on the existing and new wind turbines.</p> <p>Continue carcass monitoring at the existing WPP and extend it to the Capacity Extension Project the first two years of operation between March and October. Continuation of the carcass monitoring by the IOE throughout the loan duration of the Project will be decided according to the results of the first two years of operation.</p> <p>Turbines and infrastructures will not offer perching or breeding opportunities for bats.</p> <p>Free-wheeling i.e. free spinning of rotors under low wind conditions with no power generation, will be eliminated to the extent feasible in the case of the existing turbines.</p> <p>Additional conservation measures for bat species will be developed in case the results of monitoring of bat mortality will show significant effects. These measures might include support to bats conservation off-site like roosts protection and enhancement, and awareness raising at the local and national level in cooperation with local qualified experts.</p> | Moderate/Minor |
| (B) Bat mortality due to barotrauma caused by | <i>Pipistrellus pipistrellus</i> (Common Pipistrelle) | - Local to wide (outside License Area) | High | High | Major | | Moderate/Minor |

| Impact Description | Receptor | Impact Identification (extent, reversibility, duration, frequency) | Impact Magnitude | Sensitivity/ Value of Receptor | Impact Significance (prior to mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--|---|--|------------------|--------------------------------|---|--|------------------------------|
| rapid air pressure reduction near moving turbine blades | | - Irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | | | | Continue bat activity monitoring throughout construction phase of the Project including the first two years of operation, through the Independent Ornithological Expert (IOE). | |
| | <i>Pipistrellus nathusii</i> (Nathusius' Pipistrelle) | - Local to wide (outside License Area) - Irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | High | High | Major | Bat activity monitoring should be conducted between March and October and focus on monitoring at ground level and at height (if it is technically possible to attach it to the turbine) with appropriate automatic bat detectors in order to determine the use of the airspace by different bat species. Transects monitoring can be suspended as it does not provide data useful to inform the mitigation strategy. | Moderate/Minor |
| | EU Habitats Directive Annex II and/or KBA qualifying bat species recorded at the Project License Area | - Local to wide (outside License Area) - Irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | High | High | Major | <p>Cut-in wind speed will be set in the first instance at 5 m/s for the 10 existing wind turbines with highest bat mortality between April and October until the results of the monitoring studies will allow to define more specific measures in terms of turbines involved, periods and cut-in wind speed.</p> <p>The installation of bat deterrents on existing turbines will be assessed and decided based on a cost-benefit analysis. The bat studies will allow to understand the effectiveness of the bat detectors on the existing turbines and to determine if they are a suitable alternative to the implementation of cut-in wind speed on the existing and new wind turbines.</p> <p>Continue carcass monitoring at the existing WPP and extend it to the Capacity Extension Project the first two years of operation between March and October. Continuation of the carcass monitoring by the IOE throughout the loan duration of the Project will be decided according to the results of the first two years of operation.</p> <p>Turbines and infrastructures will not offer perching or breeding opportunities for bats.</p> <p>Free-wheeling i.e. free spinning of rotors under low wind conditions with no power generation, will be eliminated to the extent feasible in the case of the existing turbines.</p> <p>Additional conservation measures for bat species will be developed in case the results of monitoring of bat mortality will show significant effects. These measures might include support to bats conservation off-site like roosts protection and enhancement, and awareness raising at the local and national level in cooperation with local qualified experts.</p> | Moderate/Minor |
| (C) Barrier effect for preferred migratory routes/flight corridors of birds/bats, displacement from habitats used by birds/bats, fragmentation of landscape which can reduce the ability of an area to support bird/bat populations | <i>Ciconia ciconia</i> (White Stork) | - Local to wide (outside License Area) - Reversible/irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | Medium | High | Major | Impacts are variable and are likely to be species, site and season specific including presence of other wind farms in the vicinity of the Project Area. Implement habitat management and maintenance practices at the site level to reduce the risk of attracting collision-prone birds such as avoiding establishing ponds or waste sites within the development. | Moderate/Minor |
| | <i>Pernis apivorus</i> (European Honey-Buzzard) | - Local to wide (outside License Area) - Reversible/irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | Medium | High | Major | Turbines and infrastructures will not offer perching or breeding opportunities for birds. | Moderate/Minor |
| | <i>Buteo buteo</i> (Common Buzzard) | - Local to wide (outside License Area) - Reversible/irreversible - Long-term (more than 3 years) | Medium | High | Major | The Before-After Control Impact approach should be used, and post-construction monitoring data compared with pre-construction will feed into development of adaptive management strategies that will be further integrated into Project BAP and implemented. | Minor |

| Impact Description | Receptor | Impact Identification (extent, reversibility, duration, frequency) | Impact Magnitude | Sensitivity/ Value of Receptor | Impact Significance (prior to mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--------------------|---|--|------------------|--------------------------------|---|------------------------------|------------------------------|
| | | - Recurrent (seasonal) | | | | | |
| | <i>Aquila heliaca</i> (Imperial Eagle) | - Local to wide (outside License Area) - Reversible/irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | Medium | Medium | Moderate | | Minor |
| | <i>Ciconia nigra</i> (Black Stork) | - Local to wide (outside License Area) - Reversible/irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | Medium | Medium | Moderate | | Minor |
| | <i>Circus macrourus</i> (Pallid Harrier) | - Local to wide (outside License Area) - Reversible/irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | Medium | Medium | Moderate | | Minor |
| | Other migratory species recorded that fall under EU Birds Directive Annex I | - Local to wide (outside License Area) - Reversible/irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | Medium | Medium | Moderate | | Minor |
| | Other recorded migratory and resident bird species | - Local to wide (outside License Area) - Reversible/irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | Medium | Low | Minor | | Minor/Negligible |
| | <i>Pipistrellus pipistrellus</i> (Common Pipistrelle) | - Local to wide (outside License Area) - Reversible/irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | Medium | High | Major | | Moderate/Minor |
| | <i>Pipistrellus nathusii</i> (Nathusius' Pipistrelle) | - Local to wide (outside License Area) - Reversible/irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | Medium | High | Major | | Moderate/Minor |
| | EU Habitats Directive Annex II and/or KBA qualifying bat species recorded at the Project License Area | - Local to wide (outside License Area) - Reversible/irreversible - Long-term (more than 3 years) - Recurrent (seasonal) | Medium | High | Major | | Moderate/Minor |

11. VISUAL IMPACT ASSESSMENT

The existing components of the Kiyikoy WPP has already resulted in changes in the visual environment. The Capacity Extension Project will result in temporary visual changes during the construction phase, while the additional turbines to be erected and operated will result in further changes in the visual environment. This Chapter assesses the cumulative visual impact of the Kiyikoy WPP on the selected receptors.

11.1. Project Standards

The management of the visual aspects of the Project is based on the Scottish Natural Heritage's (SNH) Guidance on Siting and Designing Wind Farms in the Landscape (*SNH, February 2017*) and the Guidelines for Landscape and Visual Impact Assessment (*UK Landscape Institute, Institute for Environmental Management and Assessment-IEMA, 2013. 3rd Edition*) to the extent possible.

11.2. Baseline Conditions

Kiyikoy WPP is located at the coast of Black Sea within an undulating landscape. The elevations (asl) within the License Area range between 20 m (southern part) and 135 m (north-western part). The majority of the License Area is situated on state forest land, where there are patches of parcels registered as agricultural, pasture and raw soil.

The License Area is located approximately 65 km (air distance) southeast of Kirklareli city centre and 25 km northeast of Vize district centre. The closest settlement to the License Area is Kiyikoy town. Kislacik, Aksicim and Hamidiye are other villages located within approximately 5 km distance.

Access to the Project site is provided through the centre of Saray district located in Tekirdag province. From Saray district centre, Saray-Kiyikoy road is followed for about 25 km, which diverges to the north in the direction of the existing Kiyikoy WPP. From this point, the stabilised forest road is followed for about 12 km to access the site through the existing main access road of the operational Kiyikoy WPP. There are other local roads leading to Kiyikoy, which are used by the local people as well as the visitors of the area. The License Area also comprises existing internal site access roads built for the existing Kiyikoy WPP. The substation and the Energy Transmission Line (ETL) of the existing Kiyikoy WPP are other built structures within the License Area.

The License Area corresponds to mainly Forest Products Production Function, partly Hydrological Function and very finitely Nature Protection Function. Forests with economic functions serve for forestry product production. Meso-and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland (EUNIS Code G1.A) is the dominant habitat within the License Area. There are also limited patches of permanent mesotrophic pastures (EUNIS Code E2.1) within the License Area.

The Pabucdere Dam Reservoir (operated by Istanbul Water and Sewerage Administration-ISKI for drinking water supply purposes) is located next to the western boundary of the License Area, approximately 1.4 km south-southwest of the closest turbine (T31).

Detailed information on the legally protected areas and key biodiversity areas (KBA) in the vicinity of the License Area is provided in Chapter 10 ("Biodiversity"). The Pabucdere 1st Degree Natural Protection Site (Sit), located approximately 300 m south-southeast, is the closest legally protected area outside the License Area. The Kasatura Bay Nature Protection Area (4.8 km southeast), Igneada Longoz Forests National Park (8 km north), Camlikoy Nature Park (8 km south) and Istanbul Catalca Wildlife Development Area (9.2 km south) are other legally protected areas in the surroundings of the License Area. The nearest lake to the Project License Area is Saka Lake at a distance of approximately 11 km.

There is one registered archaeological and one non-registered potential site identified within the Project License Area. The registered Cingene İskelesi Mevkii Necropolis and Church Remains is a 3rd Degree Archaeological Site. The non-registered potential site within the License Area has been newly discovered³¹ as part of the Project's ESIA studies and has been referred to as "Kiremitlimandira" by the cultural heritage team (see Chapter 15 on "Cultural Heritage" for detailed information and assessment).

The License Area falls within the boundaries of Istranca Mountains KBA³². Igneada Forests Important Bird Area (IBA) and Terkos Basin IBA are other internationally recognised areas in the vicinity of the License Area.

As discussed in Chapter 16 "Cumulative Impact Assessment", there are multiple existing and future WPP Projects in the wider region (within 30 km from the boundaries of the License Area), which could appear as dominant visual amenities of the area. Amongst the WPP projects, YEKA Kiyikoy WPP (offshore) and YEKA Kırklareli WPP (406 MWe onshore) projects (categorised as hypothetical projects in Chapter 16) would be the most dominant WPP characteristics in the region upon their commissioning. The Landfall Terminal and the associated facilities of the TurkStream Project are also located at the southern/south-eastern boundary of Kiyikoy WPP License Area, between the WPP and Kiyikoy town centre. As of September 2019, construction works of the TurkStream Project are ongoing and almost 95% completed. From the receiving terminal in Kiyikoy, one of the two underground onshore pipelines will connect to the existing Turkish gas network at Luleburgaz. The other pipeline will continue to the Turkish-European border, where it ends. Following the completion of the construction activities, the above ground facilities of the TurkStream Project (landfall terminal, intake facilities) and access roads will also be key visual amenities near Kiyikoy town.

³¹ The Project Company notified the Edirne Regional Directorate of Cultural Assets about this potential site. The experts from the Regional Board carried out a field investigation at the potential site on 12 June 2019) and identified that the potential site does not have any important feature that is to be protected/managed under the Law on Preservation of Cultural and Natural Assets (Law No: 2863).

³² According to the "KBAs of Turkey" and as given in the World Database of KBAs. This said, the KBA is not yet shown within the database of Integrated Biodiversity Assessment Tool (IBAT). KBA Regional Focal Points for Mediterranean and Eastern Europe and Asia confirmed that the existing data gap of Istranca Mountains KBA will be addressed in late 2019.

11.3. Impact Assessment and Management

This section of the ESIA Report assesses the potential visual impact of Kiyikoy WPP on the selected receptors in accordance with the methodology defined in Chapter 4 (“ESIA Methodology”). As the construction phase impacts will be temporary and limited, the assessment focused on the cumulative visual impacts to be caused by the existing and future turbines.

The magnitude of change for the operation phase visual impacts has been evaluated in terms of the number of turbines that will be visible from the selected receptors. The sensitivity criteria for the visual receptors have been developed based on Scottish Natural Heritage (SNH) Guidance on Siting and Designing Wind Farms in the Landscape (SNH, February 2017) and the Guidelines for Landscape and Visual Impact Assessment 3rd edition (Landscape Institute, IEMA, 2013). As identified in the reference documents, people’s responses to wind farms vary – to some a wind farm may seem to dominate its surroundings, while others may view it as an exciting, modern addition with symbolic associations with clean energy and sustainability. The impact of a wind farm depends on how, and from where, it is experienced; for example, from inside a residence, while moving along a road, or from a remote mountaintop (SNH, February 2017). These factors have been taken into account when determining the sensitivity of the visual receptors for Kiyikoy WPP. Specific sensitivity criteria developed for the visual receptors are provided in Table 11-1.

Table 11-1. Criteria for the Sensitivity of Visual Receptors (for potential adverse impacts)

| High | Medium | Low | Negligible |
|--|---|---|---|
| <ul style="list-style-type: none"> Local communities residing in the houses located in the close vicinity of the Project to whom the turbines are visible from their houses | <ul style="list-style-type: none"> People engaged in touristic, recreational, forestry and other outdoor activities for the landscape beauties of the area | <ul style="list-style-type: none"> Local communities residing in the wider area and using public places in the surrounding settlements (e.g. Kiyikoy, Kisilacak Aksicim, Hamidiye) to whom the turbines are visible from their houses Users of the local beaches Travellers on the local road infrastructure or other transport routes (e.g. maritime) | <ul style="list-style-type: none"> Kiyikoy WPP personnel Personnel working at the nearby local businesses |

Magnitude of change criteria has been defined (see Table 11-2) in consideration of the information on the wind farm sizes as given in the Guidance on Siting and Designing Wind Farms in the Landscape (SNH, February 2017. Section 3: Wind Farm Design and Siting) but adopting stricter values in terms of number of turbines.

Table 11-2. Criteria for the Magnitude of Change for Visual Receptors (for Operation Phase only)

| High | Medium | Low | Negligible |
|--|--|---|--|
| More than 15 turbines visible from a visual receptor | 3-15 turbines visible from a visual receptor | 1-3 turbines visible from a visual receptor | No turbines visible from a visual receptor (Impact is never negligible as long as a turbine is visible from a visual receptor) |

11.3.1. Land Preparation and Construction Phase

The visual effects of the land preparation and construction activities such as topsoil stripping, earthworks, stockpiling of excavated materials, construction materials, power plant components and construction wastes, presence and operation of construction machinery and equipment, movements of heavy transportation vehicles, erection of temporary construction facilities, etc. will be temporary, limited in geographical scale and removed upon completion of the construction phase.

As the Capacity Extension Project will utilise the substation, ETL and main access road of the existing Kiyikoy WPP, there will be no additional visual impact due to construction of associated facilities.

The long-term visual impacts of the Capacity Extension Project units together with the existing operational turbines are discussed under Section 11.3.2.

11.3.2. Operation Phase

Both the design and the layout/array of the turbines are the factors influencing the visual effect of a WPP Project. The layout of the Capacity Extension Project has been determined to maximise the energy yield of the plant to the extent the wind speed, wind direction and technical separation distances allow, whilst the layout of the existing turbines as well as the environmental and social constraints (e.g. land use, land ownership, cultural heritage sites, etc.) have also been taken into consideration.

The existing fourteen (14) turbines of Kiyikoy WPP are sited as a single row along the natural ridge within the Project's License Area. As the landscape has variable elevation and pattern, the addition of twenty (20)³³ new turbines will result in a rather irregular, grid type layout that will ensure maintenance of technical separation distances required by the applicable national legislation and technical standards, while considering the environmental and social constraints. This will result in a more complex view and uneven siting of the turbines once the construction of the Capacity Extension Project units is completed. The existing and final layouts are presented in Figure 11-1. As can be seen, five (5) of the new turbines (T15, T16, T17, T25, T34, T35) have been sited on the same ridge with the existing turbines, which reduces the visual complexity of the WPP after the Capacity Extension. Twelve (12) of the additional turbines have been sited as parallel lines in the north of the existing turbines. The remaining four (4) turbines have been sited unregularly for the sake of the maximum possible energy yield.

The characteristics of the existing and planned turbines have been previously presented in Chapter 1, , of which that are relevant to the potential visual impacts are summarised in Table 11-3. The existing and planned turbines have different dimensions and scale.

Table 11-3. Project Characteristics Related to Visual Impacts

| Information | Existing Project (in operation) Gamesa G90 Turbine Model | Planned Capacity Extension Vestas V136 Turbine Model |
|--------------------|---|---|
| Number of turbines | 14 | 20 |
| Hub Height | 78 m | 112 m |
| Tip Height | 126.5 m | 180 m |
| Rotor Diameter | 97 m | 136 m |
| Tower Colour | Light grey | Light grey |

³³ The Project Company initially considered 21 turbines, but the technological advancements have allowed the Company to build and operate this additional capacity with 20 turbines, each having a capacity of 3.6 MWm. Thus, the Capacity Extension Project will be implemented with 20 new turbines. As of August 2019, the Company is in the process of selecting the ultimate 20 turbines to be built and operated as part of the Project. As the turbine to be eliminated as part of this process has not been selected at the time of writing this report, all the 21 turbines have been considered in the identification, assessment and management of potential impacts as part of the ESIA study.

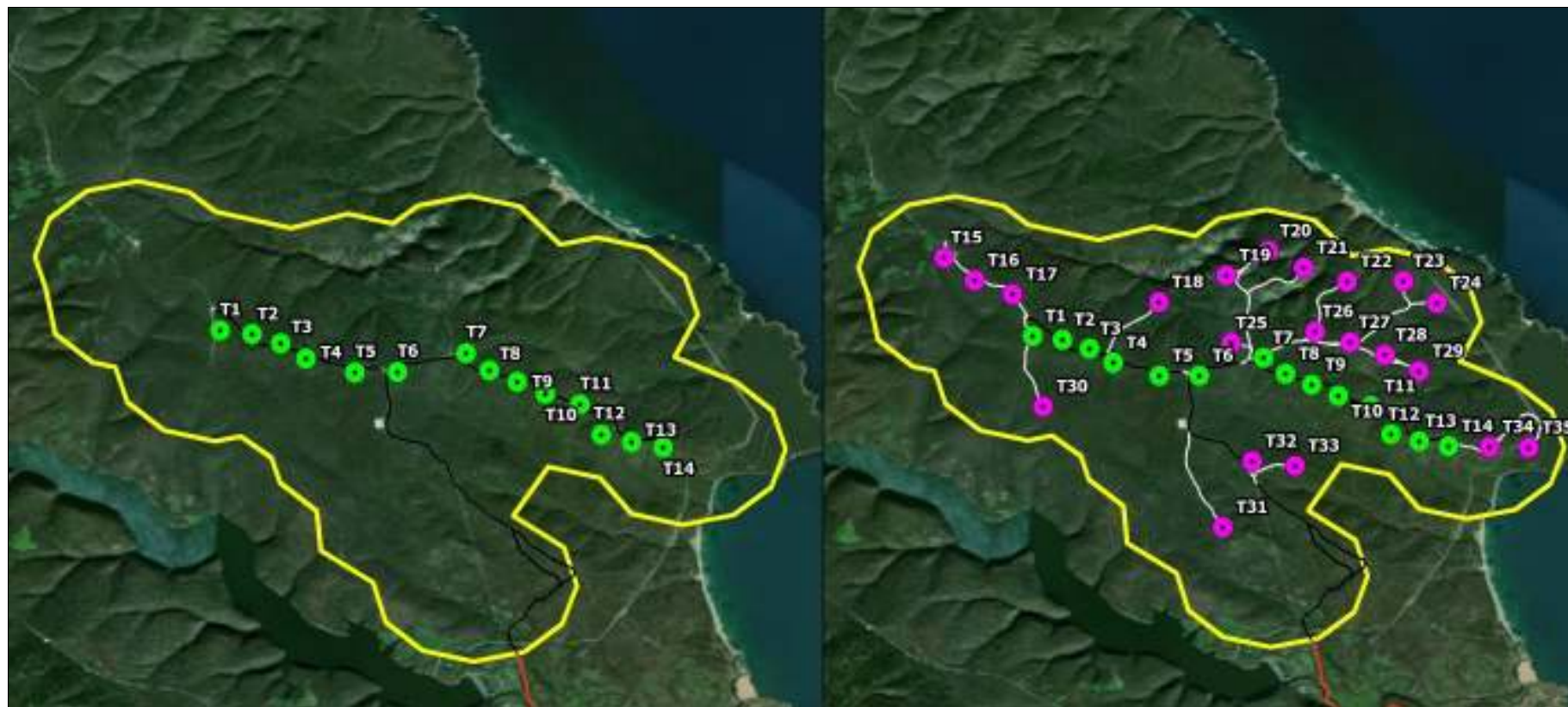


Figure 11-1. Comparison of the Existing and Final Layouts

The existing and planned turbines have/will have aviation obstruction lights (white during the day and twilight; red during the night) installed on top of their nacelles. The colour of the towers and blades of the existing and planned turbines will be consistent so as to minimise visual complexity and contrast with the land and the sky.

As the Capacity Extension Project will utilise the substation, ETL and main access road of the existing Kiyikoy WPP and the technology of the existing and planned turbines provide that the wind turbine transformers are to be housed within the turbine towers, the number of elements and visual complexity of the WPP are inherently minimised.

The visual impact (magnitude of change) of the Project on the selected receptors have been assessed by using 3D modelling and GIS tools, which were run by Frekans Acoustics and Environmental Laboratory ("Frekans"). The following studies have been conducted:

- Esri Arc Map software was used for the production of Zone of Theoretical Visibility (ZTV) maps. Exact locations of the existing and new turbines and terrain levels were imported from WindPro 3.3. The number of visible turbines (existing and new) were analysed in Esri Arc Map and maps indicating zone of visibility were prepared.
- The turbine models of the existing and new turbines were exported to Google Earth Pro to determine the 3D visual analysis. The visibility of turbines at visual receptors were determined 1.5 meters above the ground level and photographed by using Google Earth's 3D view. To ensure consistency of the results, photo outputs were also controlled with Esri Arc Map output maps. Wide angle of view was used and the directions of photos were always selected to represent through worst possible view.
- Frekans team conducted a field study in April 2019 in order to observe and evaluate the visual receptors on site and take photographs to support the desk-based assessments. Photographs from the License Area were imported to WindPro 3.3 and calibrated for terrain and angle of view.
- For the most sensitive receptors, where the visual impact is likely to be major, the appearance of existing and new turbines were visualised by using real field photos and Photomontage tool from windPRO 3.3

For the purpose of the Visual Impact Assessment (VIA), a study area of 20 km x 20 km has been selected for the production of the ZTV maps. This effort aimed to help understand the turbines that can be theoretically visible and select the visual receptors for the visualization study. The ZTV maps for the existing turbines and planned capacity extension turbines (cumulatively) are presented in Figure 11-2.

Based on the assessment of ZTV outputs and the outcomes of the field studies, it has been decided to assess the impacts on 13 different visual receptors, which comprised the residents of the local communities (Kiyikoy, Kislacik, Hamidiye and Aksicim), users of the local beaches (Kiyikoy Beach and Police Beach) and the users of the local road infrastructure. Each Viewpoint (VP) and the number of turbines that would be visible from them are provided in Table 11-4.

The 3D visual representation of the turbines from each VP is further presented in Figure 11-3. It should be noted that the software does not enable full representation of the actual natural and/or artificial barriers existing in the environment. Thus, the 3D outputs represent the worst-case conditions and it is likely that the number of turbines visible from the VPs are less than the figures estimated in this ESIA.

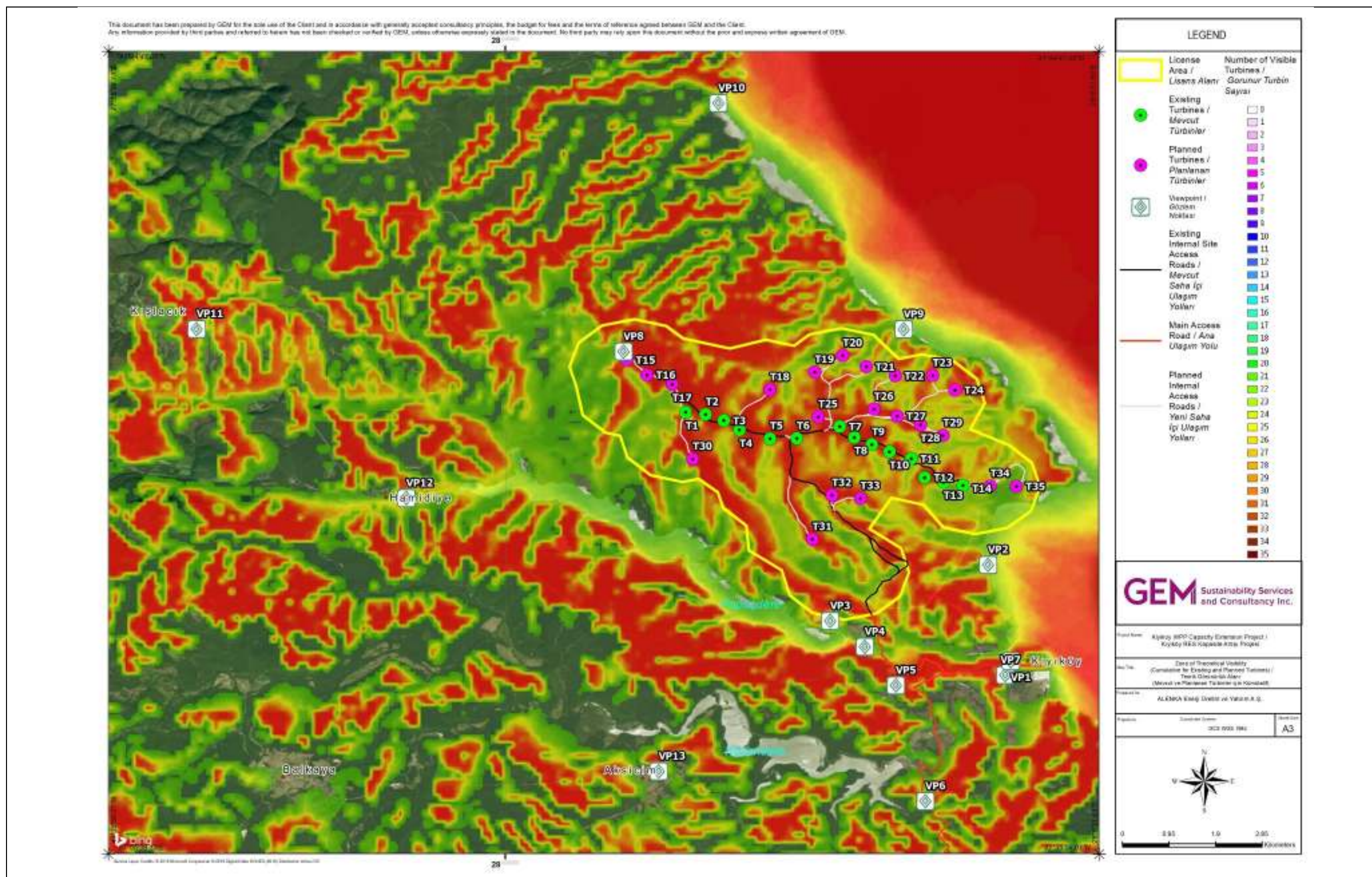


Figure 11-2. Zone of Visibility for Existing and Planned Turbines (Cumulative)

Table 11-4. Visibility (basis for Magnitude of Change) of Turbines from Selected Viewpoints (According to 3D Visual Images for the Worst Case)

| Viewpoint (VP) Code | Settlement | Location/Description of VP | Number of Turbines Visible from the VP | | |
|------------------------|------------|---|--|----------------------------------|-----------------|
| | | | Existing Turbines (14) | New Turbines (21 ³⁴) | Cumulative (35) |
| VP1 | Kiyikoy | Town centre | 14 | 20 | 34 |
| VP2 | Kiyikoy | Municipality Beach | 2 | 3 | 5 |
| VP3 | Kiyikoy | Closest residential building to the wind turbines | 8 | 8 | 16 |
| VP4 | Kiyikoy | Pabucdere Dam Operation Building | 9 | 7 | 16 |
| VP5 | Kiyikoy | Vize-Kiyikoy Road | 14 | 20 | 34 |
| VP6 | Kiyikoy | Bahcekoy-Kiyikoy Road | 12 | 19 | 31 |
| VP7 | Kiyikoy | Saray-Kiyikoy Road | 11 | 12 | 23 |
| VP8 | Kislacik | Building close to T15 | 13 | 17 | 30 |
| VP9 | Kiyikoy | Unoccupied coastline in the northeast of T21, T22 | 0 | 3 | 3 |
| VP10 | Kislacik | Police Beach | 0 | 2 | 2 |
| VP11 | Kislacik | Village centre | 14 | 21 | 35 |
| VP12 | Hamidiye | Village centre | 10 | 7 | 17 |
| VP13 | Aksicim | Village centre | 0 | 0 | 0 |

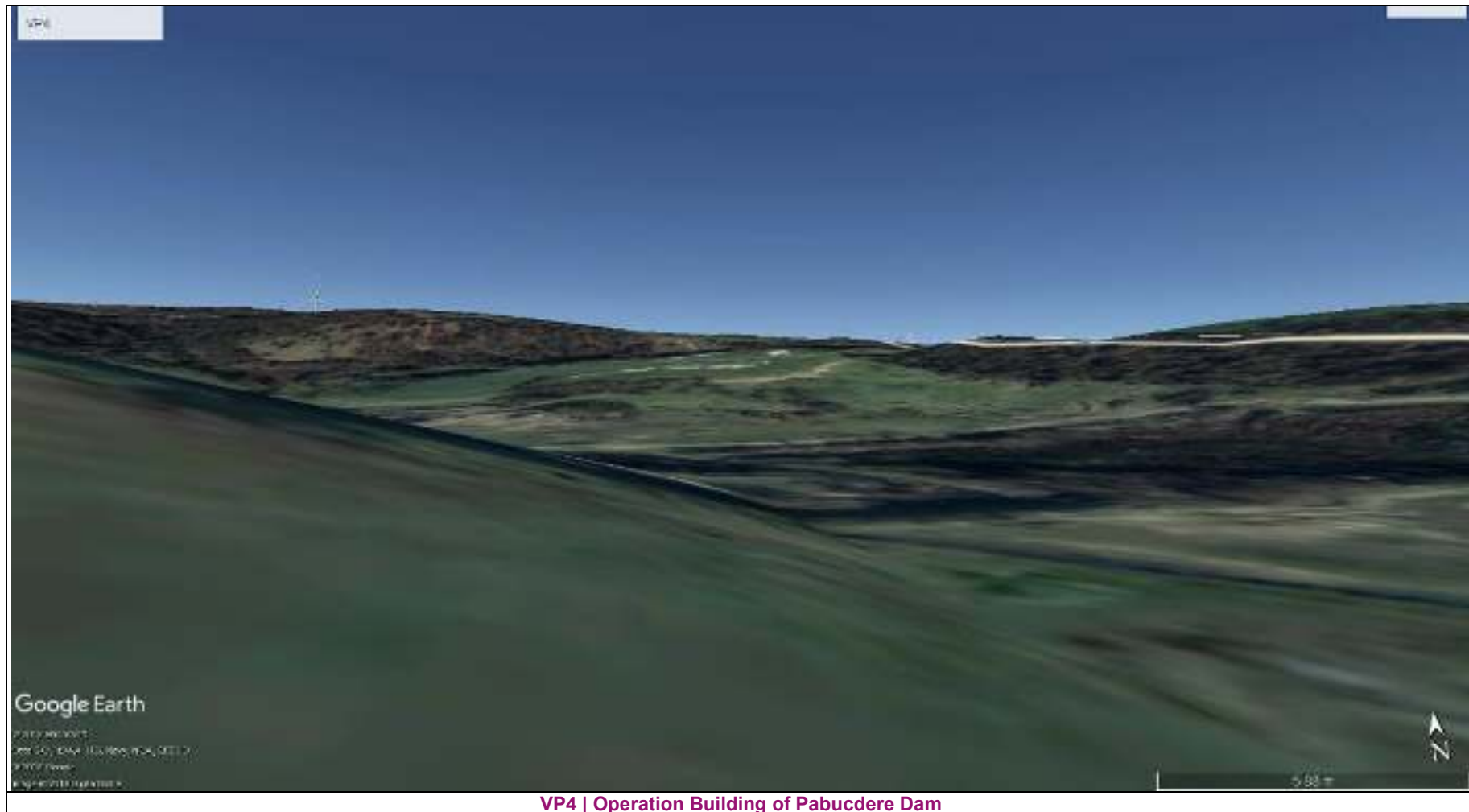
³⁴ The VIA has been conducted for all the 21 turbines as the Company is still in the process of selecting the turbine to be eliminated. The Project will be implemented with 20 turbines, thus the number of turbines that would be visible from some of the VPs may be one less than the figures estimated in this table.





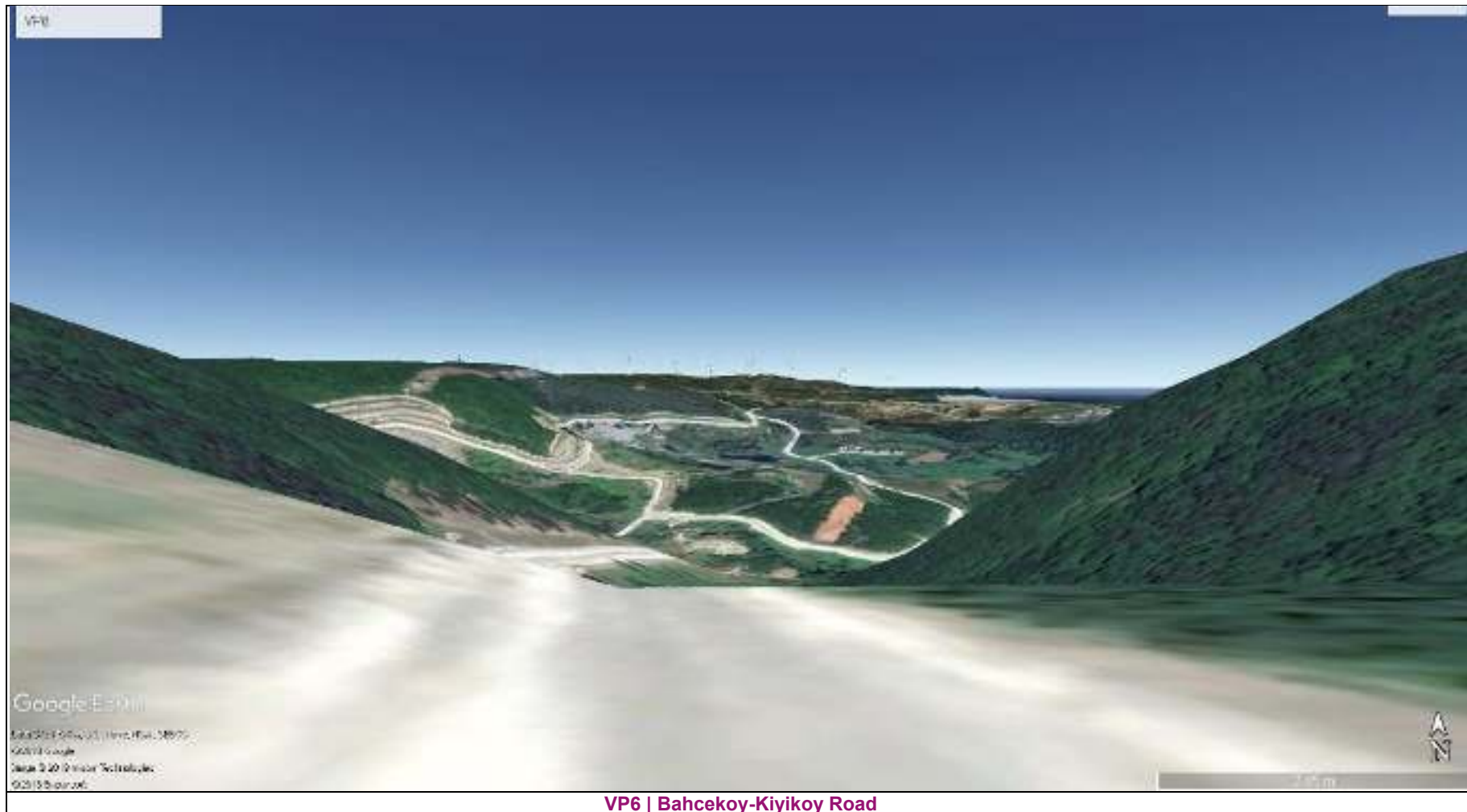
VP2 | Kiyikoy Beach

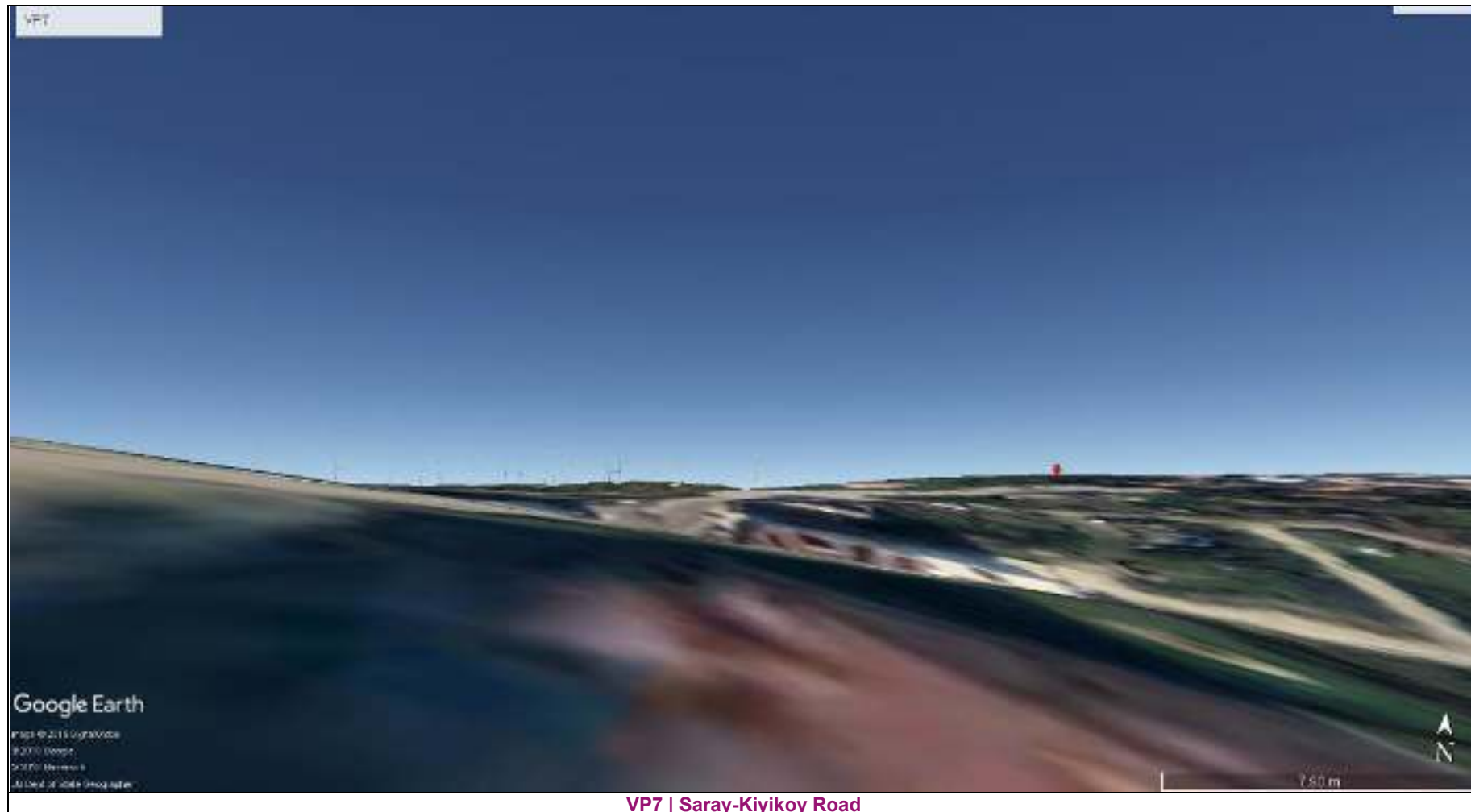




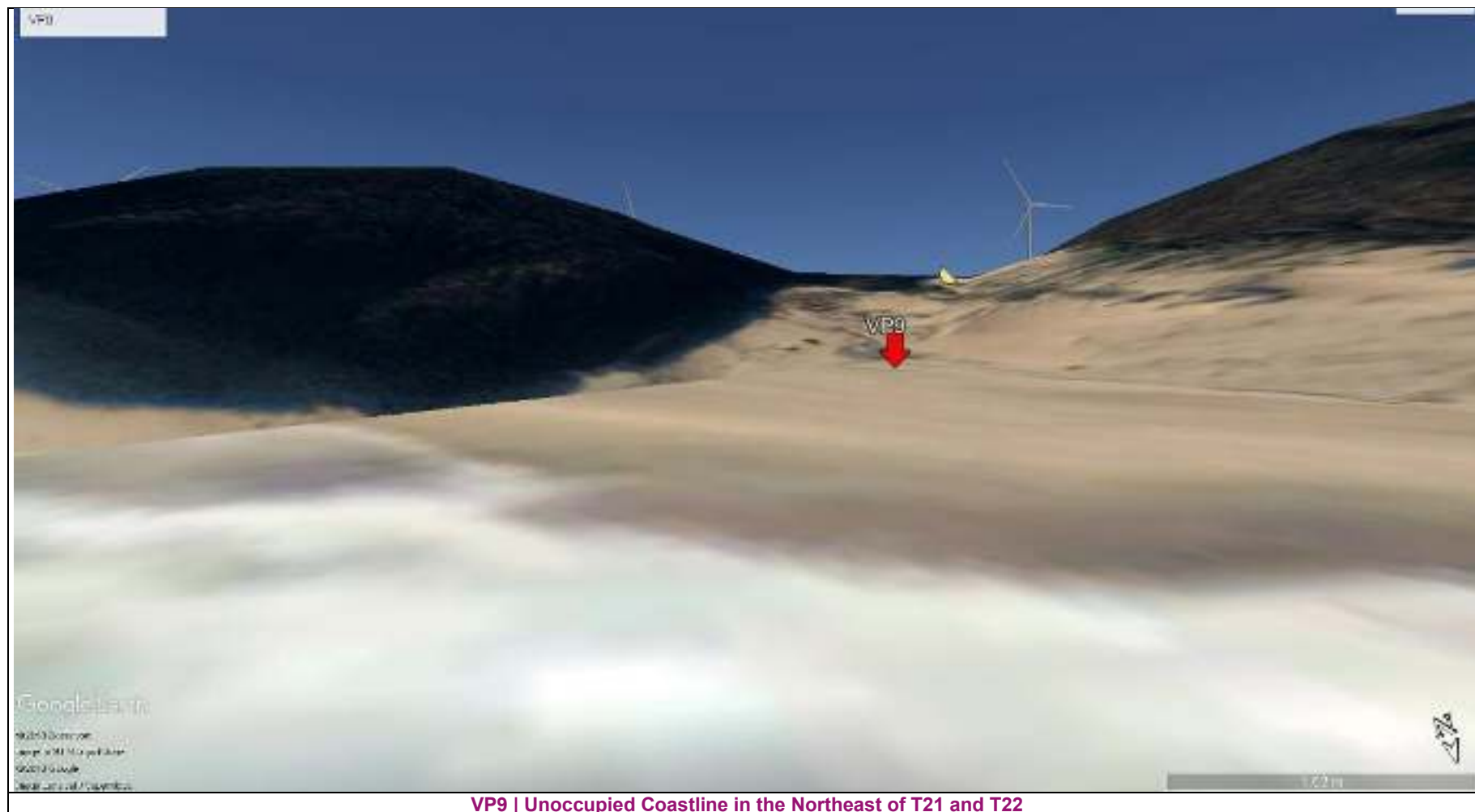


VP5 | Vize-Kiyikoy Road









VP9 | Unoccupied Coastline in the Northeast of T21 and T22





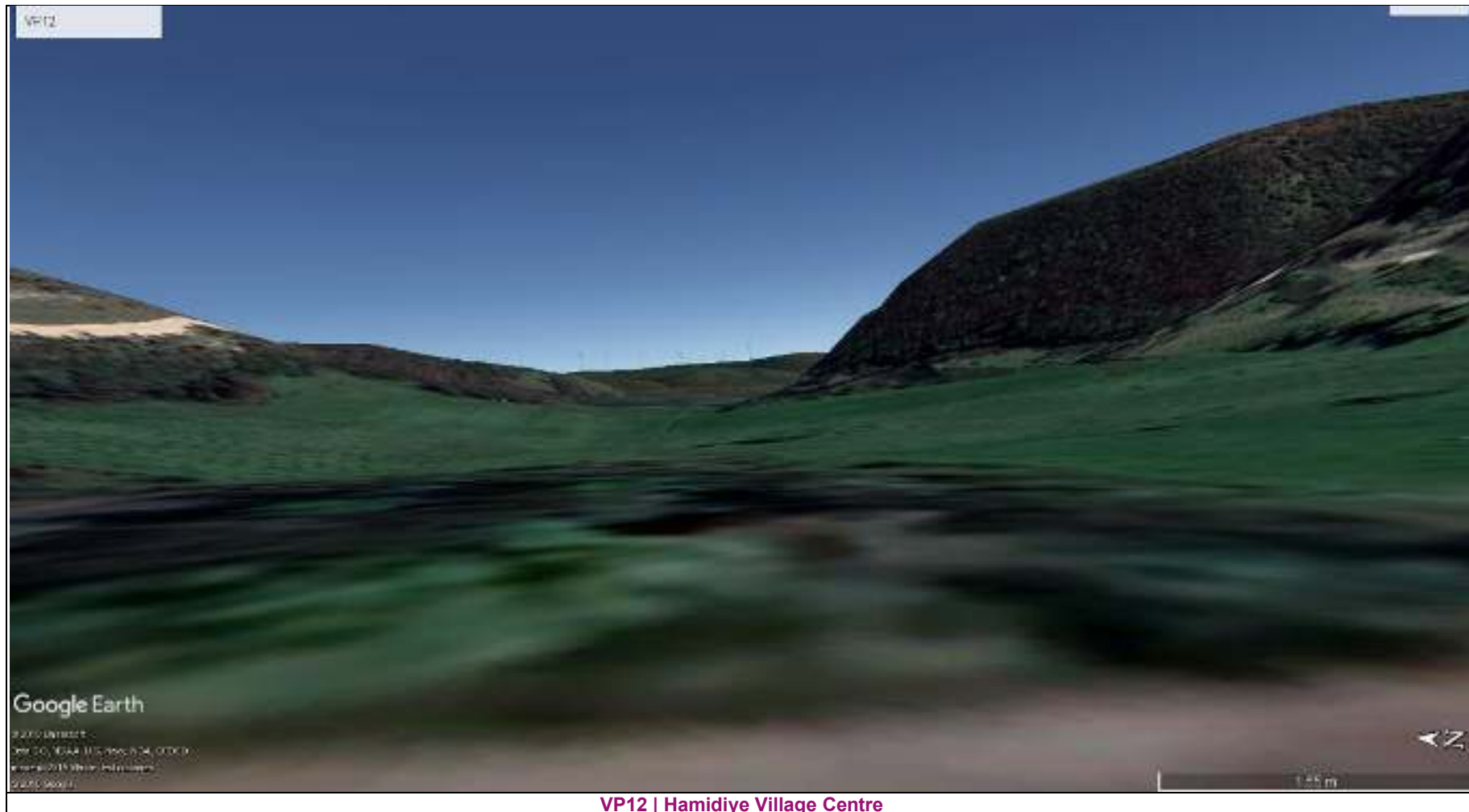




Figure 11-3. Visual Representation of the Turbines from each VP

Closest residential receptor in Kiyikoy town (VP-3) and the building in the north of T15 (VP8) are the receptors with highest sensitivity according to the criteria defined in Table 11-1. Thus, visibility of the existing and new turbines from these receptors have further been analysed by using photomontage tool of WindPro. Photomontage results for VP3 and VP8 are presented in Figure 11-4, Figure 11-5, and Figure 11-6.

11.3.3. Closure Phase

As per the current technology, design lifetime of the wind turbines is foreseen as at least 20 years, whilst the License Duration for Kiyikoy WPP is 49 years starting from the License Date. There is likely to be continued demand for renewable energy generation for many decades ahead. It is possible that existing well-designed wind farms may remain in use well beyond 20 years, with turbines either refurbished or replaced and a planning consent renewed (*SNH, February 2017*). Thus, the Project Company would seek to extend the lifetime of the Project components throughout the License Duration with proper maintenance to be done as per the state-of-the-art technologies.

At the point when the closure decision is taken, the Project units including the turbines, ancillary buildings and associated infrastructure would be dismantled and removed. Access roads and/or ETL may or may not remain in place according to the legislative requirements and expectations of the authorities and local communities. The footprints of the dismantled Project units will be rehabilitated in line with the legislation in force and consultations with the authorities. Thus, the Project will have long-term reversible visual impact, while there is the potential for some residual visible change to the landscape, even when infrastructure is removed (*SNH, February 2017*). The Project Company will develop a detailed Rehabilitation Plan after the closure decision is taken for the Project in order to minimise the residual visual impacts.

11.3.4. Impact Significance, Management and Residual Impacts

The potential Project impacts, proposed mitigation measures and residual impact significances are summarized in Table 11-5. The table comprises only the assessment of potential adverse impacts. It is recognised that the change can be adverse or positive depending on the perception of each receptor.



Figure 11-4. Photomontage Result for VP3 (Closest Residential Building to the Wind Turbines in Kiyikoy)



Figure 11-5. Photomontage Result for VP8 (Looking towards Southeast from the Forest Road Passing Adjacent to the Building in the North of T15)



Figure 11-6. Photomontage Result for VP8 (Looking towards Southwest from Southern Wall of the Building in the North of T15)

Table 11-5. Impacts, Proposed Mitigation Measures and Residual Impacts (Visual Impacts)

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--|--|---|------------------|---|-----------------------|------------|------------|-------------------|--|---|--|------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| Visual impact due to land preparation and construction works | <ul style="list-style-type: none"> Land preparation and construction Closure | Local communities in Kiyikoy and Kislacik | Local | Medium | Short-term reversible | Short-term | Continuous | Medium | Medium | Moderate | <ul style="list-style-type: none"> Good housekeeping practices will be instituted at all construction/work sites. Topsoil management measures (see Chapter 5 "Land Use") will be implemented. Habitat Restoration (Rehabilitation) Plan will be started following the completion of the construction works. Waste Management Plan will be implemented. Artificial illumination will be provided only when necessary to promote workers' safety and health, and enable safe equipment operation. | Minor |
| Visual impact due to operational turbines | <ul style="list-style-type: none"> Operation | VP1: Kiyikoy Town Centre | Wide | High (cumulatively 34 turbines visible) | Long-term reversible | Long-term | Continuous | High | Low | Moderate | <ul style="list-style-type: none"> One (1) of the twenty-one (21) planned turbines will be eliminated as a result of the ongoing final design process. The Project will be implemented with the design including 20 capacity extension turbines. The existing 154 kV ETL line of the Kiyikoy WPP will be utilised to avoid additional infrastructure that may cause visual impact. The existing substation will be utilised after necessary improvement/ refurbishment works. Habitat Restoration (Rehabilitation) Plan, including the reforestation as permitted or other measures as suggested by the forestry authorities, will be implemented throughout the operation phase. It will be ensured that the colour of the towers and blades of the existing and planned turbines are consistent to the extent possible. Aviation obstruction lights (white during the day and twilight; red during the night) will be optimised where approved by the aviation safety authorities to minimise landscape and visual impacts whilst satisfying health and safety or navigation requirements. | Moderate |
| | | VP2: Kiyikoy Beach | Wide | Medium (cumulatively 5 turbines visible) | | | | Medium | Low | Minor | | Minor |
| | | VP3: Closest residential building to the wind turbines in Kiyikoy | Wide | Medium (cumulatively 10 turbines visible according to photomontage) | | | | Medium | High | Major | | Moderate |
| | | VP4: Pabucdere Dam Operation Building | Wide | High (cumulatively 16 turbines visible) | | | | High | Negligible | Minor | | Minor |
| | | VP5: Vize-Kiyikoy Road | Wide | High (cumulatively 34 turbines visible) | | | | High | Low | Moderate | | Minor |
| | | VP6: Bahcekoy-Kiyikoy Road | Wide | High (cumulatively 31 turbines visible) | | | | High | Low | Moderate | | Minor |
| | | VP7: Saray-Kiyikoy Road | Wide | High (cumulatively 23 turbines visible) | | | | High | Low | Moderate | | Minor |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance | |
|--------------------|---------------|---|------------------|---|----------------------|-----------|--------------|--|---|------------------------------|---|-------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | | | | | Overall Magnitude |
| | | VP8: Building Close to T15 | Wide | Medium (cumulatively 10 turbines visible according to photomontage; T15 tower is not visible but the blades are foreseen to be visible from the house in the current setting) | | | | Medium | High | Major | <ul style="list-style-type: none">Project-specific Stakeholder Engagement Plan will be implemented to address any grievance related to visual impacts and plan/take corrective actions, where necessary and doable. | Moderate |
| | | VP9: Unoccupied Coastline in the Northeast of T21, T22 | Wide | Low (cumulatively 3 turbines visible) | | | | Low | Low | Minor | | Minor |
| | | VP10: Police Beach | Wide | Low (cumulatively 2 turbines visible) | | | | Low | Low | Minor | | Minor |
| | | VP11: Kislacik Village Centre | Wide | High (cumulatively 35 turbines visible) | | | | High | Low | Moderate | | Moderate |
| | | VP12: Hamidiye Village Centre | Wide | High (cumulatively 17 turbines visible) | | | | High | Low | Moderate | | Minor |
| | | VP13: Aksicim Village Centre | Wide | Cumulatively no turbines visible | | | | No impact | Low | No impact | | No impact |
| | | People engaged in touristic, recreational, forestry and other outdoor activities for the landscape beauties of the area | Local | Low to Medium (likely to be between 1 to 15) | Long-term reversible | Long-term | Intermittent | Low to Medium | Medium | Minor to Moderate | | Minor |

12. SOCIO-ECONOMY

This Chapter provides baseline information on the socio-economic conditions of the settlements located in the social study area³⁵ of the Kiyikoy WPP Project and assesses the current and potential social impacts of the Project. The social baseline, assessment and reporting studies have been conducted by the team of qualified experts (“social team”) of the Social Risk Management (SRM) Consultancy Limited Company (“SRM”).

The Chapter is structured to include the following main subjects:

- The methodology for social baseline characterisation and assessment of social impacts;
- Applicable national legislation and international standards;
- Baseline information consisting of population and demographics, income sources (including forestry, animal husbandry, agriculture, grazing, beekeeping, mushroom gathering, fishery, and tourism), education and health services, vulnerable groups and hunting activities;
- Identification and assessment of potential social impacts, description of management measures to be taken, and assessment of the residual impacts.

12.1. Methodology

The methodology for the assessment potential of social impacts as part of the ESIA process follows EBRD's Performance Requirements (PR). PR 1 requires identification of the Project impact area, engaging with stakeholders, understanding impacts and devising appropriate mitigation measures. PR 5 is applicable to the definition of social impacts pertaining to Project-related land acquisition.

The methodology for the assessment of potential social impacts of the Kiyikoy WPP Project is based on a combination of secondary research (desktop study) and field data. Following the preliminary desk-based research, a scoping (reconnaissance) site visit was conducted by the social team on 18 April 2019 with the participation of the representatives from the Project Company and the ESIA team. Based on the outcomes of the preliminary desk-based research and the scoping site visit, the social study area for the Project has been delineated as presented in Figure 12-1. Following the identification of the social study area further desk-based research has been conducted and a comprehensive field study program comprising key informant meetings, interviews with the Project Affect Persons (PAPs) focus group meetings and meetings with the local governmental and non-governmental stakeholders as well as internal stakeholders of the Project has been undertaken as described in the below sections.

³⁵ The social study area of the Kiyikoy WPP ESIA studies has been identified considering the locations of the stakeholders present in Kırklareli provincial centre, Vize district centre, Kiyikoy town, Kislacik village and the License Area of the Project.

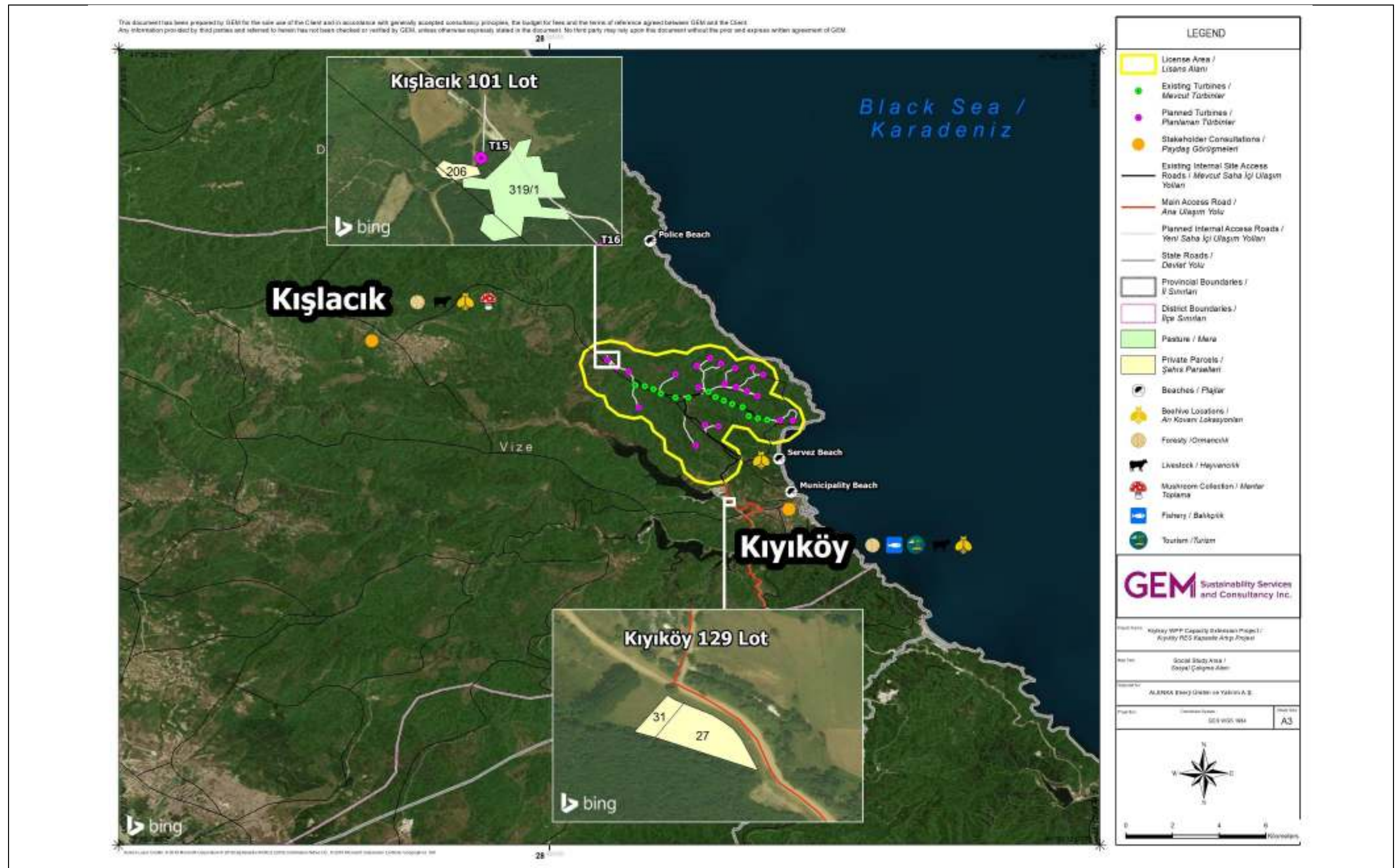


Figure 12-1. Social Study Area

12.1.1. Desktop Study

The desktop study for the Kiyikoy WPP ESIA has included gathering and review of the available secondary socio-economic data, as summarised below:

- Demographic data on the population of each settlement was obtained from the Turkish Statistical Institute (TurkStat, 2018).
- Publicly available research on regional development was obtained and used in order to depict the livelihood sources of the Project Affected Settlements (PAS).
- District based data on agriculture and animal husbandry of PAS was obtained and used in order to determine the agricultural and livestock production activities in the settlements.

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

Finally, a questionnaire form for the affected landowners/users and a mukhtar (headman) interview form were prepared. As the last step of desktop study, dates of the field study were determined, and visits were organized.

In summary, desktop study has included the following steps;

- Compiling demographic information, agricultural and livestock data of the PAS.
- Obtaining up-to-date information about settlements, parcels and PAPs impacted by land acquisition of the Project.
- Preparation of the questionnaires to be used during the field study.
- Finalizing field programme (dates, sites, consultations, surveys etc).

12.1.2. Field Study

Three separate field visits were held by the social team as part of the ESIA study, as summarised in Table 12-1. The first one was the scoping field on 18 April 2019 with the attendance of three senior social experts from SRM. The aim scoping field was to assess Project's impact area, meet with the Project owner and discuss Project history. During scoping site visit, locations of the new turbines and structures (barns) in the vicinity were visited to assess potential land acquisition impact of the Project.

After scoping visit, the second field visit that focused on key stakeholder meetings was conducted on 2-3 May 2019. Meetings were held with public stakeholders at provincial level, district level and neighbourhood level. Key stakeholder meetings revealed key social aspects of the Project; identified stakeholders that may be impacted by the Project, in addition to acquiring information on Project perception, expectations and potential impacts. During this field visit, the representatives from both provincial and district public institutions were interviewed. In addition, preliminary face to face meetings were held with five (5) mukhtars from Kiyikoy (three neighbourhoods), Kislacik and Hamidiye in order to obtain background socio-economic information to be considered in the design of the in-depth interviews, which are scheduled to take place in the third field visit.

The key findings of the scoping field survey and the second field visit, which have been taken into consideration in the design of the third field visit, are summarised below:

- The Project-related land acquisition will affect the parcels registered in Kiyikoy town and Kislacik village. The mukhtar of Hamidiye stated that the existing and planned turbines are located in the forest land registered in Kiyikoy and Kislacik settlements. This was confirmed by the mukhtars of neighbourhoods
- The number of privately-owned parcels to be affected by the Project-related land acquisition is three (3):
 - Parcel no. 129/27 registered in Kiyikoy and located along the main access road of the Project,
 - Parcel no. 129/31 registered in Kiyikoy and located along the main access road of the Project,
 - Parcel no.101/206 registered in Kislacik and located at the footprint of the foundation of T15.
- The legal owner of the house located 200 m north of T15 (on a registered agricultural parcel with the Parcel no. 101/205) resides in Kislacik village. A vulnerable person is currently using this house for accommodation with the permission of the legal owner.
- Livestock breeding and beekeeping are practices in Kiyikoy and Kislacik settlements
- The TurkStream Project located partly in the southern part of the License Area is a stakeholder of the Project (local business)

On the third field visit conducted on May 6-9 2019, in-depth interviews were held with the mukhtars of the villages/neighbourhoods. Five (5) in-depth interviews (mukhtar surveys) were conducted in two (2) settlements that were included within the field sample. (Kiyikoy town and Kislacik village) in order to establish settlement specific socio-economic baseline. In addition, four (4) focus group discussions were held with the women in Kislacik; village community in Kislacik; beekeepers in Kiyikoy, and Kiyikoy WPP employees at the existing plant. Four (4) in-depth interviews were also conducted with a livestock breeder in Kiyikoy; a buffalo breeder in Kislacik; owner of the house near T15 in Kislacik; and a vulnerable person living in the building near T15. The outcomes of the focus group discussions and in-depth interviews were used to understand the concerns/perceptions of the local communities and affected persons about the Project. A household survey was also conducted with the user of the parcel 129-31 registered in Kiyikoy town and located along the main access road of the Project.

As part of the consultations with the governmental and non-governmental stakeholders, interviews were conducted with the mayor of Vize municipality, District Directorate of Agriculture, Forest Sub-District Directorate of Kiyikoy, Provincial Directorate for Agriculture- Pasture Division as well as the officials of the Turk Stream Project, which is located partially within the southern part of the Kiyikoy WPP License Area.. In addition, interviews were also carried out with nine (9) NGOs including City Council of Kırklareli, Kiyikoy Development Cooperative, Chamber of Agriculture, associations of honey producers, cattle breeders, hunters and preservation of farmer's assets, Thrace Platform and Union of Merchants and Craftsmen.

Table 12-1. 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 | 18 April 2019 | -Meeting with the existing site operations team and obtaining information on the Project background and current operations including social activities -Visiting the License Area, turbine locations, parcels to be affected by Project-related land acquisition, nearby structures and the main access road route |
| Key stakeholder meetings | 2-3 May 2019 | -Meetings with the public stakeholders at provincial level, district level and neighbourhood level -Preliminary face to face meetings with the mukhtars of five (5) settlement (three neighbourhoods in Kiyikoy town, and Kislacik and Hamidiye villages) |
| In-depth interviews and focus group meetings | 6-9 May 2019 | -In-depth interviews with the mukhtars (mukhtar surveys) of five (5) settlements (three neighbourhoods in Kiyikoy town, and Kislacik and Hamidiye villages) -Four (4) focus group discussions -Four (4) in-depth interviews -Interviews with Vize Municipality, Vize District Directorate of Agriculture, Forest Sub-District Directorate of Kiyikoy, Provincial Directorate for Agriculture-Pasture Division; -Interviews with other local business (representatives of the TurkStream Project located partially within the southern part of the License Area) -Nine (9) NGOs |

Field methodology followed an inclusive and participatory approach. The social team on the field comprised of male and female social experts. The number of the meetings and stakeholder consulted as part of the field surveys is summarised in Table 12-2.

Table 12-2. Field Study Summary (see Table 12-3 for the detailed specific stakeholders consulted)

| No | Consulted Stakeholders | Number of Institutions / Meetings | Number of Consulted Stakeholders |
|--|--|-----------------------------------|----------------------------------|
| A. Consultations with Governmental Organisations (Total) | | 12 | 14 |
| 1 | Kirklareli Governorate | 1 | 1 |
| 2 | Provincial Directorate of Environmental and Urbanization | 1 | 1 |
| 3 | Provincial Directorate of Agriculture | 2 | 3 |
| 4 | Vize Directorate of Forestry | 2 | 4 |
| 5 | Kiyikoy Sub-district Directorate of Forestry | 1 | 1 |
| 6 | Vize District Directorate of Agriculture | 2 | 1 |
| 7 | Vize Sub-governorate | 1 | 1 |
| 8 | Vize Municipality | 1 | 1 |
| 9 | Public Education Center | 1 | 1 |
| B. Consultations with Non-governmental Organisations (NGOs) | | 9 | 11 |
| C. Socio-economic Field Research (Total) | | 20 | 36 |
| 1 | Preliminary Face to Face Meetings with the Mukhtars | 5 | 5 |
| 2 | In-depth Interviews with the Mukhtars | 5 | 5 |
| 3 | In-depth interviews with the Community | 4 | 4 |
| 4 | Focus group discussions | 4 | 19 |
| 5 | Household surveys | 1 | 1 |
| 6 | Other Local Business | 1 | 2 |
| Total | | 41 | 61 |

Source: SRM Field Study, May 2019.

The list of the stakeholders consulted is provided in Table 12-3.

Table 12-3. List of the Stakeholders Consulted

| Stakeholder | Position | Stakeholder Type | Location | Date | Method |
|---|---|------------------|---------------------|----------|----------------------|
| A. Consultations with Governmental Organisations | | | | | |
| 1 Governorate | Deputy Governor | Public Inst. | Kırklareli province | 2.5.2019 | Face to face meeting |
| 2 Provincial Directorate of Agriculture, Pasture Department | Agricultural Engineer | Public Inst. | Kırklareli province | 2.5.2019 | Face to face meeting |
| 3 Provincial Directorate of Environment and Urban Planning, Brach of EIA and Env. Permissions | Unit Head | Public Inst. | Kırklareli province | 2.5.2019 | Face to face meeting |
| 4 Vize Directorate of Forestry | Manager, Assistant Manager and Chief of Kiyikoy Forestry Man. | Public Inst. | Vize district | 2.5.2019 | Face to face meeting |
| 5 Vize District Directorate of Agriculture | Manager | Public Inst. | Vize district | 3.5.2019 | Face to face meeting |
| 6 Vize Sub-governorate | District Governor | Public Inst. | Vize district | 3.5.2019 | Face to face meeting |
| 7 Public Education Center | Manager | Public Inst. | Vize district | 6.5.2019 | Face to face meeting |
| 8 Forest Sub-district Directorate of Kiyikoy | Officer | Public Inst. | Kiyikoy town | 7.5.2019 | Face to face meeting |
| 9 Vize District Directorate of Agriculture | Manager | Public Inst. | Vize district | 8.5.2019 | Face to face meeting |
| 10 Vize Municipality | Mayor | Municipality | Vize district | 8.5.2019 | Face to face meeting |
| 11 Vize Directorate of Forestry | Chief | Public Inst. | Vize district | 8.5.2019 | Face to face meeting |
| 12 Provincial Directorate of Agriculture Pasture | Agricultural Engineers | Public Inst. | Kırklareli province | 9.5.2019 | Face to face meeting |
| B. Consultations with Non-governmental Organisations (NGOs) | | | | | |
| 1 Association for the Preservation of Farmers' Assets | Head | NGO | Vize district | 6.5.2019 | Face to face meeting |
| 2 Association of Cattle Breeders | Technician | NGO | Vize district | 6.5.2019 | Face to face meeting |
| 3 Association of Honey Producers | Head | NGO | Vize district | 6.5.2019 | Face to face meeting |
| 4 Association of Hunters | Head | NGO | Vize district | 6.5.2019 | Face to face meeting |
| 5 Union of Chamber of Tradesmen and Artisans | Head | NGO | Vize district | 6.5.2019 | Face to face meeting |
| 6 Development Cooperative of Kiyikoy | Vice-president | NGO | Kiyikoy town | 7.5.2019 | Face to face meeting |
| 7 City Council of Kırklareli (<i>Kent Konseyi</i>) | Head of Env. Assembly and Mem. of the Thracian Platform; Member of the BoD of Env. Assembly | NGO | Kırklareli province | 8.5.2019 | Face to face meeting |
| 8 Thracian Platform (Environmental) | Head of Uzunkopru City Council Environment Assembly; Head of Edirne Medical Chamber | NGO | Edirne | 8.5.2019 | Face to face meeting |
| 9 Chamber of Agriculture | Secretary General | NGO | Vize district | 9.5.2019 | Face to face meeting |
| C. Socio-economic Field Research | | | | | |

| Stakeholder | | Position | Stakeholder Type | Location | Date | Method |
|--|---|--|------------------|------------------|----------|-------------------------|
| Mukhtar Meetings and Questionnaires | | | | | | |
| 1 | Cumhuriyet Neighbourhood | Mukhtar | Mukhtar | Kiyikoy town | 3.5.2019 | Face to face meeting |
| 2 | Cumhuriyet Neighbourhood | Mukhtar | Mukhtar | Kiyikoy town | 7.5.2019 | Mukhtar Questionnaire |
| 3 | Guyen Neighbourhood | Mukhtar | Mukhtar | Kiyikoy town | 3.5.2019 | Face to face meeting |
| 4 | Guyen Neighbourhood | Mukhtar | Mukhtar | Kiyikoy town | 7.5.2019 | Mukhtar Questionnaire |
| 5 | Hamidiye Village | Mukhtar | Mukhtar | Kiyikoy town | 3.5.2019 | Face to face meeting |
| 6 | Hamidiye Neighbourhood | Mukhtar | Mukhtar | Hamidiye village | 9.5.2019 | Mukhtar Questionnaire |
| 7 | Kale Neighbourhood | Mukhtar | Mukhtar | Kiyikoy town | 3.5.2019 | Face to face meeting |
| 8 | Kale Neighbourhood | Mukhtar | Mukhtar | Kiyikoy town | 7.5.2019 | Mukhtar Questionnaire |
| 9 | Kislacik Village | Mukhtar | Mukhtar | Kislacik town | 3.5.2019 | Face to face meeting |
| 10 | Kislacik Village | Mukhtar | Mukhtar | Kislacik village | 6.5.2019 | Mukhtar Questionnaire |
| In-depth Interviews with the Community | | | | | | |
| 1 | The person who resides at the building located in the north of T15 | Vulnerable Group/Person (PAP) | Community | Kislacik village | 3.5.2019 | In-depth Interview |
| 2 | Owner of the house resided by the vulnerable person in the north of T15 | Kislacik Village Resident | Community | Kislacik village | 7.5.2019 | In-depth Interview |
| 3 | Buffalo breeder (1 person) | Kislacik Village Resident | Community | Kislacik village | 7.5.2019 | In-depth Interview |
| 4 | Bovine and ovine owner (1 person) | Kiyikoy Neighbourhood Resident | Community | Kiyikoy town | 7.5.2019 | In-depth Interview |
| Focus Group Meetings | | | | | | |
| 1 | Kislacik Village (Men) | Members of the Cooperative, stock breeders and beekeepers residing in the village (5 people) | Community | Kislacik village | 6.5.2019 | Focus Group |
| 2 | Kislacik Village (Women) | Kislacik residents (5 women) | Community | Kislacik village | 7.5.2019 | Focus Group |
| 3 | Kiyikoy Beekeepers | Kiyikoy residents (5 beekeepers) | Community | Kiyikoy town | 7.5.2019 | Focus Group |
| 4 | Kiyikoy WPP Employees | Kiyikoy WPP Employees (4 people) | Community | Kiyikoy town | 9.5.2019 | Focus Group |
| Household Questionnaires | | | | | | |
| 1 | User of the Parcel No. 129-31 which is affected from the Project-related Land Acquisition (parcel is located on the route of WPP main access road | Successor and user (Son of one of the five share holders of parcel to be acquired) | Community | Kiyikoy town | 7.5.2019 | Household Questionnaire |
| Other Local Business | | | | | | |
| 1 | TurkStream Project | Social Expert; Consultant | Private Sector | Kivikoy town | 7.5.2019 | Face to face |

Source: SRM Field Study, May 2019.

12.1.3. Impact Assessment Methodology

The methodology defined in Chapter 4 ("Impact Assessment Methodology") of this ESIA Report has been used to assess the potential social impacts of the Project. Accordingly, significance of potential social impacts has been determined as a factor of the sensitivity of the receptor and the overall magnitude of the Project's impact on that specific receptor.

The sensitivity of the social receptors has been determined based on the baseline information, which has taken into consideration the stakeholder feedback received through the consultations and in-depth interviews done with the local authorities, affected communities as well as the NGOs. The overall magnitude of the impacts has been determined by using professional judgement in consideration of the geographical extent, reversibility, duration and frequency of the impact.

Finally, the significance assessment matrix provided in Chapter 4 has been used to assess the significance of the potential social impact of the Project prior to mitigation and after mitigation, and residual impacts have also been assessed accordingly. Overall, the significance of the impacts has been categorised as major, moderate, minor or negligible.

12.1.4. Impact Area

The Project's impact area has been identified as a result of the findings of the desktop study as well as the first two field studies. During the field visits, maps showing the locations of the existing and planned turbines were shared with the mukhtars of the neighbourhoods in Kiyikoy and the Kislacik and Hamidiye villages. It was known prior to the scoping field survey that the Project-related land acquisition will affect the parcels registered in Kiyikoy town and Kislacik village. During the surveys, the mukhtar of Hamidiye stated that the existing and planned turbines are located in the forest land registered in Kiyikoy and Kislacik settlements. This information was also confirmed by the mukhtars of Kiyikoy's neighbourhoods, mukhtar of Kislacik village as well as the officials of Vize Directorate of Forestry. Thus, it was identified before the third field study that the village of Hamidiye will not be impacted by Project-related land acquisition or it is not likely that other potential social impacts of the Project could result in any significant social impact on this settlement.

12.1.5. Limitations

As mentioned previously, the number of privately-owned parcels to be affected by the Project-related land acquisition is three (3) (Parcel no. 129/31, 129/27 and Parcel no.101/206). The Project Company undertakes consultations with the shareholders and/or successors of the affected parcels depending on their availability. Currently (as of September 2019), the related governmental authorities are identifying the residence information of the legal shareholders. Following the completion of identification, the authorities will conduct negotiations and finalise the process depending on the outcomes of the negotiations. The ownership status of some of the shareholders is currently unclear possibly due to past incomplete inheritance processes. The Project Company aims to clarify the status as a result of the ongoing consultations and in collaboration with the governmental authorities. To date, Project Company achieved to consult with the shareholders and/or successors of Parcel no. 129/27 and 129/31, and making efforts to reach the owner of Parcel no.101/206.

The social team made additional reasonable efforts to reach the shareholders and users of all the three parcels, but the interviews could be done only with the owner of Parcel no. 129/31. The social team could not be able to reach the owners of Parcel no. 129/27 and Parcel no.101/206 prior to or during the field surveys as it has been informed by the mukhtars and local people that they do not reside in the affected settlements.

The Parcel no. 129/31 has six (6) shareholders. It has been identified that only one of them resides in Kiyikoy. Thus, a meeting could only be held with his son. The mukhtar of the settlement also accompanied the meeting and was requested to provide information on the remaining five shareholders. The mukhtar and the shareholder present at the meeting stated that they do not have any information on the other five shareholders. It has been identified based on desktop study and the consultations with the local people that there are five (5) shareholders of the Parcel no. 129/27. However, the meetings held with the mukhtars and residents of Kiyikoy, revealed that none of the names of the shareholders are known as they do not reside in Kiyikoy. During the meeting with the mukhtar and residents of the Kislacik village, it was stated that the owner of Parcel no. 101-206 does not live in

the village and his land is not being used for any activity. The mukhtar and other residents of Kislacik village did not have his contact information either.

12.2. Project Standards

The majority of the License Area, including the footprint of the Capacity Extension Project units, corresponds to state-owned forest land. Thus, the requirements of the Forestry Law (Law No: 6831) will be applicable to the Project. Final Forestry Permit will be obtained from the Ministry of Agriculture and Forestry prior to the start of construction.

Within the forest lands, there are patches of a few privately-owned agricultural parcels as well as pasturelands. The Capacity Extension Project requires acquisition of three additional privately-owned parcels. In accordance with the Law No. 2942 "Expropriation Law", the acquisition of the land required for the wind power plant projects is undertaken by EMRA (EPDK in Turkish). The Public Benefit Decision for the Project has been issued by EMRA on 10 May 2018 and the MoEU has taken the Expropriation Decision. Currently, the related local authorities are identifying the residence information of the legal shareholders/owners. The process will continue with the negotiations and compensation in case of successful settlement of the negotiations. The Project Company has also executed its right to apply for accelerated expropriation as per the Expropriation Law on 8 July 2019. As of September 2019, EMRA is in the process of evaluating this application.

Besides 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 for the management of Project's potential social impacts:

- EBRD PR1 on Assessment and Management of Environmental and Social Impacts and Issues
- EBRD PR4 on Health and Safety
- EBRD PR5 on Land Acquisition, Involuntary Resettlement and Economic Displacement
- EBRD PR10 on Information Disclosure and Stakeholder Engagement

12.3. Baseline Conditions

The social scoping study conducted as part of the ESIA has identified the neighbourhoods of Kiyikoy town and Kislacik village as the PAS for the Kiyikoy WPP Capacity Extension 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 (e.g. mukhtar interviews, focus group meetings, consultations with the local governmental authorities, NGOs and other local businesses) conducted by the social team.

12.3.1. Population and Demographics

Kiyikoy is a small town with a population of 2,840 people. It has a municipality and three neighbourhoods called Cumhuriyet, Kale and Guven. Kislacik is a relatively large-scale village with a population of 650 people. All affected settlements are within the administrative borders of Vize district of Kırklareli province.

According to the mukhtar interviews, population increases in summer in the settlements because of touristic visits. The total population in Kislacik and Kiyikoy reached 6,400 people in the summer of 2018. Population data of Vize district, Kiyikoy town and Kislacik village, including their gender distribution and average household sizes, is provided in Table 12-4.

Mukhtar interviews shows that Cumhuriyet (3.8) and Kale neighbourhoods (4.0) of Kiyikoy town are above the average of Turkey (3.4)

Table 12-4. Population Data of the Settlements

| Statistics | Kislacik | Cumhuriyet | Guven | Kiyikoy Kale | Total (three neighbour hoods of Kiyikoy) | Vize |
|-----------------------------|----------|------------|-------|-----------------|--|--------|
| Population* | 650 | 613 | 1,034 | 533 | 2,180 | 28,122 |
| Summer Population** | 1,500 | 700 | 3,000 | 1,200 | 4,900 | N/A |
| Average HH size | 3.0 | 3.8 | 3.1 | 4.0 | N/A | N/A |
| Number of HHs | 250 | 120 | 350 | 150 | N/A | N/A |
| Female Population Rate % | 46 | 56 | 43 | 51 | 45 | 49 |
| Male Population Rate % | 54 | 44 | 57 | 49 | 55 | 51 |

Source: *TurkStat, 2018*; **SRM Field Study, 2019.

As presented in Table 12-5, the populations of Vize district and Kiyikoy town have both increased in the last 5 years (between 2014 and 2018), whilst the population of Kislacik has declined.

Table 12-5. Population Change in Vize, Kiyikoy and Kislacik, 2014-2018

| Settlements | 2014 | 2018 | Difference |
|--------------------------|--------|--------|------------|
| Kiyikoy town (total) | 1,966 | 2,180 | 214 |
| Cumhuriyet neighbourhood | 550 | 613 | 63 |
| Guven neighbourhood | 885 | 1,034 | 149 |
| Kale neighbourhood | 531 | 533 | 2 |
| Kislacik village | 741 | 650 | -91 |
| Vize district | 27,700 | 28,122 | 422 |

Source: TurkStat, 2018.

12.3.2. Income Sources

The main sources of income within all neighbourhoods are forestry, fishery, animal husbandry, tourism and mushroom selling. According to the Chair of the Chamber of Tradesmen and Artisans of Vize, the total number of tradesmen registered in Vize district is over 1,000, of which 120 are located in Kiyikoy (*SRM Field Study, 2019*).

Primary, secondary and tertiary income sources in the settlements are given in Table 12-6. According to the information obtained from neighbourhood mukhtars, main source of income is forestry in all settlements within the social study area. Fishery, animal husbandry, tourism and mushroom selling are also significant income sources.

Table 12-6. Primary, Secondary and Tertiary Income Sources of the Neighbourhoods

| Settlement | Primary Income Source | Secondary Income Source | Tertiary Income Source |
|-------------------|-----------------------|-------------------------|------------------------|
| Kiyikoy town | | | |
| Cumhuriyet neigh. | Forestry | Fishery | Tourism |
| Guyen neigh. | Fishery | Forestry | Animal Husbandry |
| Kale neigh. | Forestry | Fishery | Tourism |
| Kislacik village | Forestry | Animal Husbandry | Mushroom Sales |

Source: *SRM Field Study, 2019*.

12.3.2.1. Forestry Activities

Forest Land

According to the information given by the Kiyikoy Forestry Sub-district Directorate, the total forest area of the affected settlements (Kiyikoy neighbourhoods and Kislacik village) that is under the jurisdiction of Kiyikoy Forestry Sub-district Directorate is 12,139 hectares (see Table 12-7). The forest area corresponding to the License Area mainly consists of oaks.

Table 12-7. Forest Land of Kiyikoy and Kislacik that falls within the Jurisdiction of Kiyikoy Forestry Sub-district Directorate

| Settlement | Forest Land (Hectare) |
|--------------|-----------------------|
| Kiyikoy | 8,368 |
| Kislacik | 3,771* |
| Total | 12,139 |

Source: *Kiyikoy Forestry Sub-district Directorate, 2019*.

* Kislacik village has forest area that fall the jurisdiction of Demirkoy Forestry Sub-district Directorate. Thus, the total forest area of Kislacik village is larger than the area that falls within the jurisdiction of Kiyikoy Forestry Sub-district Directorate.

Development Cooperatives

Kiyikoy and Kislacik both have development cooperatives³⁶ (one in each settlement). Only activity of these cooperatives is forestry. The total number of their members is 1,050 (see Table 12-8).

³⁶ Development cooperatives carry out forestry activities for income generation in the areas defined by the Forestry Management Directorate as per the legal permission obtained from the Forestry Management Directorate. They cut the trees that are allowed to be cut and sell them for income generation. A new cooperative cannot enter another forest cooperative's area unless the cooperative and / or the Forestry Operations Authority gives permission to the new cooperative.

Table 12-8. Number of the Development Cooperatives

| Development Cooperatives | Number of the Members |
|----------------------------------|-----------------------|
| Kiyikoy Development Cooperative | 650 |
| Kislacik Development Cooperative | 400 |
| Total | 1,050 |

Source: SRM Field Study, 2019 (Kiyikoy Cooperative and Kislacik Mukhtar).

Forestry Activities, Income and Expenses

All households in the affected settlements supply their firewood from the forest.

There are three types of income generated from forestry activities:

- Oak charcoal production
- Market tree sale by villagers (allowed by forest management)
- Planted tree sale (allowed by forest management)

Oak Charcoal Production

Oak charcoal production is an activity subject to legal permission of the related Forestry Management Directorates. Steps of legally permitted oak charcoal production are as follows:

- Cutting and transporting of oak trees to the production area
- Drying and stacking of trees
- Aligning trees named 'harman' (blend) on the coal wells in tower shape
- Covering up the wood towers with sand and soil to prevent air flow
- Burning the wells
- Controlling the burn to make woods into charcoal

After a period of about 10 days, 10 tons of charcoal can be obtained from a well in which 50 tons of wood used.

In the meeting with the mukhtars, it has been stated that 7 people in Kiyikoy and 6 people in Kislacik produce oak charcoal and they use their own lands as production site, which are outside the affected parcels. Oak charcoal production requires strenuous work; hence the vast majority of households keep away from the production of oak charcoal. Thus, it is a marginal forestry activity rather than a common practice.

Market Sale by Villagers

Directorate of Forestry manages the forest by determining the areas that will be cut. The designated areas are cut by households who carry out forestry activities. It is not obligatory for these people to be the member of a Development Cooperative in order to cut trees. The steps of the tree cutting and market sale by villagers are as follows:

- The Regional Directorate of Forestry informs the mukhtars about the completion time of the job, the place to work, the amount of stere³⁷ and wood (m3) to be obtained.
- The quantity of the stere is calculated by the mukhtars according to the number of members in the household instead of per household. However, the necessary arrangements are made to provide minimum 30 stere per person.
- The villagers are charged 55 TL per stere to be paid in advance.
- The collected steres are transported to the village and sold to merchants and/or sold in Istanbul via shippers.
- Each stere of the woods is sold to the merchant for 100 TL. In this case, the net fee obtained by a person for a total of 30 steres is 1,350 TL excluding expenses.
- Cost per stere (gasoline, transportation, etc.) is 30 TL, except for the day-laborer (because households do the labor themselves). Accordingly, the cost for 30 stere is 900 TL.
- The net income received by households is 450 TL.

The figures related to market sale of woods and the incomes earned by the villagers are summarised in Table 12-9.

Table 12-9. Market Sale by Villagers

| Market Sale by Villagers- Income Per Capita | Values |
|---|------------|
| Amount of 1 stere (kg) | 500 |
| Average stere amount per person (item) | 30 |
| Amount paid per stere to the Regional Directorate of Forestry (TL) | 55 |
| Amount paid by a person for a total of 30 steres to the Regional Directorate of Forestry (TL) | 1,650 |
| Stere sales price (TL) | 100 |
| Total gross income of steres per person (TL) (assuming 30 steres per person) | 3,000 |
| Net income per person excluding expenses (TL) (assuming 30 steres per person) | 1,350 |
| Expenses (Fuel, gasoline, transporation, etc) (TL) | 900 |
| Net income (TL) | 450 |

Source: Regional Directorate of Forestry, 2019.

Planted Tree Sale

Only development cooperatives and their members can benefit from the sale of planted trees. The Regional Directorate of Forestry calls for proposals to the cooperatives regarding this sale, and the sale is completed when the offer is accepted.

- The Regional Directorate of Forestry informs the cooperatives about the completion time of the job, the place of work, the amount of stere and wood (m3) to be obtained.
- Cooperatives also inform their members.

³⁷ 1 stere is accepted as equal to 500 kg in the region.

- If there are a lot of participants in Kislacik, the Forest Directorate determines the people who will participate in the sale by lottery.
- Generally, one person from each family/house is a member of the Cooperative in Kiyikoy. Forest allocations are distributed among the cooperative members. Accordingly, if a member cannot work in the allocated role herself/himself, he or she can give his/her right to another member in return of money or wood, or place someone else, i.e. a casual employee, for work.
- The price per stere varies by years. In general, the last two months of the average sales price by Directorate of Forestry are taken into consideration for the calculation. For the steres obtained from planted tree sales, the unit value is determined by the Regional Directorate of Forestry.
- It has been learned that at the current moment, the Directorate of Forestry has set price of 400 TL per stere to be paid in advance.
- Members pay 5% commission to the cooperatives.
- An average 40 stere per member is given.
- The collected steres are sold to traders or they are usually offered for sale in Istanbul by transport vehicles.
- The stere of wood is sold to the merchant from 500 TL. In this case, the net fee for a person excluding expenses is 3,200 TL excluding expenses.
- The average forestry expenses is 1,355 TL.
- Accordingly, net profit per household from planted tree sale is 1,845 TL. The net minimum wage in Turkey is 1,829 TL per month. Earned profit almost corresponds to minimum wage.

The figures related to the sale of planted trees and the incomes earned by the villagers are summarised in Table 12-10.

Table 12-10. Average Annual Planted Tree Sale

| Planted Tree Sale- Income Per Capita | Values |
|---|--------------|
| Amount of 1 stere (kg) | 500 |
| Average stere amount per person (item) | 40 |
| Amount paid per stere to the Regional Directorate of Forestry (TL) | 400 |
| Amount paid for a total of 40 steres to the Regional Directorate of Forestry (TL) | 16,000 |
| Member fee paid to the Cooperative stere/TL (5%) | 20 |
| Amount paid for a total of 40 steres to the Cooperative | 800 |
| Stere sales price (TL) | 500 |
| Average gross income of stere (TL) per person | 20,000 |
| Average net income per person excluding expenses (TL) | 3,200 |
| Expenses (Fuel, gasoline, etc) (TL) | 1,355 |
| Net Income (TL) | 1,845 |

Source: Regional Directorate of Forestry, 2019

The forestry expenses related to transportation of steres are summarised in Table 12-11. Assuming that 40-stere of wood is transported per day, the total cost related to forestry would be 1,355 TL. However, this expense may show changes in practice. Only the expense items and average unit values are given in the table below.

Table 12-11. Forestry Expenses

| Cost Items | Explanation | Amount | Unit Value (TL) | Total Cost for 30 ster/day |
|---------------------------------|-------------|--------|-----------------|----------------------------|
| Transportation | Stere/TL | 40 | 27.5 | 1,100 |
| Diesel fuel of tractor (Day/lt) | Day/lt | 10 | 7 | 70 |
| Chainsaw gasoline (Day/lt) | Day/lt | 5 | 7 | 35 |
| Chainsaw oil (Day/lt) | Day/lt | 3 | 10 | 30 |
| Day-labourer | Day/TL | 1 | 120 | 120 |
| Total | | | | 1,355 |

Source: Regional Directorate of Forestry, 2019.

Average Annual Sales

According to the information received from the Vize Directorate of Forestry and the mukhtars, a total of 58,000 steres (32,000 stere of market sales by villagers and 26,000 stere of planted tree sales)- is sold every year. The gross income earned from these sales is given as 16,200,000.00 TL (see Table 12-12).

Table 12-12. Income Earned through Wood Sales

| Average/Year | Market Sale by Villagers (Stere) | Planted Tree Sale (Stere) | Total (Stere) |
|-------------------------------------|----------------------------------|---------------------------|---------------|
| Kislacik | 24,000 | 16,000 | 40,000 |
| Kiyikoy | 8,000 | 10,000 | 18,000 |
| Total | 32,000 | 26,000 | 58,000 |
| Financial Value of Sales (Stere/TL) | 3,200,000 | 13,000,000 | 16,200,000 |

Source: Vize District Directorate of Forestry, 2019.

12.3.2.2. Agriculture Activities and Animal Husbandry

Vize District Directorate of Agriculture (May 2019) stated that agricultural activities in Kiyikoy and Kislacik are very limited.

According to the information received from the District Directorate, total agricultural area in Kiyikoy is 23 decare and there is only one farmer registered at the Farmer Registration System (FRS). Kislacik has a larger agricultural area with 810 decare and 26 farmers are registered in the FRS (see Table 12-13).

Table 12-13. Agricultural Data

| Settlement | Farmers Registered in the Farmer Registration System (FRS) | Agricultural Area (Decare) | Average per Person (Decare) |
|--------------|--|----------------------------|-----------------------------|
| Kislacik | 1 | 23 | 23 |
| Kiyikoy | 26 | 810 | 31 |
| Total | 27 | 833 | 31 |

Source: Vize District Directorate of Agriculture, 2019.

There are households that breed bovine and ovine both in Kiyikoy and Kislacik. According to the information given by the Vize District Directorate of Agriculture, the total number of ovine is 2,756 and of bovine is 1,880 in Kiyikoy and Kislacik. 540 of bovines are buffalos (see Table 12-14).

Table 12-14. Animal Numbers

| Settlement | Sheep | Goat | Total Ovine | Cattle | Buffalo | Total Bovine |
|--------------|--------------|------------|--------------|--------------|------------|--------------|
| Kislacik | 626 | 200 | 826 | 240 | 80 | 320 |
| Kiyikoy | 1,600 | 330 | 1,930 | 1,100 | 460 | 1,560 |
| Total | 2,226 | 530 | 2,756 | 1,340 | 540 | 1,880 |

Source: Vize District Directorate of Agriculture, 2019.

It has been stated in the interviews with the mukhtars that there are 40 households with 4 or more bovine animals and 35 households with 10 or more ovine animals (see Table 12-15).

Table 12-15. Number of Households Breeding Animal

| Settlements | Number of Bovine-Owning Households | Number of Ovine-Owning Households |
|--------------|------------------------------------|-----------------------------------|
| Kiyikoy | | |
| Guven | 15 | 10 |
| Kale | 10 | 10 |
| Cumhuriyet | 5 | 0 |
| Kislacik | 10 | 15 |
| Total | 40 | 35 |

Source: SRM Field Study, 2019.

12.3.2.3. Pastureland and Grazing Area within Forested Land

The total amount of pastures of Kiyikoy town is 429 decare and consists of 19 parcels. There is no pastureland in Kislacik village (see Table 12-16).

Table 12-16. Pasture Area

| Settlement | Pasture Area (Decare) |
|--------------|-----------------------|
| Kiyikoy | 429 |
| Kislacik | 0 |
| Total | 429 |

Source: Vize Regional Directorate of Forestry, 2019.

According to the information received from the Vize Regional Directorate of Forestry, grazing in forested land is allowed. The forest area in Kiyikoy and Kislacik has a total grazing capacity of 3,040 bovine and 1,789 ovine animals (see Table 12-17).

Table 12-17. Grazing Capacity

| Settlement | Bovine Grazing Capacity | Ovine Grazing Capacity |
|--------------|-------------------------|------------------------|
| Kiyikoy | 2,095 | 1,233 |
| Kislacik | 945 | 556 |
| Total | 3,040 | 1,789 |

Source: Vize Regional Directorate of Forestry, 2019.

When the grazing capacities of the forests are taken into account, the current bovine capacity of the forest area has the capacity to increase to 1,160 to meet the grazing capacity. Current number of bovines corresponds to 62% of bovine grazing capacity available for forested areas. Yet, the number of ovine exceeds forest's capacity. The gap between capacity for bovine versus actual number of bovine animals compensates for the ovine production's grazing capacity needs. Table 12-18 illustrates grazing capacity and livestock figures.

Table 12-18. Grazing Capacity and Current Livestock of the Forest Land

| Settlement | Bovine Grazing Capacity | The Number of Bovine Animals | Difference (Bovine) | The Ratio of Current Bovine to Grazing Capacity (%) | Ovine Grazing Capacity | The Number of Ovine animals | Difference (Ovine) | The Ratio of Current Ovine to Grazing Capacity (%) |
|--------------|-------------------------------|--|------------------------|---|------------------------------|--------------------------------------|-----------------------|--|
| Kislacik | 945 | 320 | 625 | 34% | 556 | 826 | -270 | 149% |
| Kiyikoy | 2,095 | 1,560 | 535 | 74% | 1,233 | 1,930 | -697 | 157% |
| Total | 3,040 | 1,880 | 1,160 | 62% | 1,789 | 2,756 | -967 | 154% |

Source: Vize Directorate of Forestry, 2019.

12.3.2.4. Beekeeping

Beekeeping is carried out both in Kiyikoy and Kislacik. The ESIA studies identified that there are no active beehives and beekeeping activities within Project's License Area. The closest beehives are located outside the License Area, around 1.7 km south of T34, adjacent to an existing forest road in the vicinity of the TurkStream project site (see Figure 12-1).

The beehives in Kiyikoy and Kislacik settlements are kept stationery and beekeepers do not move their hives in winter. The kind of honey product obtained is generally extracted honey. There are 6 beekeepers with 336 beehives in Kiyikoy and 12 beekeepers with 940 beehives in Kislacik registered at the Vize District Directorate of Agriculture (see Table 12-19). No outsider beekeeper is allowed in the area.

Table 12-19. Number of Beekeepers and Beehives

| Settlement | Number of Beekeepers | Number of Beehives | Beekeepers/ Beehives Average |
|--------------|----------------------|--------------------|---------------------------------|
| Kiyikoy | 6 | 336 | 56 |
| Kislacik | 12 | 940 | 78 |
| Total | 18 | 1,276 | 71 |

Source: Vize District Directorate of Agriculture, 2019.

In the interviews with the beekeepers, it has been learned that they sell the honey priced at 50-60 TL per kilogram with their own means. The average honey yield is 15 kilograms per hive.

12.3.2.5. Mushroom Gathering

Mushroom gathering is only practiced in the village of Kislacik and the Boletus type of mushrooms are gathered and sold.

Mushrooms are gathered twice a year; during spring and autumn seasons (May for spring and October-November for autumn). Collected mushrooms are sold daily to the merchants that come to the village. The Regional Directorate of Forestry stated that a total of 3 million TL sales were made in 2018 from mushroom sales. Villagers who sell mushrooms pay 0.49 TL commission per kilogram to the Regional Directorate. The average selling price of the mushroom is 20-30 TL per kilogram. This means that a total of 100 tons of mushrooms (30 TL per kilogram) were collected and sold in 2018.

Mushroom gathering is mainly regarded as women's job. Focus group with mushroom gatherers in Kislacik revealed that women are very active in mushroom gathering. There are two seasons for mushroom gathering. Spring season starts in May; and lasts for a month. Autumn season is October to November. Women go to the forest on foot or by car to earn income by collecting and selling Boletus mushrooms. Although the amount of mushrooms varies according to the rainfall rates and temperature (high temperature causes mushrooms to deterioration), it is possible to collect 10-20 kilogram of mushrooms per person in a day during the mushroom collecting period which starts after May 19. The price of Boletus mushroom sold to wholesalers who come to the village is around 20-30 TL per kilogram depending on supply-demand relationship. On average one woman earns 200-400 TL per/person daily from mushroom sales. On average, income from sales of mushroom ranges from 3,000 TL-6,000 TL per season. If more than one member of the household gathers mushrooms, incomes increase significantly.

Mushrooms are sold to the merchants; which export these products mostly to European countries (Germany, Italy, etc.). Women spend their income derived from mushroom gathering for household expenses and needs. Apart from Boletus mushroom, women collect and sell many other types of mushrooms like Sigirdili (*hydnum repandum*), Zurna, Kazayagi (*cantharellus cibarius*), Gelinyanagi (*amanita caesarea*).

In addition to Kislacik, people from the surrounding settlements and Istanbul come to the Kislacik forest during mushroom season to gather and sell mushrooms. These people from outside the village stay in their vehicles, or camp in the forest to collect and sell the mushrooms to wholesalers. The villagers stated that they are not bothered by outsiders because the forest is abundant with mushrooms; and there is enough mushrooms for everyone to collect.

The mukhtar said that the number of people coming from outside the village surrounding to collect mushrooms is approximately 3,000. At the Annual Festival of History and Tourism, Kislacik comes in second in the gastronomy competition every year because of its mushrooms.

12.3.2.6. Fishery

Fishery is among the most important sources of income in Kiyikoy. There is one aquaculture cooperative in Kiyikoy. According to the information received from TurkStream experts, approximately 1,500 people are known to earn their living from fishing.

Fishermen are divided into two groups based on their boat sizes; fishermen with a boat larger than 12 meters and smaller than 12 meters. The fishing port of Kiyikoy has a total of 182 fishing boats, 160 of which are below 12 meters (7m, 9m, 10m) and 22 of which are over 12 meters. Large boats fish by techniques such as trawling, purse seine and small boats fish by other techniques like longline, trammel nets etc. Small boats can fish in an area from 3 miles to 6 miles, while large boats can fish from 3 miles to 25 miles. The fishing seasons for large boats is from September 1st to 15 April according to the Aquaculture Circular. 150 boats and 500 crews were supported within the scope of the TurkStream Project, which is located at the southern boundary of the License Area.

12.3.2.7. Tourism

Kiyikoy town has outstanding historical and geographical features. The local tourism activity in the town is increasingly developing and contributing to the livelihoods of the local residents. Due to the close proximity to Istanbul, there has been an increase in the number of domestic visitors in recent years. There are approximately 20 motels and guest houses known and around 15 restaurants in the town.

Visitors visit the town mostly from May to October, and summer months (July and August) are the most preferred times. Such activities mostly consist of regional tours. Therefore, tourism is a seasonal source of income for the region.

There are two beaches in the region where Pabucdere and Kazandere streams reach the Black Sea. These beaches are visited by local and foreign tourists frequently.

In the northeast of Kiyikoy town, there is a 1,770-meter long coastline, which includes the Municipality Beach and the Servez Beach. Touristic facilities are established at these beaches during summer season (see Figure 12-1). In addition, Police Beach, which is registered in Kiyikoy and located approximately 5 km north of the Kiyikoy WPP License Area. The Police Beach is visited in summer months especially by the tourists.

Tourism is an increasingly developing sector in the Kiyikoy town. It is been stated that in the summer there are many visitors especially from Istanbul. There are approximately 20 motels and pensions known and 15 restaurants in the town³⁸.

³⁸ <https://www.trakyaagezi.com/kiyikoy-gezi-rehberi/>

12.3.3. Education and Health Services

Education

There is 1 high school, 1 profession and 1 religious high school in the district of Vize.

Kiyikoy has primary and secondary schools. The number of students enrolled in primary school is 68 and of classrooms is 4 whereas the number of students enrolled in secondary school is 95 and of classrooms is 6. There is 1 high school with 44 students and 4 classrooms in Kiyikoy.

In the village of Kislacik, there is 1 primary and 1 secondary school. The number of students enrolled in primary school is 21 and the number classrooms is 4. There are 28 enrolled students and 4 classrooms in secondary school.

Health Services

A state hospital located in Vize has 30 beds and includes internal medicine, family medicine, child diseases services, emergency service, operating room and laboratory.

There is a Family Health Center (FHC) in Kiyikoy.

In the village of Kislacik there is a health house and a delivery nurse. One day of the week, health service is provided by a doctor from Kiyikoy FHC.

12.3.4. Vulnerable Groups

As part of the social field surveys, the mukhtars of Kiyikoy and Kislacik stated that the important vulnerable groups in their settlements include the elderly people who need care, disabled people and people who receive social aids from government institutions.

The number of vulnerable persons in the surveyed settlements is provided in Table 12-20.

Table 12-20. Vulnerable Groups in the Settlements

| Neighbourhood | Number of Disabled People | 65+ and Need Care | Government Aid |
|---------------|---------------------------|-------------------|----------------|
| Kiyikoy town | | | |
| Cumhuriyet | 3 | 20 | 30 |
| Guyen | 5 | 30 | 60 |
| Kale | 4 | 6 | 10 |
| Kislacik | 7 | 10 | 40 |
| Total | 19 | 66 | 140 |

Source: SRM Field Study, 2019.

There is one disabled vulnerable person, living in the house located in the north of T15 within the Project's License Area. The house he is residing in is owned by another PAP, who is living in Kislacik. This vulnerable PAP is on Government aid and also receives disability aid. The legal owner of the building allows the vulnerable PAP to stay without paying any rent as he does not have sufficient income.

12.3.5. Hunting Activities in the Region

Hunting is carried out by the local people in the region. According to the information received from the Head of the Association of Hunters of Vize, there are 45 settlements where members come from. It has been learned that there are 35 persons from Kiyikoy and 10 persons from Kislacik affiliated with the Association.

According to the decision number 18 of the Central Hunting Commission published on 23 May 2019, the hunting season has been determined as October 19-January 12 for the first group of mammals (Wild rabbit, European rabbit, fox, beech marten) and August 17-February 16 for the second group of mammals (Wild boar, weasel). According to this decision, both groups of mammals can be hunted in places defined as hunting ground. In addition, the bird species listed in Table 12-21 can be hunted in the specified period.

Table 12-21. Hunting Season and The Bird Categories Allowed for Hunting within the Specified Seasons

| 2018-2019 Hunting Season | Start | Finish |
|--|------------|------------|
| Birds Category No.1 (Quail and turtledove hunting) | 17.08.2019 | 17.11.2019 |
| Birds Category No.2 (See-see partridge, chukar, perdix perdix hunting) | 19.10.2018 | 12.01.2020 |
| Birds Category No.3 (Clumsily, mallard, gadwall, wigeon, teal, red-crested pochard, tufted duck, pintail etc. hunting) | 19.10.2019 | 01.03.2020 |
| Birds Category No.4 (Jay, rook, cormorant, magpie) | 17.08.2019 | 01.03.2020 |

Source: Ministry of Agriculture and Forestry, 2018

The boundaries of the Kiyikoy state hunting ground is also drawn in this decision. The details of this hunting ground are shown in Table 12-22. The hunting area does not overlap with Project Licence Area or footprint of the Project units.

Table 12-22. Kiyikoy State Hunting Ground

| Direction | Hunting Ground |
|-----------|---|
| East | Black Sea coastline to Kiyikoy |
| West | Village road linking Hamidiye-Kislacik villages to Sivrilir village |
| North | The stabilized forest road linking the village of Sivrilir to the forest nursery and the road going outside the boundaries of the National Park of the nursery and reaching the Black Sea |
| South | The provincial road connecting Hamidiye village turn to Kiyikoy |

Source: Ministry of Agriculture and Forestry, 2018.

12.4. Impact Assessment and Management

12.4.1. Land Preparation and Construction Phase

12.4.1.1. Population and Demographics

The temporary construction site for the management of construction activities by the construction contractors will be established at the current substation area used by the Project Company for the operation of existing Kiyikoy WPP. Therefore, any external construction facilities outside the existing boundaries of the Project will not be built as part of the Capacity Extension Project.

It is anticipated that there will be 100 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 maximise use of local workforce, especially by utilising the experienced and qualified workforce available in Kiyikoy. Thus, the impact of the Project related employment on the population movements in the region is considered to be limited during the temporary construction phase. There will be no on-site accommodation of the construction workforce.

Construction personnel will be transported to the Project site by service buses. A temporary camp site is planned to be established by the contractors at the existing substation site. At the camp site, administrative offices, wastewater management facilities (e.g. package domestic wastewater treatment unit), waste storage areas, material storage areas, etc. will be provided for the construction personnel. If additional area is required by the contractors, a Camp Site Management Plan will be developed and implemented to identify and manage the relevant impacts.

The Project Company will improve the existing road providing access to the License Area. The Project-related traffic will use this improved access road in order to avoid any disruption for the Kiyikoy residents and the visitors of the settlement/tourists using the existing access road of the Kiyikoy town. As a result of this arrangement, it is anticipated that the Project will not cause any significant adverse impact on the number of tourists visiting Kiyikoy during summer months.

12.4.1.2. Local Economy

The construction of the Project will result in temporary positive economic impacts because of procurement of goods and services required during construction phase. 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.

Temporary economic impacts will also emerge from induced effects of spending on goods and services by construction workers, who will have increased disposable income and the ability to spend more money in the local economy (indirect impacts).

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 License Area.

During the field consultations, it has been noted that there are demands for local procurement, especially catering services, to be supplied from the enterprises in Kiyikoy. These firms will be informed about the requirements of the Project in terms of local procurement.

12.4.1.3. Employment

The Project will be constructed by contractor firms and the supervision and coordination of these firms will be carried out by the Project Company. The current operations team of the existing Kiyikoy WPP, which consists of 16 personnel in total (8 of them are from Kiyikoy), will continue their services during the construction of Capacity Extension Project units.

A total of 100 workers will be employed by the contractor firms during the peak construction period. Construction workforce will be required for the earthworks, construction of buildings and foundations, turbine erection and electricity works. Among these jobs, jobs requiring the most unskilled workers are excavation and construction. Accordingly, it is anticipated that 35% of the workforce will be unskilled. On the other hand, the Project may encounter challenges in providing the skilled workers from the local.

Although there are demands for local employment from stakeholders in the settlements, it has been observed during the field visit that the expectation of employment is low because of the short term and temporary nature of the construction works.

12.4.1.4. Land Acquisition

The Project-related land acquisition entails acquisition of mainly forest land. There are also limited private and state-owned (pasture) parcels corresponding to the footprint of Capacity Extension Project units (turbines and access roads). Chapter 5 ("Land Use") of the ESIA Report provides detailed information on the land use types at the footprint of the Capacity Extension Project units.

Impacts on Forest Land

The forest area which will be impacted by the construction of the units for the new turbines consists of 1% of the total License Area and 0.2% of the total forest area of Kiyikoy and Kislacik settlements (see Section 12.3.2.1 "Forestry Activities"). Thus, the Project's impact on forest 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 existing substation site will not be fenced.

Impact on Pastureland

According to the data obtained from Vize Regional Directorate of Forestry (2019), the total size of the Kiyikoy pasture area is 429 decares, consisting of 19 parcels (see Section 12.3.2.3 "Pasture Land and Grazing Area within Forested Land"). Among this, only 1 pasture parcel (Parcel no. 319/1) will be affected by the Project. According to the land registry, the total land size of this affected pastureland is 45 decares and the part that will be affected is 11.8 decares (approximately 26% of the total parcel area).

There is no pastureland in Kislacik village.

Field visits done as part of the ESIA process showed that livestock producers are concerned about the reduction of pasture areas and its potential negative impact on their livelihoods. It has been stated that households whose income depends on animal husbandry actively use this pasture for animal grazing, though there are alternative pasture parcels and forest land in the settlement that are used for grazing purpose. There are no buildings (shed, porch, trough etc.) on this Project impacted pasture.

Table 12-23. Impact Summary for the Pasture Parcel No. 319/1

| Items | Value |
|---|-------|
| Total Pasture (Decare) | 429 |
| Total Number of Pastures in the Town | 19 |
| Number of Pasture Parcels to be Affected by Project-related Expropriation | 1 |
| Total Area of the Affected Pasture Parcel according to Land Registry (Decare) | 45.0 |
| Area of the Part of the Pasture Parcel that will be Expropriated (Decare) | 11.8 |
| The Ratio of the Affected Pasture to the Total Pasture in the Town (%) | 2.8% |
| The Ratio of the Affected Part of the Pasture Parcel to the Total Parcel Area (%) | 26.2% |

Source: Kırklareli Agriculture and Forestry Directorate, 2019.

The area of the affected pasture parcel area is limited when compared to the total area of the pastures registered in Kiyikoy town. In addition, the field surveys revealed that the PAPs prefer to utilize forest land for grazing.

During the construction phase, the remaining area of the affected pasture parcel, which is 33.2 decare, will still be available for the grazing activities of the local people. The improvement of the remaining part (33.2 decare) of the pasture parcel no. 391/1 would considerably mitigate the economic impacts on the PAPs using this parcel for grazing 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.

Impact on Private Land

Three private parcels are affected by the Project related land acquisition. One of the parcels is located in Kislacik, 2 parcels are in Kiyikoy. Only the parcel in Kislacik has single owner who resides in Vize (District centre). The parcels in Kiyikoy have multiple shareholders, and only 1 of the shareholders is a permanent resident in Kiyikoy.

The total area of the affected private parcels is 5.5 decare (see Table 12-24).

Table 12-24. Impact Summary for the Agricultural Parcels Subject to Land Acquisition

| No | Settle ment | Lot | Parcel | Land Type | Current Status of Use | No. of Share holders | Parcel Title Deed Area (da) | Acq. Par cel Size (da) | Affected Area/ Title Deed Area (%) | Project Facility on that Req. Acq. | Related Turbine |
|----|----------------|-----|--------|-----------------------|--------------------------------------|----------------------------|---|------------------------------------|--|--|--------------------|
| 1 | Kislacik | 101 | 206 | Agricultural Field | Uncultivated | 1 | 5.0 | 2.4 | 47% | Turbine | T15 |
| 2 | Kiyikoy | 129 | 27 | Agricultural Field | No users | 5 | 4.6 | 2.0 | 44% | Road | T31 |
| 3 | Kiyikoy | 129 | 31 | Agricultural Field | Uncultivated; used for grazing | 6 | 1.2 | 1.1 | 91% | Road | T31 |

The owner of the affected parcel in Kislacik (101/206) does not reside in Kislacik (lives in Vize district centre). According to information received from the Mukhtar and the residents of Kislacik, the owner has more than 100 decare of land in the area and engages in agriculture. The parcel impacted by the Project is not used for any agricultural activity; and there are no users of the land. Land is left uncultivated.

There are 5 shareholders of the 129-27 numbered parcel in Kiyikoy. The names of the shareholders are not known or recognized by the Mukhtar and other residents. There are no identified users of this parcel³⁹. One of the main reasons for issues with owner/user identification related to parcel information is the history of the area. Most of the lands in the area were allocated to Balkan immigrants by the State. The migrants that did not want to settle, continued to migrate to other parts of Turkey/Europe leaving their land.

There are 6 shareholders of the 129-31 numbered parcel in Kiyikoy. Only one of the shareholders of this parcel lives in Kiyikoy. The names of the other shareholders are not recognized by neither the residents nor the mukhtar. In-depth interview was conducted with the son of the shareholder living in Kiyikoy since shareholder was not available. The land acquired by the Project is not cultivated, yet the grass is used for grazing purposes. The PAP has 5 bovine animals, but the main source of income is forestry activities. The son of the parcel's shareholder also said that he has another 5-10 decares of inherited land from his parents. He requests the full parcel to be acquired, which is subject to evaluation and approval of the governmental authority responsible from execution of expropriation.

12.4.1.5. Impacts on Livelihoods

Forestry Activities

The Project is not anticipated to have a negative impact on the livelihoods of the PAPs sourced from forestry activities as the forest area to be acquired by the Project is very limited such that only 0.2% of the total forest land of Kiyikoy and Kislacik is affected by the Project. Therefore, the forest area that is outside the area affected by the Project is large enough to sustain ongoing forestry activities such as firewood supply.

The production of oak charcoal is not anticipated to be affected neither in Kiyikoy nor in Kislacik as the production areas are not located on the land being acquired by the Project. Total number of households producing oak charcoal is 13 (in Kiyikoy and Kislacik) and all of them use their own private lands as production area.

The Project will not cause any significant negative impact on the livelihoods of the households that practice charcoal production as their private lands are outside the Project's impact area. As the forest area to be affected by the Project is very limited, any future charcoal production activity would also not be restricted by the Project.

A similar situation is also seen in the sale of forest products. The forest is divided into units by the Regional Directorate of Forestry. In accordance with the Forestry Management Plan, wood cutting is allowed in the designated units where only the marked trees can be cut. It means that the sustainable forestry approach is followed by the Regional Directorate.

The households are concerned about the reduction of forest land and possible negative cumulative impacts on livelihoods due to various projects in the region. The cumulative impacts of the Project together with other present and future projects (e.g. other WPP projects in the region, TurkStream, etc.) are discussed in Chapter 16 ("Cumulative Impacts").

Grazing Area and Livestock Activities

The information regarding grazing in the forestry areas of the settlements affected by the Project was obtained from Vize and Kiyikoy Directorates of Forestry. According to this; there is no grazing prohibition for bovine and ovine animals in the forest areas. The size of Kiyikoy's forest area is 83,680 decares providing ample land for

³⁹ The location of the parcel was shared with mukhtar, residents, beekeepers on title-deed mobile registry system to assess users (parcel inquiry application of General Directorate of Land registry and Cadastre) of the parcels.

grazing when compared to the current 429 decares of registered pasture area in the village. Availability of forest land for grazing, decreases pressure on limited pastureland due to Project's land acquisition.

The Project will not restrict access to grazing areas within the forest land in Kiyikoy and Kislacik as the affected forest area will be very limited and there will be no fencing around the License Area of the Project units except the existing substation site. Thus, no Project-related impact is anticipated on animal husbandry.

Beekeeping

According to the data of the Vize District Directorate of Agriculture (2019), there are a total of 18 beekeepers, 12 in Kislacik and 6 in Kiyikoy, who have a total of 1,276 beehives. Entrance of external beekeeper entrance to the region is not allowed. Beekeepers can place their beehives wherever they want in the forest land.

In the field studies conducted by the external flora expert and the cultural heritage experts as part of the ESIA process, it has been identified that there are no active beehives and beekeeping activities within Project's License Area. However, there are beehives located outside the License Area, around 1.7 km south of T34, adjacent to an existing forest road in the vicinity of the TurkStream project site. The air quality modelling results presented in Chapter 7 ("Air Quality and Greenhouse Emissions") show that the Project's construction activities will not cause any significant dust effect at the location of any existing beehives. The noise modelling results presented in Chapter 6 ("Noise") also show that the noise effect caused by construction activities will not cause any significant impact at these locations. The Project is not likely to result in any impact on livelihoods sourced from beekeeping. The existing forest road on which the beehives are located is not an access road planned to be used for Project-related transportation.

In the field interviews/focus group meetings with the beekeepers, it has been identified that there are no beehives in the capacity extension turbine construction areas. Nevertheless, it is important to keep the beekeepers in Kiyikoy 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 are placed outside the impact area of the construction activities throughout the temporary construction duration. During focus group meeting with beekeepers, it has been identified that there has not been a complaint or negative feedback on existing turbines' impact on beekeeping in the region until today.

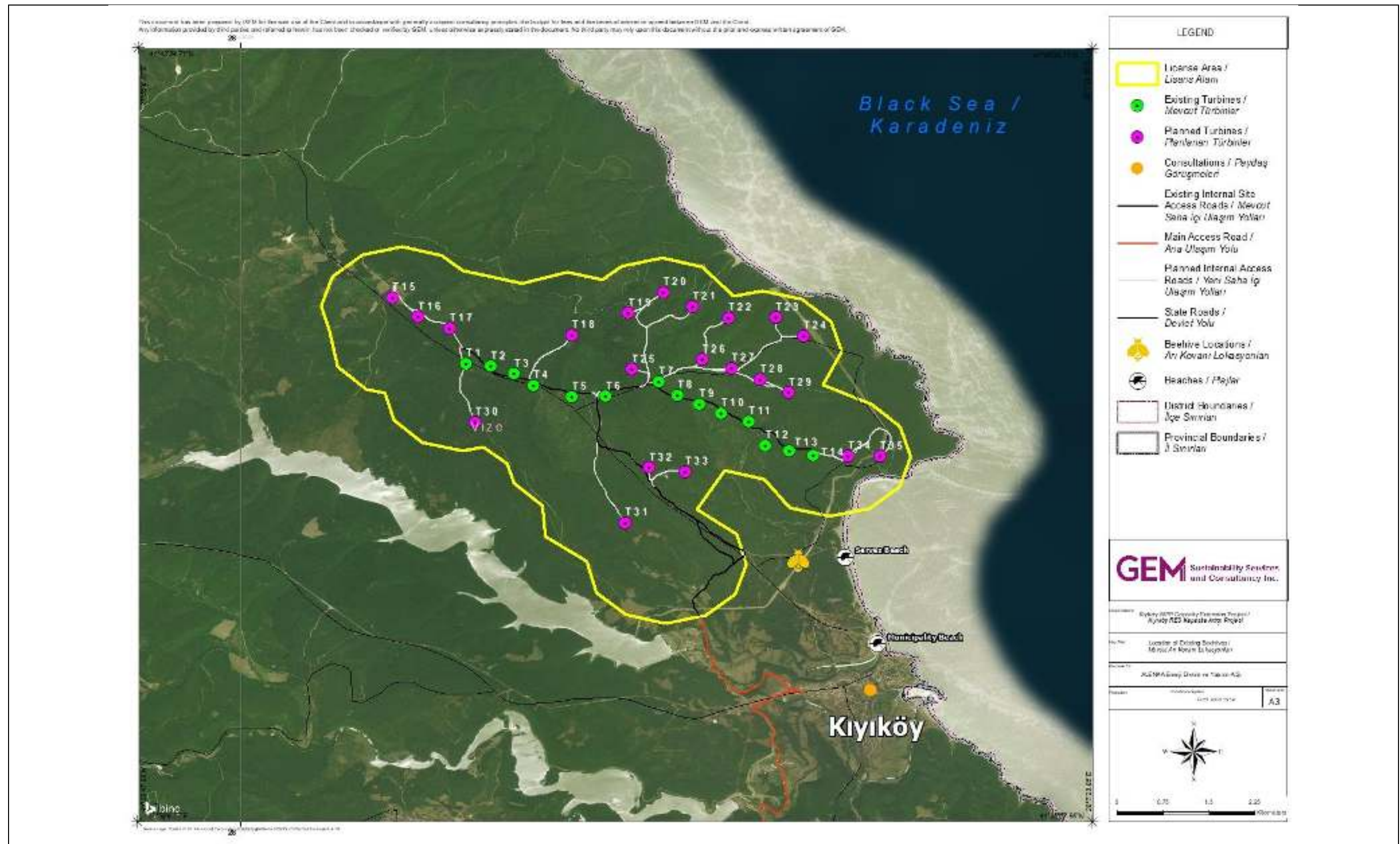


Figure 12-2. Location of Existing Beehives

Mushroom Gathering

Mushroom gathering and sale is an important source of income for households only in the village of Kislacik. The closest planned turbine distance is approximately 6 km from Kislacik.

The forest area to be acquired for the construction of Capacity Extension units is very limited when compared to the ample forest land available in Kislacik village. As the License Area or the Project units except the existing substation site will not be fenced, the Project will not cause any restriction to access to the forest land.

Hence, the Project is not anticipated to cause any impact on mushroom gathering activities of Kislacik villagers. Moreover, women mushroom gatherers who were consulted during field study stated that they collect mushroom close to their village in order to sell it quickly. They informed that the forest is abundant with mushrooms, and Project impacted area is not their mushroom collection zone since it is 6 km away.

Fisheries

The Project is not anticipated to cause any direct impact on the local fisheries as the WPP turbines will be located in the hilly terrain, outside of the port and fishery facilities.

Tourism

Distance of the local touristic locations to the License Area is listed in Table 12-25. The turbine locations and internal site access roads to be constructed as part of the Capacity Extension Project are located within the License Area of the Kiyikoy WPP. The construction activities planned in the scope of the Project are not anticipated to cause any significant impact on the historical and touristic parts of Kiyikoy or the local tourism activities.

Table 12-25. Local Touristic Locations and Their Distance to the Project License Area

| Location | Air Distance to the License Area Boundary (km) | Direction with respect to the License Area |
|---------------------|--|--|
| Servez beach | 0.5 | Southeast |
| Municipality beach | 2.0 | Southeast |
| Kiyikoy town centre | 2.2 | Southeast |
| Police beach | 5.0 | North |

In order to avoid any disruption for the Kiyikoy residents and the visitors of the settlement/tourists⁴⁰ using the existing access road of the Kiyikoy town, the Project Company will;

- improve the existing road providing access to the License Area and ensure that the Project-related traffic uses this improved access road only; place necessary warning signs and visible instructions at the diverging points in order to ensure that the Project-related traffic is diverted to the improved access road and local traffic is diverted to the existing Kiyikoy access road.
- collaborate with the authorities to ensure that the roads in the vicinity of the License Area are closed to local traffic during the transportation of oversized and heavy turbine components.
- schedule concrete works at hours where local traffic volumes are normally at their lowest during the day and if allowed by the related authorities, supply concrete from the existing concrete plant of TurkStream Project (located at the southeastern boundary of the Project License Area) in order to avoid or minimize external traffic due to concrete supply from local concrete plans.

⁴⁰ Kiyikoy is a touristic settlement with a high season between May and October.

- schedule the traffic to avoid the peak hours on the local road network wherever practicable (e.g. early in the morning with the daylight).
- communicate scheduling information and planned traffic disruptions in advance to all related parties including authorities, local communities and nearby businesses.

12.4.1.6. Public Education and Health Services

There are no educational or health services that will be affected by the Kiyikoy WPP as the Project facilities are located out of the settlements and the Project construction works will not involve significant 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 local healthcare services.

12.4.1.7. Vulnerable Groups

Women, children, people with disabilities and elders in need of nursing are considered as vulnerable groups. The Project-related land acquisition is not anticipated to impact the vulnerable groups/persons residing in Kiyikoy and Kislacik settlement centres, which are located outside the Project's License Area.

The disabled vulnerable person residing in the house located in the north of T15, will not be affected directly from the Project-related land acquisition. On the other hand, the construction related effects including dust emissions and noise generation might temporarily affect this receptor during the period of construction activities to be conducted at the location of T15. Upon completion of the construction works at this location, construction related impacts will cease. This vulnerable person will be closely monitored and consulted throughout the construction activities in order to avoid and/or mitigate potential impacts.

12.4.1.8. Hunting Activities

The access to any hunting field corresponding to the construction sites within the License Area will be temporarily restricted during the construction phase. However, the remainder of the Kiyikoy state hunting ground will remain accessible. In the construction phase, hunters and the Provincial Commission of Hunting will be informed about the turbine locations and the schedule of activities.

12.4.2. Operation Phase

The existing operation teams (16 personnel as of September 2019) will continue operating the Kiyikoy WPP after the Capacity Extension Project is commissioned by strengthening the capacity of the Environmental and Social Management System (ESMS) as specified in Chapter 18. Additional employment is not planned during the operation period. Thus, the Project is not likely to bring any significant positive or adverse impact on the population movements, local economy or employment levels. The land to be acquired for the Project will not impede or restrict PAPs' access to common resources during the operation phase as the License Area or the Project units except the existing substation site will not be fenced. Thus, the Project will not affect the forestry, grazing and livestock, mushroom collection activities of the local people and their livelihoods depending on these activities. The beekeepers will be able to place beehives near the turbine area or internal site access road if desired and allowed by the authorities. The grievance mechanism will be kept operational throughout the Project life so as to allow the local people submitting any complaints or requests to the Project Company. The Project Company will duly consider and manage any grievance received in line with the mechanism defined in the Project SEP.

It should be noted that the focus group meetings carried out with beekeepers as part of the ESIA process, identified that there has not been a complaint or negative feedback on existing turbines' impact on beekeeping in the region until today. Similarly, discussions with women mushroom gatherers revealed that the existing wind turbines do not limit growth of boletus mushrooms. Thus, the Project is not anticipated to cause any impact on these livelihood sources during the operation phase.

The Project Company does not envisage any further land acquisition during operation phase. On the other hand, the disabled vulnerable person residing in the house located in the north of T15, will be engaged with and monitored for the management of operation related impacts including turbine noise and blade/ice throw risks during the operation phase. The management options will include relocation of the vulnerable PAP to an alternative resettlement site where he would feel himself comfortable to stay (considering his vulnerability) and continue his current economic activities, if there is any. The Project Company aims to maximise Project's benefits to local communities through the implementation of its CDP as part of CSR Plan.

12.4.3. Closure Phase

The closure activities to be conducted in the scope of the Project will not cause any significant activities on the socio-economic conditions of the local communities. There will be temporary benefits due to employment and procurement of goods, materials and services from the local. Access to certain parts of the License Area would also be partially restricted due to commissioning, dismantling and transportation activities. However, all relevant impacts will be temporary and removed upon completion of closure activities.

12.4.4. Impact Significance, Management and Residual Impacts

The potential Project impacts, proposed mitigation measures and residual impact significances are summarized in Table 12-26.

Table 12-26. Impacts, Proposed Mitigation Measures and Residual Impacts (Socio-economy)

| Impact Description | Project Phase | Receptor | Impact Magnitude Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation) | Proposed Mitigation Measures | Residual Impact ⁹ Significance |
|--|--|--|-------------------------|--|----------------------------------|------------|----------------------|-------------------|--|---|---|---|
| Impacts on Population | • Land Preparation and Construction | • Local Communities (Kiyikoy town's neighbourhoods, Kislacik, Vize district and other settlements in the vicinity of the License Area) | Wide | Low | Short-term reversible | Short-term | Continuous | Low | Low | Minor | <ul style="list-style-type: none"> The Project SEP will be implemented. The Contractor and Supply Chain Management Plan will be implemented. Contractors will be contractually required to maximise use of local workforce, especially by utilising the experienced and qualified workforce available in Kiyikoy. | • Minor |
| Impacts on Local Economy as a result of Employment and Procurement of Required Goods, Materials and Services | • Land Preparation and Construction | • Local Communities (Kiyikoy town, Kislacik, Vize district, Saray district and other settlements in the vicinity of the License Area) | Wide | Medium (Beneficial) (100 workers at the peak period of construction) | Short-term reversible | Short-term | Intermittent | Medium | Low | Minor (Beneficial) | <ul style="list-style-type: none"> The Project Contractor and Supply Chain Management Plan including the local employment and procurement procedures will be implemented. The SEP will be implemented. The goods and services to be provided from the local will be determined together with the contractor company/companies. Consultations will be held with businesses in Kiyikoy town to inform them about the potential local procurement of goods and services. Contractor procurement will be monitored by the Project Company by monthly reports. In case any issues arise with procurement and employment, the grievance mechanism will be operated. | • Minor (Beneficial) |
| Impacts on Forest Land | • Land Preparation and Construction, Operation | • Local Communities in Kiyikoy and Kislacik, which have a total forest land of 12,139 ha | Local | Low Capacity Extension Project units affect 25.5 ha of forest land (the cumulative forest land to be affected by existing WPP and Capacity Extension Project units is 38.5 ha) | Long-term Reversible/Irrversible | Long-term | Recurrent/Continuous | Medium | Medium | Moderate | <ul style="list-style-type: none"> The Project SEP including the grievance mechanism will be implemented. The Project Livelihood Restoration Plan (LRP) will be prepared for land acquisition. The Project Habitat Restoration Plan will be implemented. The mukhtars, forest users, members of Kiyikoy and Kislacik Development Cooperatives, livestock producers, and owners of the impacted lands will be informed about land acquisition process. The remaining part of the pasture parcel 319/1 (in Kiyikoy) will be improved to mitigate adverse economic impacts on the households involved in animal husbandry. | Minor |
| Impacts on Pastureland | • Land Preparation and Construction, Operation | • Local Communities in Kiyikoy, which has a registered pasture area of | Local | Low (11.8 da of a single registered pasture) | Long-term Reversible/Irrversible | Long-term | Recurrent/Continuous | Medium | Medium | Minor | | Negligible |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | Reversibility | Duration | Frequency | Overall Magnitude | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation) | Proposed Mitigation Measures | Residual Impact ⁹ Significance |
|--|--|---|------------------|--|----------------------------------|------------|----------------------|-------------------|--|---|---|---|
| | | | Extent | Magnitude | | | | | | | | |
| | | 429 da (19 parcels) and Grazing Area within the Forest Land • Parcel no. 319/1 in Kiyikoy | | parcel with a total area of 45.0 da) | | | | | | | | |
| Impacts on Private Land | • Land Preparation and Construction, Operation | Owners/ users of the following parcels: -Parcel no. 129/31 registered in Kiyikoy and located along the main access road of the Project, -Parcel no. 129/27 registered in Kiyikoy and located along the main access road of the Project, -Parcel no.101/206 registered in Kislacik and located at the footprint of the foundation of T15. | Local | Low (3 parcels summing up to a total area of 5.5 da) | Long-term Reversible/Irrversible | Long-term | Recurrent/Continuous | Medium | Low | Minor | | Negligible |
| Impacts on Forestry Activities | • Land Preparation and Construction | • Forest workers in Kiyikoy and Kislacik | Local | Low | Short-term reversible | Short-term | One-off/rare | Low | Medium | Minor | • The Project Company will implement the SEP and consult with the forestry authorities and the forestry cooperative. | • Negligible |
| Impacts on Livestock Activities on Affected Pasture Parcel | • Land Preparation and Construction, Operation | • Livestock households using Parcel no. 319/1 registered in Kiyikoy | Local | Medium | Long-term Reversible/Irrversible | Long-term | Continuous | Medium | Medium | Moderate | • The Project SEP including the grievance mechanism will be implemented. • The Project LRP will be implemented. • 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. • The ovine and bovine breeders will be informed about the construction activities. | • Negligible |
| Impacts on Beekeeping | • Land Preparation and Construction | • Beekeepers | Local | Low | Short-term reversible | Short-term | One-off/rare | Low | Low | Minor | • The Project SEP including the grievance mechanism will be implemented. • Prior to start of construction phase, the Project Company will collaborate with the mukhtars, related authorities and agencies in order to inform the local beekeepers will | • Negligible |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | Reversibility | Duration | Frequency | Overall Magnitude | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation) | Proposed Mitigation Measures | Residual Impact ⁹ Significance |
|-------------------------------|-------------------------------------|---|------------------|------------|-----------------------|------------|--------------|-------------------|--|---|---|---|
| | | | Extent | Magnitude | | | | | | | | |
| | | | | | | | | | | | <ul style="list-style-type: none"> be notified about the construction areas and schedule. During the construction period, if beehives are identified and in case required in the vicinity of the construction areas, the beehive owners will be contacted to provide for the relocation of beehives. | |
| Impacts on Mushroom Gathering | • Land Preparation and Construction | • Women mushroom collectors and sellers in Kislacik | Local | Negligible | Short-term reversible | Short-term | One-off/rare | Negligible | Low | Negligible | <ul style="list-style-type: none"> The Project SEP including the grievance mechanism will be implemented The Project LRP will be prepared. Construction schedule and sites will be shared with the women mushroom collectors in Kislacik LRP will be implemented. | • Negligible |
| Impacts on Fishery | • Land Preparation and Construction | • Local Fishers in Kiyikoy | Wide | Negligible | Short-term reversible | Short-term | One-off/rare | Negligible | Negligible | Negligible | <ul style="list-style-type: none"> The Project SEP including the grievance mechanism will be implemented to inform fisheries about the Project construction activities. | Negligible |
| Impacts on Tourism | • Land Preparation and Construction | • Local businesses | Wide | Low | Short-term reversible | Short-term | Intermittent | Low | Low | Minor | <ul style="list-style-type: none"> The Project Transportation and Traffic Management Plan will be implemented. The Project Company will improve the existing road providing access to the License Area and ensure that the Project-related traffic uses this improved access road only; place necessary warning signs and visible instructions at the diverging points in order to ensure that the Project-related traffic is diverted to the improved access road and local traffic is diverted to the existing Kiyikoy access road. The Project Company will collaborate with the authorities to ensure that the roads in the vicinity of the License Area are closed to local traffic during the transportation of oversized and heavy turbine components. The Project Company will schedule concrete works at hours where local traffic volumes are normally at their lowest during the day and if allowed by the related authorities, supply concrete from the existing concrete plant of Turk Stream Project (located at the southeastern boundary of the Project License Area) in order to avoid or minimize external traffic due to concrete supply from local concrete plans. The Project Company will schedule the traffic to avoid the peak hours on the local road network wherever practicable (e.g. early in the morning with the daylight). The Project SEP including the grievance mechanism will be implemented. | • Negligible |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | Reversibility | Duration | Frequency | Overall Magnitude | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation) | Proposed Mitigation Measures | Residual Impact ⁹ Significance |
|---|-------------------------------------|---|------------------|------------|-----------------------|------------|--------------|-------------------|--|---|---|---|
| | | | Extent | Magnitude | | | | | | | | |
| | | | | | | | | | | | Scheduling information and planned traffic disruptions will be communicated to all related parties including authorities, local communities and nearby businesses in advance of the start of relevant activities. | |
| Impacts on Public Education and Health Services | • Land Preparation and Construction | • Local Communities | Wide | Negligible | Short-term reversible | Short-term | One-off/rare | Negligible | Negligible | Negligible | <ul style="list-style-type: none"> The Project SEP including the grievance mechanism will be implemented. The Project Contractor and Supply Chain Management Plan will be implemented. On-site Infirmary service will be provided for employees during the construction phase. | Negligible |
| Impacts on Vulnerable Groups | • Land Preparation and Construction | • The disabled vulnerable PAP, living in the house located in the north of T15 within the Project's License Area. | Local | Low | Short-term reversible | Short-term | Intermittent | Medium | High | Major | The Project Company will engage with the vulnerable PAP residing at the building located in the north of T15 prior to the start of and during the construction activities to be conducted at this location in order to inform the user about the scope and duration of the activities and mitigate the potential impacts for the period of construction at this turbine site. | Minor |
| | • Operation | | | | Long-term reversible | Long-term | Intermittent | Medium | | Major | <ul style="list-style-type: none"> The Project Company will engage with the vulnerable PAP during the ESIA public disclosure period regarding relocation and inform the PAP on the potential operational impacts and risks (e.g. noise, shadow flicker and blade/ice throw risk) of the Project based on the findings of the ESIA and the proposed mitigation measures during the construction and operation (until the end of Project's financing period) including the option for relocation. Based on the engagement, the Project Company will document vulnerable PAP's willingness or unwillingness to relocate during the ESIA public disclosure period. In case the vulnerable PAP declares his unwillingness to relocate during the ESIA disclosure period, the Project Company will recognise the right of the PAP to choose relocation until the end of second year of operation. Ring-fenced funds will be allocated and kept available until the end of second year of operation for preparation and implementation of a RAP, should the PAP subsequently accept the option to relocate within this period. <p><u>If the PAP is willing to relocate:</u></p> <ul style="list-style-type: none"> If the PAP is willing to relocate, a RAP will be prepared in line with EBRD PR5, submitted to Lenders for approval and | |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | Reversibility | Duration | Frequency | Overall Magnitude | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation) | Proposed Mitigation Measures | Residual Impact ⁹ Significance |
|-------------------------------|-------------------------------------|--|------------------|------------|-----------------------|------------|--------------|-------------------|--|---|---|---|
| | | | Extent | Magnitude | | | | | | | | |
| | | | | | | | | | | | <p>implemented for the vulnerable PAP living in the setback distance of T15.</p> <ul style="list-style-type: none"> The RAP will ensure that the operational noise impact on the vulnerable PAP is avoided at the resettlement site, which will provide adequate housing with improved living conditions, where the PAP would feel himself comfortable to stay (considering his vulnerability) and continue his current economic activities, if there is any. <p><u>If the PAP is unwilling to relocate:</u></p> <ul style="list-style-type: none"> Projects-specific noise management and mitigation measures (including monitoring) described in Chapter 6 ("Noise") of this ESIA Report will be implemented. Projects-specific measures for the management of shadow flicker impact and ice throw risk of the Project will be implemented as described in Chapter 14 ("Community Health and Safety"). The Project Company will continue engagement with the vulnerable PAP through face to face meetings to be undertaken monthly in the first year of operation, quarterly in the second and third years of operation and semi-annually after the third year of operation until the end of financing period. Project Grievance Mechanism will be implemented throughout the operation to address any noise-related grievance and plan/take corrective actions, where necessary. The Air Quality and GHG Management Plan, the Noise Management Plan and the Community Health and Safety Management Plan will be implemented during the construction and operation phases of the Project. Noise and air quality monitoring will be conducted at the relevant receptor to verify compliance with Project standards and in case of receipt of noise-related grievances in line with the frequencies specified in these management plans. | |
| Impacts on Hunting Activities | • Land Preparation and Construction | • Local hunter in Kiyikoy and Kislacik | Local | Negligible | Short-term reversible | Short-term | Intermittent | Negligible | Negligible | Negligible | <ul style="list-style-type: none"> The Project SEP will be implemented. The Vize Association of Hunters management team and members will be informed about the Project activities. | Negligible |

13. LABOUR AND WORKING CONDITIONS

This Chapter provides baseline information on the labour and working conditions in Turkey and explains the Project Company's approach to the management of labour and working conditions including occupational health and safety (OHS) aspects and management measures to ensure compliance with the applicable legislative requirements as well as international standards.

13.1. Project Standards

The Project Company has in place OHSAS 18001:2007 Health and Safety Management System certification for wind energy production and energy sales (Issue Date: 17 July 2018, Expiry Date: 6 February 2020). At the corporate level, programs, plans and procedures exist on labour and OHS issues as given under Project ESMS.

The following list of national legislation and international standards will be applicable to the Project:

- Turkish Labour Law (Law No. 4857; Official Gazette No. 25134 dated June 10, 2003) and related regulations
- Turkish Law on Occupational Health and Safety (Law No. 6331; Official Gazette No. 28339 dated June 30, 2012) and related regulations
- National Programme on the Elimination of Child Labour (2017-2023)
- EBRD PR2 on Labour and Working Conditions (2014)
- EBRD PR2 Guidance Note on Human Resources Policies and Employee Documentation; Children, Young People and Work; Forced Labour; Non-discrimination and Equal Opportunity; Wages and Working Hours; Workers' Accommodation; Workforce Retrenchment; and Employee Grievance Mechanism (December 2017)
- IFC and EBRD's Guidance Note on Workers' Accommodation: Processes and Standards (2009)
- International Labour Organization (ILO) conventions to which Turkey is a party.

13.2. Baseline Conditions

Main data sources used to compile the baseline information are listed below:

- European Agency for Safety and Health at Work (EU OSHA), Occupational safety and health in the wind energy sector, European Risk Observatory Report (2013)
- Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST), Wind Energy Sector: Occupational Health and Safety Risks and Accident Prevention Strategies Report (2015)
- ILO website and related documentation (www.ilo.org)
- Renewable United Kingdom (UK), Onshore Wind Health and Safety Guidelines (2015)
- Turkish Social Security Institute (SGK) website and related statistics (www.sgk.gov.tr)
- Turkish Statistical Institute (TurkStat) website and related statistics (www.turkstat.gov.tr)

13.2.1. Labour and Working Conditions

Turkey is 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. The current Turkish Labour Law is aligned with the international labour standards and EBRD PR2 requirements, including aspects such as child labour, forced labour, non-discrimination and equal opportunity and right to join workers' organisations. However, 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 Turkey. In addition to these, another issue that has become prominent recently is the informal employment of refugees and other foreign seasonal workers, as the official refugee number in Turkey has surpassed 3.6 million in 2019 (*Ministry of the Interior Affairs, 2019*).

Child Labour

Article 1 of the UN Convention on the Rights of the Child, which Turkey is a party to, defines "child" as a person under the age 18. 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.

In Turkey, 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 works 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 written contract and getting permission for each of the activities, the 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 the 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.

As reported in the 2017-2023 National Programme on the Elimination of Child Labour published by the former Ministry of Labour and Social Security – Directorate General of Labour, in Turkey, Child Labour Force Survey was conducted in 1994, 1999, 2006 and 2012 by TurkStat. According to the data of 2012, the number of children in the age group of 6-17 is 15 million 247 thousand. Amongst these, 66.5% of the children live in urban areas and 33.5% live in rural areas.

According to the results of the 2012 Child Labour Force Survey, 5.9% of children in the age group of 6-17 are working. Of 893 thousand working children, 292 thousand are in the age group of 6-14 and 601 thousand are in the age group of 15-17. Whilst 68.8% (614 thousand people) of working children are boys and 31.2% (279 thousand people) are girls.

The distribution of the children in the age group of 6-17, which are economically active in Turkey is examined in terms of the sectors: 44.7% (399 thousand) works in agriculture sector, 24.3% (217 thousand) in industry and 31% (277 thousand) in service sector. When the sector-based results are compared to the results of 2006, the share of the agricultural sector amongst employed children increased by 8.1% whilst the share of the industrial sector decreased by 6.6% and the share of the service sector decreased by 1.5%.

On the other hand, the children of the Syrian refugees, who have migrated to Turkey mainly with their mothers since 2011, have faced with the risk of child labour. It is likely that the illegal employment of Syrian refugee children has contributed to the increase in child labour in Turkey.

According to the 2016 Findings of the Worst Forms of Child Labour Report published by the United States (US) Department of Labour; various academic, media, and other reports, continued to suggest growing numbers of child labourers within the increasing Syrian refugee population, including exploitation in the worst forms of child labour. Regarding this issue, the Turkish government expanded education programs to refugee children; however, Syrian refugee children are still engaged in street begging, manufacturing work in various sectors and agriculture sector (*US Department of Labour, 2016*).

Women Participation in Labour Force

ILO describes the women employment rate in Turkey as extremely low compared to the European Union (EU) Member States. According to the modelled estimates of ILO, female participation rate (% of female population age of 15+) in the labour force was 33.5% in 2018. The participation rate was at its lowest in 2006 and has been in a steady increase since then. However, as reported in the World Bank Open Data 2019 Labour Force Participation Statistics (<https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS?locations=TR>), the estimated participation rate decreased slightly in 2018.

Unregistered/Uninsured Employment

Currently, more than 3 million refugees, most of which consist of Syrian refugees, are residing in Turkey. This resulted in illegal employment of refugees with significantly lower wages and no insurance and thus the displacement of Turkish workers, consequently leading to increase in conflict. Turkey has recently implemented a major change in its refugee employment policy and is now issuing work permits for registered Syrian refugees. In addition, ILO Office for Turkey has introduced in 2015 a comprehensive strategy for employment of Syrian refugees and implemented various projects within this scope.

The main aim of the strategy is directly quoted below:

- Increase the availability of skilled, competent and productive labour supply to facilitate access to decent work for Syrian refugees and Turkish host communities;
- Support an enabling environment for business development and economic growth in identified sectors and geographic locations to address job creation and stimulate entrepreneurship opportunities for Syrian refugees and Turkish host communities;
- Provide support to strengthen labour market governance institutions and mechanisms to assist Turkey in implementing inclusive development strategies.

As per the 2016 Turkey Migration Report issued by the Ministry of Interior Affairs – General Directorate of Immigration Authority, Istanbul, Sanliurfa and Hatay provinces have the highest numbers of registered Syrian refugees with 438,861, 405,511 and 379,141 refugees, respectively. The number of registered Syrian refugees in Kırklareli province is 2,082 which is 0.59% of the total province population.

13.2.2. OHS in Wind Energy Sector

OHS data in wind energy sector is generally scarce and as referenced by the EU-OSHA publication entitled “Occupational Safety and Health in the Wind Energy Sector – European Risk Observatory Report”, the Caithness Wind Farm Information Forum (CWIF) (<http://www.caithnesswindfarms.co.uk/index.htm>) gathers worldwide information on wind turbine related accidents (including wind industry directly as well as construction, maintenance, transport) through press reports or official information releases. CWIF provides a detailed table including all documented cases of wind turbine related accidents and incidents which could be found and confirmed through press reports or official information releases up to 30 June 2019. This data also provides information on the type of accidents that did occur together with the consequences which will form a basis for future management of OHS in the wind energy sector. As reported by CWIF, as more turbines are built, more accidents occur as reflected in the number of recorded accidents with an average of 44 accidents per year from 1999-2003 inclusive; 95 accidents per year from 2004-2008 inclusive; 156 accidents per year from 2009-2013 inclusive, and 174 accidents per year from 2014-2018 inclusive.

Table 13-1 provides wind energy accidents statistics as reported by CWIF and Table 13-2 summarizes the wind energy accidents reported in Turkey as given in CWIF database.

Table 13-1. Global Wind Energy Accident/Incident Statistics

| Year | Number of Accidents | Fatal Accidents ⁽¹⁾ | Human Injury ⁽²⁾ | Blade Failure ⁽³⁾ | Fire ⁽⁴⁾ | Structural Failure ⁽⁵⁾ | Ice Throw ⁽⁶⁾ | Transport | Others ⁽⁶⁾ |
|--------------------------|---------------------|--|-----------------------------|------------------------------|---------------------|-----------------------------------|--------------------------|------------|-----------------------|
| Before 2000 | 109 | 24 | 5 | 35 | 7 | 15 | 9 | N/A | 13 |
| 2000-2004 | 244 | 12 | 11 | 53 | 63 | 32 | 8 | 7 | 47 |
| 2005 | 72 | 4 | 6 | 12 | 14 | 7 | 4 | 6 | 12 |
| 2006 | 83 | 5 | 10 | 17 | 12 | 9 | 3 | 6 | 16 |
| 2007 | 125 | 5 | 16 | 23 | 21 | 13 | 0 | 19 | 18 |
| 2008 | 135 | 11 | 18 | 20 | 17 | 9 | 3 | 12 | 24 |
| 2009 | 132 | 8 | 9 | 26 | 18 | 16 | 4 | 11 | 27 |
| 2010 | 124 | 8 | 14 | 20 | 16 | 9 | 1 | 11 | 25 |
| 2011 | 171 | 15 | 12 | 20 | 22 | 13 | 1 | 24 | 43 |
| 2012 | 174 | 17 | 15 | 29 | 23 | 10 | 1 | 17 | 36 |
| 2013 | 181 | 5 | 9 | 36 | 26 | 15 | 0 | 14 | 33 |
| 2014 | 167 | 3 | 9 | 32 | 19 | 13 | 1 | 17 | 33 |
| 2015 | 160 | 8 | 9 | 22 | 21 | 12 | 1 | 14 | 42 |
| 2016 | 166 | 6 | 10 | 21 | 28 | 11 | 3 | 16 | 32 |
| 2017 | 185 | 9 | 13 | 18 | 25 | 14 | 1 | 19 | 34 |
| 2018 | 193 | 3 | 4 | 26 | 27 | 9 | 2 | 14 | 56 |
| 2019 (till 30 June 2019) | 79 | 3 | 3 | 13 | 16 | 2 | 1 | 9 | 20 |
| Total | 2,500 | 146 (Number of fatalities is 193) | 173 | 423 | 375 | 209 | 43 | 216 | 511 |

Source: Caithness Wind Farm Information Forum (<http://www.caithnesswindfarms.co.uk/accidents.pdf>)

⁽¹⁾ There are 146 accidents resulting in 193 fatalities. Out of 193 fatalities, 121 were wind industry and direct support workers (construction, maintenance, engineers, etc.) or small turbine owner/operators and 72 were public fatalities including workers not directly dependent on the wind industry (e.g. transport workers).

⁽²⁾ During the 173 accidents, 205 wind industry or construction/maintenance workers were injured and a further 76 members of the public or workers not directly dependent on the wind industry (e.g. fire fighters, transport workers) were also injured.

⁽³⁾ Pieces of blade are documented as travelling up to one mile. In Germany, blade pieces have gone through the roofs and walls of nearby buildings.

⁽⁴⁾ The biggest problem with turbine fires is that, because of the turbine height, the fire brigade can do little but watch it burn itself out. While this may be acceptable in reasonably still conditions, in a storm it means burning debris being scattered over a wide area with obvious consequences. In dry weather, there is obviously a wider-area fire risk, especially for those constructed in or close to forest areas and/or close to housing. Five fire accidents have badly burned wind industry workers.

⁽⁵⁾ "Structural failure" is assumed to be major component failure under conditions which components should be designed to withstand. This mainly concerns storm damage to turbines and tower collapse. However, poor quality control, lack of maintenance and component failure can also be responsible. The accident consequences and risks to human health are most likely lower than that of blade failure as risks are confined to within a relatively short distance from the turbine.

⁽⁶⁾ Component or mechanical failure has been reported here if there has been no consequential structural damage. Also included are lack of maintenance, electrical failure (not led to fire or electrocution) etc. Construction and construction support accidents are also included also lightning strikes when a strike has not resulted in blade damage or fire.

Table 13-2. Wind Energy Accidents in Turkey

| No | Accident Type | Date | Location | Details | Source |
|---|----------------------------------|------------------|-------------------------|--|---|
| 1 | Fire | 17 August 2013 | Balikesir, Turkey | Fire reported at wind turbine due to short-circuit near Balikesir, Turkey | Reported on 17 August 2013 at https://www.memurlar.net/haber/397362/ |
| 2 | Transport | 6 November 2013 | Afyon, Turkey | People look at the general scene of an accident that a wind turbine wing which was transported by a truck crashed and entered into a bus on November 6, 2013 in Turkey's western city of Afyonkarahisar. Nobody killed and wounded in the accident. | Reported on 6 November 2013 at http://www.gettyimages.de/detail/nachrichtenfoto/people-look-at-the-general-scene-of-an-accident-that-anachrichtenfoto/187215200 |
| 3 | Fatal Accident and Severe Injury | 24 December 2015 | Balikesir, Turkey | During the repair of a speed sensor, part of the equipment fell onto the maintenance workers, killing one and severely injuring another. | Reported by Reshaber on 24 December 2015 |
| 4 | Fire | 27 October 2016 | Hatay, Turkey | Fire reported at a wind turbine in Belen, Hatay. | Reported by Reshaber on 27 October 2016 |
| 5 | Blade failure | 3 December 2016 | Candarli, Izmir, Turkey | Report of a wind turbine blade incident in Turkey. A 34m long section of the 48m blade broke off, with pieces of the blade reported to be thrown into neighbouring garden, house and olive groves. Luckily no-one was injured, but there was damage to property. | Reported by Evrensel.net on 3 December 2016 (https://www.evrensel.net/haber/297949/45-tonluk-resin-kanadi-koptu-faciaya-ramak-kaldi) |
| 6 | Fire | 30 January 2019 | Senoba, Hatay, Turkey | Fire reported at a wind turbine in the Senoba neighbourhood, Hatay Yayladagi district, Turkey. The fire resulted in a local power cut. | Reported by CNN Turkey on 31 January 2019 (https://www.cnnturk.com/turkiye/hatayda-ruzgar-turbininde-yangin) National Wind Watch: https://www.wind-watch.org/news/2019/01/31/fire-in-hatay-wind-turbine/ |
| 7 | Blade Failure | 1 February 2019 | Aliaga, Izmir, Turkey | The blade failed and spread pieces over 500m from the turbine. The nacelle then toppled over. | Reported by aydin24haber on 1 February 2019 (http://m.aydin24haber.com/izmirde-ruzgar-turbini-ruzgara-dayanamadi-427930h.htm) |
| Source: Caithness Wind Farm Information Forum (http://www.caithnesswindfarms.co.uk/index.htm) Global Wind Turbine Accident Data till 30 June 2019 (http://www.caithnesswindfarms.co.uk/fullaccidents.pdf) | | | | | |

13.3. Impact Assessment and Management

This section details the potential OHS risks and impacts associated with the Project activities and the mitigation measures proposed for the identified impacts.

13.3.1. Land Preparation and Construction Phase

Labour and Working Conditions

It is anticipated that there will be 100 personnel working on site at the peak period of construction activities, of which 35% is anticipated to be unskilled. The Project Company will request the Contractors to give priority to employment from local workforce available in Kiyikoy. The Turkish Labour Law already provides for the basic principles of international labour standards and the EBRD PR2 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 management of their workforce.

Within the scope of the Capacity Extension construction works, worker's accommodation is not planned to be provided on-site. The workers to be employed from Kiyikoy, will lodge in their local houses and transported to the Project site by means of service buses to be arranged by the Project. There are available accommodation opportunities including hotels and rental houses in the nearby district centres, including Vize, Saray and Cerkezkoy and limitedly in Kiyikoy town⁴¹. Thus, it is anticipated that the non-local workers will utilise these accommodation opportunities in the nearby district centres. As the number of construction workers is limited and the total period for construction is foreseen to be 11 months (the peak construction period when all the 100 workers will work at the same time will be a much shorter duration), the adverse impacts on the nearby district centres, 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, benefits of off-site housing on the economies of the nearby district centres 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 Project Company will ensure that all the direct and contracted workers are provided with trainings on BEE's corporate Social Guidelines at the beginning of employment (individually or collectively). These trainings will also cover the code of conduct for accommodation, as well as general moral, cultural and ethical rules required from all Project workers.
- The Project Company will analyse 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 centres in order to ensure safe travel of the Project workers to the Project site and minimise Project-related traffic in the region.
- The Project Company will ensure that the relevant aspects of 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.

⁴¹ According to TurkStat, 2018; Population of Kırklareli, Vize district: 28,122; Population of Saray district: 49,106; Population of Tekirdag, Cerkezkoy district: 166,789; Population of Kırklareli, Vize district. According to the social field survey headmen interviews; Population of Kiyikoy town: 2,180 during winter and 4,900 during summer.

The construction workers will be contracted by the Contractor for a fixed term duration covering only the construction phase activities. The workers will be informed on the fixed term duration of their contracts at the time of the employment, which will be explicitly reflected in the individual contracts.

The construction activities will be conducted in one shift, which includes eight hours (08:00-18:00 with 2 hours break). In case of technical requirements, additional shifts could be planned for certain tasks such as turbine erection that may need suitable wind speeds.

As per the Project ESMS, the Project Company will implement the Human Resources (HR) Policy developed in line with the Project Standards. Furthermore, the Project-specific Contractor and Supply Chain Management Plan will provide the framework for the management of labour related topics in line with the Project Standards.

Occupational Health and Safety

The major OHS hazards for the land preparation 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. Lifting operations will be conducted during installation of wind turbines, since the components will be transported separately and assembled on-site. Construction activities that involve working with ladders, scaffolding, partially built structures and cranes constitute risks related to working at height. These risks include the fall from at least 2 m high work environments onto ground, construction equipment, etc. and objects that may fall from height on the individuals working below.

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. Being struck, trapped and/or entangled by machinery parts or heavy equipment can lead to fatal accidents, especially since heavy equipment operators have limited fields of view of the area close to the equipment they use. For WPP projects, this risk is significant since installation of turbine components require working with heavy equipment, including cranes.

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 transportation of turbine components.

Managing working at height activities requires suitable planning and the allocation of sufficient resources. 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).

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 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.

13.3.2. Operation Phase

Labour and Working Conditions

The current operations team at the existing Kiyikoy WPP consists of 16 personnel in total, including 4 staff from BEE Headquarters, 5 staff from the Project Company, 7 staff from the contractors for private security and services. All the Project staff are male and 12 of them permanently works at the site operations (one of the senior technicians from BEE temporarily works at the site). All the contractor personnel and 2 of the operation technicians working at the Project Company are from the local (in total 8 personnel are from Kiyikoy town). The operations team works in three shifts.

The existing operation team will continue after the Capacity Extension Project is commissioned by strengthening the capacity of the ESMS as required.

As per the Project ESMS, the Project Company will implement the HR Policy developed in line with the Project Standards. Furthermore, the Project-specific Contractor and Supply Chain Management Plan will provide the framework for the management of labour related topics in line with the Project Standards.

Occupational Health and Safety

The major OHS hazard for the operation phase of wind energy facilities are related to working at height for maintenance purposes. As summarized in Table 13-1, structural failure, blade failure, ice fall/throw and fire are also amongst incidents that might potentially impact workers during operation phase.

13.3.3. Closure Phase

All construction phase risks and impacts identified are also applicable for the closure phase, since closure activities consist of decommissioning and dismantling/uninstalling of existing Project units and rehabilitation activities. Therefore, the assessment for construction phase is also valid for closure phase.

13.3.4. Impact Significance, Management and Residual Impacts

In the assessment of impact significance (see Table 13-3), magnitude of factors has been determined based on professional judgement. For the assessments related to OHS and working conditions, the receptor sensitivity level has always been assumed as high as this can affect human health, safety and welfare. Sensitivity level has been assumed as moderate for other impact types.

Table 13-3. Impacts, Proposed Mitigation Measures and Residual Impacts (Labour and Working Conditions)

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|---|---|---|------------------|-------------|---------------------------------------|------------|-----------|----------------------|---|--|--|------------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| Impacts due to workers contractual arrangements | <ul style="list-style-type: none"> Land Preparation and Construction Operation Closure | <ul style="list-style-type: none"> Project personnel | Restricted | Medium | Long term reversible/ Irreversible | Short term | One-off | Medium | Medium | Moderate | <ul style="list-style-type: none"> Implement Contractor and Supply Chain Management Plan. Implement SEP and the Grievance Mechanism. Ensure all workers are aware of the duration and scope of their work and all conditions to be explicitly written in their written contracts. Ensure all contractual arrangements are in line with Project Standards for contractors and sub-contractors as well. | Negligible |
| Incidents/accidents due to on site H&S risks and H&S practices (e.g. working at height, lifting operations) | <ul style="list-style-type: none"> Land Preparation and Construction Operation Closure | <ul style="list-style-type: none"> Project personnel | Restricted | Low to High | Short term reversible to Irreversible | Short term | One-off | Low to High | High | Minor to Major | <ul style="list-style-type: none"> Implement Emergency Preparedness and Response Plan. Implement Contractor and Supply Management Plan. Implement SEP and the Grievance Mechanism. Always ensure correct PPE use. Provide general and job specific OHS trainings and first aid trainings. Personnel that conduct work at height and lifting operations to be properly trained on the specific job type and competent. Fall protection systems in place during works at height (e.g. fall arrest equipment, etc.). Set and maintain appropriate exclusion zones below any working at height activities to avoid incidents/accidents due to falling objects. All tools and equipment to be appropriately positioned whilst working at height to avoid falling of objects. Major on-site operations as lifting operations to be scheduled and planned well in advance taking into account the weather conditions and details of the operation to be communicated to all site personnel on time. Do not conduct work at height and lifting activities during heavy rain/storm and other poor/extreme weather conditions. Ensure all equipment are checked and maintained regularly. Implement limits on manual lifting/handling. Install guard rails, signs. Ensure sufficient illumination. Conduct regular visual checks and maintenance/clean-up of excavation debris and other potential risk sources such as cables and ropes. Restrict operation of heavy machinery to those that are trained and competent (licensed if required). Conduct periodic medical checks for personnel. | Negligible |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--|--|---|------------------|-------------|---------------------------------------|----------------------|------------------------------------|----------------------|---|--|---|------------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| Health risks due to emissions to air and noise/vibration generation | <ul style="list-style-type: none"> Land Preparation and Construction Closure | <ul style="list-style-type: none"> Project personnel | Restricted | Low | Short term reversible to Irreversible | Short term | Intermittent | Low | High | Moderate | <ul style="list-style-type: none"> Implement Air Quality and GHG Management Plan and Noise Management Plan. Ensure use of related PPEs as required. Consider changing equipment or implementing time limits in case of a grievance regarding vibration. | Negligible |
| Incidents/accidents due to on site traffic | <ul style="list-style-type: none"> Land Preparation and Construction Closure | <ul style="list-style-type: none"> Project personnel | Local | Low to High | Short term reversible to Irreversible | Short to medium term | Intermittent | Medium | High | Major | <ul style="list-style-type: none"> Implement the Transportation and Traffic Management Plan. Restrict operation of heavy vehicles to those that are trained and competent. Provide traffic trainings for all personnel and provide specialised trainings to personnel that will operate industrial vehicles. Install and maintain signage and other traffic regulating means. Set speed limits and implement right of way practices. Conduct periodic vehicle maintenance. | Negligible |
| Impacts on local communities due to off-site accommodation of Project's construction workforce | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> Local communities (Vize, Saray and Cerkezkoy district and Kiyikoy town) | Wide | Low | Short term reversible | Short term | Continuous (for maximum 11 months) | Low | Medium | Minor | <ul style="list-style-type: none"> The Project Company will ensure that all the direct and contracted workers are provided with trainings on BEE's corporate Social Guidelines at the beginning of employment (individually or collectively). These trainings will also cover the code of conduct for accommodation, as well as general moral, cultural and ethical rules required from all Project workers. The Project Company will analyse 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 centres in order to ensure safe travel of the Project workers to the Project site and minimise Project-related traffic in the region. An Off-site Accommodation Management Plan will be developed and implemented for the construction phase. | Minor |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|---|---|-------------------|------------------|-----------|-----------------------|------------|--------------|----------------------|---|--|---|------------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| Impacts due to worker's on-site accommodation conditions (in case of on-site accommodation) | <ul style="list-style-type: none"> Land Preparation and Construction Operation Closure | Project personnel | Restricted | Low | Short term reversible | Short term | Intermittent | Low | High | Moderate | <ul style="list-style-type: none"> Implement SEP and the Grievance Mechanism. Implement Contractor and Supply Chain Management Plan and Camp Site Management Plan. Implement the Waste Management Plan. Ensure compliance with Workers' accommodation: processes and standards (IFC and EBRD, 2009) for on-site facilities (canteen, sanitary facilities). Ensure potable water and domestic purpose water to be supplied on site meet the requirements of the Turkish Regulation on Water Intended for Human Consumption. Ensure proper first aid equipment is kept on site, at various related locations. Provide trainings to personnel on general waste management, good housekeeping and first aid. Conduct visual checks on site to ensure proper housekeeping. | Negligible |

14. COMMUNITY HEALTH AND SAFETY

This Chapter provides baseline information on the local conditions associated with the community health and safety (CHS) and explains the Project Company's approach to the CHS issues ensuring compliance with the applicable legislative requirements as well as international standards.

The potential impacts on CHS due to Project noise and air emissions, water use, wastewater and waste generation and visual impacts are discussed under respective chapters of this ESIA Report.

14.1. Project Standards

The following list of national legislation and international standards will be applicable to the Project:

- Civil Aviation Law (No. 2920)
- Highway Traffic Law (No. 2918)
- Law on Private Security Services (No. 5188) and its Implementation Regulation
- Regulation on Highway Traffic
- EBRD PR4 on Health and Safety
- World Bank Group (WBG) Environmental, Health, and Safety (EHS) Guidelines, General EHS Guidelines: Community Health and Safety (April 30, 2007)
- WBG EHS Guidelines for Wind Energy (August 7, 2015)

At the Project level, CHS management plan will be in place.

14.2. Baseline Conditions

The main data sources used to compile the baseline information are listed below:

- General Directorate of Highways, 2018 Traffic and Transportation Data (2019)
- General Directorate of Forestry (<https://www.ogm.gov.tr>) Forest Fire Statistics
- Geodata application, (<http://geodata.ormansu.gov.tr/>) Fire Prevention and Response Capacity in the Region

Global wind energy incident/accident statistics including those due to blade failure, fire, structural failure, ice throw and transport are given in Chapter 13 on Labour and Working Conditions.

14.2.1. Existing Transport Network

Access to the Project License Area is provided through the centre of Saray district located in Tekirdag province. From Saray district centre, Saray-Kiyikoy road is followed for about 25 km which diverges to the north in the direction of the existing Kiyikoy WPP. From this point, the stabilised forest road is followed for about 12 km to access the site through the existing main access road of the operational Kiyikoy WPP.

The existing road infrastructure around Kiyikoy WPP License Area is shown in Figure 14-1.



Figure 14-1. Existing Road Infrastructure (Source: KGM, May 2019. 2018 Traffic and Transportation Data)

The state road sections planned to be followed during the transportation of turbine components from Tekirdag (Akpiyer) Port to the License Area and the corresponding annual average daily traffic volumes are provided in Table 14-1.

Table 14-1. Annual Average Daily Vehicle Values

| State Road Sections | Annual Average Daily Light Vehicle Values | Annual Average Daily Heavy Vehicle Values | Annual Average Daily Traffic Values |
|---------------------|---|---|-------------------------------------|
| 110-04 zone 1 | 25,535 | 2,803 | 28,338 |
| 110-04 zone 2 | 25,685 | 2,786 | 28,471 |
| 110-04 zone 3 | 14,320 | 1,904 | 16,224 |
| 110-04 zone 4 | 18,872 | 2,281 | 21,153 |
| 110-05* | 18,872 | 2,281 | 21,153 |
| 567-02 zone 2 | 4,349 | 1,027 | 5,376 |
| 567-02 zone 1 | 15,082 | 2,788 | 17,870 |
| 567-01 zone 4* | 15,082 | 2,788 | 17,870 |
| 567-01 zone 3 | 9,805 | 2,092 | 11,897 |
| 567-01 zone 2 | 12,817 | 1,766 | 14,583 |

Source: KGM, May 2019. 2018 Traffic and Transportation Data.

*At the stated road sections, traffic counts could not be executed so the counting results of the nearest counting station were used considering the road conditions and that there will not be any major effect.

14.2.2. Forest Fires and Existing Infrastructure

Kirklareli Province is within the jurisdiction of Istanbul Regional Directorate of Forestry. The Project License Area falls within the jurisdiction of Vize Directorate of Forestry, Kiyikoy Sub-district Directorate of Forestry. Table 14-2 summarizes the forest fire statistics for Turkey, provinces (including Kirklareli) under jurisdiction of Istanbul Regional Directorate of Forestry and Kirklareli Province as published by the General Directorate of Forestry for the period 2014-2018. As can be seen in the table, there were 82 fires in 2018 (last year of the period for which the data is available). As per the data provided at the Regional Directorate level for all years, amongst the 82 fires, 12 were due to negligence (e.g. picnic, shepherd fire), 3 were intentional, 67 were unknown and none were due to lightning and accidents. This statistic is given at the Regional Directorate level for all years.

Table 14-2. Forest Fire Statistics (2014-2018)

| Location | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | |
|---|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|---------------------|-----------|
| | No. of Forest Fires | Area (ha) | No. of Forest Fires | Area (ha) | No. of Forest Fires | Area (ha) | No. of Forest Fires | Area (ha) | No. of Forest Fires | Area (ha) |
| Turkey (total) | 2,149 | 3,117 | 2,150 | 3,219 | 3,188 | 9,156 | 2,411 | 11,993 | 2,167 | 5,644 |
| Provinces under jurisdiction of Istanbul Regional Directorate of Forestry | 108 | 18 | 153 | 41 | 254 | 92 | 173 | 39 | 82 | 26 |
| Kirklareli Province | 2 | 2.5 | 14 | 10.17 | 22 | 8.13 | 12 | 3.26 | 0 | 0 |

Source: Republic of Turkey, Ministry of Agriculture and Forestry, General Directorate of Forestry website (<https://ogm.gov.tr>)

The closest fire tower is located along Vize-Kiyikoy Road at Goztepe, approximately 20 km to south-west of the Project License Area.

As per the Geodata Application (<http://geodata.ormansu.gov.tr>) of the Ministry of Agriculture and Forestry, there are three fire water supply locations in the vicinity of Kiyikoy and the Project License Area.

The closest fire communication centres for forest fires in Kirklareli province are located at Igneada (to the north of the Project License Area) and Vize district (to the west of the Project License Area) centres.

14.3. Impact Assessment and Management

The potential CHS risks and impacts associated with the Project is described below. Management of Project related impacts due to air and noise emissions, water supply, wastewater and waste generation and visual changes, which have the potential to affect communities, are assessed separately in respective chapters of this report, together with related mitigation measures.

Potential CHS related issues that require management in wind power projects primarily include the following:

- Abnormal load transportation
- Blade and ice throw
- Aviation
- Electromagnetic interference and radiation
- Public access
- Exposure to diseases
- Security Personnel

14.3.1. Land Preparation and Construction Phase

14.3.1.1. Abnormal Load Transportation and Traffic Load

The Capacity Extension Project involves construction of 20⁴² additional wind turbines, necessary internal site access roads and underground collector (i.e. cabling) system. Improvements will also be made at the existing switchyard and the control room as part of the Capacity Extension Project. Project's transportation plan for oversized turbine components, concrete, other materials, equipment, goods as well as Project workforce is summarized in Table 14-3.

According to the current Project schedule, the construction phase and the delivery of plant equipment is planned to be started in Q4 2019. Overall, it is anticipated that the transportation of turbine components will be completed in 11 months, in parallel to the ongoing construction works. Other construction materials (e.g. concrete) and equipment will also be transported throughout the construction phase.

Project Road Survey

Project-specific road surveys have been conducted by the potential suppliers of the turbine components in order to identify the risks along the planned transportation routes, assess the logistical requirements and constraints, determine the most effective and safest routes. Through these surveys, the site-specific requirements to avoid potential impacts on the communities and existing transportation infrastructure (e.g. turning radii of the intersections, road conditions, bridges, overpasses and underpasses) and ensure safe transportation of the turbine components have been determined. The findings of the surveys have been compiled in a Road Survey Report issued by Borusan Logistics, a sister company of Borusan EnBW, on 5 December 2018.

As part of the surveys, more than fifty observation points have been determined along the route between Izmir and License Area entrance. Potential risks that may emerge due to Project-related transportation and measures to be taken to avoid or mitigate those risks have been identified based on the observation results and detailed assessments. There is no specific risk identified in the Road Survey Report at any settlement area or sensitive receptors such as schools, health institutions or mosques. Nevertheless, the routes to be used in the vicinity of the License Area will be closed to local traffic during the transportation of oversized and heavy turbine components and police escort will be ensured at all critical locations (e.g. pinch points) where other traffic is to be stopped or traffic flow is to be diverted into reverse direction.

Roads passing through settlements will be avoided whenever alternative routes are available. The local communities and if necessary local authorities will be informed about the transportation routes and schedule. As the Project Company will improve and use the existing main access road providing access to the License Area, the Project-related traffic will not cause any disruption for the Kiyikoy residents and the visitors of the settlement/tourists⁴³ using the existing access road of the Kiyikoy town. Necessary warning signs and visible instructions will be placed at the diverging points in order to ensure that the Project-related traffic is diverted to the improved access road and local traffic is diverted to the existing Kiyikoy access road.

The Road Survey Report issued by Borusan Logistics has identified the risks due to presence of existing road intersections, traffic islands, lighting poles and traffic signs, risks associated with ground levels and existing road widths and existing infrastructure in the region.

The general categories of the measures identified in the Road Survey Report are generally listed below, whilst location-based specific measures are defined in the Road Survey Reports:

⁴² The Project Company initially considered 21 turbines, but the technological advancements have allowed the Company to build and operate this additional capacity with 20 turbines. Thus, the Project will be implemented with 20 turbines, whilst this ESIA considered 21 turbines to assess the worst case conditions.

⁴³ Kiyikoy is a touristic settlement with a high season between May and October.

- Physical arrangements at the existing road intersections, traffic islands, lighting poles, traffic signs;
- Improvements on the existing roads;
- Adjustment of ground levels;
- Providing necessary design structure for the passage of existing infrastructure (e.g. water pipelines of the Istanbul Water Sewerage Administration – ISKI)

The Project Company will ensure that the adjustments and improvements are completed prior to the start of Project-related transportation. The Company will consult with the related governmental authorities (e.g. General Directorate of Highways, local police forces, etc.) prior to the start of transportation activities and ensure that all the necessary permits/approvals are in place.

Table 14-3. Summary of Project Transportation Plan

| Transportation Activity | Project Phase | Project Transportation Plan | Transportation Details |
|---|---------------|---|--|
| Heavy and oversized equipment, other plant equipment | Construction | <p>The turbine components (turbine towers, blades, nacelles, etc.) are planned to be supplied from foreign countries through Tekirdag port.</p> <p>Route from Izmir will follow Menemen-Bergama-Soma-Akhisar intersection-Balikesir-Susurluk-Bandirma and enter the Celebi port, Balikesir. The ferries will be used to pass Marmara Sea and land at the Akport in Tekirdag. From Akport, the route follows Marmaraeregisi-Seymen-Fevzipasa-Cerkezoy-Kapakli-Saray.</p> <p>Each turbine component will arrive at the port at a different time point according to Kiyikoy Overall Time Schedule, so the total time interval foreseen is one year. But the transportation of each component or the convoy from the port to the License Area will take two days, so the regional traffic will only be affected from the transportation for this two-day time interval.</p> | <p>Each turbine includes the following components:</p> <ul style="list-style-type: none"> • 1 nacelle (80 tonnes) • 1 drive train (80 tonnes) • 1 hub (15 tonnes) • 3 blades (15 tonnes) • 5 tower pieces (60-80 tonnes) • 1 switchgear <p>Each set is anticipated to be transported by means of one trailer. Thus, transportation of the components for each turbine will require involvement of 11 trailers (a total of 220 trailers will be required to transport the components of 20 turbines).</p> |
| Transportation of ready-made concrete | Construction | <p>Concrete is planned to be supplied from local licensed concrete plants in the region.</p> <p>The Project Company has identified licensed concrete plants in Pinarhisar and Saray districts and Evrencik village.</p> | <p>Each turbine foundation will require approximately 750 m³ concrete. Concrete pouring at each turbine foundation will be conducted continuously by approximately 10-12 concrete mixers, each having a capacity of 8-12 m³. Thus, a total of 60-80 traffic movements/tours (round trip) will take place (approximately 6 traffic movements/tours per each concrete mixer).</p> |
| Construction machinery and equipment, water and excavated material trucks | Construction | <p>The heavy construction machines such as excavators, bulldozers, cylinders and graders will work inside the Licence Area so there will be no major off-site traffic due to heavy construction machinery and equipment.</p> <p>The excavated materials are planned to be reused in road construction, thus there will be no off-site traffic due to disposal of excess excavated materials.</p> | <p>Main construction machinery and equipment includes the following:</p> <ul style="list-style-type: none"> • Dump truck (14) • Excavator (10) • Vibratory earth roller (3) • Grader (2) • Water truck (2) • Track loader (2) • Backhoe loader (2) |

| Transportation Activity | Project Phase | Project Transportation Plan | Transportation Details |
|--|-------------------------|---|---|
| | | | <ul style="list-style-type: none"> • Dozer (1) • Tractor (1) |
| Transportation of steel, diesel fuel, transformer oil and other necessary equipment and goods | Construction | Materials, equipment and goods will be supplied from the local sources. | <p>Local providers will transport the materials to the site.</p> <p>25 tons of transformer oil will be transported to the Project site.</p> |
| Transportation of the construction workforce to the construction camp site and construction sites | Construction | Construction workforce will be transferred to the camp and construction sites by means of service buses. | Contractor will make the workforce transportation arrangements. |
| Transportation of the existing operations workforce (will continue serving the Project after the commissioning of Capacity Extension Project Units) to the substation site and maintenance sites within the License Area | Operation | There are 16 personnel currently working at the existing plant. Materials and goods to be required for maintenance works will be supplied from the region. | <p>The personnel of the existing plant come to the site by using private vehicles.</p> <p>Local providers will transport the maintenance materials and goods to the site.</p> |
| Transportation of wastes to be disposed of and domestic wastewater to be removed by means of Municipality trucks | Construction, Operation | Trucks/vehicles of the licensed disposal facilities will transport the waste and wastewater to the disposal/discharge locations within the provincial boundaries. | Disposal trucks/vehicles will occasionally come to the site to remove the wastes and wastewaters collected. |

Consultations with TurkStream Project

The camp and construction sites of the TurkStream Project is located at the southeastern boundary of the Project License Area. The transportation routes of the TurkStream and Kiyikoy WPP projects are partially coinciding. There is a bridge located approximately 800 m south of the entrance of the License Area, which is currently being used by the TurkStream Project. This bridge is located on the planned transportation route of Kiyikoy WPP and will be used in the scope of Project-related transportation activities. The width of the existing bridge is sufficient for the passage of one vehicle at a time.

In order to evaluate the load carrying capacity of the existing bridge, the Project Company consulted with the officials of the TurkStream Project. As part of these consultations, the Project Company obtained the detailed load carrying capacity analysis reports prepared in the scope of TurkStream engineering works. Based on these reports, the Project Company's engineering team has identified that the necessary bore piling for foundation and steel fly over bridge assembly have already been completed by TurkStream in order to strengthen the bridge. The Project Company has also shared the related load carrying capacity analysis reports with the supplier of the new V136-3.6 MW turbines (Vestas). The Project Company and the supplier firm has reviewed the engineering documentation, conducted site assessments and verified that the current capacity of the bridge is sufficient for the transportation of the new turbine components and other Project equipment to the License Area. During the consultations, TurkStream officials confirmed that the fly over bridge will be kept in place minimum until the completion of the transportation works for the Capacity Extension Projects.

The Project Company will improve the existing road providing access to the License Area. During the construction phase of the Project (including the transportation period), two flagmen will be positioned during material and equipment transport at each side of the existing bridge located in the south of the License Area (as shown in Figure 14-2).

14.3.1.2. Workers' Influx

Within the scope of the Capacity Extension construction works, it is anticipated that there will be 100 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 maximise use of local workforce, especially by utilising the experienced and qualified workforce available in Kiyikoy. Thus, the impact of the Project related employment on the population movements in the region is considered to be limited during the temporary construction phase. Worker's accommodation is not planned to be provided on-site.

The workers to be employed from Kiyikoy, will lodge in their local houses and be transported to the Project site by means of service buses to be arranged by the Project. There are available accommodation opportunities including hotels and rental houses in the nearby district centres, including Vize, Saray and Cerkezkooy and limitedly in Kiyikoy town⁴⁴. Thus, it is anticipated that the non-local workers will utilise these accommodation opportunities in the nearby district centres. As the number of construction workers is limited and the total period for construction is foreseen to be 11 months (the peak construction period when all the 100 workers will work at the same time will be a much shorter duration), the adverse impacts on the nearby district centres, 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, benefits of off-site housing on the economies of the nearby district centres 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:

⁴⁴ According to TurkStat, 2018; Population of Kırklareli, Vize district: 28,122; Population of Saray district: 49,106; Population of Tekirdag, Cerkezkooy district: 166,789; Population of Kırklareli, Vize district. According to the social field survey headmen interviews; Population of Kiyikoy town: 2,180 during winter and 4,900 during summer.

- The Project Company will ensure that all the direct and contracted workers are provided with trainings on BEE's corporate Social Guidelines at the beginning of employment (individually or collectively). These trainings will also cover the code of conduct for accommodation, as well as general moral, cultural and ethical rules required from all Project workers.
- The Project Company will analyse 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 centres in order to ensure safe travel of the Project workers to the Project site and minimise Project-related traffic in the region.
- The Project Company will ensure that the relevant aspects of EBRD/IFC Guidance Note on Workers' Accommodation (2009) will apply to Project-related off-site accommodation.

14.3.1.3. Exposure to Diseases

Contractors will be contractually required to maximise use of local workforce, especially by utilising the experienced and qualified workforce available in Kiyikoy.

As mentioned in the previous section, it is anticipated that there will be 100 personnel working on site at the peak period of construction activities and the worker influx to the area is anticipated to be negligible during construction phase. Additionally, the construction duration will be limited to 11 months. The risk of communicable and vector borne diseases is anticipated to be low for the communities, whilst the Project Company will closely monitor potential diseases among the Project employees (direct and contracted) throughout the construction phase and ensure that necessary medical checks are in place at the time of hiring, which would be repeated as necessary. The Company has medical screening reports for all the existing operations personnel.

Within the scope of the Capacity Extension construction works, worker's accommodation will not be provided on-site. Hygienic working conditions will be ensured, and 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 meet the requirements of IFC and EBRD's Guidance Note on Worker's Accommodation Processes and Standards.

14.3.1.4. Emergency Preparedness and Response

An Emergency Management Plan Procedure (last revision issue date is 26 December 2017) is in place for the Kiyikoy WPP. The Procedure covers the following emergency situations, which are applicable to the construction phase of the Capacity Extension Project as well:

- First aid and incidents and accidents that required evacuation
- Fire
- Earthquake
- Unfavourable weather conditions (flood, snowfall, etc.)
- Interruptions on road transportation
- Sabotage / terrorist attack
- Poisoning
- Emergencies related with turbines
- Environmental incidents
- Health incidents including community health

Based on the existing Emergency Management Plan Procedure, an Emergency Preparedness and Response Plan (covering both on-site and off-site issues such as off-site traffic accidents) has been prepared as a stand-alone document. This Plan defines the following:

- Roles and Responsibility including the Emergency Response Teams
- Project Standards
- Emergency Preparedness Measures/Actions (including any measure and/or warning system designed to notify local communities in case of emergencies)
- Emergency Response Measures/Actions

- Emergency Contact Numbers (including communication details of the headmen of Kiyikoy town's neighbourhoods and Kislacik village, any school principals and authorities to be collaborated in case of emergencies)
- Emergency Trainings and Drills

The Project Company conducts emergency drills at the existing Kiyikoy WPP. During the construction phase, the Emergency Preparedness and Response Plan will be implemented in order to avoid potential community health and safety risks that may emerge as a result of the incidents/accidents that would occur at the Project site.

14.3.1.5. Public Access

Local communities use the state-owned forest parcels located within the License Area (in Kiyikoy and Kislacik) for generating income from forestry activities, which include oak charcoal production, market sale by villagers (allowed by forest management) and planted tree sale (allowed by forest management). As discussed in Chapter 12 ("Socio-economy") in details, the forest area which will be impacted by the construction of the units for the new turbines consists of 1% of the total License Area and 0.2% of the total forest area of Kiyikoy and Kislacik settlements. Thus, the Project's impact on forest resources is very limited. The land to be acquired for the Project will not permanently impede or restrict public access to common resources as the License Area or the Project units except the existing substation site will not be fenced. On the other hand, access to the construction sites and routes will be temporarily restricted to avoid potential health and safety risks (due to use of heavy vehicles, construction vehicles causing site traffic, earthworks, electrocution hazards due to cabling works, etc.) on local community members using the forest lands within the License Area.

The social field surveys conducted as part of the ESIA process also revealed that the PAPs prefer to utilize forest land for grazing as there is no grazing prohibition for bovine and ovine animals in the forest areas. Indeed, there is no pastureland in Kislacik village. As explained above, public access to relevant parts of the forest lands within the License Area will only be temporarily restricted during the construction period and the forest land will remain accessible to the public throughout the operation period.

The total size of the Kiyikoy pasture area is 429 decares, consisting of 19 parcels (*Vize Regional Directorate of Forestry, 2019*). Among this, only 1 pasture parcel (Parcel no. 319/1) will be affected by the Project (26% of the total parcel area will be affected). According to the land registry, the total land size of this affected pastureland is 45 decares and the part that will be affected is 11.8 decares (approximately 26% of the total parcel area). The remaining area of the affected pasture parcel, which is 33.2 decare, will still be available for public access.

Mushroom (*Boletus* type) gathering is practiced in the village of Kislacik. Similarly, potential restrictions on public access to mushroom collection areas due to health and safety considerations will be eliminated upon completion of construction activities and there will be no permanent restriction of access to the forest lands used for mushroom gathering.

Because of the access restrictions to be applied temporarily during the construction period (at the construction sites for turbine foundations and along the internal site access road routes), it is anticipated that there will be no significant risk on community health, safety and security due to the construction activities to be conducted within the License Area and along the construction traffic routes. The Project Company 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.

As part of SEP, local communities will be informed about the construction sites, traffic restrictions to be applied for health and safety purposes and duration of such restrictions.

14.3.1.6. Security Personnel

The existing Kiyikoy WPP receives security services from a reputable Turkish private security contractor, which is a firm certified by the Ministry of Interior. The Project Company has a Private Security Permit Certificate (for unarmed security) in place, which was issued by the Kırklareli Governorate on 18 January 2018 as per the Law on Private Security Services (No. 5188).

As per the national law, private security officers are required to receive basic security trainings for not less than 120 hours, consisting of theoretical and practical trainings. The basic trainings are required to be renewed every 5 years. The private security basic training program includes the following courses, which includes effective communication techniques as well empathy and sympathy recommendations:

- Private Security Law and Immaterial Rights
- Security Measures
- Security Systems and Devices
- Basic First Aid
- Fire Safety and Natural Disaster Response Style
- Information on Drugs
- Effective Communication
- Crowd Management
- Person Protection (against the risk of assassination)
- Relations with General Law Enforcement
- Information on Weapon and Shooting Practice

The private security contractor firm has a standard dressing guidance approved by the Ministry of Interior, which defines the clothes and equipment to be used by the private security officers. The agreement executed between the private security contractor firm and the Project Company requires appointment of certified officers, who received basic trainings for private security officers, were subject to necessary security inquiries and fulfils the age and education standards specified by the Company.

As of August 2019, 6 of the 16 operations personnel are serving as unarmed private security officers, who are from Kiyikoy. Employment of the private security officers from the local communities has minimised the risk of potential social conflicts in the past operations. The existing operation teams, including the security officers, will continue operating the Kiyikoy WPP after the Capacity Extension Project. Thus, the project security threats to workers and local communities is anticipated to be a negligible risk for the Kiyikoy WPP Project. On the other hand, the Project Company will continue monitoring the trainings to be provided by the private security contractor to the security officers and ensure that these officers receive periodical trainings on adequate use of force and appropriate conduct towards the Project employees and the local communities in line with the requirements of national legislation as well as EBRD PR2 and PR4. The security management measures will be covered in the Community Health and Safety Plan to be prepared and implemented for the Project. The public and internal grievances mechanisms defined in the Project SEP will also be implemented throughout the Project, to address any potential risk that may be related to the acts of the private security officers employed in the Project.

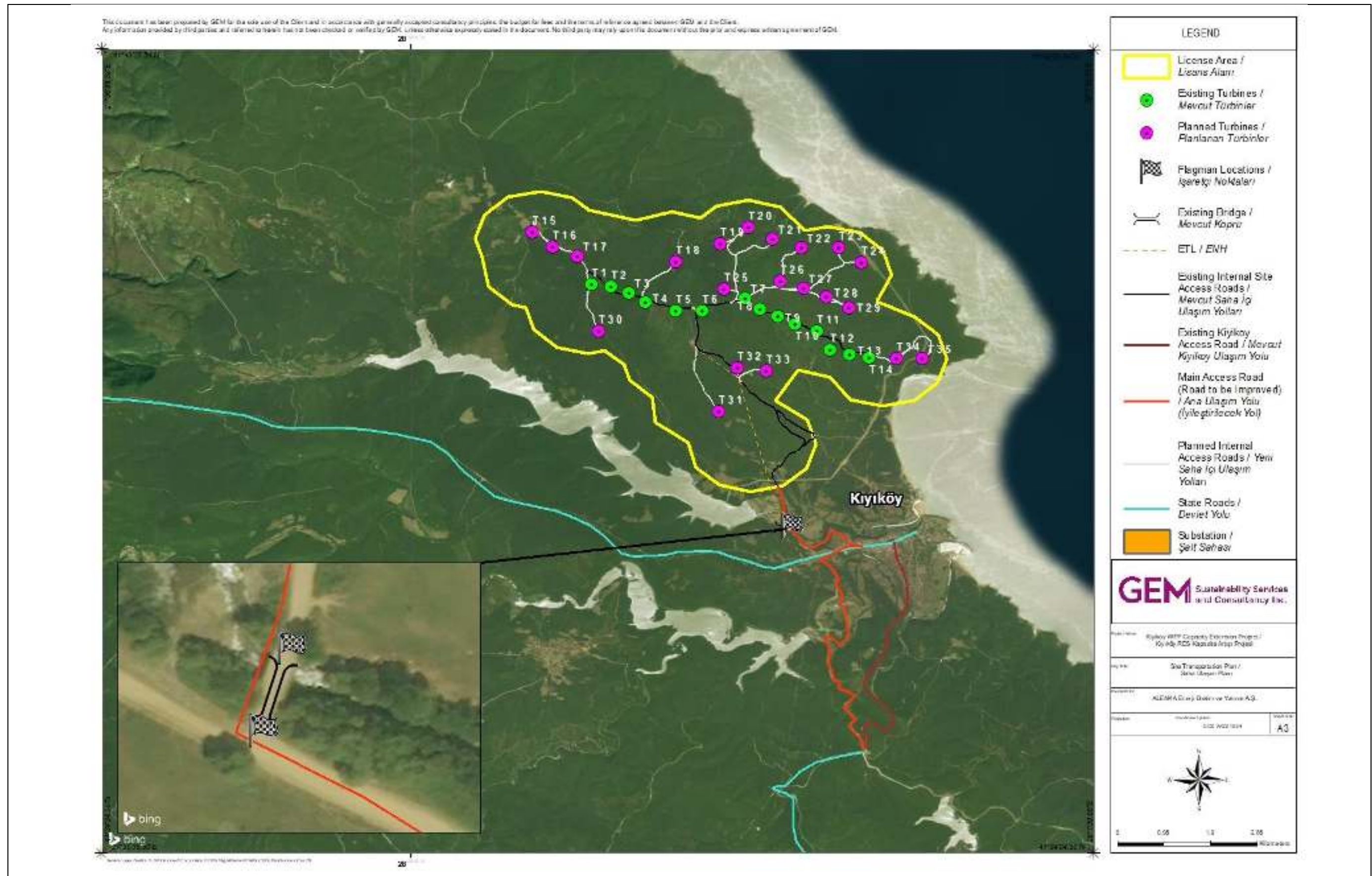


Figure 14-2. Site Transportation Plan

14.3.2. Operation Phase

14.3.2.1. Shadow Flicker

Shadow flicker occurs when the sun passes behind the wind turbine and casts a shadow. As the rotor blades rotate, shadows pass over the same point causing an effect termed shadow flicker. Shadow flicker may become a problem when potentially sensitive receptors are located nearby or have a specific orientation to the wind energy facility.

Shadow flicker is limited in time and location. As per the WBG EHS Guideline on Wind Energy (August 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, based on a worst-case scenario as described below.

Modelling Study

WindPRO software is used to model the shadow flicker effect of the Project considering both the worst-case and real-case scenarios. The shadow receptor is selected as the residential receptor located 200 m north of T15. The legal owner of the house resides in Kislacik village. A vulnerable person is currently using this house for accommodation with the permission of the legal owner.

The shadow module of WindPRO software requires terrain data, monthly sunshine probabilities, annual operational times of turbines for each wind sectors, maximum distance of influence and minimum sun height over horizon for influence. The shadow flickering is modelled for each minute of a day throughout a year, based on a worst-case scenario and a realistic scenario. Model assumptions for the two scenarios are described below.

As per the WBG EHS Guideline on Wind Energy, in order to assess compliance with the recommended limits, shadow flicker should be modelled and predicted based on worst-case scenario, which is defined as follows:

- Sun is shining all day with no disturbance from clouds or fog.
- Sun rays, the turbine rotor and the windows are in the same line-of-sight all day long.
- Wind is blowing all day, which means that wind turbines are always operating.
- Dwelling is composed only of windows (like a greenhouse).
- There is no light obstruction from obstacles (existing turbines, trees, other buildings, etc.).
- There is no light obstruction from topography.
- Moreover, even if the shadow is too weak to be observable, the period of flicker will be recorded.

The occurrence of shadow flicker can be altered by the following factors:

- Sunshine/cloudiness data of the Project Area
- Wind data of the Project Area, allowing to consider the real direction of the turbine rotor and the period when the turbine doesn't rotate
- Presence of obstacles like existing wind turbines, trees or buildings
- Topography of the site which could create a natural shadow
- External configuration of the dwellings (direction of building faces, number and size of the windows)
- Internal configuration of the dwellings (size and location of the rooms)
- Physical obstacles inside the dwellings (curtains, blinds, etc.)

Amongst the abovementioned factors, the sunshine/cloudiness data of the Project region and the topography of the site are factored in to simulate the real-case scenario. Factors such as internal configuration of the dwellings and the physical obstacles inside the dwellings which might lower the shadow flicker exposure are not adjusted. To this end, the modelled real-case scenario is considered a conservative estimate.

The modelling study results for the **worst-case scenario** are given in Table 14-4. The map showing the shadow contours (hour/year) is given in Figure 14-3.

As can be seen from the results, the receptor will experience shadow flicker effect for durations above WBG EHS Guideline on Wind Energy recommended limits, based on the worst-case scenario results. The shadow flicker will be effective for 242h29 min per year for the receptor due to turbines T15, T16 and T17. The contribution of each turbine is also separately given in Table 14-4. In terms of maximum shadow hours experienced per day, the receptor is also above the 30-minute limit recommended by the WBG.

Table 14-4. Shadow Flicker Modelling Results – Worst-Case Scenario

| Receptor | Worst-Case Shadow Hours per Year | Shadow Days per Year | Maximum Shadow Hours per Day | Effective Turbine |
|--|----------------------------------|----------------------|------------------------------|-------------------|
| Residential receptor (vulnerable PAP) within the setback distance of T15 | 242h29min (Total) | 199 | 1h44min | T15, T16, T17 |
| | 131h27min | | | T15 |
| | 73h50min | | | T16 |
| | 37h12min | | | T17 |

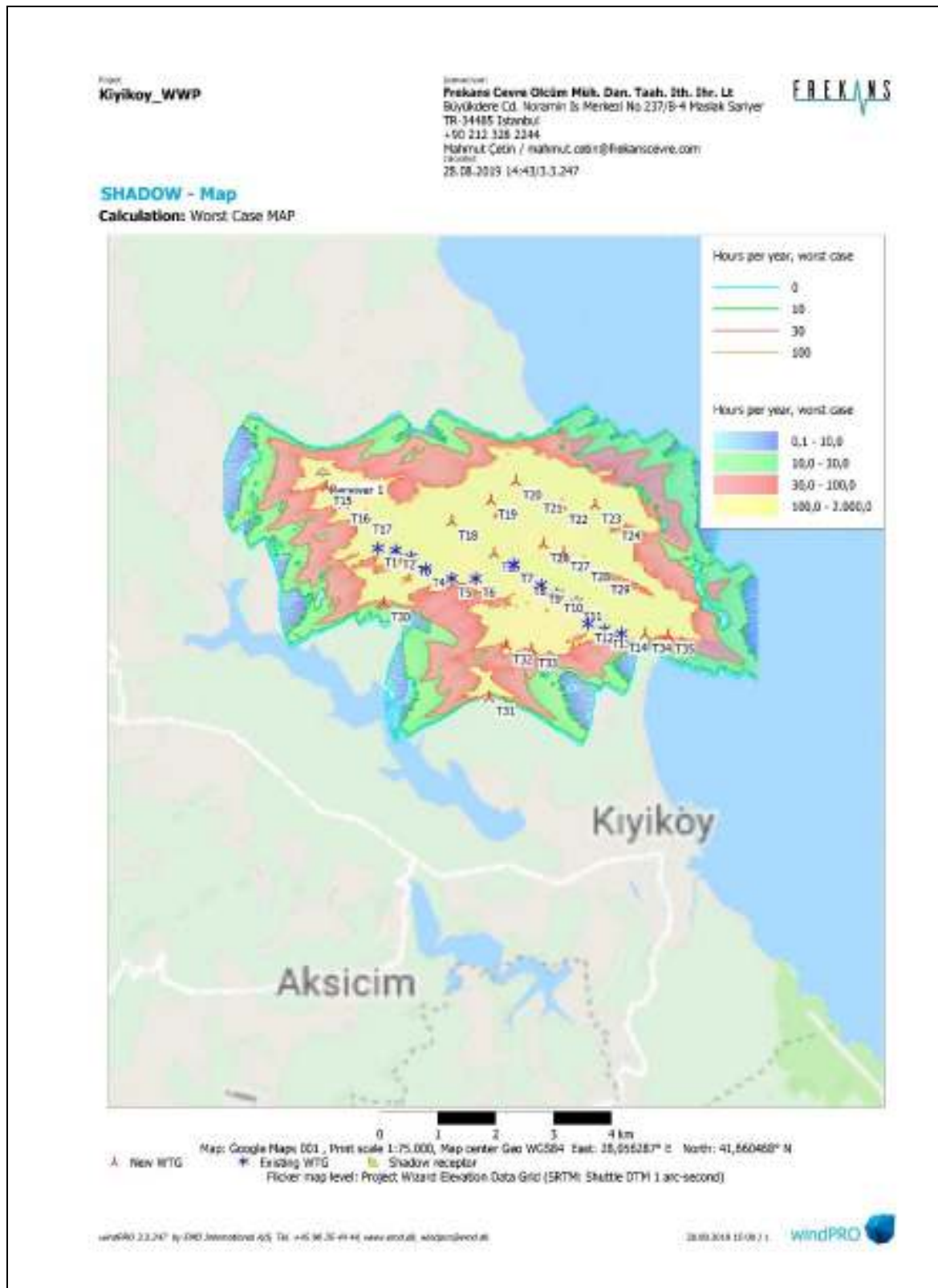


Figure 14-3. Shadow Map – Worst-case Scenario

Table 14-5 summarizes the results of shadow flicker per month caused by T15, T16 and T17 for the worst-case scenario.

Table 14-5. Shadow Flicker – Calendar per Turbine (Worst Case Scenario)

| Month | Potential Sun Hours | Sum of Minutes with Flicker | | | Total |
|--------------|------------------------|--|---------------------------------------|---------------------------------------|---|
| | | T15 | T16 | T17 | |
| January | 296 | 0 | 1,500 | 838 | 2,338 |
| February | 296 | 59 | 278 | 0 | 337 |
| March | 369 | 2,679 | 0 | 0 | 2,679 |
| April | 399 | 1,174 | 0 | 0 | 1,174 |
| May | 450 | 0 | 0 | 0 | 0 |
| June | 454 | 0 | 0 | 0 | 0 |
| July | 461 | 0 | 0 | 0 | 0 |
| August | 429 | 202 | 0 | 0 | 202 |
| September | 375 | 2,855 | 0 | 0 | 2,855 |
| October | 345 | 918 | 0 | 0 | 918 |
| November | 296 | 0 | 1,264 | 500 | 1,764 |
| December | 286 | 0 | 1,388 | 894 | 2,282 |
| Total | | 7,887 min (eq. to 131h27min) | 4,430 min (eq. to 73h50min) | 2,232 min (eq. to 37h12min) | 14,549 min (eq. to 242h29min) |

The modelling study results for the **realistic scenario** are given in Table 14-6. The map showing the shadow contours (hour/year) is given in Figure 14-4.

According to the results, the receptor is affected by shadow flicker for a duration of 79h13min per year due to turbines T15, T16 and T17. The contribution of each turbine is also separately given in Table 14-6. It should be noted that for the realistic case, the shadow module of Wind PRO software does not provide results on shadow days per year and maximum shadow hour to be experienced on a day.

Table 14-6. Shadow Flicker Modelling Results – Realistic Scenario

| Receptor | Shadow Hours per Year | Effective Turbine |
|--|-----------------------|-------------------|
| Residential receptor (vulnerable PAP) within the setback distance of T15 | 79h13min (Total) | T15, T16, T17 |
| | 56h48min | T15 |
| | 17h17min | T16 |
| | 7h06min | T17 |

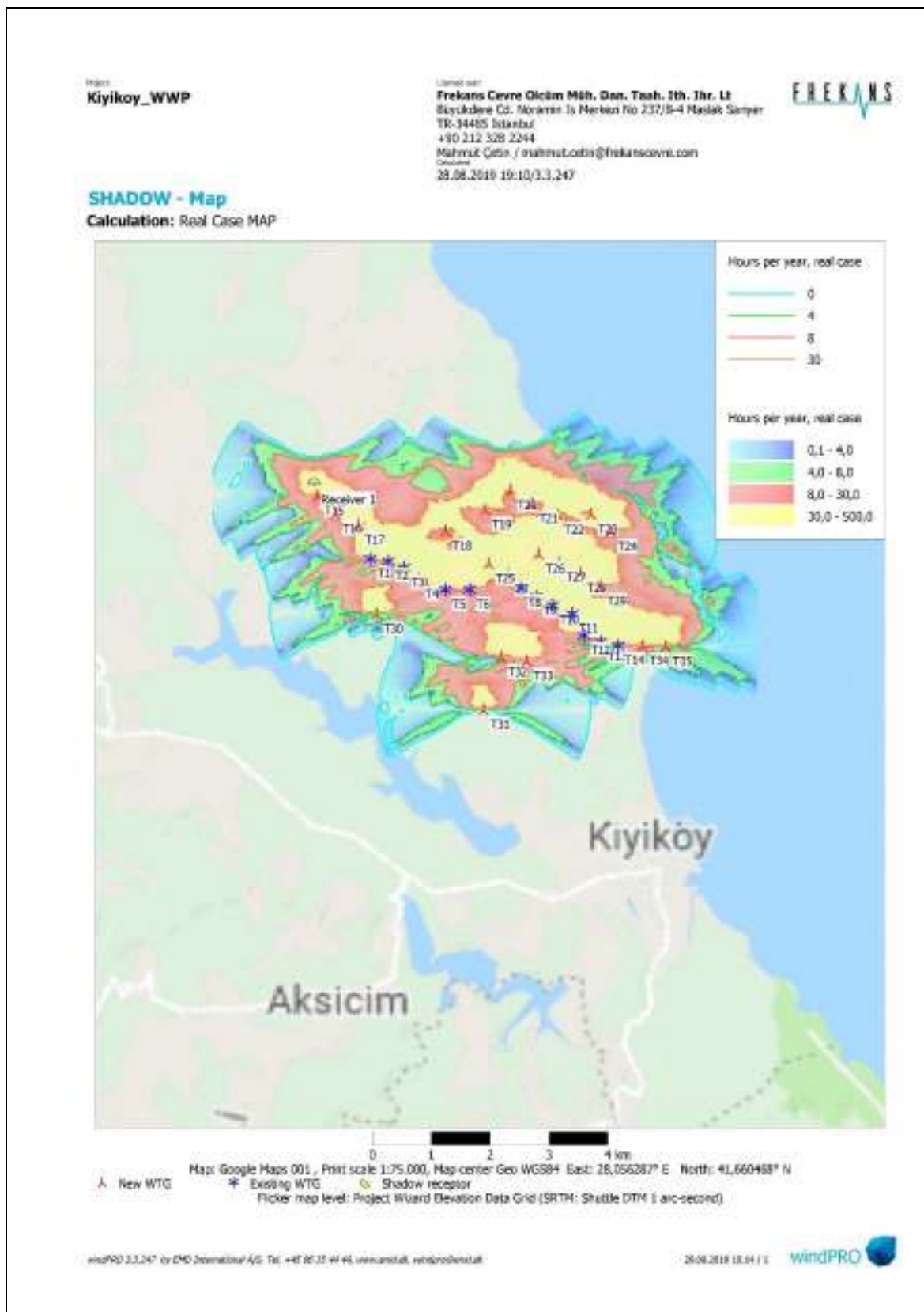


Figure 14-4. Shadow Map – Realistic Scenario

Table 14-7 summarises the results of shadow flicker per month caused collectively by the three turbines for the realistic case scenario. It should be noted that the results per turbine are not provided by the WindPRO software for the realistic case scenario.

Table 14-7. Shadow Flicker – Calendar (Realistic Case Scenario)

| Month | Potential Sun Hours | Sum of Minutes with Flicker at the Receptor |
|--------------|---------------------|---|
| January | 296 | 469 |
| February | 296 | 78 |
| March | 369 | 764 |
| April | 399 | 438 |
| May | 450 | 0 |
| June | 454 | 0 |
| July | 461 | 0 |
| August | 429 | 123 |
| September | 375 | 1,583 |
| October | 345 | 402 |
| November | 296 | 469 |
| December | 286 | 427 |
| Total | | 4,753 min (eq. to 79h13min) |

14.3.2.2. Blade and Ice Throw

A failure of the rotor blade can result in the “throwing” of a rotor blade, or part thereof, which may affect public safety. The overall risk of blade throw is considered extremely low as highlighted in the World Bank Group (WBG) 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.

Turbines must be sited at an acceptable distance (“setback”) between wind turbines and adjacent sensitive receptors to maintain public safety in the event of ice throw or blade failure.

For blade throw risk management, WBG EHS Guideline on Wind Energy recommends establishing setback distances between turbines and populated locations. The minimum setback distance is 1.5 x turbine height (tower + rotor radius), although modelling suggests that the theoretical blade throw distance can vary with the size, shape, weight, and speed of the blades, and the height of the turbine. It is therefore recommended that the minimum setback distances required to meet noise and shadow flicker limits be maintained with respect to sensitive residential receptors to provide further protection.

For ice throw risk management, WBG EHS Guideline on Wind Energy recommends establishing setback distances as per International Energy Agency (IEA, 2017) guidance document⁴⁵.

The maximum ice throw distance for a rotating turbine is represented by the Seifert Formula (IEA, 2017), in flat terrain:

$$d = 1.5 \times (D+H)$$

d: Maximum throwing distance of ice (m)

⁴⁵ IEA Wind TCP Recommended Practice 13, Wind Energy Projects in Cold Climates, 2nd Edition, (2017).

D: Rotor diameter

H: Hub Height

For the existing Gamesa G90 turbines the set-back distance for blade and ice throw is calculated as:

$$d = 1.5 \times (97 \text{ m} + 70 \text{ m}) = 250.5 \text{ m (for 2 turbines)}$$

$$d = 1.5 \times (97 \text{ m} + 78 \text{ m}) = 262.5 \text{ m (for 12 turbines)}$$

For the Vestas V136 turbines to be built within the scope of the Capacity Extension Project, the set-back distance for blade and ice throw is calculated as:

$$d = 1.5 \times (136 \text{ m} + 112 \text{ m}) = 372 \text{ m}$$

There is one rural dwelling/building located within the 372 m distance from T15. The rural house is located 200 m north of T15. The legal owner of the house resides in Kislacik village. A vulnerable person is currently using this house for accommodation with the permission of the legal owner.

An ice monitoring station will be established at the best representative turbine to be determined at the Project Area. Thus, when icing is detected at this specific turbine, an alarm signal will be transmitted to the operator through the SCADA system. The chief operator appoints an authorized control team to visit the turbine locations and conduct visual checks at a safe distance by using binoculars to ensure occupational health and safety of the control team. If the control team identifies ice throw risk, they report the risk to the chief operator and the shut-down decision is taken until the risk is alleviated to acceptable levels. A detailed procedure will be developed by the Project Company to describe the management steps for this process.

14.3.2.3. Public Access

The land to be acquired for the Capacity Extension Project will not impede or restrict public access (i.e. forest lands used for forestry activities, grazing or mushroom collection) to common resources during the operation phase as the License Area or the Project units except the existing substation site will not be fenced as the selected turbine model as part of the Capacity Extension ensures that all the electrical equipment is enclosed.

On the other hand, as there will be no access restrictions to be applied during the operation phase, local people using the forest lands within the License Area will be able to access to the locations of the operational turbines. The ladder (with a fall arrest system) providing access to the transformer room in the nacelle is through the tower, which is controlled by a door equipped with a lock as per the specifications of the selected turbine model. Thus, as long as the standard locking procedures are applied, there would be no fall from height or electrocution risks for the local people who access to the turbine locations. On the other hand, blade and ice throw would remain as a risk that needs to be properly managed by installing necessary warnings and taking additional precautions during the days of the year when there is risk of ice throw. An Ice Throw Management Procedure will be developed and implemented throughout the operation phase of the Project. This procedure will identify the setback distances around the turbines and the measures to be taken within these distances (e.g. putting warning signs).

14.3.2.4. Aviation

Wind energy facilities located near radar may impact the operation of aviation radar by causing signal distortion, which may cause loss of signal, masking real targets and/or erroneous signals on the radar screen, creating flight safety issues. These effects are caused by the physical structures of the tower/turbine and the rotating blades. Wind turbine blade tips, at their highest point, can reach above 200 meters. If located near airports, military low-flying areas, or known flight paths, a wind energy facility (including anemometer mast) may impact aircraft safety directly through potential collision or alteration of flight paths.

Visual flight rules (VFR) are defined as regulations that specify weather and visibility conditions for pilots. The VFR rules ensure the pilots to operate the aircraft with visual reference to the ground, and by visually avoiding obstructions and other aircraft (*International Virtual Aviation Organization, 2015a*). In principle, any objects extending higher than 150 meters above the terrain cause an obstruction in the airspace.

According to the Civil Aviation Law (No. 2920), construction of “buildings and structures that will prevent air traffic, aviation security, and telecommunication and endanger the navigation and airfield security around the airports and related facility or equipment” is not allowed. Therefore, the impact of wind power plants on aviation operations is required to be assessed to ensure aviation safety. At the minimum, the turbines shall be clearly visible by ensuring standard marking/lighting and if required, overhead cables marking. For the Project, marking and lighting will be installed in accordance with the recommendations of International Civil Aviation Organization (ICAO) Annex 14 (*ICAO, 2016*). Necessary approvals have been secured from the related national authorities (including General Directorates of State Airports Authority and Civil Aviation) as part of the national zoning process.

14.3.2.5. Electromagnetic Interference

Wind turbines could potentially cause electromagnetic interference with telecommunication systems (e.g. microwave, television, and radio). This interference could be caused by path obstruction, shadowing, reflection, scattering, or re-radiation. The nature of the potential impacts depends primarily on the location of the wind turbine relative to the transmitter and receiver, characteristics of the rotor blades, signal frequency receiver characteristics, and radio wave propagation characteristics in the local atmosphere.

The turbine model and related equipment selected for the Capacity Extension Project fulfils the European Union (EU) Electromagnetic Compatibility (EMC) legislation on the harmonisation of the laws of the member states relating to electromagnetic compatibility.

All relevant governmental and commercial institutions including the Turkish telecommunications company (Turk Telekom), have provided positive opinion letters for the Project as part of the zoning process.

14.3.2.6. Emergency Preparedness and Response

The relevant risks and impacts of the Project will start during the construction phase and will also be in place during the entire operation phase, which will be managed in line with the Emergency Preparedness and Response Plan described in Section 14.3.1.3

Fire risk is the main emergency risk that may potentially be heightened by the Project in case of lack of related design and mitigation measures and a framework for management of emergencies, since the Project is located inside forest areas. Fire risk is important in terms of both potential forest fire that may be sourced due to Project activities such as turbine fires or the turbines being affected from a forest fire sourced from outside the Project Area.

Fires can stem due to the following main factors:

- Failure of electrical equipment and turbine components.
- Overheating or sparking of turbine components in combination with flammable fluid or vapour, most likely due to leaking oil pipes and loose connections. Turbine components that can burn are; rotor blade (composite structures with resin), gearbox (grease, oil), generator (insulation material), nacelle (cables, hydraulic oil) transformers (oil, cables, insulation material) and other electrical components.
- Hot surfaces induced by turbine components such as mechanical brakes and emergency brake.
- ETL interaction with unmaintained vegetation.
- Direct contact with an uncontrolled forest fire sourced from outside the Project Area.
- Lack or insufficiency of a framework for emergency management, resulting in poor communications with related emergency services and authorities.
- General lack of fire safety awareness, including lack of attention during welding works.

Fire at the Project site can lead to the following impacts:

- Damage to turbines or complete loss of turbines due to potential delays in emergency response.
- Spread of the fire due to burning debris drifted by the wind that may result in habitat loss, displacement of animal species, etc.
- Potential risks to nearby settlements due to potential delays in emergency response.
- In case of a turbine fire during a manned operation such as maintenance, a serious risk arises for personnel involved in the work, especially for those that are conducting work at height.

As given in the turbine specifications, turbine model selected for the Capacity Extension Project is equipped with a Smoke Detection System including multiple smoke detection sensors placed in the nacelle (above the disc brake), in the transformer compartment, in main electrical cabinets in the nacelle and above the high voltage (HV) switchgear in the tower base. The Smoke Detection System is connected to the turbine safety system ensuring immediate action if smoke is detected.

In addition to the Smoke Detection System, each Capacity Extension turbine will be equipped with Lightning Protection System (LPS) covering the blades, nacelles, hubs and the towers. The LPS is designed according to relevant International Electrotechnical Commission (IEC) standards and will help protect the turbines against the physical damage caused by lightning strikes. It will consist of the following main components:

- Lightning receptors,
- Down conducting system,
- Protection against overvoltage and overcurrent,
- Shielding against magnetic and electrical fields, and
- Earthing system.

In addition to embedded fire safety and lightning protection design measures, handheld carbon dioxide (CO₂) fire extinguishers, first aid kits and fire blankets will be provided in the nacelle during the operation period.

The Emergency Preparedness and Response Plan describes the measures/actions (including alarms, detection system, fire-fighting equipment, etc.) against fire incidents. The Plan also defines the responsibilities of the Fire Fighting Team, whose members are trained and exercised on controlling the fire-prevention measures, taking the fire under control and the defence against fire. All the preventive and response measures described will minimise the risks associated with fire and lightning.

14.3.3. Closure Phase

All construction phase CHS risks and impacts identified are also applicable for the closure phase, since closure activities consist of decommissioning and dismantling/uninstalling of existing Project units and rehabilitation activities (i.e. identified construction phase impacts such as traffic management and abnormal load transportation, emergency preparedness and response, etc. are also valid for closure phase). Therefore, the assessment for construction phase is also valid for closure phase.

Project-specific Stakeholder Engagement Plan including the grievance mechanism will be in place to address any public grievance related to community health and safety risks/impacts.

14.3.4. Impact Significance, Management and Residual Impacts

The potential impacts of the Project, significance of the impacts prior to mitigation, proposed mitigation measures and the significance of residual impact are summarised in Table 14-8.

Table 14-8. Impacts, Proposed Mitigation Measures and Residual Impacts (Community Health and Safety)

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|---|--|--|------------------|-----------|---------------------------------------|------------|--------------|----------------------|---|---|--|------------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| Abnormal Load Transportation and Traffic Load | <ul style="list-style-type: none"> Land Preparation and Construction Closure | Local Communities on the Transport Route Local Communities in the Vicinity of the Project Road Users | Wide | Medium | Short term reversible to irreversible | Short term | One off | Medium | Medium | Moderate | <ul style="list-style-type: none"> The Transport and Traffic Management Plan, 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 authorities (i.e. General Directorate of State Highways, local police force), particularly for the transportation of oversized and heavy vehicles. The Project Company 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. Police escort will be ensured at all critical locations (e.g. pinch points) where other traffic is to be stopped or traffic flow is to be diverted into reverse direction. 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 on the environment, local communities and Project personnel. Construction contractors will be required to arrange buses/services for the transportation of Project personnel to minimizing external traffic. The Project Company will ensure that the adjustments and improvements identified in the Road Survey Report (covering the physical | Minor |
| | | Road Infrastructure | Wide | Low | Short term reversible | Short term | Intermittent | Medium | Low | Minor | | Negligible |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--------------------|---------------|----------|------------------|-----------|---------------|----------|-----------|----------------------|---|---|--|------------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| | | | | | | | | | | | <p>arrangements required to be done at the existing road intersections, traffic islands, lighting poles and traffic signs; improvements on existing roads; adjustment of ground levels; and providing necessary design structure for the passage of existing infrastructure) are completed prior to the start of Project-related transportation. The Company will consult with the related governmental authorities (e.g. General Directorate of Highways, local police forces, etc.) prior to the start of transportation activities and ensure that all the necessary permits/approvals are in place.</p> <ul style="list-style-type: none"> • 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. The Project-related traffic will use this improved access road in order to avoid any disruption for the Kiyikoy residents and the visitors of the settlement/tourists⁴⁶ using the existing access road of the Kiyikoy town. Necessary warning signs and visible instructions will be placed at the diverging points in order to ensure that the Project-related traffic is diverted to the improved access road and local traffic is diverted to the existing Kiyikoy access road. • The Project Company will consult with the Turkstream Project officials for the scheduling of transportation activities. • Two flagmen will be positioned at each side of the existing bridge located in the south of the License Area at all times where Project-related transportation will take place. • Concrete works will be planned at hours where local traffic volumes are normally at their lowest during the day. If allowed by the related authorities, concrete is planned to be supplied from the existing concrete plant of Turkstream Project located at the southeastern boundary of the Project License Area in order to avoid or minimize external traffic due to concrete supply from local concrete plans. | |

⁴⁶ Kiyikoy is a touristic settlement with a high season between May and October.

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--------------------|---------------|----------|------------------|-----------|---------------|----------|-----------|----------------------|---|---|--|------------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| | | | | | | | | | | | <ul style="list-style-type: none"> • 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. • All Project personnel/drivers, including the contractors and subcontractors, will be provided with training on the implementation of the Transportation and Traffic Management Plan. These trainings will emphasize safety aspects among drivers. • All the operators and vehicle drivers will have valid operators/drivers licenses and competency to use heavy machineries. • The Project Company will identify the requirements for defensive driving and road safety trainings and ensure that required personnel are provided with these trainings at the start of work. • Refreshment trainings will be planned in consideration of the Project Schedule. • A regular maintenance and inspection programme will be developed to ensure that all heavy and light construction machinery, vehicles, service buses and are operating safely and effectively. • Drivers and operators of each vehicle will be required to conduct daily visual inspection and fill an inspection checklist before using light or heavy vehicle. • Periodic servicing of the vehicles will be required and the vehicles which are broken or have missing equipment will not be accepted inside the work site. • Tires will be monitored, recorded and replaced when necessary. • Project-specific Stakeholder Engagement Plan 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 | |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--|--|--|------------------|-----------|-----------------------|------------|------------------------------------|----------------------|---|---|---|------------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| | | | | | | | | | | | construction sites, traffic restrictions to be applied for health and safety purposes and duration of such restrictions. | |
| Impacts on local communities due to off-site accommodation of Project's construction workforce | <ul style="list-style-type: none"> Land Preparation and Construction | Local communities (Vize, Saray and Cerkezoy district and Kiyikoy town) | Wide | Low | Short term reversible | Short term | Continuous (for maximum 11 months) | Low | Medium | Minor | <ul style="list-style-type: none"> The Project Company will ensure that all the direct and contracted workers are provided with trainings on BEE's corporate Social Guidelines at the beginning of employment (individually or collectively). These trainings will also cover the code of conduct for accommodation, as well as general moral, cultural and ethical rules required from all Project workers. The Project Company will analyse 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 centres in order to ensure safe travel of the Project workers to the Project site and minimise Project-related traffic in the region. An Off-site Accommodation Management Plan will be developed and implemented for the construction phase. | Minor |
| Exposure to Disease | <ul style="list-style-type: none"> Land Preparation and Construction Closure | Local Communities | Local | Low | Short term reversible | Short term | One-off | Low | High | Moderate | <ul style="list-style-type: none"> The Project Company will ensure that necessary medical checks for all direct and contracted employees are in place at the time of hiring, which would be repeated as necessary. The Project Company will ensure that necessary medical checks for all direct and contracted employees are in place at the time of hiring, which would be repeated as necessary. The Project Company will ensure that legally required basic occupational health and safety (OHS) trainings, covering the general and health related subjects (e.g. workplace hygiene and good housekeeping, principles for protection from sickness and protection techniques, biological and psychosocial risk factors), are provided to all direct and contracted employees at the time of hiring, which would be repeated as necessary. The Project Company will closely monitor potential diseases among the Project employees (direct and contracted) throughout the construction phase. Hygienic working conditions at all work sites (belonging to the Project Company and the contractors) will be ensured throughout the construction phase. | Negligible |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|---|---|--|--------------------|-------------|------------------------------------|------------|--------------|----------------------|---|---|--|------------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| | | | | | | | | | | | <ul style="list-style-type: none"> Potable and sanitary water will be supplied in line with the requirements of the national legislation. Necessary laboratory analysis will be conducted by accredited laboratories in line with the frequencies set by the relevant legislation and the Project Company will review the results to ensure compliance with applicable standards. On site facilities such as sanitary facilities and medical/first aid facilities will meet the requirements of IFC and EBRD's Guidance Note on Worker's Accommodation Processes and Standards. The Waste Management Plan will be implemented. The Wastewater Management Plan will be implemented Project-specific Stakeholder Engagement Plan will be implemented to address any relevant grievance and plan/take corrective actions in line with the Grievance Mechanism, where necessary. | |
| Emergency Preparedness and Response and Fire Risk | <ul style="list-style-type: none"> Land Preparation and Construction Operation Closure | Local Communities Project Personnel | Restricted to Wide | Low to High | Short term to long term reversible | Short term | One-off | Low to High | High | Minor to Major | <ul style="list-style-type: none"> The Emergency Preparedness and Response Plan (covering both on-site and off-site issues) will be implemented. Smoke Detection System including multiple smoke detection sensors placed in the nacelle (above the disc brake), in the transformer compartment, in main electrical cabinets in the nacelle and above the high voltage (HV) switchgear in the tower base will be installed and maintained for the Capacity Extension turbines. The existing SCADA system at the control centre will be improved. Each Capacity Extension turbine will be equipped with Lightning Protection System (LPS) covering the blades, nacelles, hubs and the towers, meeting the design requirements of the relevant IEC standards. Handheld carbon dioxide (CO2) fire extinguishers, first aid kits and fire blankets will be provided in the nacelle during the operation period. | Minor |
| Public Access (access restrictions to the construction sites) | <ul style="list-style-type: none"> Land Preparation and Construction Closure | Local Communities | Restricted | Low | Short term reversible | Short term | Intermittent | Low | High | Moderate | <ul style="list-style-type: none"> Access to the construction sites and routes will be temporarily restricted by using appropriate separation techniques to avoid potential health and safety risks (due to use of heavy vehicles, construction vehicles causing site traffic, earthworks, electrocution hazards due to cabling works, etc.) on local community members using the forest lands within the License Area. | Minor |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--------------------|---|--|------------------|-----------|-----------------------|------------|-------------------------------------|----------------------|---|---|---|------------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| | | | | | | | | | | | <ul style="list-style-type: none"> The security officers will monitor the construction sites and routes closely in order to prevent any unauthorised access to the restricted sites. The Transport and Traffic Management Plan, describing general traffic rules and measures and driving safety measures will be implemented. Project-specific Stakeholder Engagement Plan will be implemented to address any relevant grievance and plan/take corrective actions in line with the Grievance Mechanism, where necessary. | |
| Security Personnel | <ul style="list-style-type: none"> Land Preparation and Construction Operation Closure | Local Communities | Restricted | Low | Short term reversible | Short term | One-off | Low | High | Moderate | <ul style="list-style-type: none"> The Project Company will continue receiving services from reputable and certified Private Security Contractor Firms. The agreements with the Private Security Contractor Firms will include provisions related to Project Company's requirements pm the appointment of certified officers, who received basic trainings for private security officers, were subject to necessary security inquiries and fulfills the age and education standards specified by the Company. The Project Company will continue monitoring the legal and special trainings provided to the private security officers and ensure that these officers receive periodical trainings on adequate use of force, appropriate conduct towards the Project employees and the local communities, gender sensitivities, cultural sensitivities (if required) and human rights in line with the requirements of national legislation as well as EBRD PR2 and PR4. The security management measures will be covered in the Community Health and Safety Management Plan to be prepared and implemented for the Project. Project-specific Stakeholder Engagement Plan will be implemented to address any potential risk that may be related to the acts of the private security officers employed in the Project in line with the Grievance Mechanism, where necessary. | Negligible |
| Shadow Flicker | Operation | Residential receptor (vulnerable PAP) within the setback distance of T15 | Restricted | High | Short Term Reversible | Long Term | Intermittent (repetitive each year) | High | High | Major | <ul style="list-style-type: none"> The Project Company will further engage with the vulnerable PAP living in the setback distance of T15 during the ESIA public disclosure period regarding relocation and inform the PAP on the potential operational shadow flicker impacts of the Project based on the findings of the ESIA and the proposed mitigation measures including the option for relocation during the construction and operation. | Minor |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--------------------|---------------|----------|------------------|-----------|---------------|----------|-----------|----------------------|---|---|--|------------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| | | | | | | | | | | | <ul style="list-style-type: none"> In case the vulnerable PAP declares his unwillingness to relocate during the ESIA disclosure period, the Project Company will recognise the right of the PAP to choose relocation until the end of second year of operation. <p><u>If the PAP is willing to relocate:</u></p> <ul style="list-style-type: none"> If the PAP is willing to relocate, a RAP will be prepared in line with EBRD PR5, submitted to Lenders for approval and implemented for the vulnerable PAP living in the setback distance of T15. <p>The RAP will ensure that the operational shadow flicker impact on the vulnerable PAP is avoided at the resettlement site, which will provide adequate housing with improved living conditions, where the PAP would feel himself comfortable to stay (considering his vulnerability) and continue his current economic activities, if there is any.</p> <p><u>If the PAP is unwilling to relocate:</u></p> <ul style="list-style-type: none"> If the PAP is unwilling to relocate, the Project Company will regularly (e.g. at least monthly) engage with the vulnerable PAP regarding his experience on shadow-flicker throughout the first year of operation (except the months May, June and July when there is no shadow flicker impact anticipated) and inform the PAP about the Project Grievance Mechanism so that the PAP can convey his grievance in case of shadow flicker impacts. The regular engagement outcomes will be evaluated on a monthly basis and corrective measures will be developed and implemented progressively at the end of each monthly monitoring campaign (implementation of corrective measures will be completed within 3 months following the monthly monitoring). The complete set of the engagement outcomes (consisting of documents on monthly engagement with the vulnerable PAP) obtained throughout the first year of operation) will be evaluated collectively at the end of the first year of operation. Based on the outcomes of the on-going engagement, the Project Company will developed corrective measures in consultation with the | |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--------------------------|---------------|--|------------------|---------------|-----------------------|------------|-----------|----------------------|---|---|--|------------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| | | | | | | | | | | | <p>vulnerable PAP and the owner of the building and implement these measures with a mutually agreed method that will be approved by Lenders (implementation of corrective measures will be completed within 3 months after the end of the first year of operation, whenever technically feasible). These measures will include the following:</p> <ul style="list-style-type: none"> ○ Fitting the windows of affected rooms with sunblinds. ○ Landscaping/provision of vegetation screening if this is proved to be effective in avoiding shadow flicker impact at this specific location (effectiveness will be technically evaluated by the Company) <ul style="list-style-type: none"> • The Project Company will continue engagement with the vulnerable PAP through face to face meetings to be undertaken quarterly in the second and third years of operation and semi-annually after the third year of operation until the end of financing period. • Project-specific Stakeholder Engagement Plan and the Project Grievance Mechanism will be implemented throughout the operation to address any noise-related grievance and plan/take corrective actions, where necessary. | |
| Blade and Ice Fall/Throw | Operation | Residential receptor (vulnerable PAP) within the setback distance of T15 | Restricted | Low to Medium | Short Term Reversible | Short Term | One-Off | Low to Medium | High | Moderate to Major | <ul style="list-style-type: none"> • In case the vulnerable PAP living in the setback distance of T15 is unwilling to relocate, the Project Company will monitor the ice throw risk by means of 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 afterwards as necessary and/or if required by the Lenders. • The Project Company will develop and implement an Ice Throw Risk Assessment and Management Procedure that will be approved by Lenders. As part of this Procedure, an ice monitoring station will be established at the best representative turbine to be determined at the Project Area. Thus, when icing is detected at this specific | Negligible |

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/ Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--------------------|---------------|--|------------------|-----------|---------------|----------|-----------|----------------------|---|---|---|------------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| | | | | | | | | | | | <p>turbine, an alarm signal will be transmitted to the operator through the SCADA system. The chief operator will appoint an authorized control team to visit the turbine locations and conduct visual checks at a safe distance by using binoculars to ensure occupational health and safety of the control team. If the control team identifies ice throw risk, they report the risk to the chief operator and the shut-down decision is taken until the risk is alleviated to acceptable levels. The procedure will identify the setback distances around the turbines and the measures to be taken within these distances (e.g. putting warning signs).</p> <ul style="list-style-type: none"> The Project Company will ensure that periodic blade inspections and repair of defects that could affect blade integrity are performed and recorded. | |
| | | <p>Users of the forests for forestry, grazing and mushroom collection activities (from Kiyikoy and Kislacik settlements)</p> <p>Recreational users the forest land within the License Area</p> | | | | | | | | | <ul style="list-style-type: none"> Necessary warnings will be installed and additional precautions during the days of the year when there is risk of ice throw in consideration of the fact that public access to the License Area will not be restricted during the operation phase. | |

15. CULTURAL HERITAGE

15.1. Methodology

The ESIA studies for the identification and assessment of the potential Project impacts on the tangible and intangible cultural heritage assets within and in the surroundings of the Kiyikoy WPP License Area ("cultural heritage study area") has been performed by the qualified experts of REGIO Cultural Heritage Management Consultancy ("REGIO"). As part of the study, the experts conducted desktop studies, field research and consultations with the related local cultural heritage authorities (Ministry of Culture and Tourism, Edirne Regional Directorate of Cultural Assets). Findings of the studies are presented in the following sections.

15.1.1. Desktop Study

Publications on archaeological, ethnographic and intangible cultural heritage pertaining to the License Area and its immediate surroundings (cultural heritage study area) have been compiled in order to determine the cultural heritage potential of the site. As part of the study, an interview was made with the Edirne Regional Directorate of Cultural Assets to discover whether existence of any tangible archaeological or cultural heritage has already been recorded for the study area.

Resources used during the desktop studies are listed below:

- Academic publications
- Historical maps
- Cultural Heritage Assessment Reports prepared for other construction and infrastructure projects conducted in the region
- Inventory records of the Ministry of Culture and Tourism
- Documentaries related to the intangible cultural heritage of the region

15.1.2. Field Research

The field research was conducted by the team of qualified experts of REGIO⁴⁷ on 11-12 April 2019. The cultural heritage team visited the locations of 21 turbines planned to be erected, new internal site access roads planned to be constructed and settlements located in the close vicinity of the Project's License Area in order to gather field data on the tangible and intangible cultural heritage elements relevant to the Project.

The survey aimed to identify and evaluate the potential risks and impacts of the Project on the cultural heritage elements within the study area and develop Project-specific management measures to be implemented to avoid and/or minimise those risks and impacts, where required.

15.1.2.1. Archaeological Field Surveys

During the archaeological field surveys, the archaeological findings that could be observed on the surface were recorded by taking Geographical Positioning System (GPS) coordinates together with detailed photographs of the findings from various angles to form a Project archive.

⁴⁷ Senior Archaeologist Mr. Halim ÖZATAY, Archaeologist Mr. Serkan AKDEMİR, Archaeologist Ms. Seray AYAZ AKDEMİR, Administrative Assistant MR. Hüseyin DAĞ.

15.1.2.2. Intangible Cultural Heritage Surveys

The intangible cultural heritage surveys conducted as part of the Project employed a qualitative research approach, which aimed to develop an in-depth exploration of intangible cultural heritage in the study area. The surveys were carried out based on "face to face interviews" held with the people living in Kiyikoy town centre and Aksicim, Hamidiye, Kislacik villages by using pre-prepared questionnaires.

The respondents of the survey were selected among the residents of the four settlements based on a purposeful sampling strategy. As intangible cultural heritage is mostly linked and embedded in elderly people and transmitted to younger generations through them, the age group of the respondents was an important criterion taken into consideration in the selection of interviewees. Thus, the majority (75%) of the respondents were 50 years or older, while younger residents were also included to ensure adequate representation of each age group. As a result, the intangible cultural heritage interviews were conducted with 16 persons⁴⁸ from the selected settlements. The information on the settlement, age group and occupation⁴⁹ of respondents of the intangible cultural heritage interviews is provided in Table 15-1.

Table 15-1. Respondents* of the Intangible Cultural Heritage Interviews

| Settlement | Age Group | Occupation |
|------------|-----------|---|
| Kiyikoy | 19-29 | Master Trainer at Public Education Centre |
| Kiyikoy | 19-29 | Master Trainer at Public Education Centre |
| Kiyikoy | 30-39 | Business Administrator |
| Kiyikoy | 60+ | Fisherman |
| Kiyikoy | 60+ | Coal Dealer |
| Kiyikoy | 50-59 | Animal Breeder |
| Kiyikoy | 60+ | Lumberjack |
| Kislacik | 50-59 | Retired |
| Kislacik | 50-59 | Retired |
| Kislacik | 50-59 | Retired |
| Kislacik | 60+ | Retired |
| Aksicim | 39-49 | Animal Breeder |
| Aksicim | 50-59 | Coffeehouse Owner |
| Aksicim | 50-59 | Coffeehouse Owner |
| Hamidiye | 50-59 | Mukhtar |
| Hamidiye | 50-59 | Animal Breeder |

* The anonymity of the respondents has been respected to ensure research ethics governing the standards of conduct for researchers.

The questionnaire used for the intangible cultural heritage research is presented in Appendix A.1. It included a total of 23 questions which has been designed based on general literature related to intangible cultural heritage studies supported by the findings of the preliminary desktop study as well as the information received through initial contacts with the residents of the survey settlements.

⁴⁸ 14 participants of the intangible cultural heritage surveys were male and 2 were female. As the intangible cultural heritage surveys as part of this study was conducted at public places used for social gathering, trading, etc., the survey could reach mainly male members of the communities such that 14 of the respondents were male and 2 of the respondents were female.

⁴⁹ The occupation of the respondents is presented to provide additional information on the survey group and is not directly relevant to intangible cultural heritage research.

The respondents of the survey were approached as they continue their daily activities (see Figure 15-1 to Figure 15-5). During the interviews, the dialogue with participants and their answers to the questions were recorded with their consent by using a voice recorder. Following the completion of the field work, all audio recordings have been transcribed into text for further analysis and evaluation.



Figure 15-1. Intangible Cultural Heritage Interviews at a Local Market Place in Kiyikoy



Figure 15-2. Intangible Cultural Heritage Interviews with Local Charcoal Producers



Figure 15-3. Intangible Cultural Heritage Interviews with Kiyikoy Water Products Cooperative



Figure 15-4. Intangible Cultural Heritage Interviews



Figure 15-5. Intangible Cultural Heritage Interviews

15.2. Project Standards

The Project will comply with the national legislative requirements and international conventions, agreements, standards applicable to the protection and management of tangible and intangible cultural heritage elements.

15.2.1. National Legislation

According to the Constitution of the Republic of Turkey (see Chapter Three “Social and Economic Rights and Duties”, Section 11 “Protection of Historical, Cultural and Natural Assets”, Article 63) “The State shall ensure the protection of the historical, cultural and natural assets, and shall take supportive and promotive measures towards that end”.

In line with the Constitution, movable and immovable cultural and natural assets are protected and shall be conserved as per the “Law on Preservation of Cultural and Natural Assets” (Law No: 2863; amended by the Law No: 3386), published in the Official Gazette numbered 18113 and dated 23 July 1983. According to the Law, essential assets which are identified as having cultural and natural heritage value and considered under legal protection are defined as follows:

- Natural and immovable cultural assets belonging to 19th Century and before;
- Any immovable cultural asset constructed after the end of the 19th Century but categorized as “a significant asset which requires preservation” by the Ministry of Culture and Tourism;
- Immoveable cultural assets located within the Protection Sites (in the Law, Protection Sites are defined as ancient sites and ruins which reflect the main social, economic or architectural characteristics of their era. Protection Sites may also be locations where fundamental historical events took place or areas containing considerable natural or cultural assets with natural or cultural features requiring preservation); structures, buildings or places that have witnessed significant historical events during the Turkish Independence War or the foundation of the Republic of Turkey, regardless of the time and registration; and all dwellings and buildings that have been used by Mustafa Kemal ATATURK without considering their time of construction or status of registration.

In addition to the Law on Preservation of Cultural and Natural Assets (Law No: 2863), specific regulations govern the procedures about the protection and preservation of cultural and natural assets. The most predominant one being the Principle Decision (No. 658, issued 5 November 1999) which states that all archaeological sites need to be classified and protected according to their significant features. Three main categories are determined relevant to archaeological sites as:

- **1st Degree Archaeological Sites:** Areas requiring highest level of protection. They shall be preserved except for scientific excavations. The area shall be free of any type of buildings and construction. All kinds of construction, excavation, and modification activities are prohibited. However, for exceptional cases such as the necessity for essential infrastructure construction, Regional Preservation Boards may permit such activities based on the approval of the relevant museum and the head of the scientific excavation team.
- **2nd Degree Archaeological Sites:** Areas requiring medium level of protection. They shall be preserved based on the conditions of protection and utilisation set by the Regional Preservation Boards. Additional construction is prohibited. As the 1st Degree Sites, for exceptional cases such as necessity for infrastructure construction among others, Regional Preservation Boards may permit such activities based on the approval of the relevant museum and the head of the scientific excavation team.

- **3rd Degree Archaeological Sites:** Lowest level of protection area. Construction is permitted based on the decisions of Regional Preservation Boards. Before applying for a construction permit, test pit excavations shall be conducted, and the outcomes of these excavations shall be reviewed by the relevant museum and, if present, the head of the scientific excavation team. Reviews shall be submitted to Regional Preservation Boards. The Boards may ask for extension of the coverage of test pits before taking any decision.

The intangible cultural heritage, which are located within the borders of the Republic of Turkey, is officially protected by "Law No. 5448 on 19 January 2006 on the Law on the Approval of the Convention for the Protection of the Intangible Cultural Heritage". The intangible cultural heritage legally protected by the relevant Law is defined as follows:

- Any cultural value created by public in oral cultural environments and included in folklore research; verbal expressions and cultural traditions such as oral traditions, performing arts, social practices, rituals and festivals, popular knowledge, practices related to the universe and nature, tradition of handicrafts and production processes.

15.2.2. International Conventions, Standards and Guidance

Turkey has ratified the following key international conventions regarding the cultural heritage, which are applicable to the Project:

- United Nations Educational, Scientific, and Cultural Organization (UNESCO), Convention on the Protection and Promotion of the Diversity of Cultural Expressions. Paris, 20 October 2005
- United Nations Educational, Scientific, and Cultural Organization (UNESCO), Convention for the Safeguarding of the Intangible Cultural Heritage. Paris, 17 October 2003.
- United Nations Educational, Scientific, and Cultural Organization (UNESCO), Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property. Paris, 14 November 1970.21/04/1981
- United Nations Educational, Scientific, and Cultural Organization (UNESCO), Convention concerning the Protection of the World Cultural and Natural Heritage. Paris, 16 November 1972.

In addition, the guiding principles of the following international standards are also applicable to the Project:

- The EBRD Environmental and Social Policy, PR 8 on Cultural Heritage (2014);
- Guidance on Heritage Impact Assessments for Cultural World Heritage Properties, ICOMOS 2011.

15.3. Baseline Conditions

The baseline conditions of the cultural heritage elements within the study area have been characterised based on the findings of the desktop research and field surveys conducted as part of the ESIA study. Detailed information on the baseline conditions is provided in the following sections.

15.3.1. Archaeological and Historical Background

The License Area of the Kiyikoy WPP Project is located in the Eastern Thracian Region, which was called Thracia in ancient periods. It is bordered by Pontos Euxinos (Black Sea) in the north and the east and by Mons Asticus (Istranca Mountains) in the south and the west.⁵⁰

In his tragedy "Prometheus Bound", Aeschylus (526 – 456 Before Common Era - BCE), calls the settlement Salmydessos which is known as Kiyikoy/Midye in modern era. Aeschylus also speaks of the Thracian presence in the region. In Sophocles' important work "Antigone", which is dated to 442 BCE, Salmydessos and its vicinity is mentioned as the homeland of Ares, the God of War. Salmydessos (Kiyikoy-Midye) is mentioned in "Anabasis" of Xenophon as one of the end points of the region, which he calls "Delta" since because of its triangular shape between the roads to Propontis, Bosporos, Euxinus and Perinthos (Marmara Ereğlisi)⁵¹. Kiyikoy is bordered by Mons Asticus (Istranca Dağları), which is believed to be named after Asts that is one of the Thracian tribes inhabited the region. The name Mons Aticus was given to Istranca Mountains, which stretch alongside the Black Sea coast, by the Romans.⁵² Since it is located on the Black Sea coast, Kiyikoy exhibits rainy Black Sea climatic conditions. Plain fields of the town are suitable for agricultural production. In addition, timber, obtained from forestland is an important commodity of trade.⁵³ There are copper and zinc mines on Mons Asticus (Istranca Mountains).⁵⁴

There is not sufficient information on the agricultural activities conducted in Kiyikoy and its close vicinity in the ancient period. However, Homeros mentions of barley and hemp production in the entire Eastern Thrace and Xenophon states that the region was prominent in barley and wheat production. Grape and vine production was also widespread in the region.

For the coastal regions such as Kiyikoy, fishery is an important means for living. It is thought that likewise it is done today, trout, carp and gray mullet fishing was common in the ancient period in areas where Pabuc and Kazan creeks are located in the south of the License Area. These creeks encircle Kiyikoy and flows to the sea⁵⁵. With its fertile soil, vegetation, rivers and ports that are suitable for marine trade, Kiyikoy has been an attractive settlement for centuries.

No archaeological site or trace dated to the 3rd millennium (the Early Bronze Age) or older has been encountered in Kiyikoy or its close vicinity until the present time. In fact, no Early Bronze Age settlement has been discovered in Kiyikoy nor the entire Black Sea coast of Thrace to date. This is explained via the fact that the lands and cliffs on the Black Sea coast, which are scoured by the sea and shrank continuously, are not suitable for dwelling. Because of heavy rains, the plateaus on the Black Sea coast including Kiyikoy are separated by multitude of very deep valleys. On the other hand, Istranca Mountains, which are covered with forests, form a strong barrier. It is thought that, there was no settlement in the early periods because of such type of physical obstacles⁵⁶.

It is known that due to structural changes between the end of the 2nd millennium and the beginning of the 1st millennium BCE, Thracian tribes, who came from the north, settled in the region⁵⁷. The Thracians were Indo-European warrior people divided into many tribes. They were pagan. It is known that, the Thracian tribe named Thyns settled in the Black Sea coastline between Kiyikoy (Salmydessos) and Burgaz of the modern period, which was known as Thynias or Thynia in the ancient sources. Astais, or Thracians of Mountains were Thyns

⁵⁰ Sevin, V. (2000). *Anadolu'nun Tarihi Coğrafyası*, Ankara: Türk Tarih Kurumu Basım Evi. S. 18

⁵¹ *Anabasis*, VII 1: 33

⁵² Sarıkaya, B. (2009). *Epigrafik Buluntular Işığında Trakya'da Kültürler*, Edirne: Trakya Üniversitesi Sosyal Bilimler Enstitüsü Yayınları. S.5

⁵³ Sevin, V. (2000). *Anadolu'nun Tarihi Coğrafyası*, Ankara: Türk Tarih Kurumu Basım Evi. S. 19

⁵⁴ Pehlivan, E. (2010). *Doğu Trakya'da Roma Dönemi Yolları*, Edirne: Trakya Üniversitesi Sosyal Bilimler Enstitüsü Arkeoloji Anabilim Dalı Yüksek Lisans Tezi, (s.4).

⁵⁵ <http://www.kiyikoy.gen.tr/tag/pabuc-dere>

⁵⁶ Divarçı, F. (2012). *Trakya Bölgesi İlk Tunç Çağı Yerleşimlerinin Coğrafik Bir Değerlendirmesi*, İsmail Fazlıoğlu Anı Kitabı, s. 81), Ankara.

⁵⁷ Pehlivan, E. (2010). *Doğu Trakya'da Roma Dönemi Yolları*, Edirne: Trakya Üniversitesi Sosyal Bilimler Enstitüsü Arkeoloji Anabilim Dalı Yüksek Lisans Tezi, (s.18).

neighbours who inhabited Mons Asticus (Istranca Mountains)⁵⁸. In the end of the 8th century, the Hellene tribes formed many colonies in the coasts of Thrace⁵⁹. In this period, there was a vibrant trade network between the Thracian tribes and the Hellenes. It is known that, as a result of the relationships with the Greek colonies in Thrace, money was started to be used and minted for the first time in Thrace in the 6th century. In the same period, certain relationships were formed between the Thracians and the Scythians due to the Scythian invasions that started in the 7th century. During the 6th and 5th century BCE, Persians took control of Thrace as a result of military campaigns they launched against the Scythians and Greeks. According to Herodotus, while some Thracian tribes embraced the Persian sovereignty, others totally rejected it. Herodotus also mentions that the Persian Emperor Darius passed by Salmydessos (Kiyikoy) with the Persian army in 513 BCE⁶⁰. After Persians left Thrace, an independent Thracian State was established in the Eastern Thrace under the lead of Odyris. After the death of Alexander the Great, the Thracian Satrapy was established in the region. After then, entire Thrace was captured first by the Seleucids and then Ptolemaic Kingdom. Later on, in the 1st century BCE, the Romans partially conquered the region. In 38 BCE, Rhaimetalkes, who was supported by the Romans, was declared the King of the Thracians. The grave, which is located in the District of Vize and named Vize A Tumulus, belongs to the King Rhaimetalkes. For this reason, it is thought that the last capital of the Thracians was Vize. After the King Rhaimetalkes was killed in 45 BCE, the last remnants of Thracian territories were annexed to the Roman Empire and formed a Roman province⁶¹. It is known that the Black Sea coast road between Constantinople and Crimea passed through Kiyikoy (Salmydessos) and from there reached to Thynias (İğneada) and then diverged to the north and headed to the Crimea⁶². After the Roman Empire was divided into two, the region remained within the borders of the Eastern Roman Empire.

The community living in the study area consists of residents of four villages in the region. A literature survey and preliminary desktop survey provided that; a part of the community immigrated in the area after War of '93⁶³. While Ottoman empire had lost the war, the population faithful to the empire migrated to Anatolia from Russia and Balkans. It is also found out that there had been tension between the residents in the area and the newcomers, whilst this has been settled in time also by the intervention of the state officials.

15.3.2. Tangible Cultural Heritage

There is one registered archaeological and one non-registered potential site identified within the Project License Area. The registered Cingene İskelesi Mevkii Necropolis and Church Remains is a 3rd Degree Archaeological Site. The non-registered potential site within the License Area has been newly discovered⁶⁴ as part of the Project's ESIA studies and has been referred to as "Kiremitlimandira" by the cultural heritage team. The locations of the registered archaeological and non-registered potential sites are shown on the map provided in Figure 15-6. Further information on both sites is provided in the following sections.

⁵⁸ Erzen, A. (1994). *İlkçağ Tarihinde Trakya, Başlangıçtan Roma Çağına Kadar*: Ankara: Türk Tarih Kurumu Basımevi. S. 28-30

⁵⁹ Sevin, V. (2000). *Anadolu'nun Tarihi Coğrafyası*, Ankara: Türk Tarih Kurumu Basım Evi. S. 22

⁶⁰ Beksaç, E. (2006). *Kuzey Batı Anadolu ve Trakya'da Erken Kültürel Kaya (Kaya Oyma ve Megalit) Anıtları ve Kültür Alanları Projesi Edirne ve Kırklareli İlleri 2004 Yüzey Araştırması*, 23. Araştırma Sonuçları Toplantısı 2005, Cilt 1, S. 2-8 Ankara.

⁶¹ Pehlivan, E. (2010). *Doğu Trakya'da Roma Dönemi Yolları*, Edirne: Trakya Üniversitesi Sosyal Bilimler Enstitüsü Arkeoloji Anabilim Dalı Yüksek Lisans Tezi, (s.25).

⁶² Pehlivan, E. (2010). *Doğu Trakya'da Roma Dönemi Yolları*, Edirne: Trakya Üniversitesi Sosyal Bilimler Enstitüsü Arkeoloji Anabilim Dalı Yüksek Lisans Tezi, (s.58).

⁶³ The 'War of '93' or "93 War", named after the year 1293 in the Islamic calendar which corresponds to 1877-1878. The referred period is linked with Ottoman-Russian war, which took place in periods of Ottoman Sultan Abdulhamid II and the Russian Tsar Alexander II. The Ottoman Empire lost the war, and this has triggered a mass of immigrants (more than a million) from Balkans and Caucasia to Anatolia.

⁶⁴ The Project Company has officially notified the Edirne Regional Board for Conservation of Cultural Assets about this potential archaeological site. The experts from the Regional Board carried out a field investigation at the potential site on 12 June 2019 and identified that the potential site does not have any important feature that is to be protected/managed under the Law on Preservation of Cultural and Natural Assets (Law No: 2863). With its official letter dated 27 June 2019, the Regional Board has allowed the Project Company to undertake the activities planned as part of the Kiyikoy WPP Capacity Extension Project at this site.

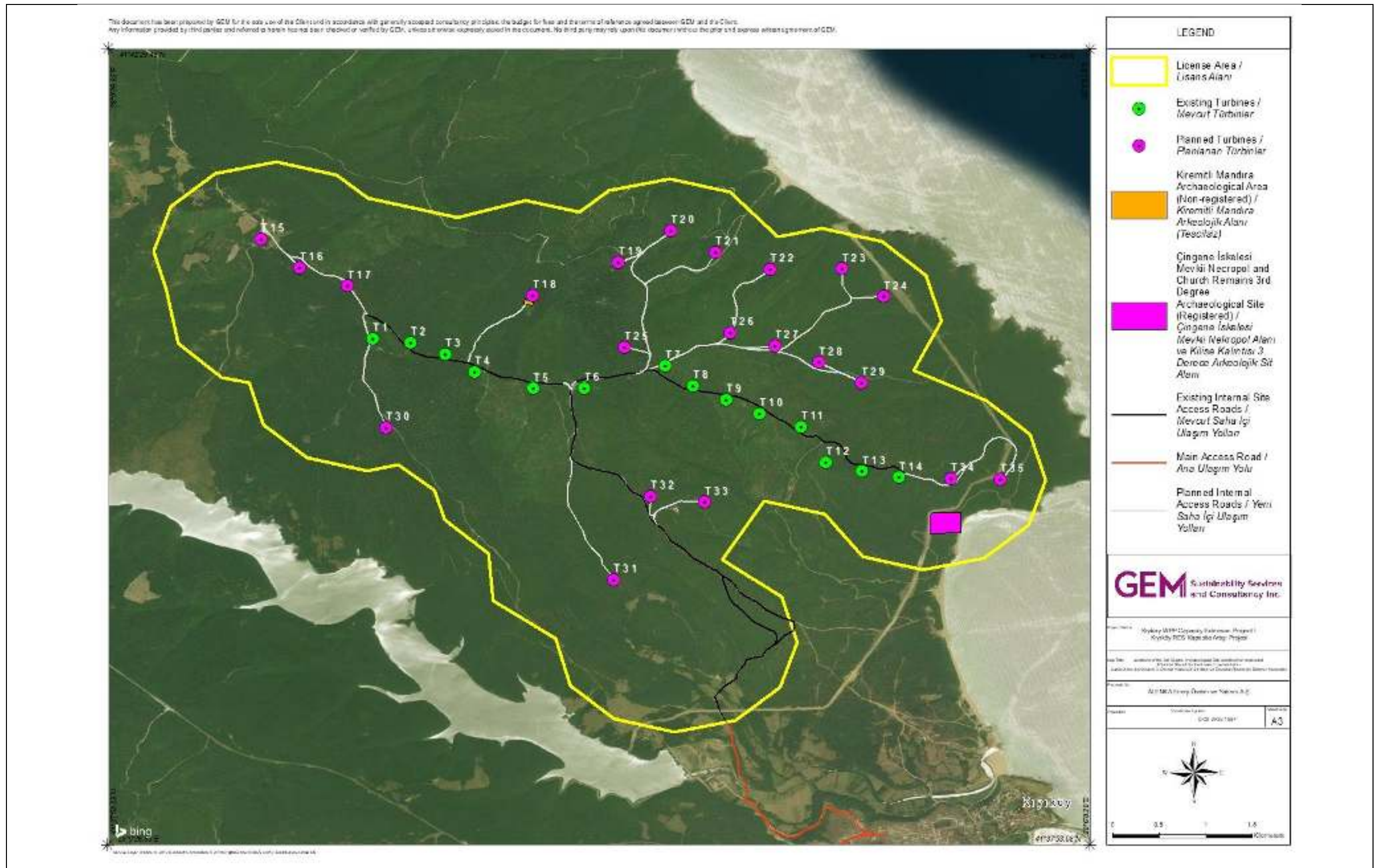


Figure 15-6. Locations of the 3rd Degree Archaeological Site and the Non-registered Potential Site within the Project License Area

15.3.2.1. Registered Archaeological Site

There is a registered archaeological site within the boundaries of the Project License Area. This site has been declared as “Cingene İskelesi Mevkii Necropolis and Church Remains 3rd Degree Archaeological Site” by the decision of the Edirne Regional Board for Conservation of Cultural Assets (Decision No: 4487, Decision Date: 16 October 2018 (Appendix A.2). Adjacent to an existing forest road, the archaeological site is located 286 meters south of access road to T34, 374 meters south of the T34, and 470 meters southeast of the existing T14.

The registered area is protected and conserved as per the “Law on Preservation of Cultural and Natural Assets” (Law No: 2863). Yet, there are many illegal digging pits observed in the area. Remains of a structure with rectangular base made of rubble stones was found on a flat terraced area in the southern part of the site (see Figure 15-7). In the northern part of the site, there are complex structural architectural elements carved into the main rock, wall remains, artificial hillocks that might be tumuli of small diameter and ceramic fragments. It was observed that these hillocks were placed as clusters. Many tile pieces were found around the hillocks that were destroyed by illegal excavations. There are also platforms and structural complexes that were carved into the main rock by hand and could possibly be related to water or different cults (e.g. sacrifice, etc.). A little further on these structures, a relief cross mark was found on a piece of marble slab (see Figure 15-8)



Figure 15-7. Remains of the Structure at Cingene İskelesi 3rd Degree Archaeological Site



Figure 15-8. A Piece of Marble Slab with Relief at Cingene İskelesi 3rd Degree Archaeological Site

15.3.2.2. Non-registered Potential Site

A potential archaeological site was discovered by the ESIA cultural heritage team within the License Area of the Project. This potential site is located approximately 180 meters west of Kiremitlimandıra River and 65 meters south of the planned T18, near the planned route of the access road to this turbine. This site has been named by the cultural heritage team as “Kiremitlimandıra”. Part of the remains observed on the surface is about 40 m x 80 m (approximately 3,200 m²). Foundation remains belong to structures built with rubble stones and a water well was found on the surface of area (see Figure 15-9). The structural plan of the foundation has no integrity because of destructions. Water well which is 3 meters in diameter is filled with earth and its integrity is also destroyed (see Figure 15-10). Many ceramic fragments were found on the surface (see Figure 15-11). It is thought that the potential site may be an idyllic farm belonging to late Ottoman period.



Figure 15-9. Foundation Remains at Kiremitlimandıra Potential Site



Figure 15-10. Water Well at Kiremitlimandıra Potential Site



Figure 15-11. Ceramic Fragments at Kiremitlimandıra Potential Site

15.3.3. Intangible Cultural Heritage

The responses of the participants to the intangible cultural heritage questionnaires conducted with 16 residents from the Kiyikoy, Kislacik, Aksicim and Hamidiye settlements have been used to characterise the intangible forms of cultural heritage existing within the study area. A summary of the responses provided to intangible cultural heritage questionnaires is provided in Table 15-2.

Table 15-2. Summary of Responses Provided to Intangible Cultural Heritage Questionnaires

| Question | Summary of the Responses |
|--|---|
| Do you have information about the Kiyikoy Wind Power Plant Project and the project site? | Nearly all participants stated that they are informed about the Kiyikoy Wind Power Plant Project and the License Area (<i>response to Question 4</i>) |

| Question | Summary of the Responses |
|---|--|
| Do you have information about the immigrant families who had settled in your village or in the nearby region after 93 War? | All the participants explained that they know the history, their origin and the events related to people immigrating to the area after the War of '93. They have named many locations in the region as related to the historical events. However, they made no clear connection with a special location in the project area. The participants also stated that they have oral memories and expressions about War of '93, but they are not related with the License Area (<i>response to Questions 5,6</i>) |
| Are there oral memories connected to the village and project area about the '93 War? | |
| Do you have oral traditions/expressions in your village/ neighbourhood concerning the Project site or its nearby area? (Such as fairy tales, lullabies, legends, beliefs, heroic stories, idioms, proverbs, folk songs, etc.) | Local communities do not have oral traditions and expressed that the License Area is not part of their oral memories (<i>response to Question 7</i>) |
| Do you have ceremonies related to important events in the daily life of the village residents or people living in the Project field or the surrounding area? (Such as wedding, dowry, circumcision, military drafting, birth, death, cemetery, etc.) If so, is the area you are performing these rituals in or near the Project area? | Local communities in the area are not celebrating special occasions, ceremonies or annual meetings based on special dates and/or cycles of nature. There is no place/location within the License Area that is regarded to be important for local communities for gathering socially (<i>response to Questions 8, 9, 10, 13, 16</i>) |
| Are there special gathering places in the village which are used for social events, celebrations or chat meetings, and connected to the project area or surroundings? (village coffee shop, boy's rooms etc.) | Local communities are not using the License Area for collecting herbs, fruits, raw materials for healing and food processing purposes (<i>response to Questions 11, 23</i>) |
| Do you have local traditional organizations which are connected to the project area or its surroundings? (Such as crafts associations, cooperatives, "Yaren" organisations, youth organisations, etc.)" | |
| Do you have traditional, calendar based, social activities which are realized in the project area and surroundings? (Hidirellez nawruz, celebration, harvest season, cherry festival, etc.) | |
| Are there special dates reserved for commemoration of important traditional/historical events or for festives in your village? (such as Independence Day, Victory Day, Karagöz and Kakava festivals). If so, are there any places in the project area used for such purposes? | |
| Do you practise traditional medicine and healing methods in your village/ neighbourhoods that connected to project area or its surroundings? (Such as osteopath, bone setters, hernia healers, herbalists, etc.) If so, are there any plants or natural resources collected from the project area or surroundings? | |
| Are their local, traditional nutrition and food processing techniques? (Stone milled olive oil, bread, yoghurt, tarhana, village oven, etc.). If so, are you collecting any herbs, fruits etc. in the project area or is there any special place used in making them and connected with the project? | |
| Are there any traditional weather forecasting methods used in your village/ neighbourhood that is connected with the Project area and surroundings? (Such as "cloud crest on top of a mountain, wind blowing, etc.) | |

| Question | Summary of the Responses |
|---|---|
| Are there any local measurement systems used in the village? If so, are they connected to the project area and surroundings? | related to such practices (<i>response to Question 12</i>) |
| Are there traditional production activities used by the village people for economic and/or consumption purposes which are related to the project area and surroundings? (Such as Fishing, lumbering, oak coal manufacturing, animal feed production, mining, agriculture, animal husbandry, herb collecting, preparation for winter, plow, etc.) If so, are they dependent on the project area and surroundings for necessary raw materials or for the manufacturing processes? | The participants of the survey have stated that based on their traditions, their main economic activities in the region are oak charcoal ⁶⁵ production, raising livestock, especially cattle, woodcraft and fishing. The participants informed that the License Area includes pastures needed for livestock breeding. Thus, part of the License Area is related to traditional means of production and economic well-being of the local people (<i>response to Question 14</i>) (whereas the Project will not cause any permanent access restrictions to the License Area and will be accessible to the local communities except the substation site. The measures to be taken by the Project Company to ensure Community Health and Safety is provided in Chapter 13 ("Community Health and Safety"). The Project Company's engagement approach with the local communities is provided in the Project-specific "Stakeholder Engagement Plan") |
| Do you have traditional beliefs and practices which are connected with the project area? (Such as evil eye talisman, good luck amulets and devotion places, wish trees etc.). | Local communities are not performing any practices in the License Area related to their beliefs, games and cultural activities nor visiting the area for such purposes (<i>response to Questions 17, 18, 19</i>) |
| Do you have local/traditional child or adult games in your village and surroundings? (Such as camel wrestling, swing, roping, etc.) If so, do traditional playgrounds exist in the project area? | |
| Do you have traditional folk dances or stories about them in your village / neighbourhood? (Zeybek, halay, çiftetelli, Hora etc.) If so, are there any special places in the project area used or mentioned related to them? | |
| Do you have traditional instruments and folk music in your village / neighbourhood? (Such as flute, squash instrument, clarinet, drum, ballad etc.) If so, are they connected to project area in terms of raw materials used in making the instruments, or tolls needed? | The local communities do not depend on the License Area for making cultural instruments, producing handicraft, or building construction. Respondents stated that they are not using the License Area for collecting/extracting any raw materials and there is no special site within the License Area used for production (<i>response to Questions 20, 21, 22</i>) |
| Are there any traditional handicraft production in your village? (Such as weaving, needlework, felt, leather processing, glass work, pottery, basket making, wire winding, leatherwork, wool work, etc.). If so, are they connected with project area for finding raw materials or as workshop place? | |
| Are there any traditional materials that local people use in building construction? (Mudbrick, stone, wood, clay, sand, etc.) If so, is the project area involved in collecting raw materials or for means of production such as drying the bricks etc.? | |

⁶⁵ As indicated in Chapter 12 ("Socio-economy"), in the meeting held with the mukhtars of Kiyikoy and Kislacik as part of the ESIA social field surveys, it has been stated that 7 people in Kiyikoy and 6 people in Kislacik produce oak charcoal and they use their own lands as production site, which are outside the affected parcels.

15.4. Impact Assessment and Management

As described in the previous section, there are two known archaeological sites (one is registered as a 3rd degree archaeological site and one is a non-registered site discovered by the cultural heritage team as part of ESIA surveys) within the License Area of the Project. In terms of intangible cultural heritage, traditional production activities performed by the local people for economic purposes within and in the vicinity of the License Area have been reported during the field surveys. The potential impacts of the Project on these cultural heritage elements are assessed in this section. A stand-alone Project-specific Cultural Heritage Management Plan (CHMP) has been developed based on the outcomes of the baseline studies and assessments provided in the following sections.

15.4.1. Land Preparation and Construction Phase

The 3rd degree archaeological site ("Cingene İskelesi Mevkii Necropolis and Church Remains"), which is located 374 meters south of T34 and 286 m south of access road of this turbine, is protected as per the Law on Preservation of Cultural and Natural Assets (Law No: 2863). The existing forest road running along the western boundary of the site will not be used for the Project. The Project activities will not cause any physical impact on this site.

The non-registered potential site discovered by the cultural heritage team ("Kiremittlimandıra Archaeological Site") during the field surveys is located near the access road of T18, approximately 65 meters south of the turbine foundation (see Figure 15-12). The Project Company notified the Edirne Regional Directorate of Cultural Assets about this potential site. The experts from the Regional Board carried out a field investigation at the potential site on 12 June 2019) and identified that the potential site does not have any important feature that is to be protected/managed under the Law on Preservation of Cultural and Natural Assets (Law No: 2863). With its official letter dated 27 June 2019, the Regional Board has allowed the Project Company to undertake the activities planned as part of the Kiyikoy WPP Capacity Extension Project at this site.

As identified during the intangible cultural heritage surveys, it has been reported that the forestland in the region has been widely used by the residents of Kiyikoy for oak coal manufacturing, woodcutting and buffalo husbandry. The forest area to be affected by the Capacity Extension Project will be limited to the footprint of the new turbines and access roads. Besides this limited area to be affected, the forestlands will remain accessible to the local communities to the extent allowed by the Forestry authorities. There will be no fence around the License Area or the new turbines to be constructed and operated as part of the Project. The substation site will be the only location where the access will be restricted. Thus, the Project is not anticipated to cause any significant impact on the existing oak coal manufacturing or lumbering activities of the Kiyikoy residents.

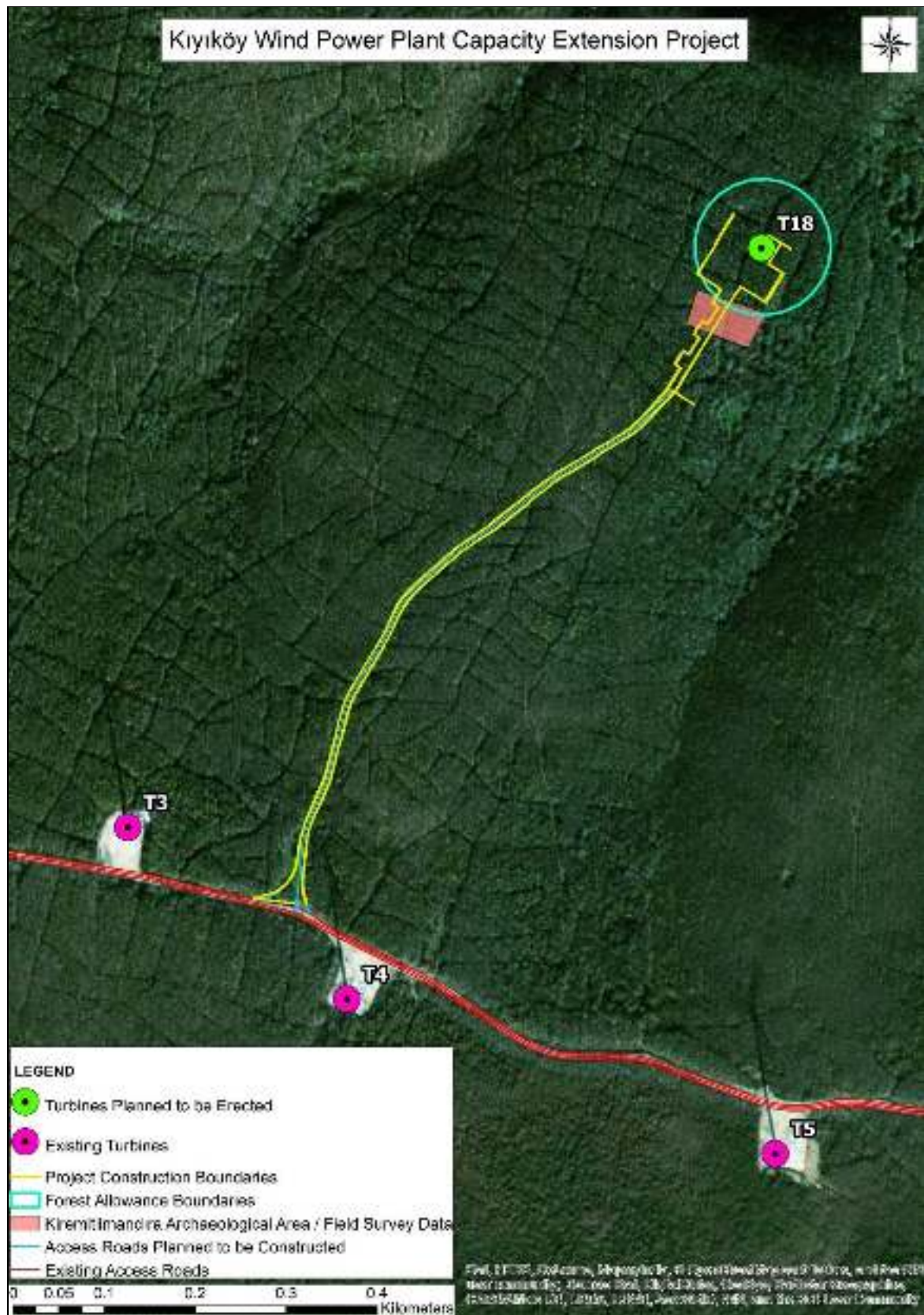


Figure 15-12. Kiremitlimandira Potential Archaeological Site

15.4.2. Operation Phase

The existing operation activities at the Kiyikoy WPP has no direct impact on cultural assets. The License Area is accessible to the local communities. The operation of Capacity Extension units is not anticipated to cause any additional impact on the existing tangible and intangible cultural heritage elements.

15.4.3. Closure Phase

As the decommissioning and rehabilitation works will be conducted at the footprint of the Project units, no additional impact on the cultural heritage elements is anticipated due to closure phase activities.

15.4.4. Impact Significance, Management and Residual Impacts

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 15.4.3-1. Regarding the archaeological/immovable cultural heritage receptors identified within the License Area, the sensitivity of the sites has been classified as listed in Table 15.4.3-2. in accordance with the Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (ICOMOS, 2011).

Table 15-3. Criteria for the Sensitivity of Cultural Heritage Receptors

| Sensitivity | Criteria According to ICOMOS (2011) | Criteria According to Turkish Law | Criteria According to EBRD PR8 |
|-------------|---|---|---|
| High | <p>Sites of acknowledged international importance inscribed as World Heritage Sites. Individual attributes that convey Outstanding Universal Value.</p> <p>Nationally designated archaeological monuments, sites, buildings or historic landscapes protected by national laws, including 1st Degree Archaeological Sites.</p> <p>Undesignated sites, structures or historic landscapes of demonstrable national value.</p> <p>Assets that can contribute significantly to acknowledged national or international research objectives, whether designated or not.</p> <p>Well or extremely well-preserved historic landscapes with considerable or exceptional coherence, time-depth, or other critical factors.</p> <p>Intangible Cultural Heritage inscribed on national registers or associated individuals of national or global significance.</p> | <p>Tangible cultural heritage: 1st Degree Archaeological Sites (registered)</p> | |
| Moderate | <p>Designated or undesignated sites, landscapes or seascapes that can contribute significantly to regional research objectives, including 2nd Degree Archaeological Sites.</p> <p>Designated or historic buildings that have exceptional qualities or historical associations, with important historic integrity and contributing significantly to historic character.</p> <p>Designated or undesignated historic landscapes or seascapes of regional value, which would warrant designation.</p> <p>Intangible cultural heritage areas in local registers or associated with individuals of local importance.</p> | <p>Tangible cultural heritage: 2nd Degree Archaeological Sites (registered)</p> | <p>Complex palaeontological and archaeological remains (if present)</p> <p>Critical Cultural Heritage (cemeteries and burial grounds)</p> |

| Sensitivity | Criteria According to ICOMOS (2011) | Criteria According to Turkish Law | Criteria According to EBRD PR8 |
|-------------|---|--|--|
| Low | <p>Designated or undesignated assets of local importance, including 3rd Degree Archaeological Sites.</p> <p>Assets compromised by poor preservation and/ or poor survival of contextual associations, or with little or no surviving archaeological interest.</p> <p>Assets with potential to contribute to local research objectives.</p> <p>Historic buildings of modest quality in their fabric or historical associations, or buildings or urban landscapes of no architectural or historical merit; buildings of an intrusive character.</p> <p>Undesignated historic landscapes or seascapes with importance to local interest groups, whose value is limited by poor preservation and/ or poor survival of contextual associations. Landscapes or seascapes of little or no significant historical interest.</p> <p>Intangible cultural heritage activities of local significance or associated with individuals of local importance. Poor survival of physical areas in which activities occur or are associated. Areas with few intangible cultural heritage associations or vestiges surviving.</p> | <p>Tangible cultural heritage:</p> <p>3rd Degree Archaeological Sites (registered)</p> <p>and</p> <p>Archaeological sites presently unknown (if present)</p> | <p>Isolated palaeontological and archaeological sites and findspots (if present)</p> |
| Negligible | <p>Assets with little or no surviving archaeological interest.</p> <p>Buildings or urban landscapes of no architectural or historical merit; buildings of an intrusive character.</p> <p>Areas with few intangible cultural heritage associations or vestiges surviving.</p> | | |
| Unknown | The importance of the resource cannot be ascertained. | | |

**Natural features/ tangible objects with cultural values and intangible cultural heritage including cultural knowledge, living traditions and religious practices have been considered to as not applicable.*

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 15-4 presents a description of the impact magnitude for archaeology and cultural heritage receptors.

Table 15-4. Criteria for Magnitude of Change

| Magnitude | Description |
|------------------|--|
| High | <p>Changes to most or all key archaeological sites such that the resource is totally altered.</p> <p>Changes to key architectural and artistic building elements such that the resource is totally altered.</p> <p>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.</p> <p>Comprehensive changes to setting.</p> <p>Major changes to an area affecting intangible cultural heritage activities, associations, visual links and cultural appreciation.</p> |
| Moderate | <p>Changes to many key materials of archaeological sites, such that the resource is clearly modified. Changes to setting that affect the character of the asset.</p> <p>Changes to many key historic building elements, or to the setting of an historic building, such that the resource is significantly modified.</p> <p>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.</p> <p>Considerable changes to an area affecting intangible cultural heritage activities, associations, visual links and cultural appreciation.</p> |
| Low | <p>Minor changes to key archaeological sites, such that the resource is slightly altered or clearly modified. Slight changes to setting, or changes to setting that affect the character of the asset.</p> <p>Slight changes to the setting of key historic building structures. Changes to many key historic building structures, or to the setting of an historic building, such that the resource is slightly different and noticeably changed.</p> <p>Change to many key historic landscape elements, parcels or components; slight or minor visual change to many key aspects of the historic landscape; limited but noticeable differences in noise or sound quality; changes to use or access; resulting in limited to minor changes to historic landscape character.</p> <p>Minor changes to area that affect intangible cultural heritage activities, associations, visual links and cultural appreciation.</p> |
| Negligible | <p>Very minor or no changes to an archaeological asset, historic building fabric or setting.</p> <p>Very minor or no changes to elements, parcels or components of landscapes; no visual or audible changes.</p> <p>Very minor or no changes in amenity or community factors.</p> |
| No change | No change. |
| Uncertain | The extent of data on the site or feature, or the nature of construction activities does not enable a determination of likely effects to be made at this stage. |

Source: ICOMOS 2011.

The potential Project impacts, proposed mitigation measures and residual impact significances are summarized in Table 5-10. As there will be no direct physical impact on the 3rd degree Archaeological Site ("Cingene İskelesi Mevkii Necropolis and Church Remains 3rd Degree Archaeological Site") located within the License Area, this site has not been included in the following table as a receptor.

Table 15-5 Impacts, Proposed Mitigation Measures and Residual Impacts (Cultural Heritage)

| Impact Description | Project Phase | Receptor | Impact Magnitude | | | | | | Sensitivity/Value of Resource/ Receptor | Impact Significance (prior to mitigation or with existing mitigation) | Proposed Mitigation Measures | Residual Impact Significance |
|--|--|--|------------------|---|------------------------|--|--------------|-------------------|---|---|---|------------------------------|
| | | | Extent | Magnitude | Reversibility | Duration | Frequency | Overall Magnitude | | | | |
| Physical disturbance due to land preparation and construction activities | Land Preparation and Construction | Non-registered Potential Site on the access road to T18 (Kiremittimandıra Archaeological Area) (spread over a total area of 3,200 m ²) or chance finds currently buried under ground | Restricted | Medium (app. 490 m ² ; corresponds to 15.3% of the total area) | Irreversible | Short Term (Within the construction period of 3 years) | One-off | Medium | Low | Minor | <ul style="list-style-type: none"> Project-specific Cultural Heritage Management Plan (CHMP) including the Chance Find Procedure will be implemented by the Project Company and the contractors (through contractual requirements). Prior to the start of land preparation and construction activities, the information and data belonging to the potential non-registered archaeological site will be processed in all Project documents. The site boundaries will be marked by using proper materials (e.g. safety strips, fence, information signs, etc.) and all Project personnel (including direct and contracted workers) will be informed on the actions to be taken for the protection of this site by means of relevant trainings. | Minor |
| Restrictions to traditional production activities used by the local people for economic purposes | Land Preparation and Construction Operation | Oak charcoal production and lumbering activities conducted by Kiyikoy residents | Local | Negligible | Medium term reversible | Medium term | Intermittent | Negligible | Low | Negligible | <ul style="list-style-type: none"> The Project Company will ensure that there will be no permanent access restrictions (other than health and safety purposes) within the License Area The Stakeholder Engagement Plan (SEP) including the Grievance Mechanism will be implemented throughout the Project life. | Negligible |

16. CUMULATIVE IMPACT ASSESSMENT

The previous chapters of this ESIA include assessments on the potential Project-level impacts. This Chapter aims to assess the potential cumulative environmental and social impacts of the Project on the Valued Environmental and Social Components (VECs), together with other existing and reasonably foreseeable future Projects.

16.1. Methodology

EBRD PR 1 references the need for the environmental and social assessment process to consider cumulative impacts of the project in combination with impacts from other relevant past, present and reasonably foreseeable developments as well as unplanned but predictable activities enabled by the project that may occur later or at a different location.

The IFC's Good Practice Handbook "Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets" defines cumulative impacts as "impacts that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones". The Handbook further states that "multiple and successive environmental and social impacts from existing developments, combined with the potential incremental impacts resulting from proposed and/or anticipated future developments, may result in significant cumulative impacts that would not be expected in the case of a stand-alone development" (see Figure 16-1).

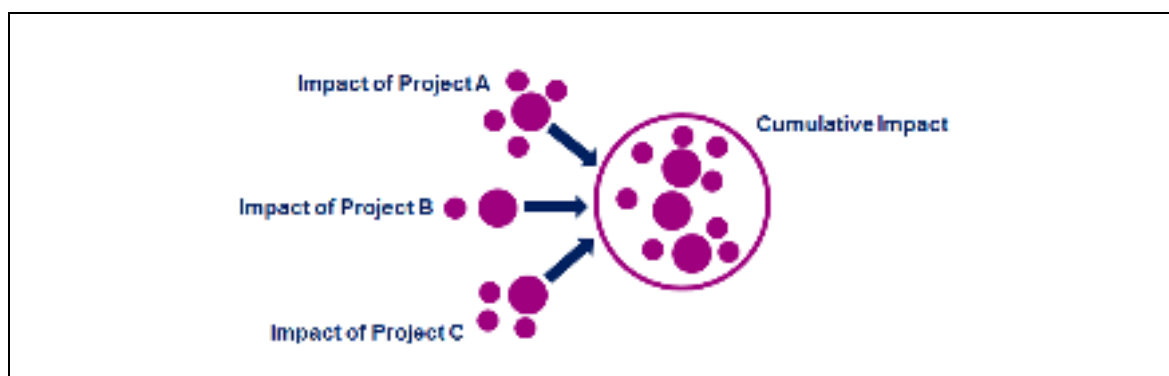


Figure 16-1. Illustration of Cumulative Impacts

The Cumulative Environmental and Social Impact Assessment study of Kiyikoy WPP will be based on the methodologies specified by the following international guidelines:

- Assessing the Cumulative Impacts of Onshore Wind Farms on Birds (SNH, August 2018);
- Cumulative Effects Assessment for (Tafila Region) Wind Power Projects (IFC, February 2017);
- The Good Practice Handbook on the Cumulative Impact Assessment and Management (IFC, August 2013);
- Scottish Natural Heritage's (SNH) Guidance for Assessing the Cumulative Impact of Onshore Wind Energy Developments (March 2012);
- Cumulative Effects Assessment and Management Guidance published by International Association for Impact Assessment (IAIA) (Canter L., and William R., 2009; <https://www.iaia.org/>);
- European Commission's (EC) Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (May 1999);
- Cumulative Effects Assessment Practitioners Guide prepared by the Cumulative Effects Assessment Working Group (Hegmann, G. C. Cockling, R. Creasey, S. Dupuis, Kennedy, L. Kingsley, W. Rodd, H. Spaling and D. Stalker; February and AXYS Environmental Consulting Ltd. for the Canadian Environmental Assessment Agency (1999).

The need for Cumulative Impact Assessment (CIA) emerges in circumstances where a series of developments, which may or may not be of the same type, is occurring, or being planned within an area where they would impact the same VECs, which are defined as the environmental and social attributes that are considered to be important in assessing risks.

The CIA process to be implemented in case of such circumstances is defined by IFC (August 2013) as:

- (i) analysing the potential impacts and risks of proposed developments in the context of the potential effects of other human activities and natural environmental and social drivers on the chosen VECs over time, and
- (ii) proposing concrete measures to avoid, reduce, or mitigate such cumulative impacts and risk to the extent possible.

The IFC proposes a six-step approach for conducting Project-initiated CIA studies as illustrated in Figure 16-2.

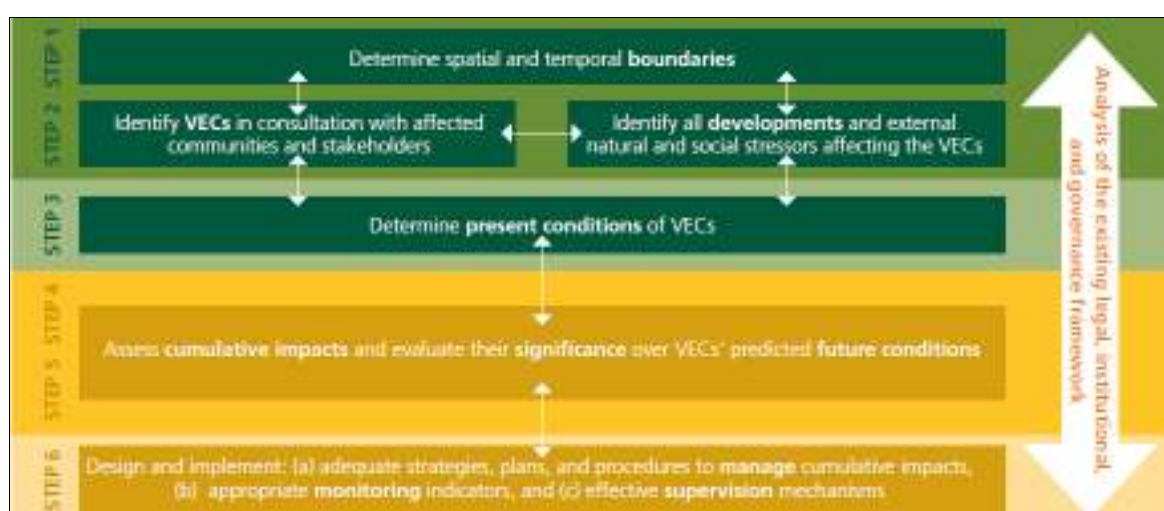


Figure 16-2. IFC's Six-step CIA Approach

There are several limitations to the assessment of the cumulative impacts of the Project with other projects over a wide area and over a long period of time. Most of these limitations would apply to many projects of similar scale and duration. The main limitations are:

- The available information on future projects is variable and, in many cases, very limited. Therefore, their physical characteristics are uncertain or subject to change. The timing of many future projects is also uncertain and subject to change. Additionally, any planning documentation regarding these projects can be confidential.
- Some of the other projects have not been subject to environmental and social impact assessments (or the assessments are not accessible) yet and the effects of these possible developments have therefore not been documented.
- There are several unknowns associated with the baseline conditions in the CIA study area.
- Cumulative impacts will be influenced by policies and developments outside of the study area.

Given the limitations described above, this CIA has been prepared to establish at a very broad level the types of effects that could occur as a result of the Project in addition to other projects.

It should be noted that mitigating the potential negative cumulative impacts are not solely the responsibility of the Project Company. Therefore, other project owners, relevant local and national authorities should also take responsibility to mitigate the potential impacts identified.

16.2. Cumulative Impact Assessment Study

The CIA study of the Project is conducted following the below steps:

- Step 1 – Scoping Phase I: VECs, Spatial and Temporal Boundaries
- Step 2 – Scoping Phase II: Other Developments and Environmental and Social Drivers
- Step 3 – Establish Information on Baseline Status of VECs
- Step 4 – Assess Cumulative Impacts on VECs
- Step 5 – Assess Significance of Predicted Cumulative Impacts
- Step 6 – Management of Cumulative Impacts

16.2.1. Step 1 – Scoping Phase I: VECs, Spatial and Temporal Boundaries

The good CIA practice suggests that the CIA studies are conducted with a focus on the environmentally or socially important natural resources, ecosystems or human values, which are referred to as Valued Environmental and Social Components (VECs) and may include the following:

Physical features, habitats, wildlife populations (e.g. biodiversity),

Ecosystem services,

Natural processes (e.g. water and nutrient cycles)

Social conditions (e.g. health, economics), or

Cultural aspects (e.g. archaeological sites, traditional spiritual ceremonies).

This approach entails the CIA studies to be looked at “from the VECs point of view”, instead of a Project-centred perspective as is the case in the ESIA studies and allows assessment of combined (i.e. cumulative) impacts of various projects/activities on each VEC.

The Project-centred perspective of the ESIA and the VEC-centred perspective of the CIA processes are comparatively illustrated in Figure 16-3. Any VEC that would be affected by other projects/activities, but not the Kiyikoy WPP, will not be assessed in the scope of the CIA.



Figure 16-3. ESIA (Project-centred) vs. CIA (VEC-centred) Perspectives

Based on the findings of the Kiyikoy WPP ESIA study, the VECs to be considered in the CIA have been selected as presented in Table 16-1.

Table 16-1. Specific VECs of Kiyikoy WPP Project

| Environmental/ Social Subject | Valued Environmental and Social Components (VECs) | Specific VECs | VEC No |
|---------------------------------------|---|---|--------|
| Biodiversity and Natural Resources | Key Biodiversity Areas/Important Bird Areas/Important Plant Areas | Istranca Mountain KBA | 1 |
| | Important Flora Species | - Potential CH trigger, regional endemic (<i>Centaurea hermannii</i>), - Regional endemic species (<i>Cirsium baytopae</i> , <i>Euphorbia amygdaloides</i> var. <i>robbiae</i> , <i>Crocus olivieri</i> subsp. <i>istanbulensis</i>) - Priority Biodiversity Features (<i>Ferulago confuse</i> , <i>Symphytum tuberosum</i> subsp. <i>Nodosum</i>) | 2a |
| | Important Fauna Species | - Istranca Mountains KBA qualifying species + Priority Biodiversity Feature [<i>Testudo graeca</i> (Common tortoise), <i>Testudo hermanni</i> (Hermann's tortoise)] - Priority Biodiversity Feature [<i>Emys orbicularis</i> (European pond turtle)] - Istranca Mountains KBA qualifying species + Nest inside soil [<i>Talpa levantis</i> (Levantine mole)] | 2b |
| | Important Bird Species | - Potential CH trigger [<i>Ciconia ciconia</i> (White Stork)] - High collision risk [<i>Pernis apivorus</i> (European Honey- Buzzard), <i>Buteo buteo</i> (Common Buzzard)] - Priority Biodiversity Feature [<i>Aquila heliaca</i> (Imperial Eagle)] - Other important migratory birds [<i>Ciconia ciconia</i> (Black Stork), <i>Circus macrourus</i> (Pallid Harrier)] | 3a |
| | Important Bat Species | - High activity and high collision risk with regional (10-100 km) spatial behaviour [<i>Pipistrellus pipistrellus</i> (Common Pipistrelle)] - High activity and high collision risk with long distance (>100 km) spatial behaviour [<i>Pipistrellus nathusii</i> (Nathusius' Pipistrelle)] - KBA qualifying bat species | 3b |
| Land Use | Forests | State forest parcel in Kislacik (Parcel no. 101/246) State forest parcel in Kiyikoy (Parcel no. 325/1) | 4 |
| Air Emissions | Air quality at local settlements | Village house close to T15 | 5 |
| Noise | Noise levels at sensitive receptors at local settlements | Village house close to T15 | 6 |
| Shadow Flicker | Community health and safety | Village house close to T15 | 7 |
| Visual Environment | Visual amenity of local communities | Visual receptors identified in Chapter 11 ("Visual Impact Assessment") | 8 |
| Cultural Heritage | Archaeological sites | 3 rd Degree Archaeological Site (Cingene Iskelesi) | 9 |
| | Non-registered archaeological sites | Non-registered Archaeological Site (Kiremitli Mandira) | 10 |

| Environmental/ Social Subject | Valued Environmental and Social Components (VECs) | Specific VECs | VEC No |
|---------------------------------------|--|--|--------|
| Social and Economic Environment | Land and assets | Owners of the privately-owned parcels acquired by the Project (Parcel no 129/31 in Kiyikoy; Parcel no. 129/27 in Kiyikoy; Parcel no. 101/206 in Kislacik) | 11 |
| | Economy | Forestry activities in Kiyikoy and Kislacik Grazing activities in Kiyikoy Beekeeping in Kiyikoy and Kislacik Mushroom collection in Kislacik Hunting in Kiyikoy and Kislacik | 12 |
| | Regional socio-economy | Regional socio-economic conditions | 13 |

As defined by the IFC, cumulative impacts can occur:

- i. when there is “spatial crowding” as a result of overlapping impacts from various actions on the same VEC in a limited area, (e.g. increased noise levels in a community from industrial developments, existing roads, and a new highway; or landscape fragmentation caused by the installation of several transmission lines in the same area), or
- ii. when there is “temporal crowding” as impacts on a VEC from different actions occur in a shorter period of time than the VEC needs to recover (e.g. impaired health of a fish’s downstream migration when subjected to several cascading hydropower plants).

The CIA Study Area for the Project was determined to ensure that the area is sufficiently large to cover Kiyikoy WPP’s direct impact area and the borders of the selected VECs. The CIA Study Area is given in Figure 16-4.

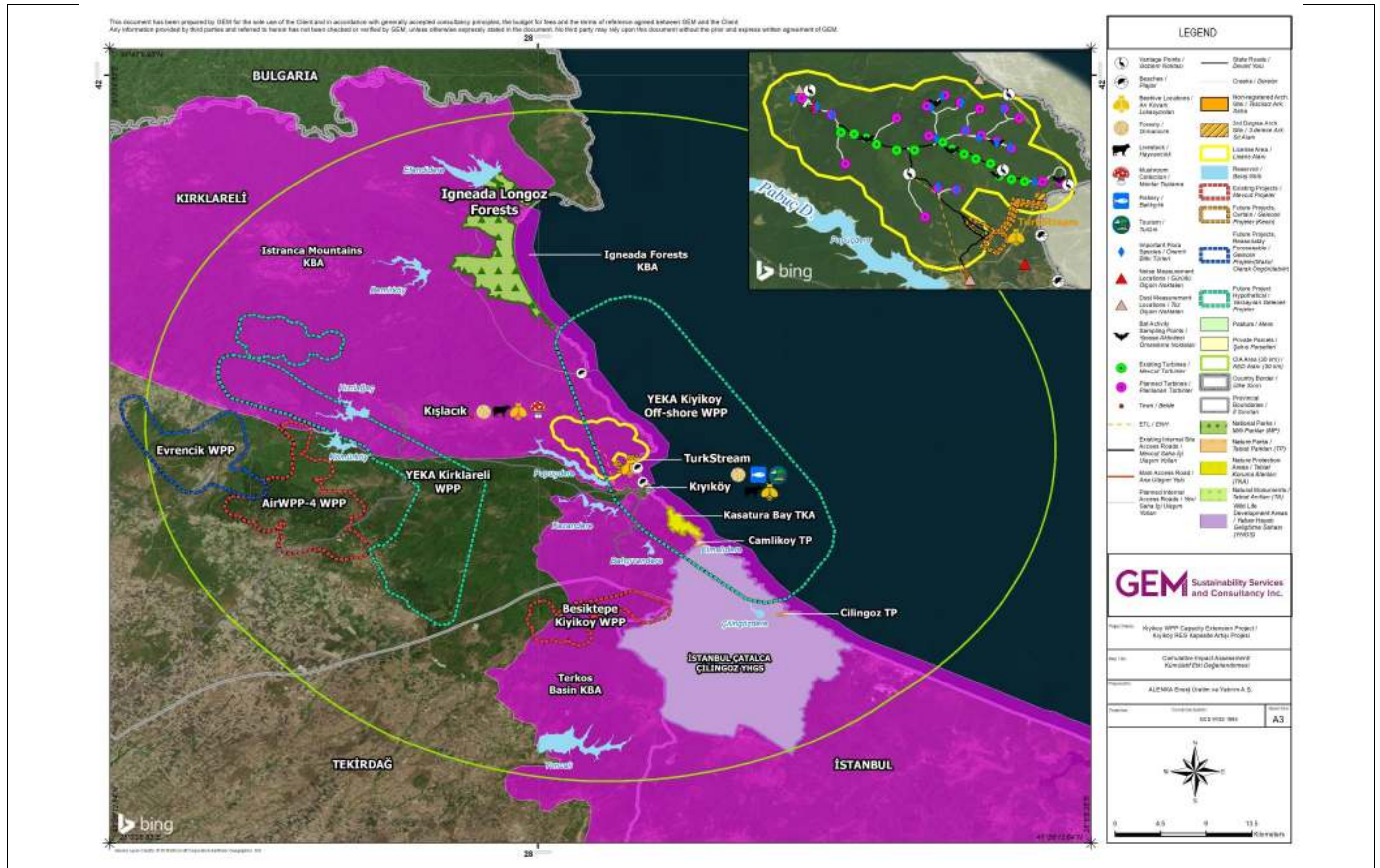


Figure 16-4. CIA Study Area, VECs and Projects Included in the CIA Study

The temporal boundary of the CIA study is determined as the Project life of Kiyikoy WPP, which will start with the beginning of land preparation activities and be limited with the duration of the applicable Electricity Generation License (assuming no License extension at the end of License Duration). The construction of WPP projects is typically completed in relatively short periods compared to the operation duration. Hence, the operation phase of Kiyikoy WPP will be the focus of this CIA study.

16.2.2. Step 2 – Scoping Phase II: Other Developments and E&S Drivers

Upon identification of the spatial and temporal boundaries of the CIA Study Area, the existing and future developments and environmental and social drivers within the CIA boundary that would affect the condition of the selected VECs are identified through review of available public databases. To this end, the following resources are used:

- Electricity Generation Licenses issued by the Energy Market Regulatory Authority for power plant projects
- EIA Positive Decisions issued by the Ministry of Environment and Urbanization
- Turkish Wind Energy Association reports and atlas
- GEODATA – Database of the Ministry of Agriculture and Forestry

In identifying other contributing projects within the CIA Study Area, the primary focus is given to the wind power sector projects including their associated energy transmission lines wherever possible, as they would have common types of impacts that would affect the same VECs. This said other types of power plant projects and the developments in other sectors have also been considered within the CIA study.

The selection of future developments has been further categorised as certain, reasonably foreseeable and hypothetical as summarized in Figure 16-5.

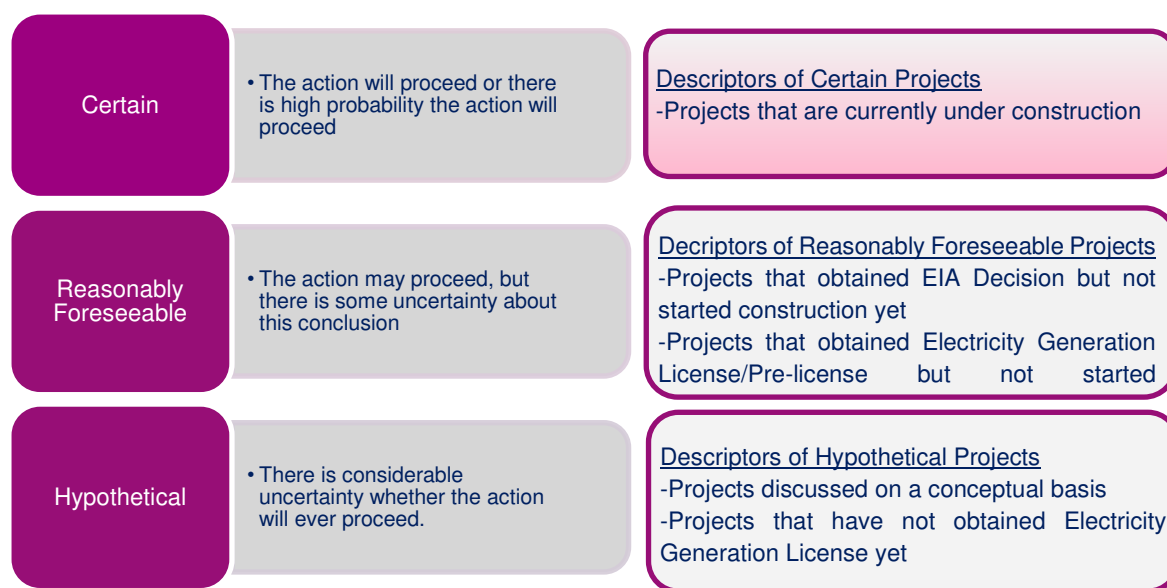


Figure 16-5. Categorisation of Future Projects

Source: Adapted from (Hegmann et al., AXYS Environmental Consulting Ltd. February 1999)

The existing and future developments identified within the CIA boundary are given in Table 16-2. The existing projects together with certain and reasonably foreseeable future projects are considered within the scope of the CIA study as given in Figure 16-4. Amongst the hypothetical projects, YEKA Kiyikoy WPP (offshore) and YEKA Kırklareli WPP (onshore) are also given in the CIA map as both are major WPP developments in the close proximity of the Project. However, these projects are not included in the CIA.

Table 16-2. Existing and Future Developments in the CIA Study Area

| Project Name | Sector | Location | Technical Info (capacity, size) | Electricity Generation License Information | | | EIA Decision | Project Status (as of September 2019) |
|--|-----------------------------|--|------------------------------------|--|---------------|----------|--|--|
| | | | | Start | End | Duration | | |
| Existing Projects | | | | | | | | |
| Kiyikoy WPP (Alenka Enerji) | Energy | Kiyikoy WPP License Area | 27 MWe, 14 turbines | 4 April 2007 | 4 April 2056 | 49 years | EIA Not Required decision (2 May 2013) | In operation since 2014 |
| Kiyikoy WPP (Alenka Enerji) 154kV ETL | Energy Transmission Line | Between Kiyikoy WPP Substation and the Kiyikoy TM | 154 kV, 4.8 km | NA | NA | NA | Out of Scope of EIA (16 May 2013) | In operation |
| Besiktepe Kiyikoy WPP (Besiktepe Enerji) | Energy | 15 km to Kiyikoy WPP (Alenka Enerji) Project Boundary | 45 MWe, 15 turbines | 28 March 2012 | 28 March 2061 | 49 years | No information available | In operation |
| AirRES-4 WPP | Energy | 18 km to Kiyikoy WPP (Alenka Enerji) Project Boundary | 55 MWe, 19 turbines | 28 March 2012 | 28 March 2061 | 49 years | No information available on the EIA Decision for the existing 55 MWe (19 turbines) WPP. As per the EIA decisions database of the MoEU, an EIA Positive decision was obtained for the capacity extension planned to increase the cumulative installed capacity of AirRES-4 to 113.8 MWe. | In operation |
| Future Projects – Certain | | | | | | | | |
| TurkStream Kiyikoy Landfall Terminal and Pipeline | O&G | Partially coincides with the southeastern boundary of Kiyikoy WPP License Area | NA | NA | NA | NA | EIA Positive decision (1 June 2018) | Under construction |

| Project Name | Sector | Location | Technical Info (capacity, size) | Electricity Generation License Information | | | EIA Decision | Project Status (as of September 2019) |
|--|--------|--|------------------------------------|--|-----------------|----------|---|---|
| | | | | Start | End | Duration | | |
| Future Projects – Reasonably Foreseeable | | | | | | | | |
| Evrencik WPP | Energy | 24 km to Kiyikoy WPP (Alenka Enerji) Project Boundary | 120 MWe | 9 February 2012 | 9 February 2061 | 49 years | EIA Positive decision (20 May 2016) | Planning (as per Turkish WPP Atlas, January 2019) |
| Future Projects – Hypothetical | | | | | | | | |
| Vize 2 WPP | Energy | 20 km to Kiyikoy WPP (Alenka Enerji) Project Boundary | 75 MWe | License is in process, not yet issued as of 13 August 2019 (Pre-license valid till 25 August 2019) | | | EIA decision information not publicly available | Information not publicly available. |
| YEKA Kiyikoy WPP (offshore) | Energy | Within 30 km CIA boundary of Kiyikoy WPP (Alenka Enerji) Project | Unknown at this stage | Pre-license/license information not publicly available. | | | EIA decision information not publicly available | Information not publicly available. |
| YEKA Kirlareli-Demirkoy WPP | Energy | Within 30 km CIA boundary of Kiyikoy WPP (Alenka Enerji) Project | 406 MWe | Pre-license under evaluation as of 13 August 2019, not yet issued. | | | EIA decision information not publicly available | Information not publicly available. |
| Igneada Nuclear PP | Energy | Within 30 km CIA boundary of Kiyikoy WPP (Alenka Enerji) Project | 4,400 MWe | Pre-license/license information not publicly available. | | | EIA decision information not publicly available | Information not publicly available |
| Zorlu Energy Kiyikoy Natural Gas CCP | Energy | Within 30 km CIA boundary of Kiyikoy WPP (Alenka Enerji) Project | 1,176 MWe | Pre-license cancelled (checked on 13 August 2019). | | | EIA decision information not publicly available | Information not publicly available |

Environmental and social drivers refer to natural drivers and other stressors, such as fires, droughts, floods, predator interactions, human migration, new settlements, etc. that may exert an influence on the VECs. For example, the fire regime in forested areas is a major driver that shapes social, ecological and economic systems.

According to the related Forestry Management Plan, the Kiyikoy WPP License Area corresponds to mainly Forest Products Production Function, which serve for forestry product production. The interviews and meetings held with the stakeholders including the local forestry authorities and communities have revealed that forestry is the main source of income in Kiyikoy and Kislacik. The households in these settlements generate income from oak charcoal production, market sale of forestry products and planted tree sales as allowed by the related authorities. Thus, the ongoing commercial forestry activities of the local communities are among the drivers that may affect the forestlands in the area. Unpredicted forest fires may also result in changes in the existing forestlands and related activities.

Based on the existing knowledge of the ecology and/or natural dynamics of the selected VECs, no other major environmental driver that may contribute to cumulative impacts has been identified for this CIA study.

16.2.3. Step 3: Establish Information on Baseline Status of VECs

Information on the baseline status of the VECs will be mainly based on the information gathered for each environmental and social subject in scope of the ESIA study. Thus, relevant information on the baseline status for VECs is presented in the related chapters of this ESIA Report.

16.2.4. Step 4: Assess Cumulative Impacts on VECs

The CIA analysis is future oriented. The impact of the project is not assessed as the difference between the expected future condition of VECs and that of a past baseline condition. It is assessed as the difference between the estimated future condition of VECs in the context of the stresses imposed by all other sources (projects and natural environmental drivers) and the estimated VEC condition in the context of the future baseline plus the development under evaluation.

The estimate of the cumulative project impact, together with ESIA results, indicates the need for project-specific mitigation. By contrast, the estimated overall cumulative impact indicates the need for mitigation to be implemented by the various project owners or proponent parties to ensure that their respective contributions to the overall condition of the VECs is coherent and/or compatible with what is mandated or required by government-led national/regional programmes and plans, or as a minimum compliant with ambient quality standards for the desired use.

The potential cumulative impacts on the selected VECs resulting from Kiyikoy WPP Project together with other projects identified in the CIA Study Area have been assessed based on a qualitative approach. The cumulative impact potential on each VEC has been classified as “yes” if the VEC is likely to be affected by other projects in addition to Kiyikoy WPP or “no” if the VEC is to be affected only by Kiyikoy WPP Project.

Taking into account the study limitations as given under Section 16.1, the results of the assessment of cumulative impacts of Kiyikoy WPP Project together with other projects identified in the CIA Study Area are summarized in Table 16-3.

Table 16-3. Interaction of Existing and Future Developments (Certain and Reasonably Foreseeable) with the Selected VECs

| Specific VEC | Project Under Assessment | Existing Projects | | | | Future Projects – Certain | Future Projects – Reasonably Foreseeable | Cumulative Impact Potential |
|---|--------------------------|--|----------------------|-----------------------------|-----------------------|---------------------------|--|-----------------------------|
| | | Kiyikoy WPP Capacity Extension Project | Existing Kiyikoy WPP | ETL of Existing Kiyikoy WPP | Besiktepe Kiyikoy WPP | AirRES-4 WPP | Turkstream Kiyikoy Terminal and Pipeline | |
| VEC #1 – Istranca Mountains KBA | √ | √ | √ | - | √ | √ | -- | Yes |
| VEC #2 – Important Flora Species | √ | √ | | √ | √ | √ | √ | Yes |
| VEC #3 – Bird and Bat Species | √ | √ | √ | √ | √ | - | √ | Yes |
| VEC #4 – Forestland in Kiyikoy and Kislacik | √ | √ | √ | √ | √ | | √ | Yes |
| VEC #5 – Air quality at village house close to T15 | √ | - | - | - | - | - | - | No |
| VEC #6 – Noise levels at village house close to T15 | √ | - | - | - | - | - | - | No |
| VEC #7 – Shadow flicker at village house close to T15 | √ | - | - | - | - | - | - | No |
| VEC #8 – Visual receptors as identified in Chapter 11 | √ | √ | √ | - | - | √ | - | Yes |
| VEC #9 – 3 rd Degree Archaeological Site | √ | - | - | - | - | √ | - | Yes |
| VEC #10 – Non-registered Archaeological Site | √ | - | - | - | - | - | - | No |
| VEC #11 – Social (Land and Assets in Kiyikoy and Kislacik) | √ | √ | √ | - | - | √ | - | Yes |
| VEC#12 – Social (Socio-economic activities in Kiyikoy and Kislacik) | √ | √ | - | - | - | √ | - | Yes |
| VEC#13 – Social (Socio-economic conditions in the region) | √ | √ | √ | √ | √ | √ | √ | Yes |

16.2.5. Step 5: Assess Significance of Predicted Cumulative Impacts

Given the limitations described in the previous sections, this CIA has been prepared to establish at a very broad level the types of effects that could occur as a result of the Project in addition to other projects. The previous chapters of this ESIA include assessments on the potential Project-level impacts on the specific VECs and the mitigation measures that will be put in place by the Project Company.

A key good practice for the appropriate determination of impact significance and overall agreement among affected communities and other relevant stakeholders is to strengthen mitigation measures and monitoring programs, focusing on expected probable cumulative impacts. In the ESIA process, components of impact significance (magnitude, spatial scale, duration, frequency) are typically factors in deciding whether mitigation is necessary. Consequently, the evaluation of significance and the design of management and/or mitigation are in reality iterative.

The significance of a cumulative impact is evaluated not in terms of the amount of change, but in terms of the potential resulting impact to the vulnerability and/or risk to the sustainability of the VECs assessed. This means evaluating cumulative impacts in the context of ecological thresholds. Determining ecological thresholds for biological and social VECs has proven to be difficult. In many cases, such thresholds may not be clearly identified until they are actually crossed, at which point recovery may take a long time with considerable cost or may simply not be possible. Consequently, a precautionary approach that explicitly considers uncertainty in ecological and sociological relationships is essential when thresholds of acceptable VEC condition are being established.

In reality; however, since such thresholds are not widely defined or available, the CIA is often hindered. There is not always an objective technique for determining thresholds and professional judgment must usually be relied upon. Good practice implies making attempts to estimate thresholds for VECs studied and applying the mitigation hierarchy to manage those impacts that may result in exceeding predicted thresholds. An alternative is to identify the limits of acceptable change, in consultation with the scientific community and the affected community. This approach focuses on the identification of VEC conditions that are deemed acceptable to stakeholders.

Amongst the specific VECs identified for the CIA study that will potentially trigger cumulative impacts (CIs) as given in Table 16-3, the significance of potential cumulative impacts are considered as medium to high for the specific VECs on biodiversity as given below taking into account the fact that the Project License Area is located at a KBA and on the Via Pontica bird migration route. Currently bird and bat monitoring data are not publicly available for the other WPPs under construction/in operation and it is not known whether pre-/post-construction monitoring is in place for those WPPs.

The Project will have in place mitigation measures to ensure no net loss and, if possible, net gain of critical habitat and priority habitat features through implementation of Project Biodiversity Action Plan. The ongoing pre-construction bird and bat activity monitoring works will continue at post-construction in line with Before-After Control Impact approach for adaptive management to assess and manage impacts and inform ongoing operational activities.

| E&S Subject | VECs | Specific VECs | VEC No | Significance of Potential CI |
|------------------------------------|-------------------------|--|--------|------------------------------|
| Biodiversity and Natural Resources | KBA/IBA/IPA | Istranca Mountains KBA, IBA, IPA | 1 | High |
| | Important Flora Species | - Potential CH trigger, regional endemic (<i>Centaurea hermannii</i>), - Regional endemic species (<i>Cirsium baytopae</i> , <i>Euphorbia amygdaloides</i> var. <i>robbiae</i> , <i>Crocus olivieri</i> subsp. <i>istanbulensis</i>) - Priority Biodiversity Features (<i>Ferulago confuse</i> , <i>Symphytum tuberosum</i> subsp. <i>Nodosum</i>) | 2a | Medium/High |
| | Important Fauna Species | - Istranca Mountains KBA qualifying species + Priority Biodiversity Feature [<i>Testudo graeca</i> (Common tortoise), <i>Testudo hermanni</i> (Hermann's tortoise)] - Priority Biodiversity Feature [<i>Emys orbicularis</i> (European pond turtle)] | 2b | Medium/High |

| E&S Subject | VECs | Specific VECs | VEC No | Significance of Potential CI |
|-------------|------------------------|---|--------|------------------------------|
| | | - Istranca Mountains KBA qualifying species + Nest inside soil [<i>Talpa levantis</i> (Levantine mole)] | | |
| | Important Bird Species | - Potential CH trigger [<i>Ciconia ciconia</i> (White Stork)] - High collision risk [<i>Pernis apivorus</i> (European Honey-Buzzard), <i>Buteo buteo</i> (Common Buzzard)] - Priority Biodiversity Feature [<i>Aquila heliaca</i> (Imperial Eagle)] - Other important migratory birds [<i>Ciconia ciconia</i> (Black Stork), <i>Circus macrourus</i> (Pallid Harrier)] | 3a | High |
| | Important Bat Species | - High activity and high collision risk with regional (10-100 km) spatial behaviour [<i>Pipistrellus pipistrellus</i> (Common Pipistrelle)] - High activity and high collision risk with long distance (>100 km) spatial behaviour [<i>Pipistrellus nathusii</i> (Nathusius' Pipistrelle)] - KBA qualifying bat species | 3b | High |

16.2.6. Step 6: Management of Cumulative Impacts – Design and Implementation

The management measures needed to prevent cumulative impacts will depend on both the context in which the development impacts occur (i.e. the impacts from other projects and natural drivers that affect the VECs) and the characteristics of the development's impacts. Since cumulative impacts typically result from the actions of multiple stakeholders, the responsibility for their management is collective, requiring individual actions to eliminate or minimize individual development's contributions.

Unlike government agencies, a private sector developer or project sponsor has no control over the actions undertaken by other developers that affect similar VECs, and therefore it is unlikely to have much leverage to influence any mitigation actions by third parties.

For the management of cumulative impacts, it is important to underline that the responsibility of the management/mitigation of the cumulative impacts resulting from the actions of multiple stakeholders involves a collective responsibility which requires individual actions to eliminate or minimize the contribution of each action/development. Specific actions that may be needed to effectively manage cumulative impacts include the following:

- Project design changes to avoid cumulative impacts (location, timing, technology).
- Project mitigation to minimize cumulative impacts, including adaptive management approaches.
- Mitigation of project impacts by other projects (not under control of the proponent to further minimize impacts on VECs).
- Collaborative protection and enhancement of regional areas to preserve biodiversity.
- Collaborative engagement in other regional cumulative impact management strategies.
- Participation in regional monitoring programs to assess the realized cumulative impacts and efficacy of management efforts.

The IFC's Cumulative Effects Assessment for Tafiia Region Wind Power Projects (2017) puts forward quantification of post-construction impacts and implementation of an adaptive management approach as part of CIA Mitigation and Monitoring Plan. To this end, project-specific on-site measures focusing on monitoring of post-construction flight activity coupled with active turbine management strategy is proposed together with inter-site monitoring activities and adaptive management strategy and joint management/action plans for priority VECs.

The Project Company will collaborate with the national authorities and the Lenders and provide relevant input data to a potential future cumulative impact assessment study that would be commissioned by the national authorities or Lenders for the WPPs in the region. The Project will promote the exchange of data with the other WPP owners to ensure that the cumulative impacts are well understood and managed.

17. STAKEHOLDER ENGAGEMENT

17.1. Stakeholder Engagement in the Pre-ESIA Process

The Kiyikoy WPP is in operation since August 2014. The Project is well known in the region and engagement with the stakeholders have been conducted conventionally by the operations team until the involvement of the Project Company. The current operations team include 8 personnel from Kiyikoy town, who have acted as a bridge in conveying Project information to the local people residing in Kiyikoy.

The stakeholder engagement activities specific to the Capacity Extension Project have 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 December 4th, 2015 at the Kiyikoy Municipality as part of the scoping stage of the national EIA process. The meeting was announced in the local newspapers per the regulatory requirements. The meeting comprised of presentation of the Project details such as construction and operation activities, recording of comments and suggestions and distribution of handouts with Project information to the attendees.

The EIA Review and Evaluation Commission set up by the MoEU, General Directorate of EIA, Permit and Inspection at the scoping stage of the national EIA processes included the governmental stakeholders listed in Table 17-1.

Table 17-1. Governmental Stakeholders Involved in the Scoping, Review and Evaluation of the national EIA Process

| Organisation | Directorate/Administration |
|--|--|
| Ministry of Culture and Tourism | Edirne Regional Directorate of Cultural Assets Preservation Board |
| | General Directorate of Investments and Enterprises |
| Ministry of Energy and Natural Resources | General Directorate of Mining |
| Ministry of Environment and Urbanization | General Directorate of Spatial Planning |
| | Kirklareli Provincial Directorate of Forestry and Urbanization |
| Ministry of Food, Agriculture and Livestock (current Ministry of Agriculture and Forestry) | Kirklareli Provincial Directorate of Food, Agriculture and Livestock |
| Ministry of Forestry and Water Affairs (current Ministry of Agriculture and Forestry) | General Directorate of Forestry |
| | General Directorate of Meteorology |
| | General Directorate of Nature Conservation and National Parks |
| | General Directorate of State Hydraulic Works Department of Survey, Planning and Consecration |
| Ministry of Health | Kirklareli Provincial Directorate of Public Health |
| Ministry of Interior | Kirklareli Provincial Directorate of Disaster and Emergency |
| Kirklareli Provincial Special Administration | Directorate of Reconstruction and Urban Improvement |

The EIA Report for the Capacity Extension 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 finalisation of the report, the EIA was disclosed to public for a period of 10 days at the MoEU and the Provincial Directorate of the Environment and Urbanization as per the requirements of the national EIA Regulation in force. Upon completion of the EIA process, the MoEU granted an "EIA Positive Decision" on 14 September 2017 (Decision No: 4763) to the Kiyikoy WPP Capacity Extension Project.

BEE completed acquisition of the Kiyikoy WPP from its previous owner on 1 December 2017. Prior to acquisition, the senior management of the company initiated preliminary stakeholder consultations on 30 October 2017 with the meeting held with the President of Kiyikoy Culture and Tourism Association. Following the field consultations, on 1 November 2017, a follow-up meeting was held with the President of Kiyikoy Culture and Tourism Association at the BEE HQs in Istanbul in order to exchange general information on Kiyikoy town, livelihoods of local people and potential cumulative impacts in the region.

As part of the zoning process being conducted as per the relevant national legislation, official views of the related governmental stakeholders were collected in 2017 and 2018 from the governmental authorities listed in Table 17-2.

Table 17-2. Governmental Stakeholders Involved in the Zoning Process

| Organisation | 2017 | 2018 |
|--|------|------|
| Petroleum Pipeline Corporation (BOTAS) Department of Survey and Project | √ | |
| BOTAS General Directorate of Natural Gas Exploitation and Market Operations | | √ |
| Electricity Generation Company (EUAS) Department of Environment and Expropriation Directorate of Real Estate and Expropriation | √ | √ |
| Thrace Region Gas Distribution Company (GAZDAS) | √ | √ |
| General Directorate of Highways | √ | √ |
| <i>First Regional Directorate</i> | | |
| General Directorate of State Airports Authority | √ | √ |
| <i>Directorate of Construction and Real Estate</i> | | |
| General Directorate of State Railways Turkish State Railways (TCDD) <i>First Regional Directorate of Real Estate Services</i> | √ | √ |
| General Directorate of Turkish Electricity Conduction Corporation | | √ |
| <i>20th Regional Directorate of Facility and Control</i> | | |
| Kirklareli Provincial Directorate of Culture and Tourism | √ | √ |
| Kirklareli Provincial Directorate of Disaster and Emergency | √ | √ |
| Kirklareli Provincial Directorate of Financial Office Natural Real Estate | | √ |
| Kirklareli Provincial Directorate of Health | | √ |
| Kirklareli Provincial Directorate of Public Health | √ | |
| Kirklareli Provincial Directorate of Science, Industry and Technology | √ | √ |
| Kirklareli Special Provincial Administration | √ | √ |
| <i>Directorate of Zoning and Urban Development</i> | | |
| Ministry of Culture and Tourism | √ | |
| <i>Edirne Regional Directorate of Cultural Assets Preservation Board</i> | | |
| Ministry of Culture and Tourism | √ | √ |
| <i>General Directorate of Investments and Enterprises</i> | | |
| Ministry of Energy and Natural Resources | √ | |
| <i>General Directorate of Mineral Research and Exploration</i> | | |
| Ministry of Energy and Natural Resources | | √ |
| <i>General Directorate of Mining</i> | | |
| Ministry of Energy and Natural Resources | | √ |
| <i>General Directorate of Mineral Research and Exploration Dep. of Geology Survey</i> | | |
| Ministry of Environment and Urbanization | | √ |
| <i>General Directorate of Environmental Impact Assessment, Permit and Inspection</i> | | |
| Ministry of Environment and Urbanization | √ | √ |

| Organisation | 2017 | 2018 |
|---|------|------|
| <i>General Directorate of Preservation of Natural Heritage</i> | | |
| Ministry of Environment and Urbanization | √ | √ |
| <i>General Directorate of Spatial Planning</i> | | |
| Ministry of Forestry and Water Affairs | | √ |
| <i>First Regional Directorate</i> | | |
| Ministry of Forestry and Water Affairs | | √ |
| <i>Kirklareli Branch Directorate</i> | | |
| Ministry of Forestry and Water Affairs | | √ |
| <i>General Directorate of Forestry Istanbul Forestry District Office Vize Forestry Dep.</i> | | |
| Ministry of Forestry and Water Affairs | √ | √ |
| <i>General Directorate of Nature Conservation and National Parks</i> | | |
| Ministry of Forestry and Water Affairs | √ | |
| <i>General Directorate of State Hydraulic Works 11th Regional Directorate</i> | | |
| Ministry of Transport, Maritime Affairs and Communications | √ | |
| <i>General Directorate of Civil Aviation</i> | | |
| Ministry of Transport, Maritime Affairs and Communications | | √ |
| <i>General Directorate of Infrastructure Investments</i> | | |
| General Directorate of Turkish Electricity Distribution Company (TEDAS) | √ | √ |
| <i>Department of Investments Monitoring Directorate of Renewable Energy Projects</i> | | |
| Thrace Electricity Distribution Company | √ | |
| <i>Directorship of Investments Directorate of Real Estate and Expropriation</i> | | |
| Thrace Regional (Trakya) Electricity Distribution Company (TREDAS) | | √ |
| <i>Kirklareli Provincial District Engineering</i> | | |
| TREDAS Directorate of Administration Management Engineering | √ | |
| Telecommunication Company | √ | √ |
| <i>Turk Telekom</i> | | |

The Project team continued engagement with the stakeholders through field interviews conducted on 3 January 2019. Two stakeholder interviews (one resident of Kislacik and one resident of Kiyikoy) were conducted in Kislacik and Kiyikoy. General information regarding the socio-economic conditions of the settlements and level of knowledge of local people on the Project and their Project-related concerns, comments, and expectations were discussed in the interviews. One employee interview was also conducted as an internal stakeholder engagement and information on the past and existing working conditions was obtained.

17.2. Stakeholder Engagement as part of the ESIA Process

Stakeholder engagement activities as part of the ESIA process were conducted through three separate field visits held by the senior social specialists of SRM as summarised in Table 17-3. Detailed information on the findings of the consultations and interviews is presented in Chapter 12 ("Socio-economy").

Table 17-3. Summary of the Stakeholder Engagement Activities Conducted as part of the ESIA

| Tasks | Date of the Field Study | Scope of the Field Study |
|--|-------------------------|---|
| Scoping study | 18 April 2019 | <ul style="list-style-type: none"> -Meeting with the existing site operations team and obtaining information on the Project background and current operations including social activities -Visiting the License Area, turbine locations, parcels to be affected by Project-related land acquisition, nearby structures and the main access road route |
| Key stakeholder meetings | 2-3 May 2019 | <ul style="list-style-type: none"> -Meetings with the public stakeholders at provincial level, district level and neighbourhood level -Preliminary face to face meetings with the mukhtars of five (5) settlement (three neighbourhoods in Kiyikoy town, and Kislacik and Hamidiye villages) |
| In-depth interviews and focus group meetings | 6-9 May 2019 | <ul style="list-style-type: none"> -In-depth interviews with the mukhtars (mukhtar surveys) of five (5) settlements (three neighbourhoods in Kiyikoy town, and Kislacik and Hamidiye villages) -Four (4) focus group discussions (including women meetings) -Four (4) in-depth interviews -Interviews with Vize Municipality, Vize District Directorate of Agriculture, Forest Sub-District Directorate of Kiyikoy, Provincial Directorate for Agriculture-Pasture Division; - -Interviews with other local business (representatives of the Turk Stream Project located partially within the southern part of the License Area) -Nine (9) NGOs |

17.3. ESIA Disclosure Process

The Kiyikoy WPP Capacity Extension Project has been assigned by EBRD as a Category A development. As per the E&S Policy and related Performance Requirements (2014) of the EBRD, the following documents have been prepared by GEM as part of the Project ESIA Disclosure Package:

- ESIA Report
- Environmental and Social Management and Monitoring Plan (ESMMP)
- Non-Technical Summary (NTS)
- Stakeholder Engagement Plan (SEP)
- Livelihood Restoration Plan (LRP)

The ESIA Disclosure Package will be disclosed at Project Company and EBRD websites for 60 days for public review and comments.

Hard copies of the ESIA Disclosure Package will also be made available at the following locations:

- BEE HQs in Istanbul
- BEE office in Ankara
- The administrative building located at the existing Kiyikoy WPP substation site
- The headmen offices or other public places (e.g. mosques, teahouses) at the affected villages/neighbourhoods (Cumhuriyet, Guven and Kale neighbourhoods of Kiyikoy town and Kislacik village)

As per the requirements of the EBRD, an ESAP has already been prepared and issued by the Bank's ESDD advisor in February 2019. As of September 2019, finalisation of the ESDD process is ongoing. The ESAP issued as part of the ESDD process will be updated based on the ESIA studies and disclosed in due course as required by the lenders.

During the 60 days disclosure period, disclosure meetings will be held in Kiyikoy town and Kislacik village in order to inform the stakeholders about the Project, status of activities and the key findings of the ESIA study and collect their comments, questions and suggestions, which are to be further incorporated to the ESIA documentation and addressed by the Project Company as appropriate. In addition to the disclosure meetings,

The Communications and PR Unit (CPR) representative of the BEE will be responsible for ensuring that the comments, questions and suggestions are duly addressed in line with the Project SEP.

Table 17-4. Stakeholder Engagement Plan for the ESIA Disclosure Period

| Stakeholder | Purpose of Engagement | Documents/Materials to be Used for Engagement | Engagement Method | Location | Responsible Party | Timetable for Implementation |
|--|--|--|--|---|---|------------------------------|
| All relevant stakeholder groups including village/neighbourhood headmen, local communities, governmental and non-governmental agencies, media, internal stakeholders, media, universities, lenders, local businesses, etc. | <ul style="list-style-type: none"> To provide information on the Project, ESIA study, impacts assessment findings and the Project-specific E&S management system including the management and action plans (SEP, LRP, BAP, etc.) | <ul style="list-style-type: none"> ESIA Disclosure Package (disclosed during the ESIA disclosure phase) <ul style="list-style-type: none"> ESIA Report ESMMP NTS SEP LRP | <ul style="list-style-type: none"> Publishing digital copies of the ESIA documentation | <ul style="list-style-type: none"> Project Company website (Lenders may also publish on their websites) | <ul style="list-style-type: none"> Senior Management Team BEE PR Unit Manager | Q4 2019 |
| Related central and local governmental agencies | <ul style="list-style-type: none"> To provide information on the Project and ESIA study findings in a timely, transparent and efficient manner To collect comments, questions and suggestions of the stakeholders for consideration in the ESIA documentation and during Project implementation To invite the stakeholders to the disclosure meetings | <ul style="list-style-type: none"> ESIA Disclosure Package <ul style="list-style-type: none"> ESIA Report ESMMP NTS SEP LRP | <ul style="list-style-type: none"> Publishing digital copies of the ESIA documentation Face to face meetings | <ul style="list-style-type: none"> Project Company website (Lenders may also publish on their websites) Ankara Istanbul Kirklareli (Vize district and local settlements) Project site Other locations as necessary | <ul style="list-style-type: none"> BEE PR Unit Manager BEE Senior Management (as required) BEE PR Unit Manager BEE Legal and Compliance Manager BEE Administrative Affairs Manager Project Manager Assistant Project Manager | Q4 2019 |
| Headmen (mukhtars) of the local communities: <ul style="list-style-type: none"> Kiyikoy town (Cumhuriyet, Güven, Kale neighbourhoods) Kislacik village | <ul style="list-style-type: none"> To provide/exchange up-to-date information on the Project status, current activities, potential E&S impacts of the current activities (according to Project phase), Project E&S Management System, community health and safety management, emergency preparedness and response, community development projects, planned stakeholder engagement events, employment and procurement opportunities, etc. in a timely, transparent, understandable, and efficient manner | <ul style="list-style-type: none"> Information packages including brochures, booklets, posters, flyers, maps summarising the key up-to-date Project information in a non-technical and comprehensible language/format | <ul style="list-style-type: none"> Regular or on-demand face to face meetings with Mukhtars at their offices or public places, as appropriate | <ul style="list-style-type: none"> The headmen offices or other public places (e.g. mosques, teahouses) at the affected villages/ neighbourhoods (Cumhuriyet, Güven and Kale neighbourhoods of Kiyikoy town and Kislacik village) | <ul style="list-style-type: none"> BEE PR Unit Manager Project Manager Assistant Project Manager Site Manager CLO | Q4 2019 |
| Local communities: <ul style="list-style-type: none"> Kiyikoy town (Cumhuriyet, Güven, Kale neighbourhoods) Kislacik village | <ul style="list-style-type: none"> To provide information on the Project, ESIA study findings (including community health and safety), Project SEP and Grievance Mechanism in a timely, transparent, understandable and efficient manner To collect comments, questions and suggestions of the stakeholders for consideration in the ESIA documentation and during Project implementation | <ul style="list-style-type: none"> Non-technical presentations, Project maps, etc. ESIA Disclosure Package <ul style="list-style-type: none"> ESIA Report ESMMP NTS SEP LRP Brochures/flyers summarising the key Project information and E&S issues relevant to the lay members of the public | <ul style="list-style-type: none"> ESIA Disclosure meetings (presentations and question and answer sessions) Distribution of the hard copies of the ESIA documentation | <ul style="list-style-type: none"> Kiyikoy town Kislacik village (might be joint if evaluated to be feasible) BEE HQs in Istanbul BEE office in Ankara The administrative building located at the existing Kiyikoy WPP substation site The headmen offices or other public places (e.g. mosques, teahouses) at the affected villages/ neighbourhoods (Cumhuriyet, Güven and Kale neighbourhoods of Kiyikoy town and Kislacik village) | <ul style="list-style-type: none"> BEE PR Unit Manager Project Manager Assistant Project Manager Site Manager Project Company CLO External consultants appointed by the Project Company | Q4 2019 |

| Stakeholder | Purpose of Engagement | Documents/Materials to be Used for Engagement | Engagement Method | Location | Responsible Party | Timetable for Implementation |
|--|--|--|--|---|--|------------------------------|
| | | | <ul style="list-style-type: none"> Face to face meetings with PAPs and community members | <ul style="list-style-type: none"> The headmen offices or other public places (e.g. mosques, teahouses) at the affected villages/ neighbourhoods (Cumhuriyet, Guven and Kale neighbourhoods of Kiyikoy town and Kislacik village) | | |
| Local communities: <ul style="list-style-type: none"> Women (e.g. mushroom collectors in Kislacik) Vulnerable PAPs (e.g. | <ul style="list-style-type: none"> To provide information on the Project, ESIA study findings (including community health and safety), Project SEP and Grievance Mechanism, LRP in a timely, transparent, understandable and efficient manner To collect comments, questions and suggestions of the stakeholders for consideration in the ESIA documentation and during Project implementation | <ul style="list-style-type: none"> Brochures/flyers summarising the key Project information, E&S issues relevant to the specific stakeholder group, SEP and Grievance Mechanism and related measures defined in the LRP | <ul style="list-style-type: none"> Distribution of the hard copies of brochures/flyers Non-technical presentations Face to face meetings Focus group discussions | <ul style="list-style-type: none"> Kiyikoy town Kislacik village The building located in the north of T15 | <ul style="list-style-type: none"> BEE Communications and PR Unit Manager Project Manager Assistant Project Manager Site Manager Project Company CLO External consultants appointed by the Project Company | Q4 2019 |
| Local and international NGOs and CSOs | <ul style="list-style-type: none"> To provide information on the Project and ESIA study findings in a timely, transparent and efficient manner To respond to specific concerns regarding the Project or local and regional E&S issues | ESIA Disclosure Package <ul style="list-style-type: none"> ESIA Report ESMMP NTS SEP LRP | <ul style="list-style-type: none"> Face to face meetings E-mail correspondence Special engagement methods to be developed based on regular media search, etc. | <ul style="list-style-type: none"> Ankara Istanbul Marmara and Thrace regions Kirklareli (Vize district and local settlements) Project site Other locations as necessary (e.g. NGO/CSO offices) | <ul style="list-style-type: none"> Senior Management BEE HSE Unit Manager (as required) BEE Communications and PR Unit Manager Project Manager (construction phase) | Q4 2019 |
| Media | <ul style="list-style-type: none"> To convey public Project information to wider interested parties in a timely, transparent and efficient manner | <ul style="list-style-type: none"> Visual materials/ advertisements related to key Project information | <ul style="list-style-type: none"> Sharing visual materials to be published with local and national media agencies | <ul style="list-style-type: none"> Internet Newspapers Project Company website | <ul style="list-style-type: none"> BEE PR Unit Manager BEE Legal and Compliance Manager | Q4 2019 |
| Internal Stakeholders (including direct and contracted employees) | <ul style="list-style-type: none"> To share information on the Project, workers rights, working conditions, occupational health and safety requirements, Project-specific E&S policy and ESMS documentation (e.g. E&S man. plans) Ensure successful implementation of the Project SEP including the grievance mechanism | <ul style="list-style-type: none"> Employee contracts E&S management plans and procedures Announcements related to H&S, grievance mechanism, etc. | <ul style="list-style-type: none"> Induction and orientation trainings Sharing relevant written documentation with the Project employees | <ul style="list-style-type: none"> Project Company website Project site | <ul style="list-style-type: none"> BEE HSE Unit Manager BEE HR Unit Manager Project Manager Site Manager Assistant Project Manager Project Company Procurement Manager Project Company CLO Project Company Site HSE Manager Contractor and subcontractor Project Managers | Q4 2019 |

17.4. Existing Corporate Procedures and Documentation

BEE has the following corporate procedures and documentation related to engagement with the stakeholders and the grievance mechanism:

- Corporate Social Impact Assessment and Stakeholder Communication Procedure,
- Corporate Social Monitoring and Grievance Mechanism Procedure,
- Social Guidelines for BEE Site Personnel,
- Notification and Communication Opening and Closure Forms.

17.5. Project SEP and Grievance Mechanism

Based on the existing corporate documentation, the Project Company has developed a stand-alone Project SEP including the grievance mechanism, which will be implemented throughout the construction and operation phases of the Capacity Extension Project.

The Project Company will appoint a Community Liaison Officer (CLO) (interchangeably named as Project Social Officer-PSO) who will have the following key responsibilities regarding implementation of the Project SEP and the grievance mechanism:

- Ensuring effective and periodic communication with the external stakeholders,
- Ensuring community grievances are registered and responded as per the Project SEP,
- Developing and implementing additional/corrective measures for resolving community related issues, including measures aimed at resolving non-closed grievances in coordination with the contractors and subcontractors as required,
- Ensuring coordination and consistency across all Project stakeholder.

The details of the grievance mechanism is presented in the Project SEP ("Chapter 7"). The grievance mechanism of Project is presented in Figure 17-1. This mechanism allows the external stakeholders filing their grievances and comments through the below listed methods:

- Face-to-face
- Phone
- Email
- Website
- Grievance Boxes

The grievance mechanism will also be accessible to the Project employees, including all direct and contracted workers. Grievance boxes will be placed at the substation site and grievance forms together with understandable guidance will be provided. The Project Company CLO will collaborate with the Project Manager, Project Company HR Manager and Contractor and Subcontractor Managers to ensure that the internal grievances are managed in accordance with the Project SEP.

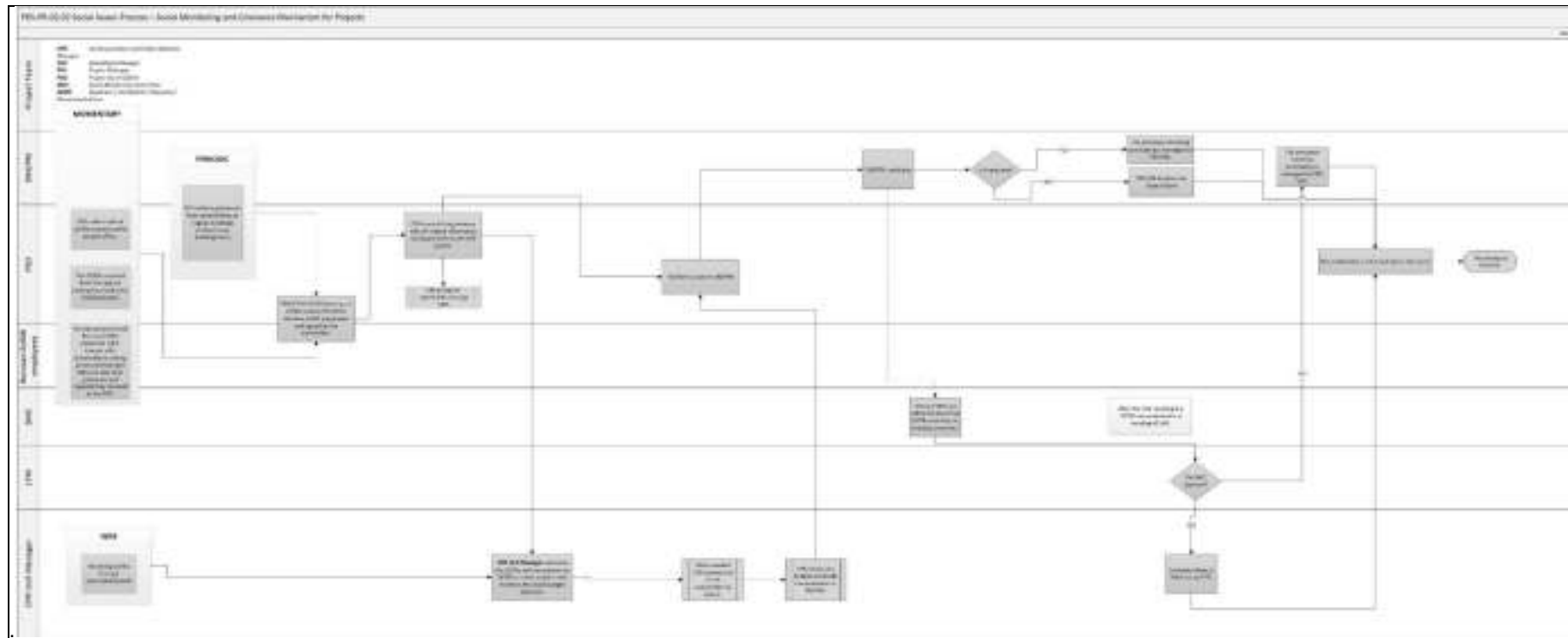


Figure 17-1. Project Grievance Mechanism

18. ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM

The Project Environmental and Social Management System (ESMS) is developed as part of the ESIA process and aims to provide a structured approach for the management of environmental and social (E&S) issues throughout all phases of the Project in line with the Project Standards. The Project ESMS has aimed to provide an appropriate approach to the management of E&S performance in line with the nature and scale of the Kiyikoy WPP Project.

18.1. Key Elements of the Project ESMS

A solid and well-functioning ESMS is made up of interrelated parts and is only valuable when it is well-implemented. The key elements of an effective ESMS are listed below (see Figure 18-1):

- Environmental and Social Policy
- Environmental and Social Management Plan (ESMP)
- Organisational Capacity and Commitment
- Stakeholder Engagement (including Grievance Mechanism)
- Emergency Preparedness and Response
- Project Monitoring and Reporting

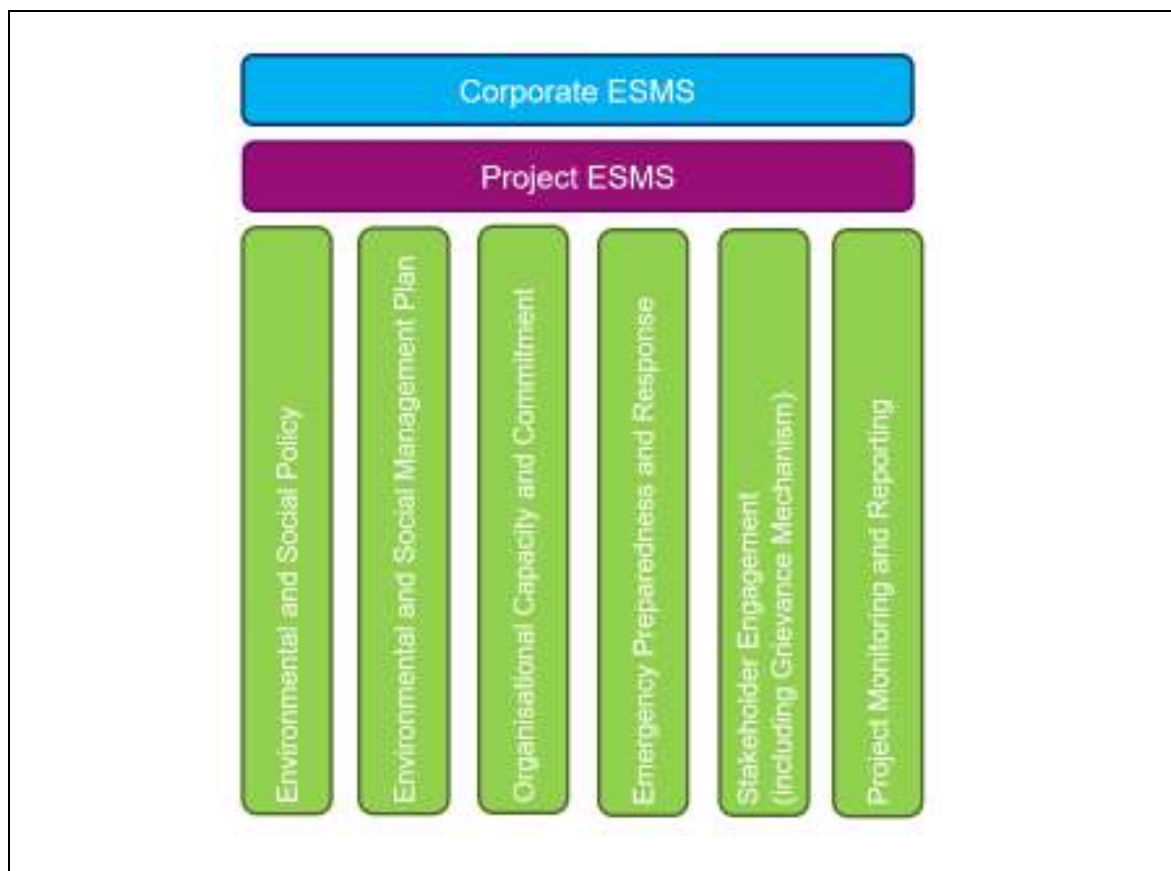


Figure 18-1. Key Elements of ESMS

The potential E&S risks and impacts of the Project are assessed as part of the ESIA process to develop the appropriate strategies and address the identified risks and their potential impacts. For each E&S topic, the magnitude of potential impacts is identified through an established methodology taking into account geographic extent, duration, reversibility and frequency factors. The magnitude of residual impacts is then identified through implementation of mitigation measures (see Chapter 4 “ESIA Methodology” for further details).

The measures to manage the impacts are reflected within the E&S Management Plan (ESMP) of the Project. The ESMP will be reviewed and updated as required, at least annually. The applicable national legal requirements and international standards of the Project are identified as part of the ESIA process. The Project specific E&S policies, procedures, management/action plans as set out in the ESMP are then endorsed to contractors, subcontractors, third parties and supply chain as relevant. The Project Company is responsible for ensuring implementation of the ESMS throughout Project life to all Project personnel, including direct and contracted employees engaged in the Project. This will be achieved through contractual requirements.

The ESMS will continually be improved and modified through ongoing reviews conducted both periodically and in case of a major change in the Project’s E&S conditions that may prompt an immediate review (e.g. change in applicable standards and legislation, design change, organisational change).

18.1.1. Environmental and Social Policy

The cornerstone of the ESMS is the set of policies where commitments of the Project Company on managing environmental, social, health and safety risks and impacts are summarized.

The E&S policies need to be clearly communicated internally and externally. Senior management commitment is crucial for continual improvement. Policies are the rules through which internal and external stakeholders are informed on what is allowed and what is not allowed regarding E&S issues such as labour and working conditions, resource efficiency and pollution prevention, community health, safety and security.

Borusan EnBW has in place the following Corporate policies and guidelines, which will be implemented in the Kiyikoy WPP Project:

- Health and Safety, Environment and Energy Policy (see Appendix A.1)
- Social Guidelines (see Appendix A.2)
- Quality Policy
- Information Security Policy

As part of the ESIA process, a Social Policy and a Human Resources Policy in line with the EBRD E&S Policy and Performance Requirements is also being developed and will be endorsed by the Project Company to all Project employees, including direct and contracted personnel.

Borusan EnBW has in place the following (see Table 18-1) multi-site management system certifications that are also applicable to Kiyikoy WPP Project.

Table 18-1. Existing Management System Certifications of Borusan EnBW Applicable to the Project

| Type of Certification | Scope of Certification | Issue Date | Expiry Date |
|--|--|----------------|-----------------|
| ISO 9001:2015 (see Appendix A.3.1) Quality Management System | Wind and hydro energy production and energy sales | 9 January 2019 | 8 January 2022 |
| ISO 14001:2015 (see Appendix A.3.2) Environmental Management System | Wind energy production and energy sales | 17 July 2018 | 6 February 2020 |
| OHSAS 18001: 2007 (see App. A.3.3) Health and Safety Management System | Wind energy production and energy sales | 17 July 2018 | 6 February 2020 |

Recertification audits will be completed within the specified timeframes and management system certifications applicable to the Kiyikoy WPP Capacity Extension Project will be obtained before the expiry dates of the existing certifications.

18.1.2. Environmental and Social Management Plan (ESMP)

The main approach in ESMS implementation is ensuring consistency of all adopted E&S processes and procedures throughout the Project phases, with required adaptation flexibility to ensure a management system that can cater to any transforming E&S issue related to the Project.

Management programs stem from the Corporate and Project-specific policies and are centred on E&S management/action plans and procedures to avoid, minimize or offset/compensate for the risks and impacts identified within the ESIA process. A simplified demonstration of the ESMP implementation under the Project ESMS and E&S policies is given in Figure 18-2. The Project Company will require all Project employees, both direct and contracted, to implement the ESMP consisting of Project-specific E&S management plans (MP)

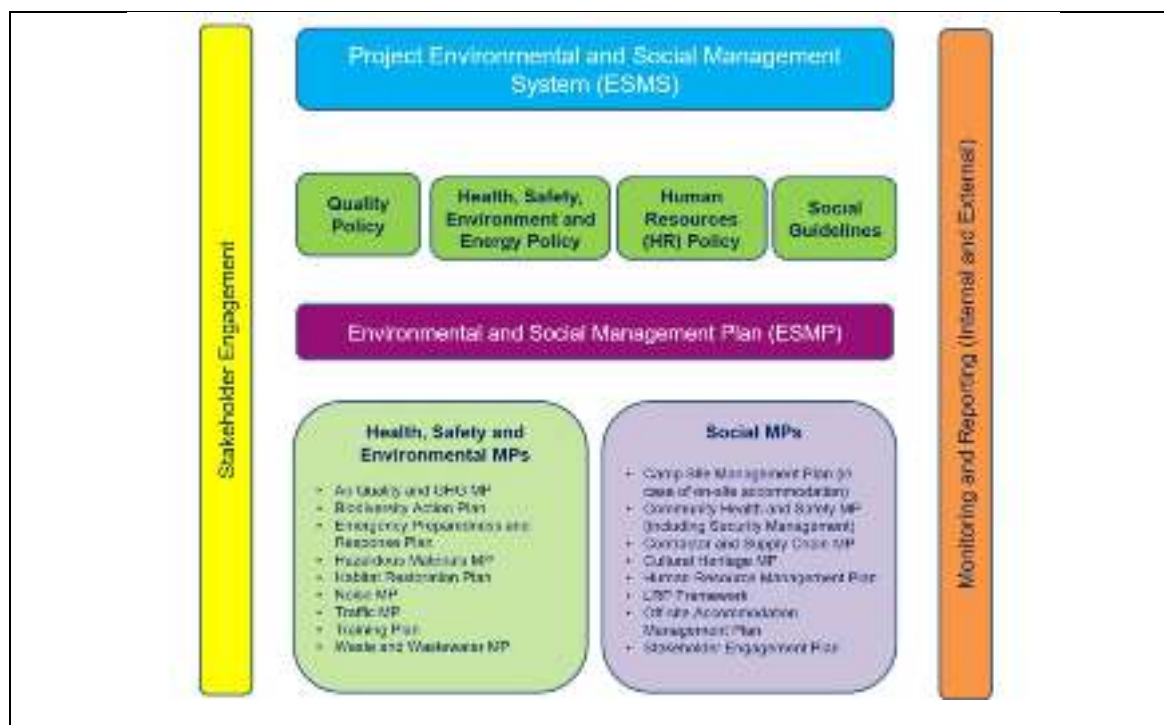


Figure 18-2. Summary of ESMP Implementation under the Project ESMS

18.1.2.1. Corporate E&S Programs, Plans and Procedures

The existing E&S programs, plans and procedures developed by BEE at the corporate level include the following:

- Corrective/Preventive Action Procedure
- Emergency Management Procedure
- Environmental Aspects and Impacts Management Procedure
- Environmental Activities Coordination Procedure
- Handbook on Integrated Management System
- Occupational Health, Safety and Environmental Requirements
- Occupational Health and Safety Manual
- Quality Management Program
- Social Guidelines for Borusan EnBW Site Personnel
- Social Impact Assessment and Stakeholder Communication Procedure
- Social Monitoring and Grievance Mechanism Procedure
- Waste Control Procedure

18.1.2.2. Existing Project Specific E&S Management Plans and Procedures Implemented at the Kiyikoy WPP

The following management plans are in place at the current Kiyikoy WPP:

- Environmental Management Program
- Health and Safety Management Plan
- Emergency Management Plan Procedure

18.1.2.3. Project Specific E&S Management Plans Developed as part of ESIA

The following specific E&S management/action plans are prepared within the scope of the ESIA studies:

- Air Quality and Greenhouse Gas Management Plan
- Biodiversity Action Plan
- Camp Site Management Plan (in case of on-site accommodation)
- Community Health and Safety Management Plan
- Contractor and Supply Chain Management Plan
- Cultural Heritage Management Plan (including the Chance Finds Procedure)
- Emergency Preparedness and Response Plan

- Habitat Restoration Plan
- Hazardous Materials Management Plan
- Human Resources Management Plan
- Livelihood Restoration Plan (LRP)
- Noise Management Plan
- Security Management Plan
- Stakeholder Engagement Plan (including the internal and external Grievance Mechanism, which are defined in the Project SEP in details)
- Traffic Management Plan
- Training Plan
- Waste and Wastewater Management Plan

The Project Company will ensure implementation of the management plans by all Project personnel including direct and contracted employees. As necessary, the plans will be updated prior to start of operations.

18.1.3. Organisational Capacity and Commitment

Senior management commitment is critical in implementing a sustainable and effective ESMS. A well-implemented ESMS relies heavily on trained and committed staff supported by adequate financial resources. Senior management commitment starts with adopting the ESMS policies and leading the effort to ensure that all employees, direct or contracted, at all levels are aware that this is a long-term commitment of the Project Company.

A well-balanced team including knowledgeable professionals responsible for health, safety and environment (HSE), human resources, procurement processes supported as necessary by technical, legal, finance and other administrative managers and officers is crucial to ensure successful implementation of the ESMS. The ESMS Team will be the key frontline identifiers of E&S risks and potential issues and thus they are required to work in close collaboration and consultation with employees from all levels of the Project Company and contractors to establish a meaningful internal engagement.

The planned organisational structure for the ESMS Team during the construction and operation phases of the Project is presented in Figure 18-3.

The roles and responsibilities of the Project Company's ESMS Team are given in Table 18-2. As the main contractor and sub-contractors are required to operate in compliance Project Standards, the Project Company will require them to establish their ESMS teams to ensure that Project activities under their responsibilities are carried out in line with the Project Standards.

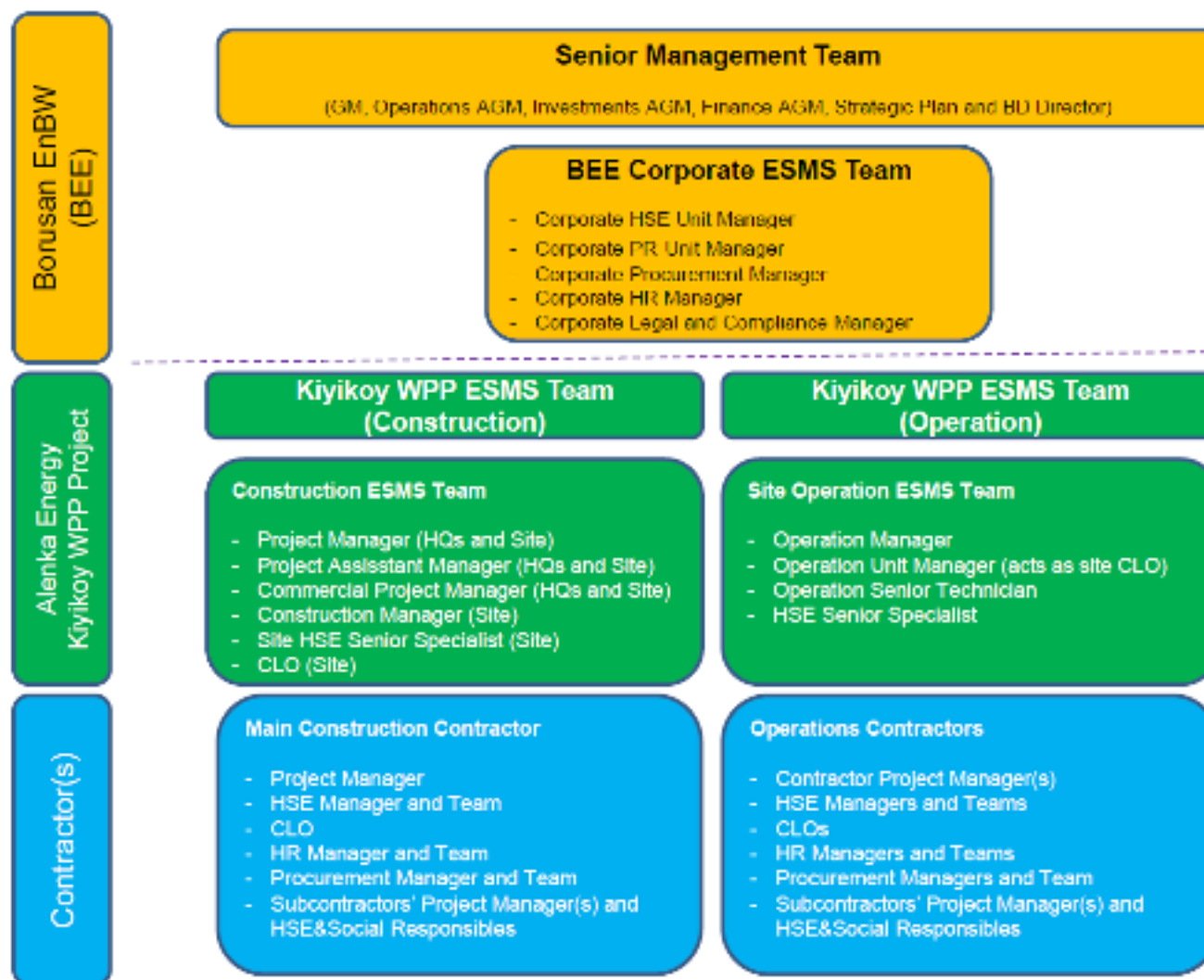


Figure 18-3. Kiyikoy WPP Project ESMS Team

Table 18-2. Roles and Responsibilities of the Project ESMS Team

| ESMS Team Member | Roles and Responsibilities |
|---|--|
| Corporate Roles for Construction and Operation | |
| Corporate HSE Unit Manager | <ul style="list-style-type: none"> • Oversee compliance of Project HSE implementations with the national legislation and IFI standards, as reflected in the Project ESAP and ESIA commitments. • Confirm that environmental permits, licenses, approvals required by the contractors and subcontractors are obtained by the Site HSE Specialist. • Approve HSE management/action plans, new programs, HSE training and monitoring plans, etc. as part of Project ESMS. • Conduct internal site HSE audits • Evaluate the capacity of the site HSE teams • Report to the Senior Management Team on Project's HSE Performance and key HSE issues. • Review internal grievances and ensure/verify that the site teams address the internal grievances/corrective actions in responsive timeframes. |
| Corporate PR Unit | <ul style="list-style-type: none"> • Oversee compliance of Project's social performance and implementations with the EBRD PR1, PR5 and PR10 requirements concerning stakeholder engagement, grievance management and land acquisition processes. • Approve SEP and other social management/action plan updates and training documents on the implementation of the SEP, grievance mechanism and other social management/action plans as part of Project ESMS. • Evaluate the capacity of the site social teams/officers. • Ensure effective and periodic communication with the external stakeholders. • Ensure community grievances are registered and responded as per the Project SEP. • Keep the database of public grievances. • In coordination with the contractors and subcontractors as required, develop and implement additional measures for resolving community related issues, including measures aimed at resolving non-closed grievances. • Ensure coordination and consistency across all stakeholder facing activities by all parties. • Report to the Senior Management Team on Project's social (e.g. stakeholder engagement) Performance and key social issues. • Review Project-related public grievances and ensure/verify that the site teams address the public grievances/corrective actions in responsive timeframes. |
| Corporate Procurement Manager | <ul style="list-style-type: none"> • Ensure Project procurement adheres to the Project standards and endorsed to the contractors and subcontractors accordingly. • Develop policies to ensure localization of procurement to the extent possible. |

| ESMS Team Member | Roles and Responsibilities |
|--|--|
| Corporate HR Manager | <ul style="list-style-type: none"> • Ensure Project labour management practices adhere to the Project standards and endorsed to the contractors and subcontractors accordingly. • Ensure contractors implement the Project grievance mechanisms, through review of grievance records reports. • Support administrative and technical teams in planning and execution of the necessary E&S trainings. |
| Corporate Legal and Compliance Manager | <ul style="list-style-type: none"> • Ensure fulfilment of all national legislative and permitting requirements in the Project. • Ensure incorporation of the corporate and Project policies, E&S Standards, requirements of the ESMS and management/action plans to the contracts/agreements made with the contractors and vendors. |
| Social Monitoring Committee (SMC) | <ul style="list-style-type: none"> • Meets on ad hoc basis based on the need. • Evaluate all submitted grievances/comments in terms of cost/benefit, monetary requirement, doability, and strategy. • Report the results of the meeting to General Manager. |
| Construction Phase | |
| Project Manager/ Project Assistant Manager/ Commercial Project Manager | <ul style="list-style-type: none"> • Ensure adequate resources are allocated for the implementation of the Project ESMS during the construction phase. • Full ownership of the implementation of E&S management/action plans and procedures at the Project level. • Ensure contractors and subcontractors are fully aligned with the Corporate policies and Project E&S Standards through contractual requirements as relevant. • Ensure maximisation of the local employment and procurement to the extent possible. • Periodic reporting to the Company Senior Management on ESMS implementation. |
| Construction Site Manager | <ul style="list-style-type: none"> • Coordinate and oversee the implementation of HSE and occupational health and safety measures by the construction teams including contractor and subcontractors. • Ensure that permits required for construction are in place. • Report to the Project Management regarding the environmental and social performance of the construction activities. • Support HR team, Site HSE Senior Specialist and CLO in the planning and execution of the HSE related trainings (e.g. induction trainings, trainings on Project ESMS, toolbox trainings, job-specific trainings, refresher trainings, etc.) • Support Site HSE Senior Specialist and the Site CLO in the management of site-specific HR issues and internal and external grievances by planning and implementing technical and administrative measures as required. |

| ESMS Team Member | Roles and Responsibilities |
|----------------------------|---|
| Site HSE Senior Specialist | <ul style="list-style-type: none"> • Ensure management of HSE issues in compliance with the national legislation and IFI standards, as reflected in the Project ESAP and ESIA commitments by planning, coordinating and implementing all relevant site activities. • Ensure that environmental permits, licenses, approvals required by the contractors and subcontractors are obtained from the relevant authorities. • Implement, review, update and monitor the ESMS, including preparation of new programs and update of existing programs. • Conduct internal HSE reporting for the Corporate ESMS managers and the Senior Management Team. • As required, develop, review and update detailed and specific HSE Management Plans and related documents (in consultation with the contractors) and approve the final documents. • Ensure HSE awareness and competency trainings are conducted by the contractors and the Project Company, through review of training records and related training documents. • Oversee contractors' HSE compliance with Project requirements through contractor monitoring and reports, including review of periodic reports to be prepared by the contractors. • Conduct internal HSE audits for contractors and subcontractors. • Identify the training requirements of the construction workforce (for both contractors and subcontractors) together with the HR Manager and ensure implementation of the training program as identified. • Manage site-specific HR issues with support from Construction Site Manager. • Ensure internal grievances are registered and responded as per the Project SEP. |
| CLO (Site) | <ul style="list-style-type: none"> • Ensure effective and periodic communication with the external stakeholders during the construction phase. • In coordination with the HR team and Site HSE Senior Specialist, ensure all Project personnel (direct and contracted) receives trainings on the implementation of the internal and external grievance mechanism developed for the Project (e.g. how to submit internal grievances, how to manage external grievances, etc.) at the time of employment. • Ensure community grievances are registered and responded as per the Project SEP. • Support HSE Senior Specialist in the management of internal grievances as required. |

| ESMS Team Member | Roles and Responsibilities |
|---|---|
| <p>Main Construction Contractor and Sub-contractors (Project Managers and ESMS Teams including HSE/HR/Procurement Managers and Teams)</p> | <ul style="list-style-type: none"> • Ensure compliance with the Project-specific E&S policies, E&S management plans and Project E&S standards as part of their contractual requirements. • Ensure competent and trained HSE staff is allocated to implement Project E&S standards. • Ensure adequate resources are allocated for the implementation of the ESMS, including resources for provision of generalised and specialised HSE trainings, PPEs, etc. • Ensure HSE non-compliances are recorded and responded to immediately. • Ensure grievances are recorded and responded to appropriately. • Ensure contractor labour management practices are in line with the Project standards. • Ensure the grievances are recorded and responded to appropriately and shared with the Project Company CLO • Conduct regular site inspections and record identified incompliances. • Prepare periodic HSE reports (Main Contractor to submit to the Project Company) |
| Operation Phase | |
| Operation Manager | <ul style="list-style-type: none"> • Ensure adequate resources are allocated for the implementation of the Project ESMS during the operation phase. • Full ownership of the implementation of E&S management/action plans and procedures at the Project level. • Ensure contractors and subcontractors are fully aligned with the Corporate policies and Project E&S Standards. • Periodic reporting to the Company Senior Management on ESMS implementation. |
| Operation Unit Manager | <ul style="list-style-type: none"> • Coordinate and oversee the implementation of HSE and occupational health and safety measures by the operation team. • Ensure that permits required for operation are in place. • Report to the Project Management regarding the environmental and social performance of the operation activities. • Support HR team, Site HSE Senior Specialist and CLO in the planning and execution of the HSE related trainings (e.g. induction trainings, trainings on Project ESMS, job-specific trainings, refresher trainings, etc.) • Support Site HSE Senior Specialist and the Site CLO in the management of internal and external grievances by planning and implementing operational and administrative measures as required. • Act as the CLO during the operation phase and ensure effective and periodic communication with the external stakeholders. • Ensure community grievances are registered and responded as per the Project SEP during the operation phase. • Support HSE Senior Specialist in the management of internal grievances of the operation workforce as required. |
| Operation Senior Technician | <ul style="list-style-type: none"> • Provide the job-specific trainings, refresher trainings planned by the Operation Unit Manager and maintain relevant records. • Ensure that relevant operational procedures (technical and health and safety related) are developed, implemented and updated as necessary. • Ensure site implementation of the HSE and occupational health and safety measures by the operation team. • Develop schedule for periodic inspection, testing and maintenance of the plant equipment for the review and approval of the Operation Unit Manager and Operation Manager |

| ESMS Team Member | Roles and Responsibilities |
|---|---|
| HSE Senior Specialist | <ul style="list-style-type: none"> • Ensure management of HSE issues in compliance with the national legislation and IFI standards, as reflected in the Project ESAP and ESIA commitments. • Ensure that environmental permits, licenses, approvals required for the operations are obtained from the relevant authorities. • Implement, review, update and monitor the ESMS, including preparation of new programs and update of existing programs. • Conduct internal HSE reporting for the Corporate ESMS managers and the Senior Management Team. • As required, develop, review and update detailed and specific HSE Management Plans and related documents (in consultation with the contractors) and approve the final documents. • Ensure HSE awareness and competency trainings are conducted by the contractors and the Project Company, through review of training records and related training documents. • Oversee contractors' HSE compliance with Project requirements through contractor monitoring and reports, including review of periodic reports to be prepared by the contractors. • Conduct internal HSE audits for contractors and subcontractors. • Identify the training requirements of the construction workforce (for both contractors and subcontractors) together with the HR Manager and ensure implementation of the training program as identified. • Ensure internal grievances are registered and responded as per the Project SEP. |
| Main Operations Contractor and Sub-contractors (Project Managers and ESMS Teams including HSE/HR/Procurement Managers and Teams) | <ul style="list-style-type: none"> • Ensure compliance with the Project-specific E&S policies, E&S management plans and Project E&S standards as part of their contractual requirements. • Ensure competent and trained HSE staff is allocated to implement Project E&S standards. • Ensure adequate resources are allocated for the implementation of the ESMS, including resources for provision of generalised and specialised HSE trainings, PPEs, etc. • Ensure HSE non-compliances are recorded and responded to immediately. • Ensure grievances are recorded and responded to appropriately. • Ensure contractor labour management practices are in line with the Project standards. • Ensure the grievances are recorded and responded to appropriately and shared with the Project Company CLO. • Conduct regular site inspections and record identified incompliances. • Prepare periodic HSE reports (Main Contractor to submit to the Project Company). |

18.1.4. Stakeholder Engagement

Systematically engaging with affected communities in a structured approach is at the heart of successful Project implementation. Identification and management of E&S impacts that might negatively affect the communities in an inclusive approach contributes to building trust, credibility and local support. Some stakeholders such as non-governmental organisations (NGOs) may not be directly affected by the Project activities but may have an interest in the Project. Keeping such groups informed and maintaining an open communication channel is crucial to build trust amongst the wider group of stakeholders.

For effective consultation with affected communities it is important to:

- Start as early as possible;
- Disclose meaningful and accurate information;
- Use culturally appropriate means to reach them;
- Provide opportunities for two-way dialogue;
- Document to keep track of issues raised; and
- Report back on how their input has been used and considered.

The ESIA process has identified the stakeholders that would be directly or indirectly impacted by the Project activities (see Chapter 17 “Stakeholder Engagement”). Once the stakeholders are identified, engagement method will be tailored for each group depending on the extent of the impacts they will be affected from.

A stand-alone Project Stakeholder Engagement Plan (SEP) has also been prepared as part of the ESIA process based on the comprehensive social survey and engagement program applied by the social specialists. The Project SEP:

- Identifies all stakeholders (individuals, groups or entities) directly and/or indirectly affected by the Project or have a direct or indirect influence/impact on the Project.
- Defines activities for appropriate engagement with each stakeholder group during the lifetime of the Project, with the ultimate aim of establishing and maintaining constructive relationship through public consultation and information disclosure.
- Establishes an internal and external grievance mechanism to ensure timely and appropriate action is put in place for any grievances raised.

Stakeholder engagement activities and means of communicating with the key stakeholders will continue under the responsibility of the Project ESMS team. The SEP will be regularly reviewed and updated to engagement activities to be conducted throughout the Project life.

18.1.4.1. External Communications and Grievance Mechanism

It is crucial to establish and maintain a publicly available and easily accessible channel for stakeholders to contact the Project team and build a proactive and responsive external communication and grievance mechanism.

A Community Liaison Officer (CLO) will be appointed by the Project Company to ensure effective communication with the external stakeholders.

The procedure for external communication has been developed as part of the stand-alone SEP and describes methods to:

- Receive, register and validate external communications and requests for information from the public;
- Screen and assess the importance of the issue raised and determine how to address it;
- Provide, track, document and publish responses; and
- Adjust the E&S management program when appropriate.

The purpose of the grievance mechanism is to establish a way for individuals, groups or communities affected by the Project to contact if they have an inquiry, a concern or a formal complaint. Grievances and details of responses will be recorded and reported internally on a regular basis. The grievance mechanism will be easily accessible for all stakeholders through disclosure activities as detailed in the SEP.

18.1.4.2. Information Disclosure

Project related E&S documentation in Turkish (ESIA Report, SEP, NTS and relevant E&S management/action plans) will be disclosed at the Company website. Hard copies of the ESIA Disclosure Package documents (in Turkish) and other relevant documentation will be kept at the Project site for any stakeholder to review. In addition, hard copies will also be distributed to the neighbourhood headmen offices and related municipalities, as described in the Project SEP.

Disclosure activities, disclosure strategy and contact details will be provided in the Project SEP. Information will also be made available for affected communities through contextually appropriate methods (e.g. directly through the CLO, meetings, newspapers, leaflets/brochures, notifications at neighbourhood headmen's offices and teahouses, etc.) throughout the lifetime of the Project.

18.1.4.3. Ongoing Reporting to Affected Communities

Keeping affected communities informed about the Project and the progress on a regular basis is a critical element for building and maintaining a constructive relationship. To this end, at least on an annual basis, the Project activities and overall progress and the E&S performance benchmarked against the Project Standards will be communicated to the stakeholders. If the Project activities change or new E&S risks emerge, the stakeholders will be contacted outside of the regular schedule to discuss these changes through communication channels as outlined in the SEP.

The reporting to affected communities will be in Turkish, in an easily understandable and non-technical way.

18.1.5. Emergency Preparedness and Response

An Emergency Preparedness and Response Plan has been developed as a stand-alone document. It provides preventive measures and response strategies in case of accidents that may likely occur at the Project, as well as preparedness and response measures to protect the public health, safety and environment on and off the Project area in the situation of a disaster such as a potential natural hazard, including forest fires, or sabotage.

The Emergency Preparedness and Response Plan will include:

- Roles and responsibilities for emergency management
- Identification of potential emergencies
- Identification of existing emergency response structure and capacity at the Project Area (i.e. police, fire brigades, hospitals, etc.)
- List and location of emergency response equipment (fire extinguishers, spill response, first aid kits, etc.)
- Use of the emergency equipment and facilities
- Clear identification of evacuation routes

- Procedures to respond to the identified emergency situations (preventive/preparatory measures, rescue, evacuation and response measures)
- Procedures to follow after an emergency situation (recovery and assessment measures)
- Framework for the schedule for periodic inspection, testing and maintenance of emergency equipment (e.g. rescue equipment)
- Framework for the schedule of trainings and drills
- Emergency contacts and communication protocols, including with communities when necessary, and procedures for interaction with the government authorities
- Procedures for periodic review and update of emergency response plans.

18.1.6. Monitoring and Review

Monitoring and review are critical as this is how the Project Company will check and adjust the ESMS.

Monitoring is an umbrella term that includes various methods for evaluating performance. These may include visual observation, measuring and testing, questionnaires, and surveys, interviews with employees and external stakeholders, and document review. It is crucial to design the monitoring program to obtain qualitative and quantitative information.

A key aspect of monitoring is defining relative indicators. These are quantitative or qualitative measures of progress against set goals. Some indicators might focus on performance, evaluated against the criteria defined in the E&S policy, and other indicators might focus on the process or inputs that are required to achieve performance.

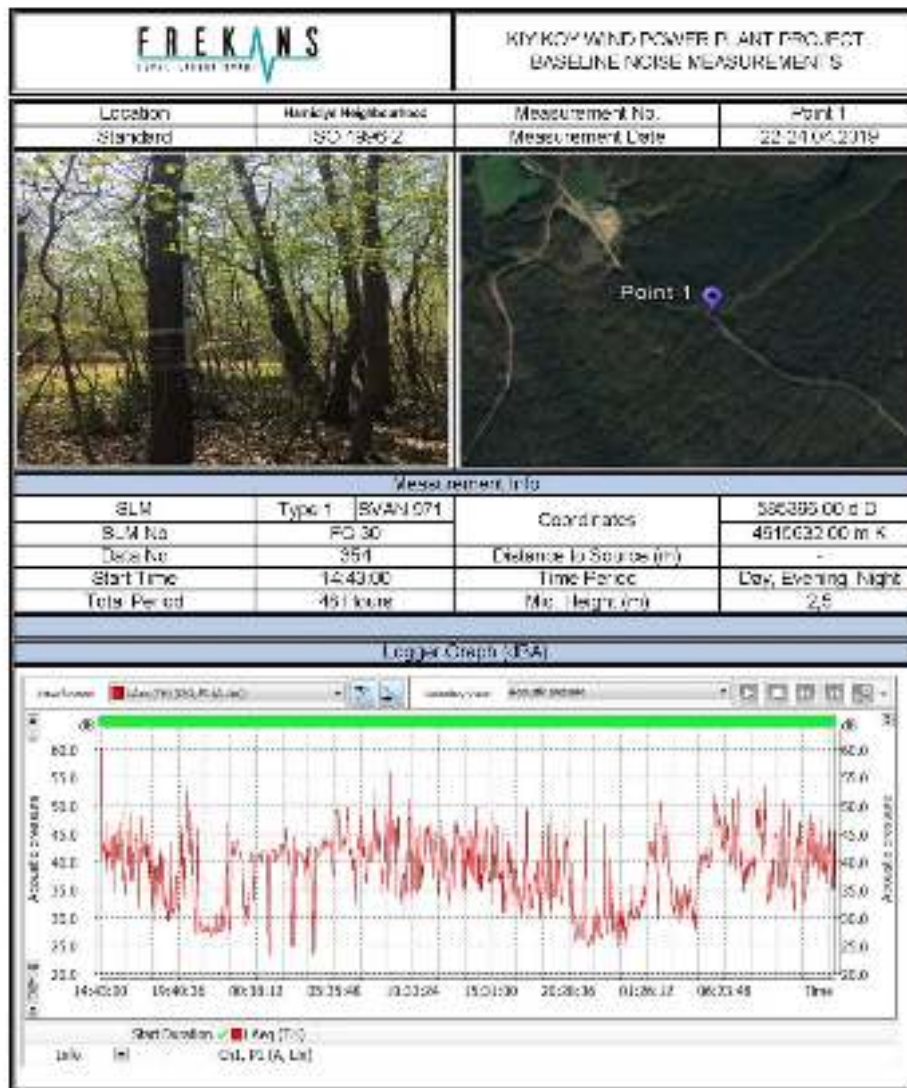
For monitoring of ESMS performance and to identify if the goals and outcomes set by the ESMS are achieved, the Project Company will carry out quarterly internal monitoring activities during the construction phase and at least annually during the operation phase. In addition to this, the Lenders will also be monitoring the E&S performance of the Project through their independent consultants at the frequencies to be determined for the construction, operation and closure phases. The ESMS will be reviewed annually and additionally in case where assessed to be required in the event of important changes to Project E&S conditions and applicable legislation and standards.


As part of the ESIA process, the Project Environmental and Social Management and Monitoring Plan (ESMMP) has been prepared outlining the mitigation measures to be put in place to manage the identified E&S impacts of the Project. The ESMMP will be implemented jointly with specific E&S management/action plans developed for the Project.

APPENDICES

Appendix A. Noise Measurement Data Sheets

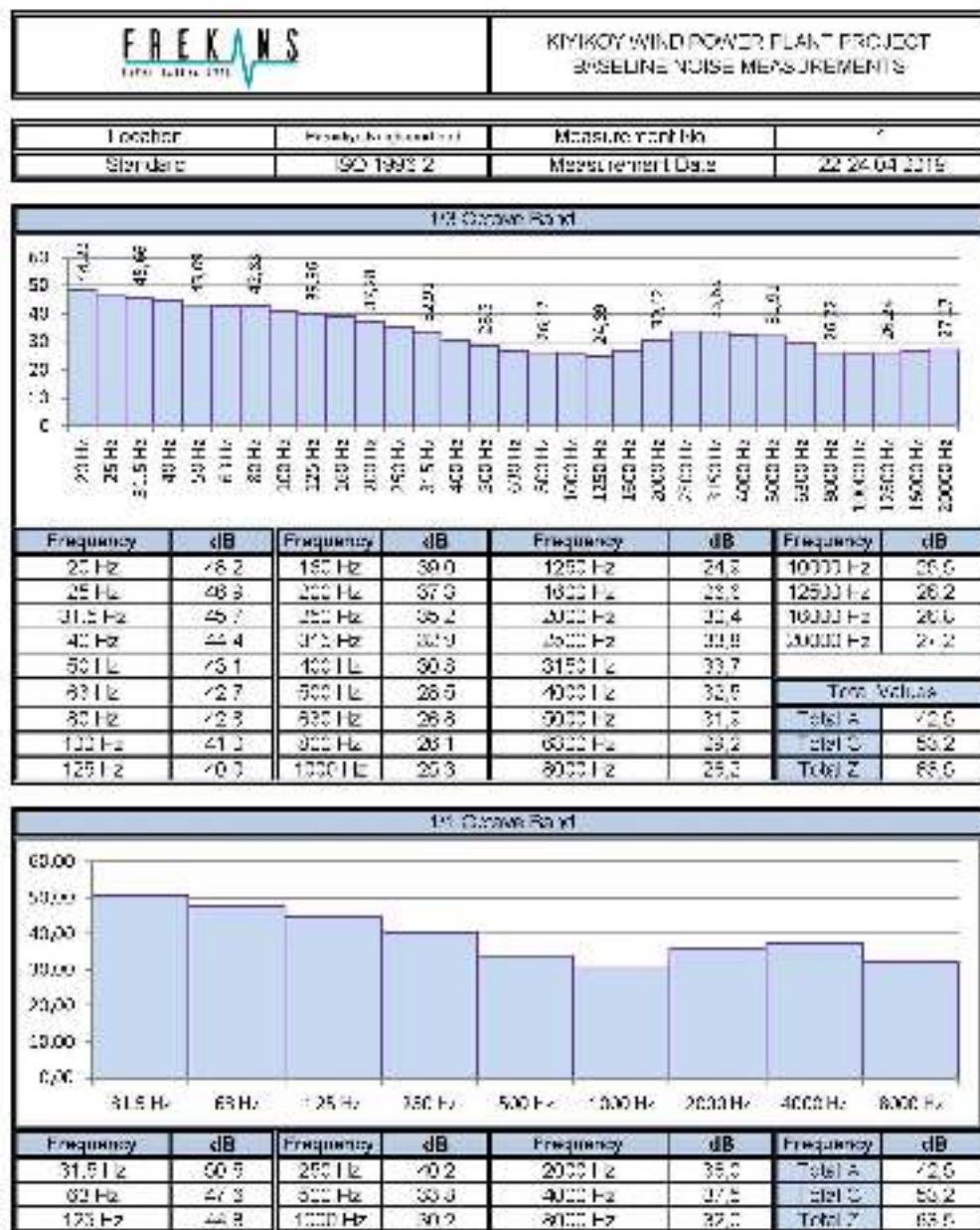
Appendix A.1. Measurement Point N-01



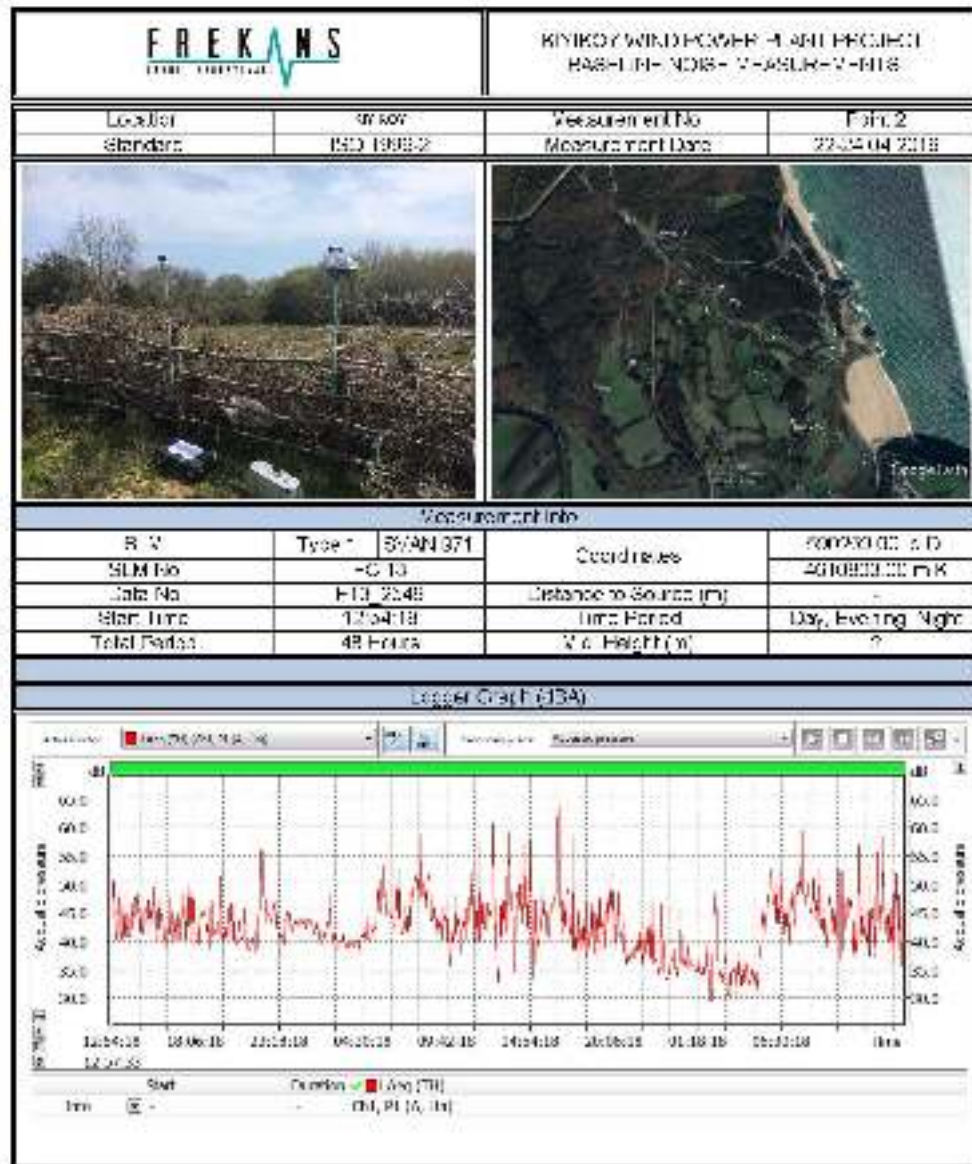
| | | | |
|---|---------------------|---|------------|
|  | | KIYIKOY WIND POWER PLANT PROJECT BASELINE NOISE MEASUREMENTS | |
| Location | Imzeye Neighborhood | Measurement No. | Point 1 |
| Standard | ISO 18389-2 | Measurement Date | 25/04/2018 |


| Results List | | | | | | |
|--------------|-------------------------------------|-------------|-------------|---|-------------|-------------|
| | Raw Results (L _{eq} (dBA)) | | | Processed Results (L _{eq} (dBA)) | | |
| | Day | Evening | Night | Day | Evening | Night |
| Time | 07:00-19:00 | 19:00-23:00 | 23:00-07:00 | 07:00-19:00 | 19:00-23:00 | 23:00-07:00 |
| 1. Day | 44,0 | 40,4 | 41,8 | 41,0 | 39,2 | 39,0 |
| 2. Day | 49,0 | 38,0 | 41,8 | 39,8 | 37,2 | 34,0 |


| Results List | | | | |
|--------------|--|-------------|---|-------------|
| | Raw Results (L _{eq} (dBA)) | | Processed Results (L _{eq} (dBA)) | |
| | Day | Night | Day | Night |
| Time | 06:00-22:00 | 22:00-07:00 | 06:00-22:00 | 22:00-07:00 |
| 1. Day | 43,8 | 41,8 | 39,5 | 39,2 |
| 2. Day | 42,2 | 41,4 | 37,4 | 34,1 |
| Notes | From raw data extraneous noise events excluded to reach processed data | | | |




Appendix A.2. Measurement Point N-02



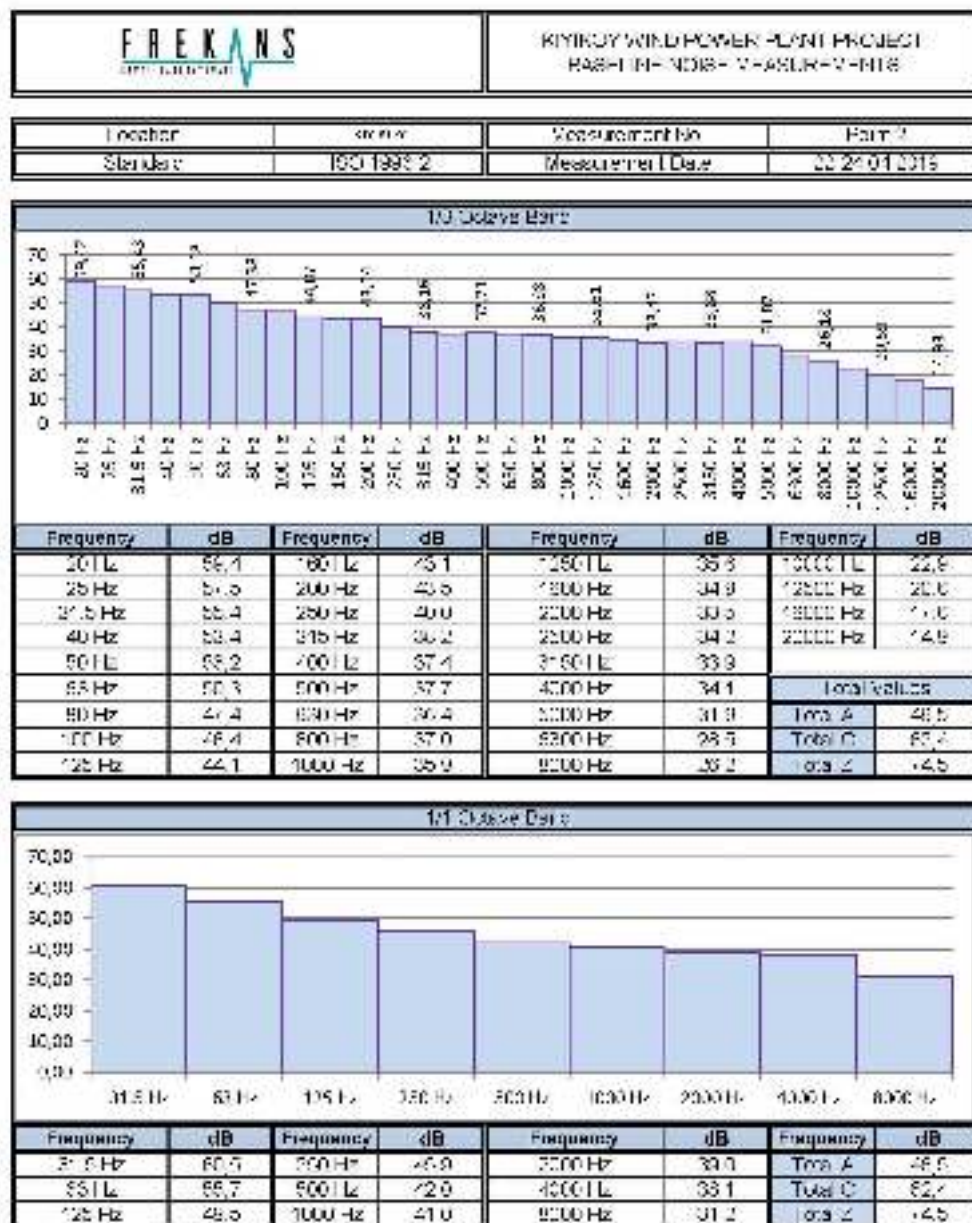
|  | | | | KIYIKOY WIND POWER PLANT PROJECT BASELINE NOISE MEASUREMENTS | | | |
|---|-----------------|-----------------|------------------|---|-----------------|-----------------|------------------|
| Location: | | Standard | | Measurement No | | Point 2 | |
| Standards | | ISO 1993 2 | | Measurement Date | | 22.04.04.2019 | |
| 1. Day 1 Nightly Measurement Results (dBA) | | | | | | | |
| Date/Time | L _{eq} | L ₉₀ | L _{max} | Date/Time | L _{eq} | L ₉₀ | L _{max} |
| 22.04.2019 12:04:00 | 42.2 | 36.2 | 73.9 | 22.04.2019 0:24:00 | 43.2 | 34.9 | 55.5 |
| 22.04.2019 12:04:00 | 42.7 | 36.2 | 67.0 | 22.04.2019 0:24:00 | 41.2 | 30.6 | 52.2 |
| 22.04.2019 12:04:00 | 41.5 | 35.2 | 60.0 | 22.04.2019 0:24:00 | 41.5 | 30.0 | 52.0 |
| 22.04.2019 12:04:00 | 40.1 | 34.4 | 56.0 | 22.04.2019 0:24:00 | 42.9 | 30.2 | 54.1 |
| 22.04.2019 12:04:00 | 42.4 | 36.2 | 69.0 | 22.04.2019 0:24:00 | 43.8 | 32.4 | 57.4 |
| 22.04.2019 12:04:00 | 42.6 | 36.2 | 66.6 | 22.04.2019 0:24:00 | 43.4 | 32.3 | 55.6 |
| 22.04.2019 12:04:00 | 41.0 | 36.2 | 62.5 | 22.04.2019 0:24:00 | 43.7 | 32.3 | 57.0 |
| 22.04.2019 12:04:00 | 42.5 | 37.1 | 68.0 | 22.04.2019 0:24:00 | 41.4 | 30.9 | 52.5 |
| 22.04.2019 12:04:00 | 44.2 | 37.9 | 69.1 | 22.04.2019 0:24:00 | 42.2 | 30.2 | 56.8 |
| 22.04.2019 12:04:00 | 41.0 | 35.4 | 56.2 | 22.04.2019 0:24:00 | 42.4 | 30.0 | 52.1 |
| 22.04.2019 12:04:00 | 44.0 | 36.2 | 69.1 | 22.04.2019 0:24:00 | 44.8 | 34.0 | 57.8 |
| 22.04.2019 12:04:00 | 44.0 | 36.2 | 66.7 | 22.04.2019 0:24:00 | 47.2 | 30.6 | 62.9 |
| 22.04.2019 12:04:00 | 42.9 | 36.2 | 59.6 | 22.04.2019 0:24:00 | 43.2 | 30.4 | 62.2 |
| 22.04.2019 12:04:00 | 44.4 | 37.5 | 70.2 | 22.04.2019 0:24:00 | 49.9 | 32.2 | 66.7 |
| 22.04.2019 12:04:00 | 44.1 | 37.5 | 69.2 | 22.04.2019 0:24:00 | 51.2 | 34.5 | 69.0 |
| 22.04.2019 12:04:00 | 43.8 | 37.5 | 69.0 | 22.04.2019 0:24:00 | 49.1 | 34.2 | 72.5 |
| 22.04.2019 12:04:00 | 41.4 | 36.2 | 69.0 | 22.04.2019 0:24:00 | 49.5 | 36.9 | 65.8 |
| 22.04.2019 12:04:00 | 40.4 | 36.2 | 69.6 | 22.04.2019 0:24:00 | 42.2 | 32.3 | 65.6 |
| 22.04.2019 12:04:00 | 51.0 | 36.2 | 71.3 | 22.04.2019 12:04:00 | 45 | 34.1 | 63.7 |
| 22.04.2019 12:04:00 | 41.0 | 36.2 | 62.2 | 22.04.2019 12:04:00 | 43.2 | 32.2 | 62.2 |
| 22.04.2019 12:04:00 | 41.1 | 36.2 | 67.5 | 22.04.2019 12:04:00 | 49.5 | 32.9 | 67.2 |
| 22.04.2019 12:04:00 | 42.9 | 36.4 | 68.2 | 22.04.2019 12:04:00 | 49.4 | 32.2 | 72.7 |
| 22.04.2019 12:04:00 | 42.0 | 40.5 | 69.0 | 22.04.2019 12:04:00 | 48.2 | 32.8 | 64.6 |
| 22.04.2019 12:04:00 | 42.4 | 41.2 | 64.7 | 22.04.2019 12:04:00 | 47.8 | 30.8 | 58.5 |

|  | | | | KIYIKOY WIND POWER PLANT PROJECT BASELINE NOISE MEASUREMENTS | | | |
|---|-----------------|-----------------|------------------|---|-----------------|-----------------|------------------|
| Location | | Standard | | Measurement No | | Point 2 | |
| Standard | | ISO 1993 2 | | Measurement Date | | 22.04.04.2019 | |
| 2. Day 1 Nightly Measurement Results (dBA) | | | | | | | |
| Date/Time | L _{eq} | L ₉₀ | L _{max} | Date/Time | L _{eq} | L ₉₀ | L _{max} |
| 22.04.2019 12:04:00 | 42.4 | 36.2 | 72.0 | 24.04.2019 0:24:00 | 35.3 | 31.5 | 51.7 |
| 22.04.2019 12:04:00 | 51.0 | 32.2 | 75.4 | 24.04.2019 0:24:00 | 35.3 | 31.5 | 52.6 |
| 22.04.2019 12:04:00 | 42.4 | 37.2 | 76.0 | 24.04.2019 0:24:00 | 47.4 | 35.2 | 60.7 |
| 22.04.2019 12:04:00 | 42.5 | 33.3 | 76.8 | 24.04.2019 0:24:00 | 49.2 | 36.0 | 69.0 |
| 22.04.2019 12:04:00 | 42.1 | 36.1 | 65.9 | 24.04.2019 0:24:00 | 34.2 | 29.1 | 52.1 |
| 22.04.2019 12:04:00 | 42.5 | 32.2 | 65.0 | 24.04.2019 0:24:00 | 34.2 | 29.3 | 54.0 |
| 22.04.2019 12:04:00 | 42.5 | 32 | 66.2 | 24.04.2019 0:24:00 | 34.2 | 30.5 | 42.2 |
| 22.04.2019 12:04:00 | 50.0 | 31.2 | 71.7 | 24.04.2019 0:24:00 | 33.2 | 30.1 | 52.2 |
| 22.04.2019 12:04:00 | 42.5 | 33.2 | 71.5 | 24.04.2019 0:24:00 | 49.2 | 34.2 | 71.0 |
| 22.04.2019 12:04:00 | 49.6 | 33.2 | 70.2 | 24.04.2019 0:24:00 | 49.1 | 36.9 | 72.7 |
| 22.04.2019 12:04:00 | 42.6 | 36.1 | 65.4 | 24.04.2019 0:24:00 | 47.8 | 34.4 | 67.1 |
| 22.04.2019 12:04:00 | 42.5 | 36.2 | 64.7 | 24.04.2019 0:24:00 | 48.2 | 36.0 | 65.4 |
| 22.04.2019 12:04:00 | 42.8 | 35.4 | 67.0 | 24.04.2019 0:24:00 | 49.2 | 36.2 | 65.2 |
| 22.04.2019 12:04:00 | 42.2 | 36.2 | 77.1 | 24.04.2019 0:24:00 | 53.4 | 34.2 | 76.2 |
| 22.04.2019 12:04:00 | 42.2 | 35.2 | 70.6 | 24.04.2019 0:24:00 | 47.2 | 39.0 | 64.2 |
| 22.04.2019 12:04:00 | 42.1 | 37.2 | 69.9 | 24.04.2019 0:24:00 | 47.4 | 34.2 | 71.1 |
| 22.04.2019 12:04:00 | 51.4 | 34.2 | 69.4 | 24.04.2019 0:24:00 | 49.2 | 34.0 | 67.5 |
| 22.04.2019 12:04:00 | 41.0 | 35.2 | 61.4 | 24.04.2019 0:24:00 | 48.2 | 32.0 | 65.6 |
| 22.04.2019 12:04:00 | 41.4 | 36.2 | 62.9 | 24.04.2019 12:04:00 | 49.2 | 34.1 | 65.1 |
| 22.04.2019 12:04:00 | 42.1 | 33.2 | 63.0 | 24.04.2019 12:04:00 | 45.2 | 33.5 | 67.7 |
| 22.04.2019 12:04:00 | 28.0 | 31.1 | 62.2 | 24.04.2019 12:04:00 | 49.2 | 33.1 | 71.0 |
| 22.04.2019 12:04:00 | 22.2 | 31.2 | 62.0 | 24.04.2019 12:04:00 | 45.2 | 32.0 | 66.7 |
| 24.04.2019 0:24:00 | 38.0 | 32.4 | 67.2 | 24.04.2019 12:04:00 | 49.2 | 34.0 | 67.4 |
| 24.04.2019 0:24:00 | 38.4 | 32.5 | 64.2 | 24.04.2019 12:04:00 | 48.5 | 34.0 | 67.1 |

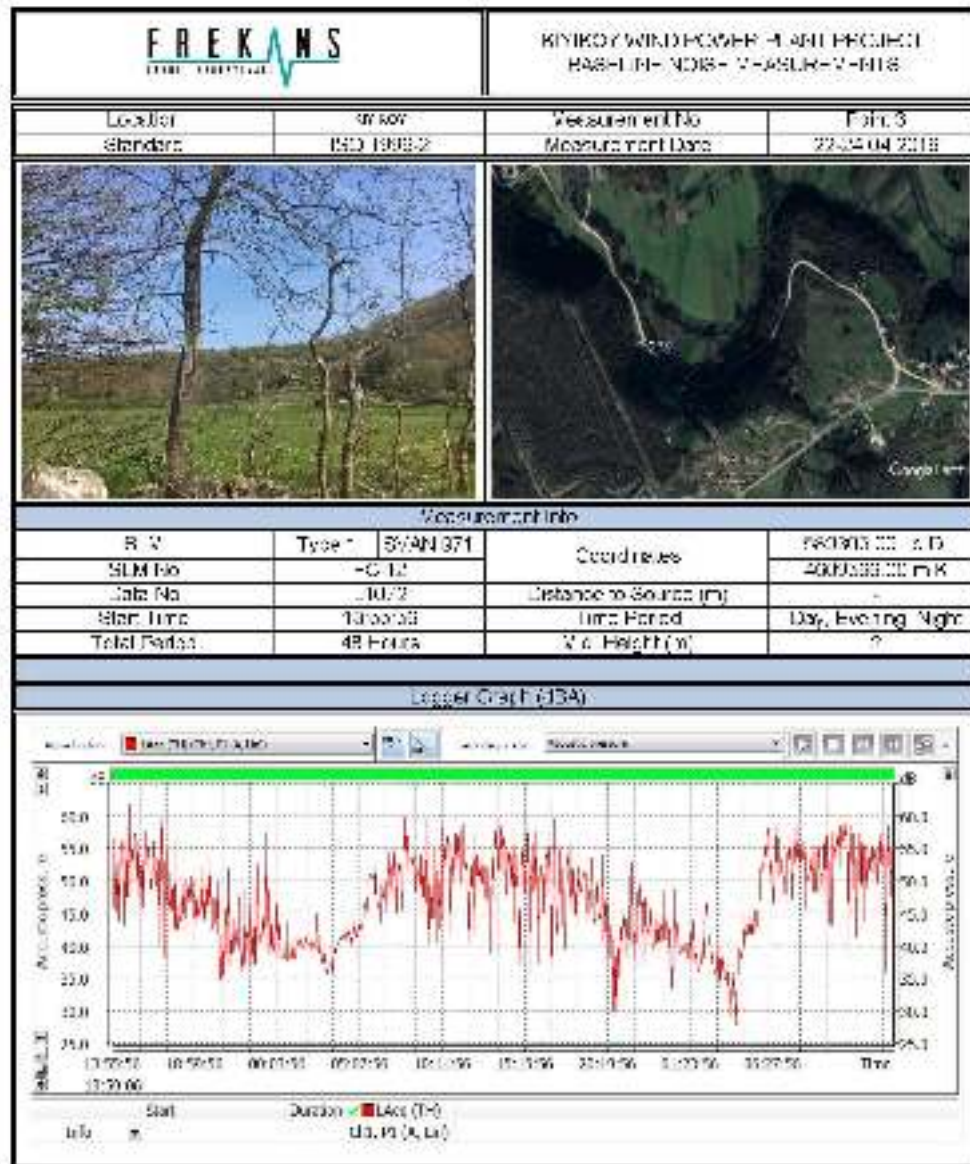
| | | | |
|---|------------|---|------------|
|  | | KIYIKOY WIND POWER PLANT PROJECT RASHI IN- NOISE- MEASUREMENTS | |
| Location | AKKÖY | Measurement No | Form. 2 |
| Standard | ISO 1996-2 | Measurement Date | 22-04-2018 |


| Results Table | | | | | | |
|---------------|----------------------|-------------|-------------|----------------------------|-------------|-------------|
| | Raw Results Leq (dB) | | | Processed Results Leq (dB) | | |
| | Day | Evening | Night | Day | Evening | Night |
| Time | 6:00-19:00 | 19:00-04:00 | 22:00-06:00 | 6:00-19:00 | 19:00-04:00 | 22:00-06:00 |
| 1 Day | 45.5 | 45.7 | 43.8 | 44.1 | 41.8 | 41.8 |
| 2 Day | 43.5 | 45.7 | 42.0 | 42.3 | 50.7 | 38.7 |


| Results Table | | | | |
|---------------|--|-------------|----------------------------|-------------|
| | Raw Results Leq (dB) | | Processed Results Leq (dB) | |
| | Day | Night | Day | Night |
| Time | 6:00-19:00 | 22:00-06:00 | 6:00-19:00 | 22:00-06:00 |
| 1 Day | 46.0 | 45.1 | 43.8 | 41.8 |
| 2 Day | 46.8 | 41.3 | 41.6 | 37.6 |
| Notes | From raw data extraneous noise events excluded to reach processed data | | | |




Appendix A.3. Measurement Point N-03



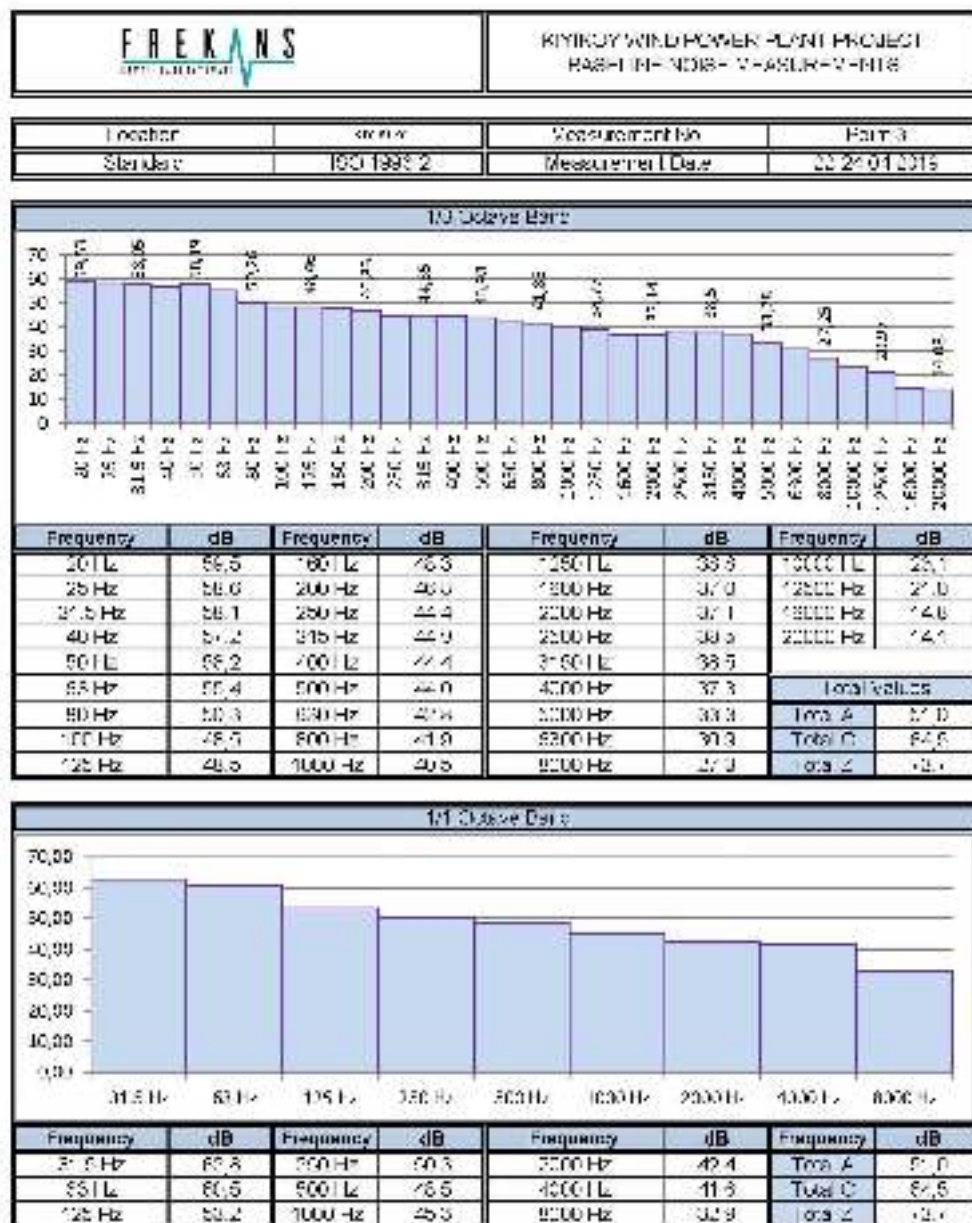
|  | | | | KIYIKOY WINDPOWER PLANT PROJECT RAFFINE NOISE MEASUREMENTS | | | |
|---|------|------------|------|---|------|---------------|------|
| Location | | dB(A) | | Measurement No | | Point | |
| Standards | | ISO 1205-2 | | Measurement Date | | 22-04-04-2018 | |
| 1. Day Half Hourly Measurement Results (dBA) | | | | | | | |
| Excess Time | Leq | L90 | Lnex | Excess Time | Leq | L90 | Lnex |
| 22.04.2018 12:01:00 | 52.8 | 52.4 | 72.8 | 22.04.2018 12:01:00 | 50.7 | 50.0 | 72.8 |
| 22.04.2018 12:01:00 | 54.4 | 53.9 | 73.7 | 22.04.2018 12:01:00 | 50.8 | 50.2 | 72.8 |
| 22.04.2018 12:02:00 | 53.0 | 52.2 | 72.4 | 22.04.2018 12:02:00 | 52.2 | 51.5 | 72.6 |
| 22.04.2018 12:02:00 | 52.0 | 51.2 | 73.0 | 22.04.2018 12:02:00 | 52.2 | 51.5 | 72.6 |
| 22.04.2018 12:02:00 | 52.0 | 51.5 | 72.0 | 22.04.2018 12:02:00 | 51.2 | 50.5 | 72.0 |
| 22.04.2018 12:02:00 | 52.6 | 52.3 | 72.0 | 22.04.2018 12:02:00 | 51.4 | 50.7 | 72.4 |
| 22.04.2018 12:02:00 | 52.6 | 51.2 | 72.0 | 22.04.2018 12:02:00 | 51.8 | 50.7 | 72.7 |
| 22.04.2018 12:03:00 | 49.1 | 48.2 | 69.8 | 22.04.2018 12:03:00 | 49.2 | 48.8 | 69.1 |
| 22.04.2018 12:03:00 | 49.2 | 48.7 | 72.4 | 22.04.2018 12:03:00 | 49.3 | 49.2 | 69.0 |
| 22.04.2018 12:03:00 | 49.3 | 48.3 | 69.1 | 22.04.2018 12:03:00 | 49.3 | 49.3 | 69.7 |
| 22.04.2018 12:03:00 | 47.2 | 47.2 | 68.2 | 22.04.2018 12:03:00 | 51.3 | 50.6 | 67.5 |
| 22.04.2018 12:03:00 | 48.2 | 47.2 | 67.0 | 22.04.2018 12:03:00 | 52.2 | 51.5 | 72.4 |
| 22.04.2018 12:03:00 | 49.1 | 48.3 | 68.0 | 22.04.2018 12:03:00 | 52.7 | 51.7 | 72.6 |
| 22.04.2018 12:03:00 | 49.8 | 49.5 | 68.8 | 22.04.2018 12:03:00 | 51.8 | 51.2 | 69.0 |
| 22.04.2018 12:03:00 | 44.4 | 43.4 | 63.1 | 22.04.2018 12:03:00 | 49.2 | 48.7 | 68.5 |
| 22.04.2018 12:03:00 | 42.4 | 41.2 | 61.8 | 22.04.2018 12:03:00 | 49.3 | 48.4 | 72.2 |
| 22.04.2018 12:03:00 | 42.0 | 41.3 | 65.0 | 22.04.2018 12:03:00 | 52.2 | 51.3 | 72.2 |
| 22.04.2018 12:03:00 | 42.6 | 42.2 | 71.1 | 22.04.2018 12:03:00 | 52.2 | 51.5 | 72.0 |
| 22.04.2018 12:03:00 | 42.6 | 42.4 | 72.0 | 22.04.2018 12:03:00 | 52.4 | 51.1 | 72.6 |
| 22.04.2018 12:03:00 | 44.0 | 43.2 | 68.2 | 22.04.2018 12:03:00 | 51.2 | 50.7 | 69.7 |
| 22.04.2018 12:03:00 | 41.1 | 40.2 | 63.0 | 22.04.2018 12:03:00 | 49.2 | 48.0 | 68.7 |
| 22.04.2018 12:03:00 | 51.8 | 49.5 | 68.8 | 22.04.2018 12:03:00 | 51.2 | 48.0 | 68.7 |
| 22.04.2018 12:03:00 | 52.7 | 52.3 | 65.9 | 22.04.2018 12:03:00 | 52.2 | 51.1 | 72.6 |
| 22.04.2018 12:03:00 | 42.5 | 41.7 | 65.0 | 22.04.2018 12:03:00 | 52.4 | 50.0 | 72.2 |

|  | | | | KIYIKOY WINDPOWER PLANT PROJECT RAFFINE NOISE MEASUREMENTS | | | |
|---|------|------------|------|---|------|---------------|------|
| Location | | dB(A) | | Measurement No | | Point | |
| Standards | | ISO 1205-2 | | Measurement Date | | 22-04-04-2018 | |
| 2. Day Half Hourly Measurement Results (dBA) | | | | | | | |
| Excess Time | Leq | L90 | Lnex | Excess Time | Leq | L90 | Lnex |
| 22.04.2018 12:04:00 | 52.6 | 52.4 | 72.8 | 22.04.2018 12:04:00 | 50.3 | 50.1 | 72.8 |
| 22.04.2018 12:04:00 | 52.1 | 51.2 | 72.2 | 22.04.2018 12:04:00 | 50.7 | 50.2 | 72.8 |
| 22.04.2018 12:05:00 | 54.1 | 53.2 | 73.0 | 22.04.2018 12:05:00 | 52.3 | 51.8 | 72.1 |
| 22.04.2018 12:05:00 | 52.9 | 52.4 | 73.0 | 22.04.2018 12:05:00 | 54.2 | 52.2 | 72.5 |
| 22.04.2018 12:05:00 | 54.1 | 51.2 | 68.1 | 22.04.2018 12:05:00 | 52.7 | 52.7 | 72.5 |
| 22.04.2018 12:05:00 | 52.0 | 51.2 | 72.0 | 22.04.2018 12:05:00 | 51.7 | 50.5 | 68.7 |
| 22.04.2018 12:05:00 | 52.9 | 51.3 | 72.0 | 22.04.2018 12:05:00 | 50.2 | 49.7 | 67.7 |
| 22.04.2018 12:05:00 | 51.4 | 49.2 | 67.8 | 22.04.2018 12:05:00 | 49.7 | 48.8 | 68.1 |
| 22.04.2018 12:05:00 | 51.0 | 48.2 | 67.4 | 22.04.2018 12:05:00 | 49.2 | 48.0 | 67.8 |
| 22.04.2018 12:05:00 | 49.7 | 48.2 | 65.0 | 22.04.2018 12:05:00 | 49.3 | 48.8 | 68.2 |
| 22.04.2018 12:05:00 | 52.0 | 51.2 | 70.0 | 22.04.2018 12:05:00 | 51.3 | 50.9 | 67.2 |
| 22.04.2018 12:05:00 | 42.0 | 41.2 | 67.5 | 22.04.2018 12:05:00 | 52.2 | 51.7 | 72.1 |
| 22.04.2018 12:05:00 | 47.1 | 47.2 | 72.0 | 22.04.2018 12:05:00 | 52.5 | 51.2 | 72.5 |
| 22.04.2018 12:05:00 | 49.4 | 47.4 | 68.8 | 22.04.2018 12:05:00 | 51.8 | 51.2 | 68.5 |
| 22.04.2018 12:05:00 | 41.8 | 40.2 | 63.0 | 22.04.2018 12:05:00 | 49.2 | 48.8 | 68.6 |
| 22.04.2018 12:05:00 | 41.8 | 40.2 | 68.8 | 22.04.2018 12:05:00 | 49.3 | 48.7 | 67.4 |
| 22.04.2018 12:05:00 | 42.1 | 41.2 | 68.5 | 22.04.2018 12:05:00 | 51.3 | 50.9 | 72.2 |
| 22.04.2018 12:05:00 | 42.6 | 42.2 | 66.5 | 22.04.2018 12:05:00 | 52.2 | 50.5 | 72.0 |
| 22.04.2018 12:05:00 | 42.0 | 41.2 | 68.0 | 22.04.2018 12:05:00 | 52.2 | 51.1 | 72.7 |
| 22.04.2018 12:05:00 | 42.1 | 41.1 | 68.7 | 22.04.2018 12:05:00 | 49.2 | 48.2 | 69.7 |
| 22.04.2018 12:05:00 | 42.1 | 40.2 | 63.0 | 22.04.2018 12:05:00 | 49.1 | 48.1 | 67.8 |
| 22.04.2018 12:05:00 | 41.8 | 40.4 | 68.0 | 22.04.2018 12:05:00 | 49.4 | 48.0 | 67.6 |
| 22.04.2018 0:02:00 | 32.0 | 31.4 | 51.0 | 22.04.2018 12:02:00 | 51.2 | 50.7 | 72.2 |
| 22.04.2018 0:02:00 | 32.9 | 32.2 | 57.0 | 22.04.2018 12:02:00 | 52.2 | 50.5 | 72.2 |

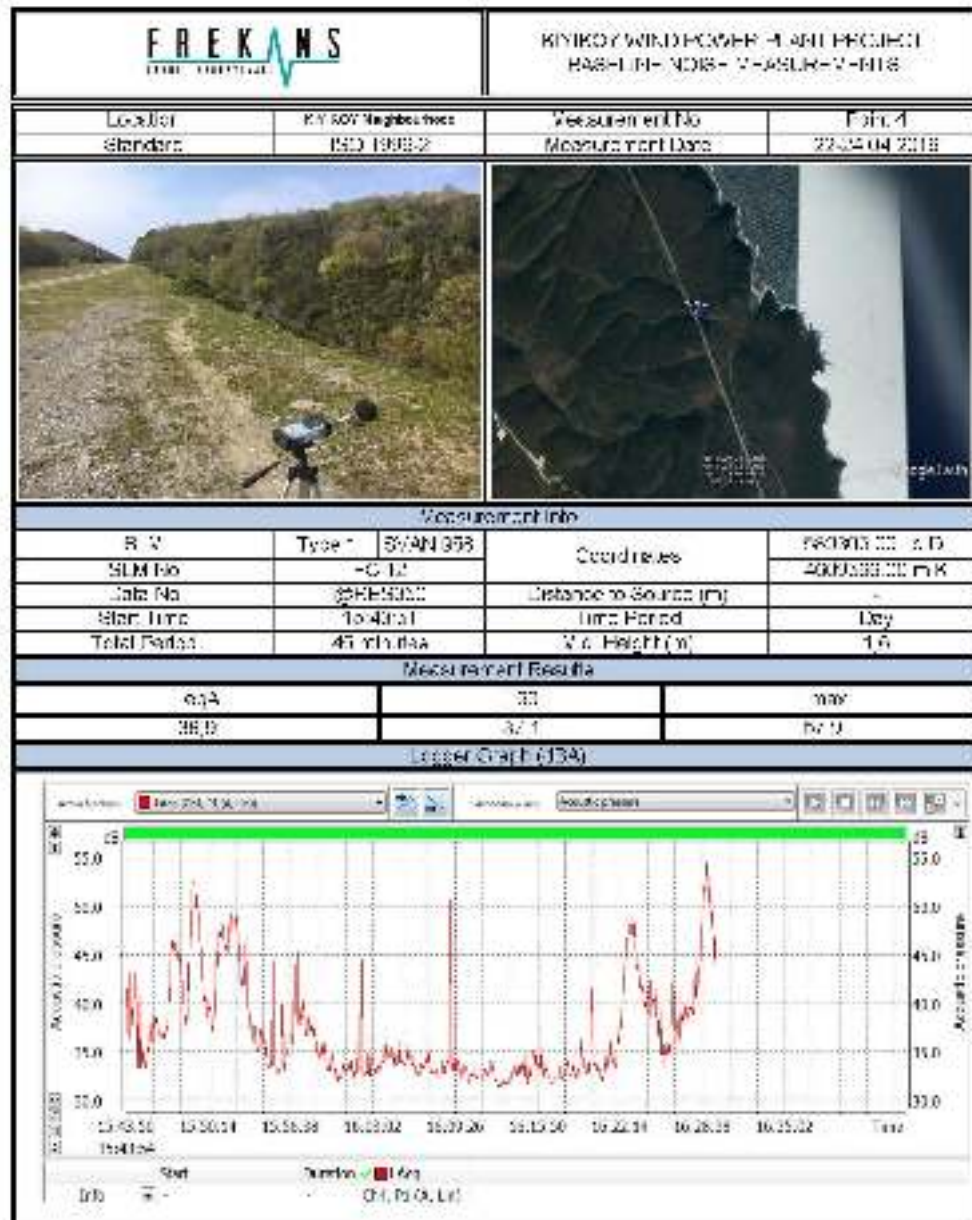
| | | | |
|---|------------|---|------------|
|  | | KIYIKOY WIND POWER PLANT PROJECT RASHI IN- NOISE- MEASUREMENTS | |
| Location | AKKÖY | Measurement No | Form.3 |
| Standard | ISO 1996-2 | Measurement Date | 22-04-2018 |

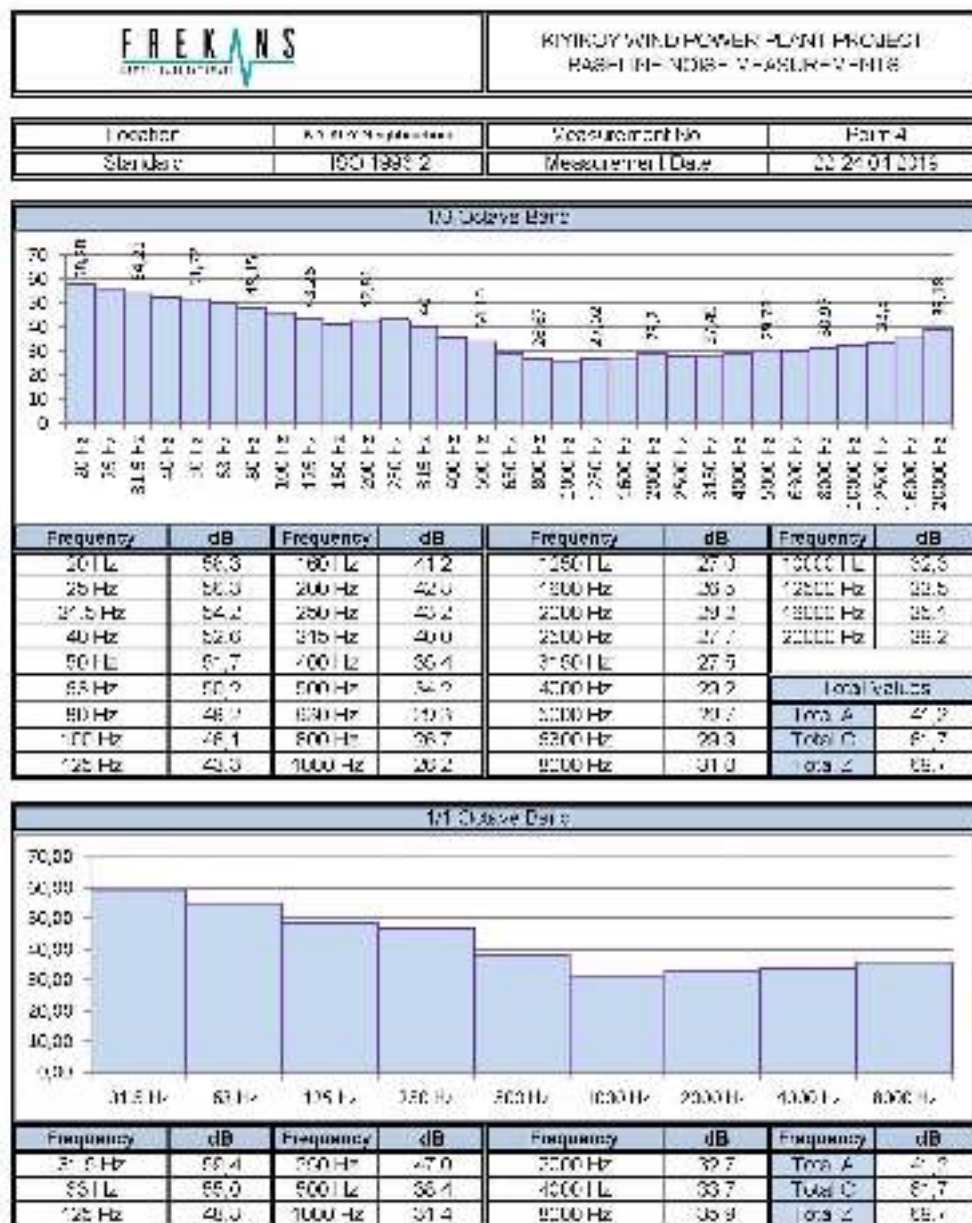
| Results Table | | | | | | |
|---------------|----------------------|-------------|-------------|----------------------------|-------------|-------------|
| | Raw Results Leq (dB) | | | Processed Results Leq (dB) | | |
| | Day | Evening | Night | Day | Evening | Night |
| Time | 6.00-19.00 | 19.00-24.00 | 22.00-06.00 | 6.00-19.00 | 19.00-24.00 | 22.00-06.00 |
| 1 Day | 53.0 | 46.5 | 44.3 | 45.3 | 40.2 | 40.1 |
| 2 Day | 53.4 | 46.6 | 47.3 | 46.3 | 40.4 | 40.7 |

| Results Table | | | | |
|---------------|---|-------------|----------------------------|-------------|
| | Raw Results Leq (dB) | | Processed Results Leq (dB) | |
| | Day | Night | Day | Night |
| Time | 6.00-19.00 | 22.00-06.00 | 6.00-19.00 | 22.00-06.00 |
| 1 Day | 47.3 | 44.7 | 44.9 | 41.2 |
| 2 Day | 47.6 | 45.3 | 45.4 | 41.5 |
| Notes | From raw data instantaneous noise events excluded to reach processed data | | | |



Appendix A.4. Measurement Point N-04





Appendix B. Laboratory Result Forms for Air Quality Measurements

Appendix B.1. Laboratory Result Forms for Pm10

| | |
|---|---------------------------------------|
|    | |
| SEGAL ÇEVRE ÖLÇÜM ve ANALİZ LABORATUVARI Aşçı Öveçler Mah. 1322 Cad (eskİ E.cad) ÇANKAYA-ANKARA Tel: 0 312 481 83 00 Fax: 0 312 481 83 99 mail: segal@segalanaliz.com web: www.segalanaliz.com www.segal.com.tr | |
| İlk Basım: 03.05.2010 Revizyon: RP.03 / Rev.02 Revizyon Tarihi: 01.01.2018 Sayfa 1 / 4 | AB-0425-T R-39711/19 27.05.2018 |

| | |
|--|--|
| Müşterinin adı/ adresi: Customer Name / Address | GEM SÜRDÜRÜLEBİLİRLİK HİZM. VE DAN. A.Ş. Mustafa Kemal Mah. Dumlupınar Blv. B Blok Apt. No:266 B/115 Çankaya/ANKARA |
| Nümunenin Adı ve Örnekleme Tarihi: Name and Sampling Date of the Sample | 24.04.2018 – 27.04.2019 (PM 10 Ölçümü) |
| Proje Adı ve No: Name and Number of the Project | PM 10 Ölçümü – P-20543/19 |
| Nümunenin Kabul Tarihi: Date of Sample Acceptance | 28.04.2019 |
| Açıklamalar: Remarks | Kırıkkale ili Kırıkkale Beldesi'nde bulunan "Kırıkkale Rüzgar Enerjisi Santrali (RES) Kapasite Artışı Projesi" kapsamında 5 noktada 24 saatlik PM 10 (Toz) ölçümü gerçekleştirilmiştir |
| Deneyin yapıldığı Tarih: Date of the Test | 24.04.2019 – 01.05.2019 |
| Raporun Sayfa Sayısı: Number of the Pages of the Report | 4 Sayfa |

Deney verileri ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve deney/ölçüm sonuçları takip eden sayfalarda verilmektedir. The test and/or measurements results, the uncertainties with confidence probability and test methods are given on the following pages which are part of this report.

Raporu Hazırlayan
Prepared by


Satılmış DOĞAN
Zinciryeri

Raporu Onaylayan
Confirmed by


Feri Kılıç
Laboratuvar Müdürü



Bu rapor, laboratuvarın yetkili izni olmadan başka amaçlarla kullanılamaz. İzinsiz ve müteselsil raporlar geçerli değildir. Sonuçlar sadece deneyi yapan numunelere aittir. (This report shall not be reproduced or taken in full aspect with the permission of the laboratory. Testing reports without signature and seal are not valid. The results belong to the tested sample)
Bu rapor, çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.

| | | |
|-------------------------|---|---|
| |  |  |
| | SEGAL ÇEVRE ÖLÇÜM ve ANALİZ LABORATUVARI | AB-0425-T |
| 1. Basım: 05.05.2010 | Araştırma ve Geliştirme: 1322 Cad. Beşiközü, ÇANKAYA ANKARA | R-39711/19 |
| RP.03 / Rev.02 | Tel: 0 312 481 83 00 Fax: 0 312 481 83 99 | 27.05.2019 |
| Rev. Tarihi: 01.01.2018 | mail: seval@segalanaliz.com | |
| Sayfa 2 / 4 | web: www.segalanaliz.com | |
| | www.segal.com.tr | |

A. GİRİŞ

Kırıkköy Rüzgar Enerjisi Santrali (RES) Kapasite Artışı Projesi kapsamında 5 noktada 24 saat süre ile PM 10 ölçümü gerçekleştirilmiştir.

Alınan deney sonucu, sadece ölçüm sırasındaki proses koşullarıyla ilgili olup yapılmış olan ölçümler neticesinde elde edilen sonuçlar 2872 sayılı Çevre Kanununun ilgili hükümleri gereğince 03.07.2009 tarih ve 27277 sayılı Resmi Gazete'de yayımlanarak yürürlüğe giren Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliği (S.K.H.K.K.Y.) ve 20.12.2014 tarih ve 29211 sayılı Resmi Gazete'de yayımlanarak yürürlüğe giren Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliğinde Değişiklik Yapılmasına Dair Yönetmelik çerçevesinde değerlendirilerek sadece sınır değerlerle karşılaştırma yapılmış olup bu emisyon raporu hazırlanmıştır.

Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliği, sanayi ve enerji üretim tesislerinin faaliyeti sonucu atmosfere yayılan is, duman, toz, gaz, buhar ve aerosol halindeki emisyonları kontrol altına almak, insan ve çevresini hava kalitesi ortamlarındaki kirlenmelerden doğacak tehlikelerden korumak; hava kirlenmeleri sebebiyle çevrede ortaya çıkan ıstıma ve kısıtlılık münasebetlerine önemli zararlar veren olumsuz etkileri gidermek ve bu etkilerin ortaya çıkmamasını sağlamak amacıyla hazırlanmıştır.

B. ÖLÇÜM YAPILAN BÖLÜM, ÖLÇÜM PARAMETRELERİ, ÖLÇÜM YÖNTEMİ VE ÖLÇÜM CİHAZI VE SONUÇLARI

Ölçüm yapılan yerler ve koordinatları Tablo-1 de verilmiştir.

Tablo - 1: PM 10 (Toz) Ölçümü Yapılan Yerler

| No | Ölçüm Yapılan Bölüm | GPS Koordinatı | Ölçüm Tarihi |
|----|---------------------|----------------|-----------------------|
| 1 | 1 Nolu Nokta | 585008-4616317 | 24.04.2019-25.04.2019 |
| 2 | 2 Nolu Nokta | 585260-4616301 | |
| 3 | 3 Nolu Nokta | 589011-4616317 | |
| 4 | 5 Nolu Nokta | 589348-4609553 | 25.04.2019-26.04.2019 |
| 5 | 4 Nolu Nokta | 589139-4610408 | 26.04.2019-27.04.2019 |



Bu rapor, laboratuvar vasfı ve niteliğinden kısmen kopyalanıp çoğaltılamaz. İnceleme ve maddi izniyle raporlar değiştirilmez. Sonuçları sadece ölçüm yapan kurumun ve kuruluşun kullanımına aittir. Bu raporlar hiçbir şekilde çoğaltılamaz. Bu raporlar sadece ölçüm yapan kurumun ve kuruluşun kullanımına aittir. Bu raporlar hiçbir şekilde çoğaltılamaz. Bu raporlar sadece ölçüm yapan kurumun ve kuruluşun kullanımına aittir.

| | | |
|-------------------------|--|------------|
| |    | |
| İlk Basım: 03.05.2010 | SEGAL ÇEVRE ÖLÇÜM ve ANALİZ LABORATUVARI Ağaç Döğre Men: 1322 Cad (eski G. cad) ÇANKAYA-ANKARA Tel: 0 312 481 83 00 Fax: 0 312 481 83 88 mail: segal@segalanaliz.com web: www.segalanaliz.com www.segal.com.tr | AD-0425-T |
| RP.03 / Rev.02 | | R-39711/19 |
| Rev. Tarihi: 01.01.2016 | | 27.05.2019 |
| Sayfa 3 / 4 | | |



Ölçüm noktalarının uydu görüntüsü

C.ÖLÇÜM SONUÇLARI VE DEĞERLENDİRİLMESİ;

Projede, emisyon ölçüm yerleri, Bakanlık tarafından onaylanmış standartlara göre, teknik yonden hatasız ve ölçüm için gerekli bağlantıları yapmaya imkan verecek şekilde sağlanmıştır. Emisyon ölçümleri, sönel rejimde çalışan halde ve izne esas olan en büyük yükte yapılmış olup ölçümlerde kullanılan cihazlar ve metotları Türk Standartlarına ve EPA normlarına uygundur.

PM 10 ÖLÇÜMLERİ;

MCZ LVS 1 PM 10 partikül madde ölçüm cihazı ile çapları 10 mikrondan küçük parçacıklar gravimetrik metot ile filtre kağıdı üzerinde TS EN 12341 standardına uygun olarak tutulur. MCZ LVS 1 ölçüm cihazı ise periyodik kontrolleri, zaman ve hacim ayarlı, elektrik ile çalışan ortamda toz örneklemesinde kullanılan ölçüm cihazıdır.

MCZ LVS 1 ölçüm cihazı kullanırken, örneklemeye yapılacak filtre kağıtları, araziye gitmeden önce laboratuvarın 19-21°C sıcaklığa ve %45-60 bağıl neme sahip olduğu koşullarda klima yardımıyla 48+12 saat boyunca şartlandırılır. Şartlandırılma sonunda filtre kağıtları hassas terazide tartılarak tartım sonuçları kaydedilir, filtre kağıtları araziye gönderildikten temiz petri kaplarına yerleştirilir ve örneklemeye noktasına götürülür.



Bu rapor, laboratuvarımız tarafından ölçümler için ayrılmış ve kullanılmak üzere hazırlanmıştır. İmza ve mühürsüz raporlar geçerli değildir. Raporlar sadece laboratuvarımız tarafından hazırlanmıştır. (This report has been prepared by our laboratory and is not valid without the signature and stamp of the laboratory. Testing reports without signature and stamp are not valid. The results belong to the tested sample.)
Bu rapor çevre mevzuatında geçen mevzuatı gerektiren şekilde kullanılmamalıdır.

| | | |
|------------------------|--|------------|
| |    | |
| İlk Basım: 03.06.2010 | SEGAL ÇEVRE ÖLÇÜM ve ANALİZ LABORATUVARI Aşağı Öveçler Mah. 1322 Cad (eski G.sad) ÇANKAYA-ANKARA Tel: 0 312 481 83 60 Fax: 0 312 481 83 99 mail: segal@segalanaliz.com web: www.segalanaliz.com www.segal.com.tr | AB-0425-T |
| RP 03 / Rev.02 | | R-36711/19 |
| Rev. Tarih: 01.01.2018 | | |
| Sayfa 4 / 4 | | 27.05.2019 |

Örnekleme cihazları, her türlü hava koşullarında kolayca ulaşılabilircek bir yer olarak seçilen örnekleme noktasına taşınır. Cihaz hava akımını engelleyebilecek herhangi bir engelden en az 30 cm uzaklıkta düzgün bir alana yerleştirilir ve cihaz kullanma talimatında belirtilen şekilde ölçüm ve örnekleme yapılır. Pompa durdurulduktan sonra filtre kağıdını cimbez yardımıyla çıkartarak, daha önce içerisinden çıkarılan patli kabına yerleştirip, tartılamak üzere laboratuvara gönderilir.

MCZ LVS-1 kullanılan cihazdan elde edilen filtre kağıdı laboratuvarında 19-21°C sıcaklığa ve %45-50 bağıl nemde sahip olduğu koşullarda klima yardımıyla 48+24 saat boyunca şartlandırılıp, hassas terazide tartılarak tartım sonuçları kaydedilir.

PM 10 konsantrasyonu (C) $\mu\text{g}/\text{m}^3$ olarak aşağıdaki formül ile hesaplanır:

$$C = 1000 (M_2 - M_1) / (V)$$

M_2 = Filtre kağıdının deneyden sonraki ağırlığı, (mg)

M_1 = Filtre kağıdının deneyden önceki ağırlığı, (mg)

V = Çekilen gaz hacmi, (m^3)

$$V = 60 * Q_{\text{sa}} * t / 1000$$

t = Zaman, saat

PM 10 ölçümü için çekiş debisi 2,3 m^3/h dir.

PM 10 Ölçüm Sonuçları:

Tablo – 2: PM 10 Ölçüm Sonuçları

| Ölçüm Yapılan Bölüm | PM 10 Ölçüm Sonucu ($\mu\text{g}/\text{m}^3$) |
|---------------------|---|
| 1 Nolu Nokta | 14 |
| 2 Nolu Nokta | 25 |
| 3 Nolu Nokta | 38 |
| 5 Nolu Nokta | 55 |
| 4 Nolu Nokta | 0 |

MCZ Marka 1005-039 ve 1555-239 Seri Numarası PM10 örnekleme cihazları ile ölçüm yapılmıştır.

D.EKLER

Ek 1. Türk Akreditasyon Kurumu Akreditasyon Sertifikası

Ek 2. Cihaz Kalibrasyon Belgeleri

Ek 3. Ölçüm Hesabında Kullanılan Formüller


Ek 4. Ölçüm Fotoğrafları



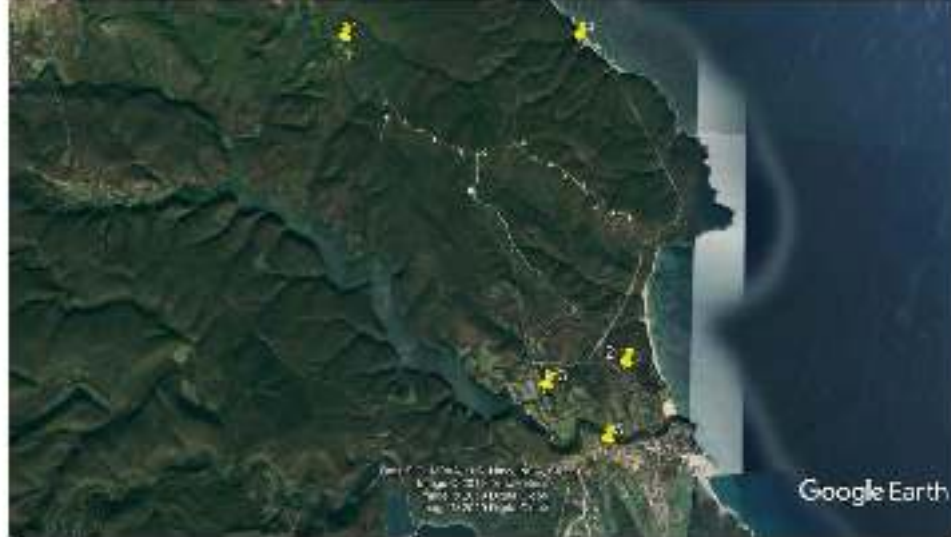
Bu rapor, laboratuvarın yasal bir cihazdan geçen kopyaları geçmez. İzinsiz ve mühusus raporlar gönderilmez. Sonuçlar sadece örnek için geçerlidir. (This report will not be reproduced other than in full, except with the permission of the laboratory. Testing reports will not be granted and used in full. The results belong to the tested sample.)
Bu rapor peşin menşudur. Başka yerlerde kullanılamaz.

[illegible]



| | | |
|---|-------------------------|-------------------|
|  GEM SÜRÜŞÜRLÜĞÜNE KULİZMUSLUĞU VE YANİŞMANLUGU TAMAMLANIŞI ÇÜM KAPAK | | |
| Erşer Numarası | Ölçüm Tarihi | Erşer Şerh |
| 2019-2020 | 21.04.2019 - 27.04.2019 | 3-4 |

1. İşletmede bulunan ve ölçüm yapılan her bir tesisten genel yerleşim içindeki fotoğrafları ve/veya uydu fotoğrafları



2. İŞLETMEDE BULUNAN VE ÖLÇÜM YAPILAN HER BİR TESİSTEN KAYNAKLANAN EMİSYON PARAMETRELERİ, KİRLİTİCİ EMİSYONLARIN NEREDEN KAYNAKLANDIĞI VE BUNLARIN KAYNAKLARA GÖRE DAĞILIMI

Tablo 1. Emisyon kaynağı ve ölçüm yapılan parametreler

| Emisyon Kaynağı / Parametre | | PM _{2,5} |
|-----------------------------|----------------|-------------------|
| PM ₁₀ 5-1 | 595060-4613317 | ■ |
| PM ₁₀ 5-2 | 595209-4613317 | ■ |
| PM ₁₀ 5-3 | 595061-4613317 | ■ |
| PM _{2,5} 5-4 | 595062-4613317 | ■ |
| PM _{2,5} 5-5 | 595130-4613317 | ■ |

Tablo 2. Ölçümde Kullanılan Cihaz Bilgileri

| Parametre | Ölçüm Metodu | Cihaz Markası | Cihaz Seri No | Kalib. Tarihi |
|-------------------|--------------|---------------|----------------------|--------------------------|
| PM _{2,5} | T5 EN 12341 | MOZ LV5 | 18074043 1712-213 | 01.03.2019 12.01.2019 |






* Bu belge, 14.03.2019 tarihinde İstanbul'da yapılmış olan ölçüm sonuçları, ölçüm raporları, ölçüm verileri, ölçüm sonuçları ve ölçüm raporları ile ilgili olarak hazırlanmıştır. Bu belge, ölçüm sonuçları ve ölçüm raporları ile ilgili olarak hazırlanmıştır. Bu belge, ölçüm sonuçları ve ölçüm raporları ile ilgili olarak hazırlanmıştır.





* Ölçüm sonuçları, ölçüm raporları ve ölçüm verileri, ölçüm raporları ve ölçüm verileri ile ilgili olarak hazırlanmıştır.

* Strongly advise clients to get their current credit report before they come to the table.

Appendix B.3. Laboratory Result Forms for Passive Measurements

| | | | | | | | | | | | | | | | | | | |
|---|--|---|---|--|---|---------------------|---|--|--------------------------------------|-----------------|--|---------------------------|--|--------------|--|--------------------------|---|------------------------------|
|    | |  | | | | | | | | | | | | | | | | |
| TÜRKAK TÜRK AKREDİTASYON KURUMU TURKISH ACCREDITATION AGENCY tarafından akredite edilmiş | | | | | | | | | | | | | | | | | | |
| ARTEK MÜHENDİSLİK ÇEVRE ÖLÇÜM VE DANIŞMANLIK HİZM. TİC. A.Ş. ÇEVRE LABORATUVARI ANALİZ RAPORU | | | | | | | | | | | | | | | | | | |
| Mehmet Akif Mah. Elatmış Cad. Tarık Buğra Sok. No:15 Ümraniye-İSTANBUL Tel: 0216 499 0 249 (Pbx) Faks: 0216 499 28 68 | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%;"> <tr> <td style="width: 50%;"> Müşteri Adı/Adresi <i>Customer name/address</i> </td> <td style="width: 50%;"> : Gem Sürdürülebilirlik Hizmetleri Ve Danışmanlık Anonim Şirketi / Mustafa Kemal Mah. Dumlupınar Blv. B Blok Apt. No: 286 B/115 Çankaya/Ankara </td> </tr> <tr> <td> İstek Numarası <i>Order No.</i> </td> <td> : IST220419.034.R00 </td> </tr> <tr> <td> Numunenin Adı ve Tarifi <i>Name and identity of test item</i> </td> <td> : Pasif Örnekleme (VOC, NO₂, SO₂) (IST.HK.19.0530191 - IST.HK.19.0530195) </td> </tr> <tr> <td> Açıklamalar <i>Remarks</i> </td> <td> : Analiz Raporu </td> </tr> <tr> <td> Ölçümün Yapıldığı Tarih <i>Date of Measurement</i> </td> <td> : 24.04.2019 - 24.05.2019 </td> </tr> <tr> <td> Numunenin Kabul Tarihi <i>The date of receipt of test item</i> </td> <td> : 30.05.2019 </td> </tr> <tr> <td> Analizin Yapıldığı Tarih <i>Date of Analysis</i> </td> <td> : 01.06.2019, 11.06.2019 </td> </tr> <tr> <td> Raporun/Eklerin Sayfa Sayısı <i>Number of pages of the Reports/Appendix</i> </td> <td> : 4 sayfa rapor (7 sayfa ek) </td> </tr> </table> | | | Müşteri Adı/Adresi <i>Customer name/address</i> | : Gem Sürdürülebilirlik Hizmetleri Ve Danışmanlık Anonim Şirketi / Mustafa Kemal Mah. Dumlupınar Blv. B Blok Apt. No: 286 B/115 Çankaya/Ankara | İstek Numarası <i>Order No.</i> | : IST220419.034.R00 | Numunenin Adı ve Tarifi <i>Name and identity of test item</i> | : Pasif Örnekleme (VOC, NO ₂ , SO ₂) (IST.HK.19.0530191 - IST.HK.19.0530195) | Açıklamalar <i>Remarks</i> | : Analiz Raporu | Ölçümün Yapıldığı Tarih <i>Date of Measurement</i> | : 24.04.2019 - 24.05.2019 | Numunenin Kabul Tarihi <i>The date of receipt of test item</i> | : 30.05.2019 | Analizin Yapıldığı Tarih <i>Date of Analysis</i> | : 01.06.2019, 11.06.2019 | Raporun/Eklerin Sayfa Sayısı <i>Number of pages of the Reports/Appendix</i> | : 4 sayfa rapor (7 sayfa ek) |
| Müşteri Adı/Adresi <i>Customer name/address</i> | : Gem Sürdürülebilirlik Hizmetleri Ve Danışmanlık Anonim Şirketi / Mustafa Kemal Mah. Dumlupınar Blv. B Blok Apt. No: 286 B/115 Çankaya/Ankara | | | | | | | | | | | | | | | | | |
| İstek Numarası <i>Order No.</i> | : IST220419.034.R00 | | | | | | | | | | | | | | | | | |
| Numunenin Adı ve Tarifi <i>Name and identity of test item</i> | : Pasif Örnekleme (VOC, NO ₂ , SO ₂) (IST.HK.19.0530191 - IST.HK.19.0530195) | | | | | | | | | | | | | | | | | |
| Açıklamalar <i>Remarks</i> | : Analiz Raporu | | | | | | | | | | | | | | | | | |
| Ölçümün Yapıldığı Tarih <i>Date of Measurement</i> | : 24.04.2019 - 24.05.2019 | | | | | | | | | | | | | | | | | |
| Numunenin Kabul Tarihi <i>The date of receipt of test item</i> | : 30.05.2019 | | | | | | | | | | | | | | | | | |
| Analizin Yapıldığı Tarih <i>Date of Analysis</i> | : 01.06.2019, 11.06.2019 | | | | | | | | | | | | | | | | | |
| Raporun/Eklerin Sayfa Sayısı <i>Number of pages of the Reports/Appendix</i> | : 4 sayfa rapor (7 sayfa ek) | | | | | | | | | | | | | | | | | |
| <p>Türk Akreditasyon Kurumu(TÜRKAK) deney raporlarının tanınması konusunda Avrupa Akreditasyon Birliği(EA) ve Uluslararası Laboratuvar Akreditasyon Birliği(ILAC) ile karşılıklı tanınma antlaşmasını imzalamıştır.</p> <p>The Turkish Accreditation Agency(TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation(EA) and of the International Laboratory Accreditation(ILAC) for the Mutual recognition of test reports.</p> <p>Deney ve/veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (gerekli ve uygun olması halinde) ve deney metodları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.</p> <p>The test and/or measurement results, the uncertainties (if necessary&applicable) with confidence probability and test methods are given on the following pages which are part of this report.</p> <p>(*) İşaretili parametrelerin ölçüm/analizi AB-0012-T TÜRKAK Akreditasyon Belgesi kapsamı dışında, diğer tüm parametrelerin ölçüm/analizi AB-0012-T TÜRKAK Akreditasyon Belgesi kapsamında gerçekleştirilmiştir.</p> <p>(*) Marked parameters' measurement/analysis is realized out of TÜRKAK Accreditation scope with Certificate No AB-0012-T and the rest of all parameters' measurement/analysis is realized within the scope of TÜRKAK Accreditation Certificate No AB-0012-T.</p> | | | | | | | | | | | | | | | | | | |
| Mühür <i>Seal</i> | ARTEK MÜHENDİSLİK ÇEVRE ÖLÇÜM VE DANIŞMANLIK A.Ş. | Tarih <i>Date</i> | | | | | | | | | | | | | | | | |
| | Laboratuvar Birim Yöneticisi Laboratory Executive Özlem GÜLER | 24.07.2019 Laboratuvar Müdürü Head of Testing Laboratory Melahat AYDIN | | | | | | | | | | | | | | | | |
| <p>The reports without stamp and signature are considered to be invalid. The results in the report is belong only to the sample examined. Technical and legal responsibility in defining group and parameters intended of the procedures shall be on the person who takes sample and sampling. This report shall not be copied and duplicated partially without taking permission of our laboratory.</p> | | | | | | | | | | | | | | | | | | |
| <p>İnceleme ve keşif raporları geçerlidir. Raporlar yer alan sonuçlar sadece incelenen numuneye aittir. Analiz yapılan numunede, numunenin altıgünden laboratuvarımıza teslimine kadar olan prosedürleri ve bakılması istenen grup ve parametreleri belirlenmesinde tecrübe ve bilimsel sorumluluk numuneyi örnekleme yapanıdır. Bu rapor, laboratuvarımızca yapıldı izni alınmadan kısmen kopyalanıp çoğaltılamaz.</p> | | | | | | | | | | | | | | | | | | |
| FORM NO:FR.510.02-01 YAYIN TARİHİ: 01.09.2014 | | | | | | | | | | | | | | | | | | |
| REV. NO: 0 REV. TARİHİ: - | | | | | | | | | | | | | | | | | | |

|  <p>TÜRKAK TÜRK AKREDİTASYON KURUMU TURKISH ACCREDITATION AGENCY tarafından akredite edilmiş</p> |  |  <p>TÜRKAK T.C. MİLLÎ EĞİTİM BAKANLIĞI T.C. ÇEVRE, ŞEHİRCİLİK VE KLİMA BAKANLIĞI T.C. İÇİŞLERİ BAKANLIĞI T.C. SAĞLIK BAKANLIĞI T.C. YATIRIM VE EKONOMİ BAKANLIĞI T.C. ENERJİ VE TEKNOLOJİ BAKANLIĞI T.C. KÜLTÜR VE TURİZM BAKANLIĞI T.C. MİLLÎ EĞİTİM BAKANLIĞI T.C. ÇEVRE, ŞEHİRCİLİK VE KLİMA BAKANLIĞI T.C. İÇİŞLERİ BAKANLIĞI T.C. SAĞLIK BAKANLIĞI T.C. YATIRIM VE EKONOMİ BAKANLIĞI T.C. ENERJİ VE TEKNOLOJİ BAKANLIĞI T.C. KÜLTÜR VE TURİZM BAKANLIĞI</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|---|---------------------------|--------------------------------------|--------------------------------------|-------------------|--|--------------------------------------|---|----------------------------|---|----------------------------|-------------------|---------------------------|-----------------|----------------------------|-------------------------|-----------------------|-------------------|------|------|---|--------------|-----------------------|-------------------|------|------|---|--------------|-----------------------|-------------------|------|------|---|--------------|-----------------------|-------------------|------|------|
| <p>ARTEK MÜHENDİSLİK ÇEVRE ÖLÇÜM VE DANIŞMANLIK HİZM. TİC. A.Ş. ÇEVRE LABORATUVARI ANALİZ RAPORU</p> <p>Mehmet Akif Mah. Elmalı Cad. Tarık Buğra Sok. No:15 Ümraniye-İSTANBUL Tel: 0216 499 0 249 (Pbx) Faks: 0216 499 28 68</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Firma Adı GEM SÜRDÜRÜLEBİLİRLİK HİZMETLERİ VE DANIŞMANLIK ANONİM ŞİRKETİ</p> <p>Rapor No/Tarihi PSF 19-028-1 / 24.07.2019</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Tablo 1. Numuneye Ait Bilgiler</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Rapor No / Tarihi</td> <td colspan="3">PSF 19-028-1 / 24.07.2019</td> </tr> <tr> <td>Talep Eden</td> <td colspan="3">GEM SÜRDÜRÜLEBİLİRLİK HİZMETLERİ VE DANIŞMANLIK ANONİM ŞİRKETİ</td> </tr> <tr> <td>Talep Edenin Adresi</td> <td colspan="3">Mustafa Kemal Mah. Dumlupınar Biv. B Blok Apt. No: 266 B/115 Çankaya/Ankara</td> </tr> <tr> <td>Örneğin Getirilişi</td> <td>Yerinden Alınma</td> <td>Örnek Alınma Tarihi</td> <td>24.04.2019 - 24.05.2019</td> </tr> </table> | | | Rapor No / Tarihi | PSF 19-028-1 / 24.07.2019 | | | Talep Eden | GEM SÜRDÜRÜLEBİLİRLİK HİZMETLERİ VE DANIŞMANLIK ANONİM ŞİRKETİ | | | Talep Edenin Adresi | Mustafa Kemal Mah. Dumlupınar Biv. B Blok Apt. No: 266 B/115 Çankaya/Ankara | | | Örneğin Getirilişi | Yerinden Alınma | Örnek Alınma Tarihi | 24.04.2019 - 24.05.2019 | | | | | | | | | | | | | | | | | | | | | | |
| Rapor No / Tarihi | PSF 19-028-1 / 24.07.2019 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Talep Eden | GEM SÜRDÜRÜLEBİLİRLİK HİZMETLERİ VE DANIŞMANLIK ANONİM ŞİRKETİ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Talep Edenin Adresi | Mustafa Kemal Mah. Dumlupınar Biv. B Blok Apt. No: 266 B/115 Çankaya/Ankara | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Örneğin Getirilişi | Yerinden Alınma | Örnek Alınma Tarihi | 24.04.2019 - 24.05.2019 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Bu rapor, Segal Çevre Ölçüm Ve Analiz Laboratuvarı Müh. Müş. San. Tic. Ltd. Şti. tarafından örneklenen ve firmamıza 30.05.2019 tarihlerinde teslim edilen pasif örnekleme tüplerinin analiz sonucunu kapsamaktadır.</p> <p>Bu rapor Kırklareli ili Kırıkköy İlçesi 'Kırıkköy Rüzgar Enerjisi Santrali (RES) Kapasite Artışı Projesi' dahilinde hazırlanmıştır.</p> <p>Ek'te Laboratuvar ile ilgili Belgeler verilmiştir.</p> <p>Bu rapor PSF 19-028 numaralı rapor üzerinden revize edilmiştir. Bu revizyon ile birlikte PSF 19-028 nolu rapor geçersiz kılınmıştır. Raporunda ölçüm sonuçlarına ait Karbon Cinsinden Toplam VOC değerleri eklenerek revize edilmiştir.</p> <p>Bu rapor 2 nüsha asıl olarak hazırlanmış ve müşteriye gönderilmiştir. Bu rapor Laboratuvarımız tarafından elektronik ortamda arşivlenmektedir.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Tablo 2. Analizde Kullanılan Cihazlar ve Metotlar</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Pasif Örnekleme (VOC, NO₂, SO₂)</th> </tr> <tr> <td>Cihaz</td> <td>Pasif Örnekleme Tüpleri</td> </tr> <tr> <td>Metot</td> <td>İşletme içi metot: Pasif örnekleme sonrası, gaz kromatografi metodu TS EN 13528-1</td> </tr> </table> <p>Tüm parametrelerin analizi, AB-0012-T TÜRKAK Akreditasyon Belgesi kapsamında gerçekleştirilmiştir.</p> | | | Pasif Örnekleme (VOC, NO ₂ , SO ₂) | | Cihaz | Pasif Örnekleme Tüpleri | Metot | İşletme içi metot: Pasif örnekleme sonrası, gaz kromatografi metodu TS EN 13528-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pasif Örnekleme (VOC, NO ₂ , SO ₂) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cihaz | Pasif Örnekleme Tüpleri | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Metot | İşletme içi metot: Pasif örnekleme sonrası, gaz kromatografi metodu TS EN 13528-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Tablo 3. Pasif Örnekleme Tüpleriyle Gerçekleştirilen NO₂ ve SO₂ Ölçümlerine Ait Analiz Sonuçları *</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>No</th> <th>Örnekleme Noktası</th> <th>Örnekleme Tarihi</th> <th>Koordinatlar</th> <th>Numune Kodu</th> <th>NO₂ (µg/m³)</th> <th>SO₂ (µg/m³)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1 nolu nokta</td> <td>35 T 588112 - 4615733</td> <td rowspan="5">24.04.2019 - 24.05.2019</td> <td>IST.HK.19.0530191</td> <td>0,42</td> <td>4,52</td> </tr> <tr> <td>2</td> <td>2 nolu nokta</td> <td>35 T 588362 - 4614564</td> <td>IST.HK.19.0530192</td> <td>0,63</td> <td>8,86</td> </tr> <tr> <td>3</td> <td>3 nolu nokta</td> <td>35 T 585991 - 4614791</td> <td>IST.HK.19.0530193</td> <td>0,59</td> <td>9,44</td> </tr> <tr> <td>4</td> <td>4 nolu nokta</td> <td>35 T 588444 - 4612991</td> <td>IST.HK.19.0530194</td> <td>0,49</td> <td>4,09</td> </tr> <tr> <td>5</td> <td>5 nolu nokta</td> <td>35 T 590959 - 4613387</td> <td>IST.HK.19.0530195</td> <td>1,55</td> <td>9,13</td> </tr> </tbody> </table> <p>* Ölçüm sonuçlarına ilişkin değerler laboratuvar LOQ değerleri gözetenek verilmiştir.</p> | | | No | Örnekleme Noktası | Örnekleme Tarihi | Koordinatlar | Numune Kodu | NO ₂ (µg/m ³) | SO ₂ (µg/m ³) | 1 | 1 nolu nokta | 35 T 588112 - 4615733 | 24.04.2019 - 24.05.2019 | IST.HK.19.0530191 | 0,42 | 4,52 | 2 | 2 nolu nokta | 35 T 588362 - 4614564 | IST.HK.19.0530192 | 0,63 | 8,86 | 3 | 3 nolu nokta | 35 T 585991 - 4614791 | IST.HK.19.0530193 | 0,59 | 9,44 | 4 | 4 nolu nokta | 35 T 588444 - 4612991 | IST.HK.19.0530194 | 0,49 | 4,09 | 5 | 5 nolu nokta | 35 T 590959 - 4613387 | IST.HK.19.0530195 | 1,55 | 9,13 |
| No | Örnekleme Noktası | Örnekleme Tarihi | Koordinatlar | Numune Kodu | NO ₂ (µg/m ³) | SO ₂ (µg/m ³) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 1 nolu nokta | 35 T 588112 - 4615733 | 24.04.2019 - 24.05.2019 | IST.HK.19.0530191 | 0,42 | 4,52 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 2 nolu nokta | 35 T 588362 - 4614564 | | IST.HK.19.0530192 | 0,63 | 8,86 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 3 nolu nokta | 35 T 585991 - 4614791 | | IST.HK.19.0530193 | 0,59 | 9,44 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 4 nolu nokta | 35 T 588444 - 4612991 | | IST.HK.19.0530194 | 0,49 | 4,09 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 5 nolu nokta | 35 T 590959 - 4613387 | | IST.HK.19.0530195 | 1,55 | 9,13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>İzinsiz ve kağız raporlar geçersizdir. Raporunda yer alan sonuçlar sadece incelenen numuneye aittir. Analiz yapılan numunede, numunenin alınıp alınmadığına ilişkin olarak laboratuvarımız tarafından laboratuvar prosedürleri ve belirlenen istenen grup ve parametrelerin belirlenmesinde teknik ve bütümlü sonuçlar numuneyi örnekleme yapıldığına aittir. Bu rapor, laboratuvarımızca yapıldığı (isi) olmasına karşın kopyalanıp çoğaltılamaz.</p> | | | | | | Sayfa 2 / 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>FORM NO:FR.510.02-01 YAYIN TARİHİ: 01.09.2014</p> | | | | | | <p>REV. NO: 0 REV. TAR.:</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

TÜRKAK
TÜRK AKREDİTASYON KURUMU
TURKISH ACCREDITATION AGENCY
tarafından akredite edilmiş

**ARTEK MÜHENDİSLİK ÇEVRE ÖLÇÜM
VE DANIŞMANLIK HİZM. TİC. A.Ş.**
ÇEVRE LABORATUVARI
ANALİZ RAPORU

Mehmet Akif Mah. Elalıs Cad. Tarık Buğra Sok. No:15 Ümraniye-İSTANBUL
Tel: 0216 499 0 249 (Pbx) Faks: 0216 499 28 68

Tel:
+90 216 499 0249
AR-5512.1

AB-0012-T

PSF 19-028-1

04.10 - 05.19

Firma Adı GEM SÜRDÜRÜLEBİLİRLİK HİZMETLERİ VE DANIŞMANLIK ANONİM ŞİRKETİ
Rapor No/Tarihi PSF 19-028-1 / 24.07.2019

Tablo 4. Pasif Örneklemeye Tüpleriyle Gerçekleştirilen Ölçüm Sonuçları

| Tüp Kodu | Koordinatlar | Örneklemeye Tarihi | Numune Kodu | Parametre | Sonuç (µg/m³) |
|-----------------|--------------------------|----------------------------|-------------------|-----------------------------|---------------|
| 1 nolu nokta | 35 T 588112 - 4615733 | 24.04.2019 - 24.05.2019 | IST.HK.19.0530191 | Toluen | <0,63 |
| | | | | Etilbenzen | <0,68 |
| | | | | o-Ksilen | <0,71 |
| | | | | m,p-Ksilen | <1,32 |
| | | | | n-Hekzan | 0,44 |
| | | | | n-Heptan | <0,80 |
| | | | | n-Dodekan | <3,62 |
| | | | | n-Tetradekan | <3,13 |
| | | | | Benzen | 0,38 |
| | | | | Toplam VOC (C Cinsinden) | 5,64 |

T.E.: Tespit edilemedi.

Tablo 5. Pasif Örneklemeye Tüpleriyle Gerçekleştirilen Ölçüm Sonuçları

| Tüp Kodu | Koordinatlar | Örneklemeye Tarihi | Numune Kodu | Parametre | Sonuç (µg/m³) |
|-----------------|--------------------------|----------------------------|-------------------|-----------------------------|---------------|
| 2 nolu nokta | 35 T 588362 - 4614564 | 24.04.2019 - 24.05.2019 | IST.HK.19.0530192 | Toluen | 1,01 |
| | | | | Etilbenzen | <0,68 |
| | | | | o-Ksilen | <0,71 |
| | | | | m,p-Ksilen | <1,32 |
| | | | | n-Hekzan | 4,03 |
| | | | | n-Heptan | 1,05 |
| | | | | n-Dodekan | <3,62 |
| | | | | n-Tetradekan | <3,13 |
| | | | | Benzen | 0,41 |
| | | | | Toplam VOC (C Cinsinden) | 13,72 |

Tablo 6. Pasif Örneklemeye Tüpleriyle Gerçekleştirilen Ölçüm Sonuçları

| Tüp Kodu | Koordinatlar | Örneklemeye Tarihi | Numune Kodu | Parametre | Sonuç (µg/m³) |
|-----------------|--------------------------|----------------------------|-------------------|-----------------------------|---------------|
| 3 nolu nokta | 35 T 585991 - 4614791 | 24.04.2019 - 24.05.2019 | IST.HK.19.0530193 | Toluen | <0,63 |
| | | | | Etilbenzen | <0,68 |
| | | | | o-Ksilen | <0,71 |
| | | | | m,p-Ksilen | <1,32 |
| | | | | n-Hekzan | 0,87 |
| | | | | n-Heptan | 0,97 |
| | | | | n-Dodekan | <3,62 |
| | | | | n-Tetradekan | <3,13 |
| | | | | Benzen | 0,46 |
| | | | | Toplam VOC (C Cinsinden) | 8,87 |




T.E.: Tespit edilemedi.

ARTEK MÜHÜRÜ
ÇEVRE LABORATUVARI

Bu rapor ve kapağı raporlar gösterir. Raporla yer alan sonuçlar sadece incelenen numuneye aittir. Analiz yapılan numune, numunenin alındığı laboratuvarımıza teslimine kadar olan prosedürlerin ve bakılması, ölçülmesi ve parametrelerin belirlenmesinde teknik ve bakihi sorumluluk aittir. Bu rapor, laboratuvarımız yazılı bir şekilde kurum kopyasıyla gönderilmektedir.

FORM NO: FR-510-02-01
YAYIN TARİHİ: 01.09.2014

REV. NO: 0
REV. TAR.:
Sayfa 3 / 4

TÜRKAK
TÜRK AKREDİTASYON KURUMU
TURKISH ACCREDITATION AGENCY
tarafından akredite edilmiş



Türk Akkreditasyon Kurumu
TSE EN ISO 15189
AB-0012-T

**ARTEK MÜHENDİSLİK ÇEVRE ÖLÇÜM
VE DANIŞMANLIK HİZM. TİC. A.Ş.**
ÇEVRE LABORATUVARI
ANALİZ RAPORU

Mehmet Akif Mah. Elalmış Cad. Tarık Buğra Sok. No:15 Ümraniye-İSTANBUL
Tel: 0216 499 0 249 (Pbx) Faks: 0216 499 28 68

Firma Adı GEM SÖRDÜRÜLEBİLİRLİK HİZMETLERİ VE DANIŞMANLIK ANONİM ŞİRKETİ

Rapor No/Tarihi PSF 19-028-1 / 24.07.2019

AB-0012-T

PSF 19-028-1

04.19 - 05.19

Tablo 7. Pasif Örnekleme Tüpleriyle Gerçekleştirilen Ölçüm Sonuçları

| Tüp Kodu | Koordinatlar | Örnekleme Tarihi | Numune Kodu | Parametre | Sonuç (µg/m³) |
|-----------------|--------------------------|----------------------------|-------------------|-----------------------------|---------------|
| 4 nolu nokta | 35 T 586444 - 4612991 | 24.04.2019 - 24.05.2019 | IST.HK.19.0530194 | Toluen | <0,63 |
| | | | | Etilbenzen | <0,68 |
| | | | | o-Ksilen | <0,71 |
| | | | | m,p-Ksilen | <1,32 |
| | | | | n-Hekzan | 1,02 |
| | | | | n-Heptan | 0,97 |
| | | | | n-Dodekan | <3,62 |
| | | | | n-Tetradekan | <3,13 |
| | | | | Benzen | 0,52 |
| | | | | Toplam VOC (C Cinsinden) | 6,40 |

T.E.: Tespit edilemedi.

Tablo 8. Pasif Örnekleme Tüpleriyle Gerçekleştirilen Ölçüm Sonuçları

| Tüp Kodu | Koordinatlar | Örnekleme Tarihi | Numune Kodu | Parametre | Sonuç (µg/m³) |
|-----------------|--------------------------|----------------------------|-------------------|-----------------------------|---------------|
| 5 nolu nokta | 35 T 590959 - 4613387 | 24.04.2019 - 24.05.2019 | IST.HK.19.0530195 | Toluen | 1,57 |
| | | | | Etilbenzen | <0,68 |
| | | | | o-Ksilen | 0,77 |
| | | | | m,p-Ksilen | 1,40 |
| | | | | n-Hekzan | 12,66 |
| | | | | n-Heptan | 1,03 |
| | | | | n-Dodekan | <3,62 |
| | | | | n-Tetradekan | <3,13 |
| | | | | Benzen | 0,48 |
| | | | | Toplam VOC (C Cinsinden) | 21,63 |

Sorumlu İmzalar:

Büşra TEZCANLILAR
Raporlama Sorumlusu

Özlem GÜLER
Laboratuvar Birim Yöneticisi

Melihat AYDIN
Laboratuvar Müdürü

ARTEK MÜHENDİSLİK
ÇEVRE ÖLÇÜM VE DANIŞMANLIK A.Ş.

İmzasız ve kapalı raporlar geçerlidir. Raporlar yer alan sonuçlar sadece inceleme amacıyla alınır. Analiz yapılan numune, numunenin alınış şekli, laboratuvarımıza teslimine kadar olan prosedürlerin ve bulundurma süresi grup ve parametrelerin belirlenmesinde teknik ve hukuki sorumluluk numuneyi, örnekleme yapan kişiye aittir. Bu rapor, laboratuvarımızın yazılı izni olmadan başka kimselere kopyalanıp gönderilmez.

FORM NO: PR.510.02-01
YAYIN TARİHİ: 01.09.2014

REV. NO: 0
REV. TAR.:

Sayfa 4 / 4

Appendix C. Social Field Study Photographs



Meeting with mukhtars of Kiyikoy (Kale, Cumhuriyet, Guven), Kislacik and Hamidiye



Interview with the mukhtars of Kiyikoy neighbourhoods



Interview with the mukhtar of Kislacik village



Interview with the Mukhtar of Hamidiye Village



Interview with the members of Kırklareli City Council Environment Unit



Interview with the Vice President of Kiyikoy Development Cooperative



**Interview with the local employees of
The Existing Kiyikoy WPP**



**Interview with the experts
from TurkStream**



**House used by the vulnerable PAP
living in the north of planned T15**



**Barn used by the vulnerable PAP
living in the north of planned T15**



**Interview with a vulnerable PAP
living in the north of planned T15**



**Interview with the owner and user
of 129-31 Parcels**



**Interview with
Women in Kislacik**



**Interview with
a Herd Owner from Kiyikoy**



**Grazing ovines
in Kiyikoy**



**Grazing ovines
in Kiyikoy**



**Interview with beekeepers, livestock owners and
cooperative members in Kislacik**



**Interview with beekeepers, livestock owners and
cooperative members in Kislacik**



Interview with beekeepers, livestock owners and cooperative members in Kislacik



Interview with beekeepers in Kiyikoy



Kiyikoy Municipality Beach



Wood stocks by the roadside in Kiyikoy

Appendix D. Supplementary Documents for Cultural Heritage Surveys And Assessments

Appendix D.1. Intangible Cultural Heritage Questionnaire

| No. | Question |
|-----|--|
| 1) | Gender |
| 2) | Age |
| 3) | Name |
| 4) | Do you have information about the Kiyikoy Wind Power Plant Project and the project site? |
| 5) | Do you have information about the immigrant families who had settled in your village or in the nearby region after 93 War? |
| 6) | Are there oral memories connected to the village and project area about the '93 War? |
| 7) | Do you have oral traditions/expressions in your village/ neighbourhood concerning the Project site or its nearby area? (Such as fairy tales, lullabies, legends, beliefs, heroic stories, idioms, proverbs, folk songs, etc.) |
| 8) | Do you have ceremonies related to important events in the daily life of the village residents or people living in the Project field or the surrounding area? (Such as wedding, dowry, circumcision, military drafting, birth, death, cemetery, etc.) If so, is the area you are performing these rituals in or near the Project area? |
| 9) | Are there special gathering places in the village which are used for social events, celebrations or chat meetings, and connected to the project area or surroundings? (village coffee shop, boy's rooms etc.) |
| 10) | Do you have local traditional organizations which are connected to the project area or its surroundings? (Such as crafts associations, cooperatives, "Yaren" organisations, youth organisations, etc.)" |
| 11) | Do you practise traditional medicine and healing methods in your village/ neighbourhoods that connected to project area or its surroundings? (Such as osteopath, bone setters, hernia healers, herbalists, etc.) If so, are there any plants or natural resources collected from the project area or surroundings? |
| 12) | Are there any traditional weather forecasting methods used in your village/ neighbourhood that is connected with the Project area and surroundings? (Such as "cloud crest on top of a mountain, wind blowing, etc.) |
| 13) | Do you have traditional, calendar based, social activities which are realized in the project area and surroundings? (Hidirellez nawruz, celebration, harvest season, cherry festival, etc.) |
| 14) | Are there traditional production activities used by the village people for economic and/or consumption purposes which are related to the project area and surroundings? (Such as Fishing, lumbering, oak coal manufacturing, animal feed production, mining, agriculture, animal husbandry, herb collecting, preparation for winter, plow etc.) If so, are they dependent on the project area and surroundings for necessary raw materials or for the manufacturing processes? |
| 15) | Are there any local measurement systems used in the village? If so, are they connected to the project area and surroundings? |
| 16) | Are there special dates reserved for commemoration of important traditional/historical events or for festives in your village? (such as Independence Day, Victory Day, Karagöz and Kakava festivals). If so, are there any places in the project area used for such purposes? |
| 17) | Do you have traditional beliefs and practices which are connected with the project area? (Such as evil eye talisman, good luck amulets and devotion places, wish trees etc.). |

| No. | Question |
|-----|---|
| 18) | Do you have local/traditional child or adult games in your village and surroundings? (Such as camel wrestling, swing, roping, etc.) If so, do traditional playgrounds exist in the project area? |
| 19) | Do you have traditional folk dances or stories about them in your village / neighbourhood? (Zeybek, halay, çiftetelli, Hora etc.) If so, are there any special places in the project area used or mentioned related to them? |
| 20) | Do you have traditional instruments and folk music in your village / neighbourhood? (Such as flute, squash instrument, clarinet, drum, ballad etc.) If so, are they connected to project area in terms of raw materials used in making the instruments, or tools needed? |
| 21) | Are there any traditional handicraft production in your village? (Such as weaving, needlework, felt, leather processing, glass work, pottery, basket making, wire winding, leatherwork, wool work, etc.). If so, are they connected with project area for finding raw materials or as workshop place? |
| 22) | Are there any traditional materials that local people use in building construction? (Mudbrick, stone, wood, clay, sand, etc.) If so, is the project area involved in collecting raw materials or for means of production such as drying the bricks etc.? |
| 23) | Are their local, traditional nutrition and food processing techniques? (Stone milled olive oil, bread, yoghurt, tarhana, village oven, etc.). If so, are you collecting any herbs, fruits etc. in the project area or is there any special place used in making them and connected with the project? |

Appendix D.2. Edirne Regional Board for Conservation of Cultural Assets regarding the 3rd Degree Archaeological Site located within the License Area (in Turkish)

39.08.299

T.C.
KÜLTÜR VE TURİZM BAKANLIĞI
EDİRNE KÜLTÜR VARLIKLARINI
KORUMA BÖLGE KURULU
K A R A R

Toplantı Tarihi-No : 16.10.2017 - 237
Karar Tarihi ve No : 16.10.2017 - 4487

Toplantı Yeri
EDİRNE

Kırklareli İli, Vize İlçesi, Kayıköy Beldesi, Kerpiçe Mevkii, sit alanı dışında kalan, devlet ormanı vasıfı 325 ada, 1 parselde yer alan, nekropol alanı ve kilise kalıntısının bulunduğu alanın, 2863 sayılı yasanın 6. ve 7. maddeleri gereği, ekli 1/25000 ölçekli paftada belirlenen koordinatlı sınırları itibarıyla 3. Derece arkeolojik sit alanı olarak tescil edilmesi istemine ilişkin hazırlanan raporların raporu ekunda, dosyası incelendi, yapılan görüşmeler sonunda;

Kırklareli İli, Vize İlçesi, Kayıköy Beldesi, Kerpiçe Mevkii, sit alanı dışında kalan, devlet ormanı vasıfı 325 ada, 1 parselde yer alan, nekropol alanı ve kilise kalıntısının bulunduğu alanın, 2863 sayılı yasanın 6. ve 7. Maddeleri gereği ekli 1/25000 ölçekli paftada belirlenen koordinatlı sınırları itibarıyla 3. Derece arkeolojik sit alanı olarak tescil edilmesine, Tasınmazlarda Koruma Amaçlı İçer Planı yapıluncaya kadar Koruma Yüklsek Kurulunun 05.11.1999 gün ve 658 sayılı ilke kararında yer alan 3. Derece arkeolojik sit alanı hükümlerinin geçiş dönemi koruma esasları ve kullanma koşulları olarak belirlenmesine karar verildi.

ASLI GİBİDİR

Yusuf SAMİ OĞLU
Müdür V.

BASKAN
Fikret DAYIÇAN
(İMZA)

BASKAN YARDIMCISI
İsmet OSMANOĞLU
(İMZA)

ÜYE
Mehmet HÜNDAR
(İMZA)

ÜYE
Nurhan ÇAKIR
(İMZA)

ÜYE
Ali YALÇINKAYA
(İMZA)

ÜYE

ÜYE

ÜYE
Nesrin ÖZDEMİR
Kayıköy Bölge Müdürü V.
(İMZA)

ÜYE
Kayıköy Bölge Müdürü
(İMLİNMADDE)

ÜYE



Appendix D.3. Edirne Regional Board for Conservation of Cultural Assets' Clearance Letter regarding the Non-Registered Potential Site Identified near T18 (in Turkish)





T.C.
KÜLTÜR VE TURİZM BAKANLIĞI
Kültür Varlıkları ve Müzeler Genel Müdürlüğü
Edirne Kültür Varlıklarını Koruma Bölge Kurulu Müdürlüğü

Sayı : 47794850-169,12-E.532714
Konu : Kırklareli, Vize, Kırıkköy RES (39.08.297)

27.06.2019

ALENKA ENERJİ ÜRETİM VE YATIRIM A.Ş.NE
Büyükdere Caddesi No: 257 Nurel Plaza B Blok, Kat: 4 34485 Maslak Sarıyer / İstanbul

İlgi : a) 19.06.2017 tarihli ve 1165 sayılı yazımız.
b) 07.02.2018 tarihli ve 114209 sayılı yazımız.
c) 16.05.2019 tarihli ve 19/015 sayılı yazımız.

Kırklareli İli, Vize İlçesi, Kırıkköy Beldesi sınırları içinde tesis edilen Kırıkköy Rüzgâr Enerji Santralinde mevcut türbinlere ilave olarak yapılacak 21 adet türbine ait koordinatlar ile tarafımızca proje alanında tespit edilen ve kültür varlığı olabileceği belirtilen kalıntılara ilişkin bilgilerin iletildiği ilgi (c) yazınız ile ekleri incelenmiştir.

Kapasite artışı projesi kapsamında yapılacak 21 adet türbine ilişkin görüşümüz ile konuya ilişkin alınan 05.02.2018 tarihli ve 4840 sayılı kural kararı ilgi (a) ve (b) yazılarımız ile iletilmiş; *III. derece arkeolojik sit alanı olarak tescilli nekropol alanı ve kabile kalıntısının koordinatlı sınırları içinde herhangi bir uygulama yapılması koşulu ile söz konusu çalışmanın yapılmasının uygun olduğu* bildirilmiştir.

Kalıntıların bulunduğu belirtilen 18 numaralı türbin noktası ve çevresinde 12.06.2019 tarihinde Müdürlüğümüz uzmanlarıarca yapılan incelemelerde, T18 noktasına yakın komanda bulunan kalıntıların 2863 sayılı Kanun kapsamına girebilecek özellikler taşımadığı tespit edildiğinden ilgi (a) ve (b) yazılarımız doğrultusunda uygulamanın yapılmasında herhangi bir sakınca bulunmamaktadır.

Yapılacak inşaat ve fiziki müdahaleler sırasında kültür varlığı niteliği taşıyabilecek herhangi bir buluntuya rastlanılması durumunda, 2863 sayılı Kanunun 4 üncü maddesi gereği, çalışmanın durdurulup en yakın mülki idare amiri veya Müze Müdürlüğüne bilgi verilmesi gerekmektedir.

Bilgilerinizi ve gereğini rica ederim.


Yusuf ŞAMİLOĞLU
Müdür

Not: 30770 sayılı Elektronik İmza Kanunu gereği bu belge elektronik imza ile imzalanmıştır.

Elektronik Doğrulama Kodu : 020107000AM10277V7NCTUTrnkTulqg Adres: <http://belgebilgisi.genelkurum.gov.tr>
Mimarif Cad. No: 20 Merkeze / EDİRNE
Telefon No : (284) 213 04 91 Belgeçeperi No : (284) 212 61 21
e-posta : edimaskimisi@kulturturizm.gov.tr
Kep Adresi : edimaskimisi@isbtl.kep.tr

Bilgi için: Huzur KAYA
Arkeolog



Appendix E. Environmental and Social Management System

Appendix E.1. Health, Safety, Environment and Energy Policy



HEALTH, SAFETY, ENVIRONMENT AND ENERGY POLICY

Borusan EnBW Energy in order to create a more safe at work, protect the environment, sustain energy efficiency and contribute the social development by making continuous improvements in its processes.

As Borusan EnBW Energy, in order to create a more safe and healthy working environment for our employees, customers, suppliers and local people in the activity areas, to reach the ideal of "Zero Occupational Accident", protect the environment that we live in and to improve our energy performance continuously, we commit;

- To abide by all related national and international legislations, standards, laws, regulations and other requirements concerning Occupational Health and Safety, Environmental Protection and our Energy activities,
- To create a benchmark in our sector by performing related studies through determining all hazards and other associated risks and by planning necessary precautions to eliminate or to mitigate those risks - which materializes or can be materialize as a result of our activities - to minimum level,
- Believing that all accidents and occupational diseases can be prevented, forming a positive Health and Safety culture with the active participation of the all employees by leading health and safety at work in their own responsibility areas and with the awareness of the their duty and responsibilities, and creating projects that keep the effects on the environment and the local residents in which we operate at the minimum level, keeping under control and auditing these projects periodically,
- To avoid waste as much as possible and ensuring disposal of waste which cannot be avoided in a way which does not harm the environment,
- To prevent environmental pollution and to protect natural life in our activity areas, to reduce natural resource consumption to the minimum level,
- To keep open to the access and audit of the related parties and continuously auditing the established integrated management system and this system's activities,
- To be the leader in the sector by making improvements in HSE and Energy and related processes based on the continuous improvement principles
- To manage Health and Safety, Environment and Energy management system requirements in the line with the standards and providing all necessary resources to realize this,
- To consider energy efficiency while creating all our processes from the beginning of the design stage,
- To buy energy efficient products and services to continuously improve our energy performance,
- To keep track of our established goals and targets on a regular basis and to provide the necessary knowledge and resources to achieve these goals and targets,

Mehmet Acarlı
General Manager

**ALENKA
ENERJİ**

Appendix E.2. Social Guidelines

BEE Saha Çalışanları İçin Sosyal Kılavuz İlkeler

Social Guidelines for the BEE Site Personnel



Tüm BEE partisi ve işletmelerinde geçerlidir.
Valid for all BEE site & operations.

Bu doküman saha çalışanlarının paydaşlarla etkileşiminde uygun gerekçe olarak kullanılmalıdır.
The Document briefly explains the manner and the code of conduct of site personnel in contacting with the stakeholders.

BEE SAHA ÇALIŞANLARI İÇİN SOSYAL KILAVUZ İLKELER

BEE işletme ve partisi saha çalışanları bu kılavuzla ilgili olan BEE çalışanlarıdır.

1. Sağta yerli halk olarak sizleri tüm paydaşlarla ilgili ve yardımcıları için polise davet ederiz.
2. Paydaşların gelen soru, şikâyet, talep ve önerileri:
 - a. iletildiği durumlarda;
 - b. PRO-PR-02 Sosyal Soru ve Şikâyet Mekanizması Prosedürüne uygun olarak Proje Sosyal Sorumlulukları Yönetim Sistemi;
 - c. herhangi başka bir prosedürde ayrılmışta yerli, dışarıdan kabul etmiş veya red edilmiş şikâyetlerin olduğu konularında bildirilmelidir.
3. Paydaşlara yetkileri dışında hiçbir taahhüt vermemelisiniz, bu tür taahhütleri ancak sahada yetkili olan Proje Müdürü ya da İşletme Müdürü'nün, Sosyal Soru ve Şikâyet Mekanizması anıyından sonra verebileceğini hatırlatmalısınız.
4. T.C. Kanun ve uygulamaları ile genel ahlak ve etik kurallara bağlı olan, ayrımcılık yapma (yaş, cinsiyet, etnik köken, din, yerel tür, etnik köken), hakaret ve aşağılama içeren vb. cezai ve hukuki sorumluluk dışı olan eylemlere ve davranışlardan kaçınmalısınız.
5. Fiziksel saldırıyla karşılaşılma durumunda kendinizi koruma durumları hakkı olarak sizleri, fiziksel saldırı ile ilgili kurullarda, böylece durumları kurumsal soruşturma, hukuki ve insan kaynakları bölümleri ile bildirmelisiniz.
6. Kanun dışı olarak yetkileri dışında hiçbir kurumsal soruşturma dışında yapılmış soruşturmalar, BEE işleri, TV, radyo, internet, sosyal medya ve benzeri araçlar üzerinden herhangi bir açıklama yapılmamalıdır.
7. Sosyal medya kullanırken Borusan Holding Sosyal Medya Politikaları Uygulama Esasları uygulanmalıdır.

BEE Saha Çalışanları İçin Sosyal Kılavuz İlkeler, BEE alt yüklenicilerinin çalışanları için de bağlayıcı niteliğe sahip ilgili sözleşmelere dâhil edilmelidir.

SOCIAL GUIDELINES FOR THE BEE SITE PERSONNEL

All BEE operation or site personnel and employees visiting those sites are required.

1. to behave in a respectful and helpful manner towards all stakeholders especially to local people;
2. In case of questions, requests, complaints and recommendations raised by the stakeholders:
 - a. To initially listen them;
 - b. To guide them to Project Social Officers in line with PRO-PR-02, Social Monitoring and Grievance Mechanism;
 - c. to explain openly to the stakeholder that they are only in charge guiding them, but not authorized to accept or reject directly by themselves
3. not to give any kind of commitments to the stakeholders exceeding their authority and inform them that unless Project Manager or Operation Manager is directly authorized to make such commitments only after approval of Social Monitoring and Grievance Mechanism;
4. to refrain from declarations and behaviors violating the Turkish Laws and regulations as well as general moral and ethical rules, discriminating age, gender, race, color, religion, life-style, ethnic origin and insulting and degrading that could result in penalty or have legal repercussions;
5. not to show any physical reaction in response to an immediate physical attack except for self-defense reasons, inform Corporate Communications, Legal and Human Resource Departments;
6. if not authorized as corporate spokesperson, not to make any declaration to the any kind of press, TV, radio, internet, social media or similar tools concerning BEE, itself, its power plant projects and/or power plants without the written consent of Corporate Communications Department;
7. to abide by the Implementation Principles on Social Media Policies published by the Borusan Holding in their social media use.

Social Guidelines for the BEE Site Personnel shall also be binding upon the project subcontractors and their staff and shall be incorporated into relevant contracts with them.

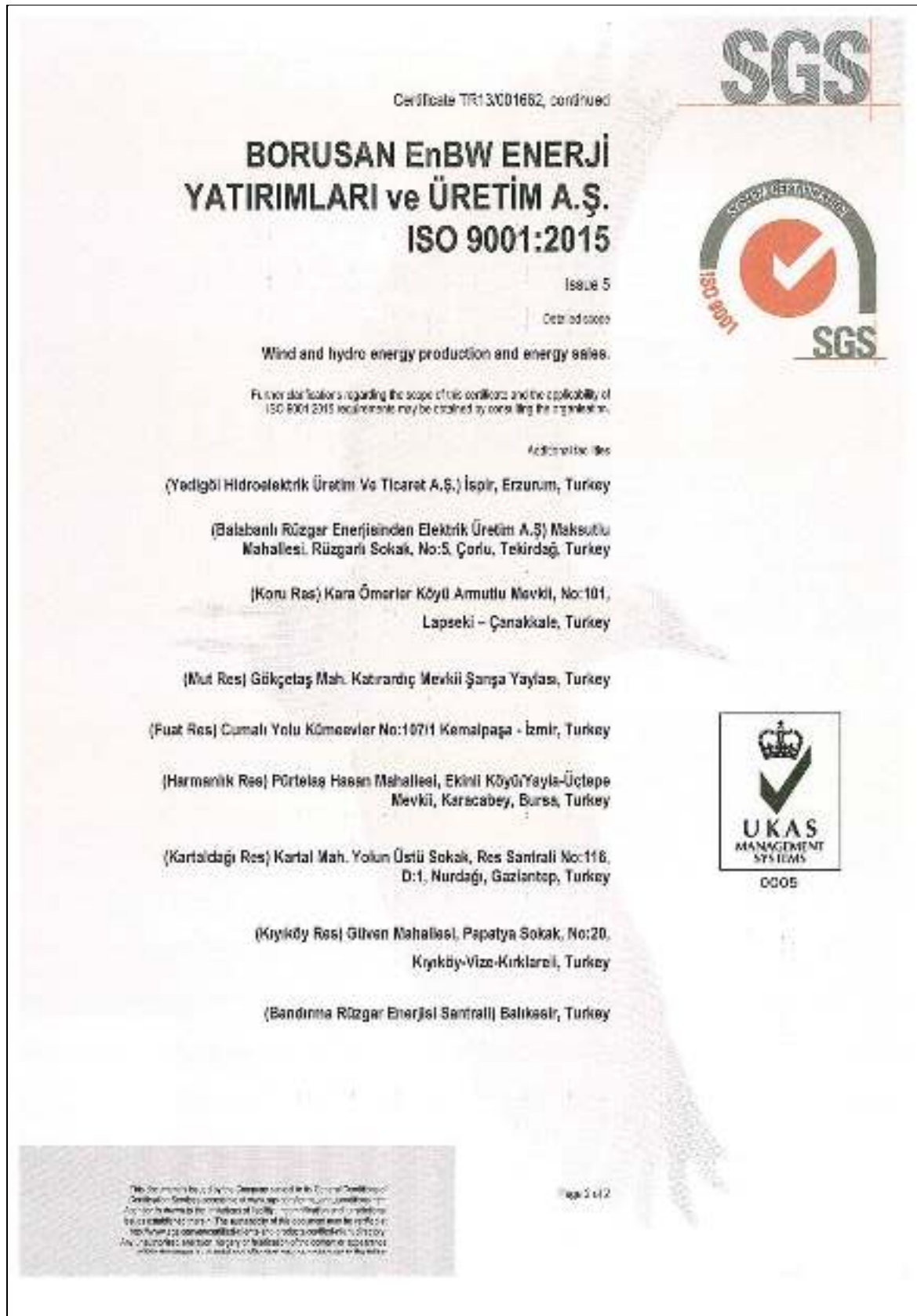


**ALENKA
ENERJİ**

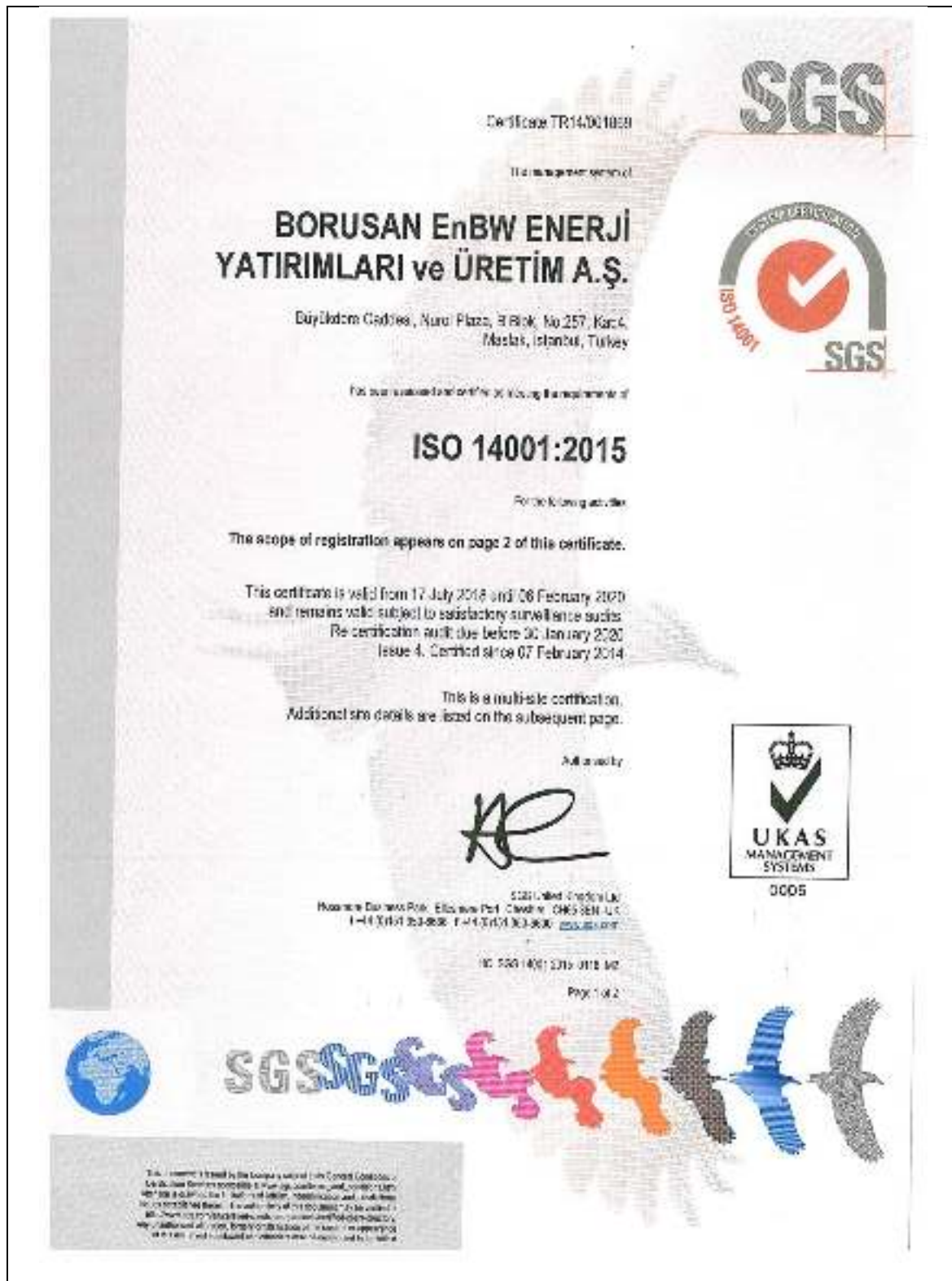
Appendix E.3. ISO/OHSAS Certifications Valid for the Project

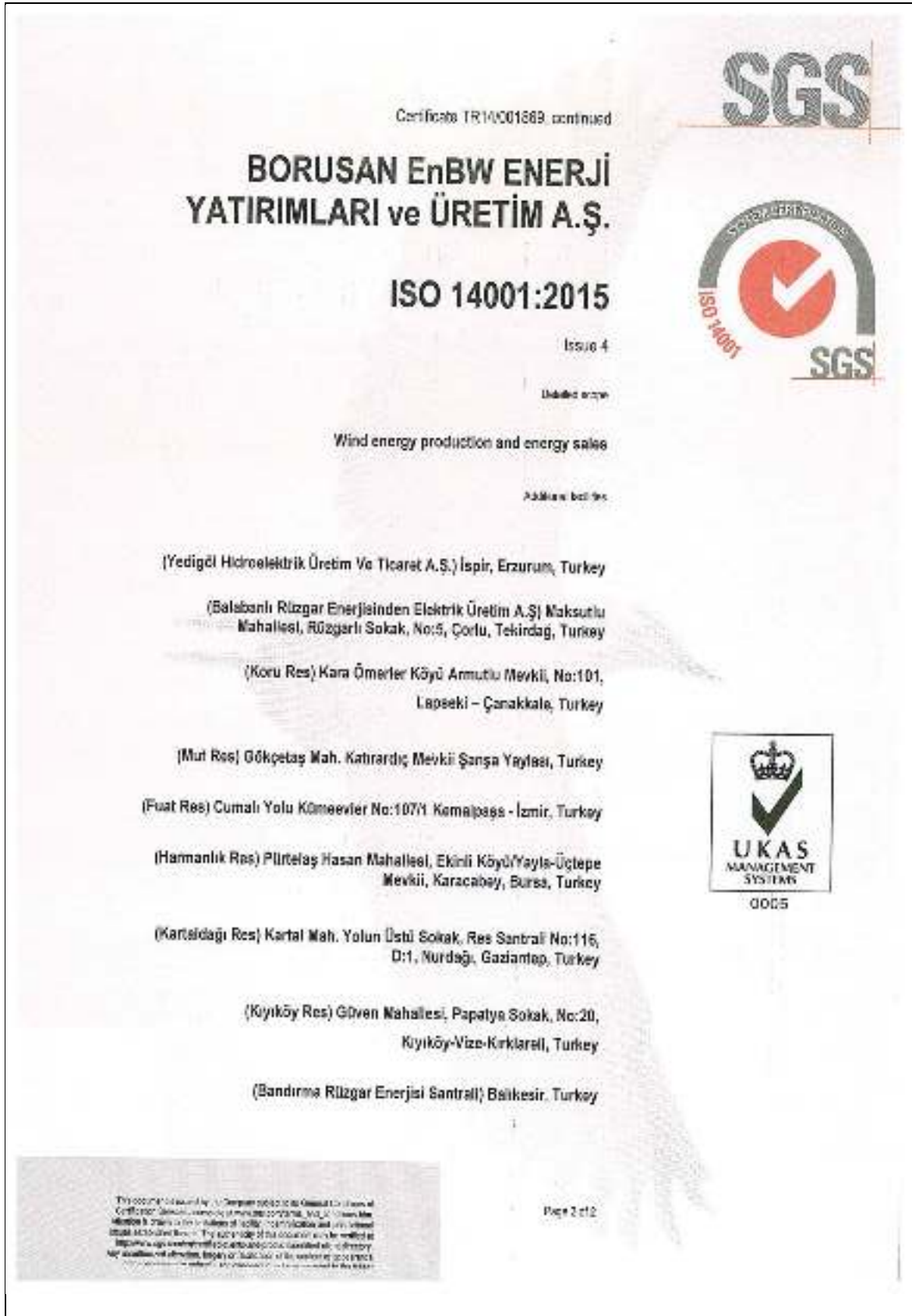
E.3.1. ISO 9001: 2015





E.3.2. ISO 14001: 2015





SGS

Certificate TR14001870

The management system of

**BORUSAN ENBW ENERJİ
YATIRIMLARI ve ÜRETİM A.Ş.**

Buyukdere Caddesi, Nurel Plaza, B Blok, No:257, Kat:4,
Maslak, İstanbul, Turkey

has been assessed and certified as meeting the requirements of

OHSAS 18001:2007

for the following activity(ies)

The scope of registration appears on page 2 of this certificate.

This certificate is valid from 17 July 2018 until 08 February 2020
and remains valid subject to satisfactory surveillance audits.
Re certification audit due before 08 January 2020
Issue 4. Certified since 07 February 2014

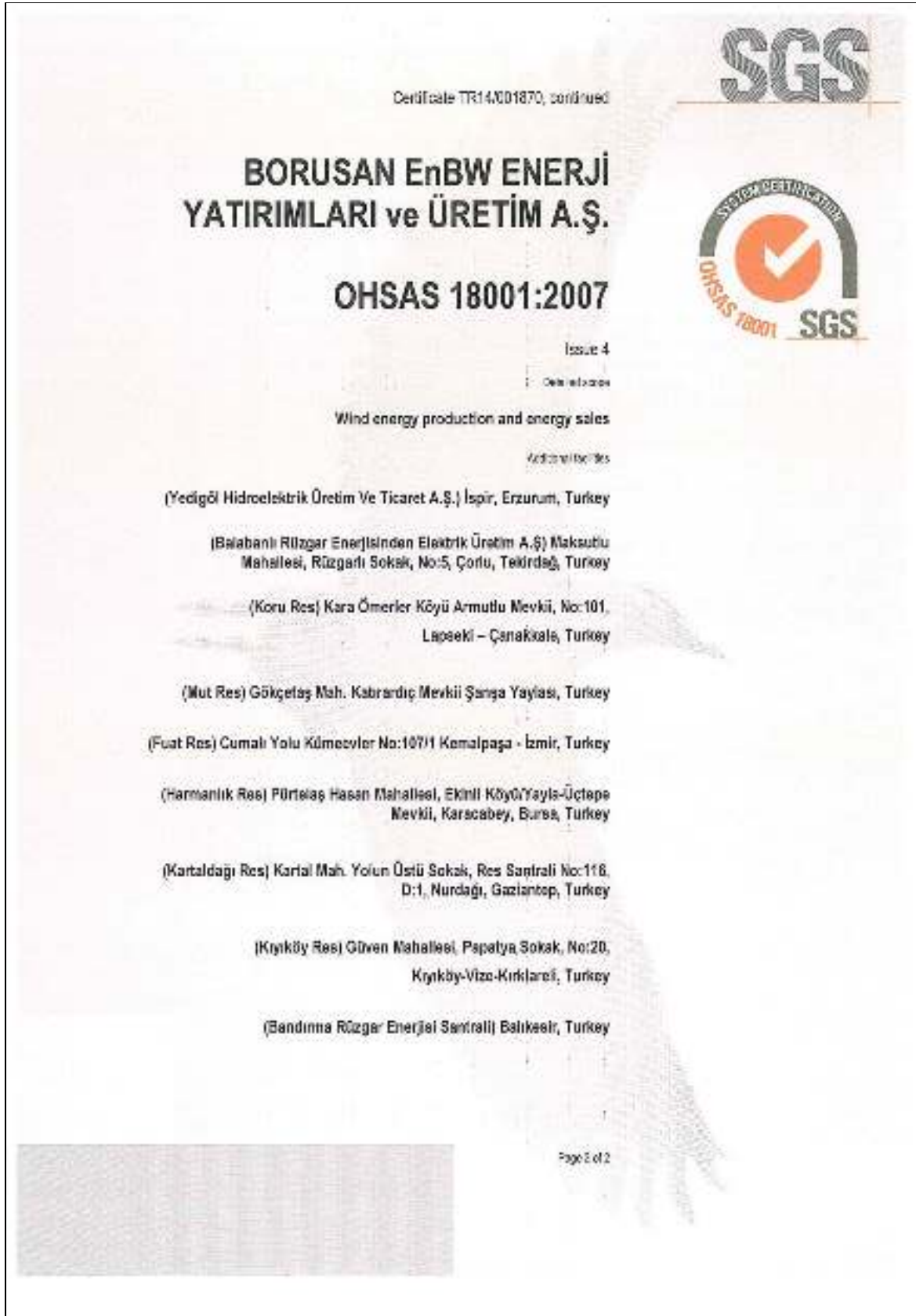
This is a multi-site certification.
Additional site details are listed on subsequent pages.

Authorized by

0202 Başbakanlık Caddesi Blok Kentsel Servis A.Ş.
Çağdaşlar 3.0 Enerji Yatırımları
Büyükdere Mah. Çarşı Caddesi Kat: 4/45
İstanbul / Turkey K. Gölge 04 206 63 00 61 / 04 206 63 00 62
0012 - 265 40 10 - 0012 - 246 42 87 83 www.tsgs.com.tr

Page 1 of 2

This document is issued by the SGS Certification Ltd. (SGS) on behalf of the
Certification Services (SGS Certification Services) and is subject to the
conditions of the SGS Certification Services. The validity of this document is subject to the
requirements of the OHSAS 18001:2007 standard. The document is issued on the basis of the
information provided by the client and is not a guarantee of the accuracy of the information.
The document is issued on the basis of the information provided by the client and is not a
guarantee of the accuracy of the information. The document is issued on the basis of the
information provided by the client and is not a guarantee of the accuracy of the information.



Appendix F. Environmental and Social Management and Monitoring Plan

The Project Environmental and Social Management System (ESMS) is developed as part of the ESIA process and aims to provide a structured approach for the management of environmental and social (E&S) issues throughout all phases of the Project in line with the Project Standards. The Project ESMS has aimed to provide an appropriate approach to the management of E&S performance in line with the nature and scale of the Kiyikoy WPP Project.

The E&S Management and Monitoring Plan (ESMMP) of the Project is prepared as given in Table 18-2 as part of the ESIA process with the aim of implementing environmentally and socially sound practices that are required to avoid and where not possible, minimise the Project's potential E&S impacts. The ESMMP reflects and measures the implementation performance of mitigation measures addressing the identified E&S impacts and outlines an overall approach to monitoring. It will be implemented jointly with subject specific environmental and social management plans.

The Project Company (ALENKA Enerji Üretim ve Yatırım A.Ş.) will be the main responsible to develop and implement the specific E&S Management Plans and ensure the implementation of the measures outlined within this ESMMP and the specific E&S Management Plans by all direct and contracted Project personnel.

Appendix F.1. Project ESMMP

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|--|-------------------------------------|--|--|---|---|
| Land Use | | | | | |
| Impact on forest land | • Land preparation and construction | Forest parcel no. 325/1 in Kiyikoy Forest parcel no. 101/246 in Kislacik | <ul style="list-style-type: none"> Implement Biodiversity Action Plan Implement Habitat Restoration (Rehabilitation) Plan | <ul style="list-style-type: none"> Habitats restored as per the Habitat Restoration Plan | <ul style="list-style-type: none"> Biodiversity Action Plan Habitat Restoration (Rehabilitation) Plan |
| Impact on agricultural lands | • Land preparation and construction | Parcel no.129/27 Parcel no.129/31 | <ul style="list-style-type: none"> Implement Livelihood Restoration Plan (LRP) | <ul style="list-style-type: none"> LRP measures in place LRP budget allocated and disbursed as per the LRP | <ul style="list-style-type: none"> Livelihood Restoration Plan (LRP) |
| Impact on pasture | • Land preparation and construction | Parcel 101/206 | <ul style="list-style-type: none"> 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. | | |
| Topsoil stripping | • Land preparation and construction | Topsoil corresponding to footprint areas of Project units | <ul style="list-style-type: none"> Storage areas for temporary topsoil storage will be selected at locations with low slopes (less than 5%) and sparse vegetation, where possible. The height of the topsoil stockpiles will not exceed 1.5 meters (which requires approximately 5 ha total surface area for topsoil storage sites, which can be provided at multiple locations within the License Area) Where possible, it will be ensured that topsoil storage durations do not exceed three months. In case of longer storage durations, the upper part of the fertile soil will be maintained fertile by using suitable species and seed mixture ratios where necessary. For the flora species (<i>Crocus olivieri subsp. Istanbulensis</i>) that requires conservation, the topsoil stripping, storage and reinstation will be provided in line with the Project BAP. Topsoil storage areas will be provided with drainage by means of open channels. Topsoil will be reused for the rehabilitation of the construction sites. Subject to Forest Authorities' approval, if there is an excess of topsoil, farmers in Kiyikoy and Kislacik will be consulted to identify their potential needs for topsoil. The PAPs affected by the Project-related land acquisition will be prioritised. | <ul style="list-style-type: none"> Appropriate topsoil storage locations identified Topsoil stored in line with the quality and storage condition requirements Topsoil use during rehabilitation works If there is an excess topsoil, subject to approval by the authorities, consultation records with farmers for potential topsoil transfer to affected PAPs | <ul style="list-style-type: none"> Biodiversity Action Plan Habitat Restoration (Rehabilitation) Plan |
| Noise | | | | | |
| Noise generation due to construction | • Land preparation and construction | N-01 (210 m northeast of T15), N-02 (2,580 m south of T34), N-03 (on the main access road) | <ul style="list-style-type: none"> Project-specific Noise Management Plan will be implemented by the Project Company and the contractors (through contractual requirements). All Project personnel including direct and contracted workers will be trained on the implementation of Noise Management Plan The Project Company will enforce speed limits for the Project vehicles that will transport construction materials/equipment along the existing main access road. The Project Company will consult with the user of the building located in the north of T15 (within the setback distance of T15) prior to the start of and during the construction activities to be conducted at this location in order to inform the user about the scope and duration of the activities and mitigate the potential impacts for the period of construction at this turbine site. Project-specific Stakeholder Engagement Plan will be implemented to address any noise-related grievance and plan/take corrective actions, where necessary. To verify compliance with Project standards, noise monitoring will be conducted one-off at each NSR identified in this ESIA, at the peak period of construction works to be conducted in the vicinity of the relevant NSR and also in case of receipt of noise-related grievances. | <ul style="list-style-type: none"> Noise monitoring results not exceeding the Project Standards | <ul style="list-style-type: none"> Noise Management Plan Stakeholder Engagement Plan |
| Noise generation due to operation of wind turbines | • Operation | N-01 (210 m northeast of T15) | <ul style="list-style-type: none"> The Project Company will further engage with the vulnerable PAP living in the setback distance of T15 during the ESIA public disclosure period regarding relocation and inform the PAP on the potential operational noise impacts of the Project based on the findings of the ESIA and the proposed mitigation measures including the option for relocation during the construction and operation. Based on the engagement, the Project Company will document vulnerable PAP's willingness or unwillingness to relocate during the ESIA public disclosure period. In case the vulnerable PAP declares his unwillingness to relocate during the ESIA disclosure period, the Project Company will recognise the right of the PAP to choose relocation until the end of second year of operation. <p><u>If the PAP is willing to relocate:</u></p> <ul style="list-style-type: none"> If the PAP is willing to relocate, a RAP will be prepared in line with EBRD PR5, submitted to Lenders for approval and implemented for the vulnerable PAP living in the setback distance of T15. <p>The RAP will ensure that the operational noise impact on the vulnerable PAP is avoided at the resettlement site, which will provide adequate housing with improved living conditions, where the PAP would feel himself comfortable to stay (considering his vulnerability) and continue his current economic activities, if there is any.</p> | <ul style="list-style-type: none"> Noise monitoring results not exceeding the Project Standards Consultation records with the PAP | <ul style="list-style-type: none"> Stakeholder Engagement Plan |

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|--|--|---|--|---|--|
| | | | <p><u>If the PAP is unwilling to relocate:</u></p> <ul style="list-style-type: none"> If the PAP is unwilling to relocate, the noise impact will be monitored at N-01 through monthly measurements to be conducted by an accredited laboratory (for 48 hours each month) during the first year of operation of T15. The Project Company will ensure on-going engagement (e.g. at least monthly) with the vulnerable PAP throughout the first year of operation. The monitoring results will be evaluated on a monthly basis and corrective measures will be developed and implemented progressively at the end of each monthly monitoring campaign (implementation of corrective measures will be completed within 3 months following the monthly monitoring). The complete set of the monitoring results (consisting of monthly monitoring data collected throughout the first year of operation) will be evaluated collectively at the end of the first year of operation. Based on the evaluation of monthly monitoring results to be obtained throughout the first year of operation and outcomes of the on-going engagement to be conducted with the vulnerable PAP, corrective measures will be developed in consultation with the vulnerable PAP and the owner of the building and implemented with a mutually agreed method that will be approved by Lenders (implementation of corrective measures will be completed within 3 months after the end of the first year of operation, whenever technically feasible). These measures will include the following: <ul style="list-style-type: none"> Provision of proper insulation for the relevant elements of the building (including façade, windows, walls and roof structure) resided by vulnerable PAP. At T15, blades will be equipped with serrated trailing edges to reduce maximum sound level at this turbine. Adjusting turbine noise as a function of reducing power output. Throughout the second and third years of operation, the residual noise impact, after the implementation of corrective actions, will be monitored through quarterly measurements to be conducted at N-01 by an accredited laboratory for 48 hours. The Project Company will continue engagement with the vulnerable PAP through face to face meetings to be undertaken semi-annually after the third year of operation until the end of financing period. Project Grievance Mechanism will be implemented throughout the operation to address any noise-related grievance and plan/take corrective actions, where necessary (e.g. adjustment of turbine operation modes at certain periods such as high wind speeds). | | |
| Noise generation due to operation of wind turbines | Operation | N-02 (2,580 m south of T34) | <ul style="list-style-type: none"> Project-specific Stakeholder Engagement Plan will be implemented to address any noise-related grievance and plan/take corrective actions, where necessary (e.g. adjustment of turbine operation modes at certain periods such as high wind speeds). | <ul style="list-style-type: none"> No noise related grievance to be received | <ul style="list-style-type: none"> Stakeholder Engagement Plan |
| Air Quality and GHG Emissions | | | | | |
| Emissions to air due to construction activities | <ul style="list-style-type: none"> Land preparation and construction | <ul style="list-style-type: none"> Residential Receptor (measurement location A-01), Residential Receptor (measurement location A-02), Residential Receptor on the main access road (measurement location A-03), Unused/unoccupied coastline outside the License Area Border (measurement location A-04), Residential Receptor on the main road to Kiyikoy (measurement location A-05) | <ul style="list-style-type: none"> Project-specific Air Quality and GHG Management Plan will be implemented by the Project Company and the contractors (through contractual requirements). All Project personnel including direct and contracted workers will be trained on the implementation of Air Quality and GHG Management Plan. The Project Company will enforce speed limits for the Project vehicles that will transport construction materials/equipment along the existing main access road. Loading and unloading of material will be carried out without scattering. Excavated soils will be stockpiled (as necessary) at designated areas. Loose materials will be properly covered, or top layers will be kept moist on dry periods. Vehicles carrying excavated materials will be covered. Dust suppression methods such as water spraying will be applied at dust generating areas especially during dry weather conditions. Access roads and internal roads will be covered with plant mix. Speed limitations will be applied for vehicles. Upper layers of the excavated material stored will be kept at a humidity level of about 10%. Construction vehicles/equipment will be prevented from idling and running unnecessarily. Regular maintenance of vehicles/equipment. Project-specific Stakeholder Engagement Plan will be implemented to address any air quality-related grievance and plan/take corrective actions, where necessary. To verify compliance with Project standards, air quality (PM10 and PM2.5) monitoring will be conducted one-off at receptors A-01, A-02 and A-03 at the peak period of construction works and also in case of receipt of noise-related grievances. | <ul style="list-style-type: none"> Air quality monitoring results not exceeding the Project Standards No air quality related grievance to be received | <ul style="list-style-type: none"> Air Quality and GHG Management Plan Transportation and Traffic Management Plan Stakeholder Engagement Plan |
| Water and Wastewater | | | | | |
| Impact on the quality and quantity of nearby water resources | <ul style="list-style-type: none"> Land Preparation and Construction Operation | Surface water/ Groundwater | <ul style="list-style-type: none"> Project-specific Waste Management Plan, Hazardous Materials Management Plan, Emergency Preparedness and Response Plan will be implemented by the Project Company and the contractors (through contractual requirements) to ensure efficient water use and avoid improper management of wastewaters. | <ul style="list-style-type: none"> Package domestic wastewater treatment unit and/or non-leaking septic tank in place for the | <ul style="list-style-type: none"> Waste Management Plan Hazardous Materials Management Plan |

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|---|--|--|--|--|---|
| | <ul style="list-style-type: none"> Closure | | <ul style="list-style-type: none"> Domestic wastewater to be generated by the construction workforce will be treated at the package domestic wastewater treatment unit to be installed at the substation site by the construction contractor (if the number of construction personnel exceeds 84 as anticipated in this ESIA) or collected in a non-leaking septic tank and removed by means of vacuum trucks of the Kiyikoy Municipality (if the number of construction personnel is below 84). The permitting requirements in the scope of the relevant national regulation (e.g. environmental permit where applicable) will be fulfilled for the management of domestic wastewaters to be generated during the construction phase of the Capacity Extension Project. Domestic wastewater produced by operations workforce will be managed through non-leaking septic tank that will be regularly emptied by vacuum trucks of the Kiyikoy Municipality. Hazardous materials will be managed (e.g. stored in designated areas as per MSDS requirements, provision of spill kits, absorbent pads/sands for management of accidental spillages etc.) in line with the provisions of the Hazardous Materials Management Plan. The existing temporary Waste Storage Area located at the substation site will be improved to ensure that waste management practices do not pose any risk on the quality of surface or groundwater resources. Routine visual checks of the hazardous materials storage and waste storage areas to ensure all provisions of the respective Management Plans are in place and that there is no spill/leakage to receiving environment. Necessary training will be provided to the site staff to ensure efficiency in Project-related water use and that the provisions of the respective Management Plans are followed at all times. The existing water storage tank at the substation will be improved to ensure that the water quality fulfills Project standards (as part of occupational health and safety management). | <ul style="list-style-type: none"> construction phase and operating as per the Project Standards National permitting requirements fulfilled and documented Non-leaking septic tank in place and managed as per the national standards for the operation phase Records of septic tank discharge by Kiyikoy Municipality Existing temporary waste storage area improved to fulfil Project requirements Hazardous materials managed in line with the provisions of the related MP Water quality results of the storage tank in line with Project Standards | <ul style="list-style-type: none"> Emergency Preparedness and Response Plan |
| Additional load on the local/regional infrastructure for the management of hazardous and non-hazardous wastes (e.g. sanitary landfills, excavated material storage areas, licensed reuse/recovery facilities, etc.) | <ul style="list-style-type: none"> Land Preparation and Construction Operation <hr/> <ul style="list-style-type: none"> Closure | <ul style="list-style-type: none"> Local/regional waste management infrastructure | <ul style="list-style-type: none"> Project-specific Waste Management Plan prepared as part of the ESIA will be implemented by the Project Company and the contractors (through contractual requirements) to avoid or minimise (when avoidance is not possible) the amount of waste to be generated as a result of the Project activities. Waste reuse/recycling/recovery/disposal agreements with the Municipality and licensed recovery/disposal firms will be executed for the management of hazardous and non-hazardous waste. <hr/> <ul style="list-style-type: none"> The decommissioning contractor will be required to develop a detailed plan prior to start of closure activities for maximising reuse/recycling/recovery and management of turbines towers, nacelles, blades, substation, cables, electrical equipment and other plant components to be dismantled based on the state-of-the-art technologies. Waste disposal agreements will be executed with licensed transportation, reuse, recycling, recovery and disposal companies. The Project Company will consult with the related authorities and follow their decisions regarding the ETL. | <ul style="list-style-type: none"> Hazardous and non-hazardous waste management (recycling, disposal, transportation etc.) related agreements in place with the licensed companies and Municipality <hr/> <ul style="list-style-type: none"> Detailed decommissioning plan in place for the management of end of life equipment Hazardous and non-hazardous waste management (recycling, disposal, transportation etc.) related agreements in place with the licensed companies and Municipality Consultation records with the authorities regarding the ETL decommissioning | <ul style="list-style-type: none"> Waste Management Plan |
| Potential impacts of on-site hazardous and non-hazardous waste on environmental resources, ecosystem, personnel H&S, visual amenity, if not managed properly | <ul style="list-style-type: none"> Land Preparation and Construction Operation Closure | <ul style="list-style-type: none"> Soil, surface water and groundwater environments Ecosystem Personnel | <ul style="list-style-type: none"> Project-specific Waste Management Plan will be implemented by the Project Company and the contractors (through contractual requirements) The construction contractors will be contractually required to implement the Project-specific Waste Management Plan and provide adequate temporary on-site Waste Storage Areas (e.g. adequate capacity, concrete floor, secondary containment, top cover, separate waste specific containers with appropriate labelling, drainage, fire-fighting equipment, gate locks, etc.). The existing temporary Waste Storage Area located at the substation site will be improved to ensure that the relevant requirements of the EBRD PR3 and applicable GIPs are met for the management of the wastes sourced from the operation and maintenance activities. Regular monitoring of the waste management practices of the direct and contracted Project employees will be conducted by means of document review (e.g. permits, waste reuse/recycling/disposal agreements) and visual checks at the turbine locations, access roads and substation site. Trainings on the implementation of the Project-specific Waste Management Plan will be provided to all direct and contracted Project employees. Project-specific Waste Management Plan will be reviewed annually and updated as necessary. | <ul style="list-style-type: none"> Existing temporary waste storage area improved to fulfil Project standards Training records | |
| Biodiversity | | | | | |
| Habitat loss and fragmentation due to removal of topsoil and clearance of vegetation | <ul style="list-style-type: none"> Land Preparation and Construction Phase | EUNIS Code G1.A Habitat (total of 25.9 ha as the Project footprint) and vegetation | <ul style="list-style-type: none"> Avoid destruction of vegetation for purposes other than planned Project activities Topsoil stripped will be stored and further used for reinstatement and rehabilitation to avoid loss of flora species of conservation importance will be managed through ex-situ and where required in-situ measures | <ul style="list-style-type: none"> Topsoil stripped and stored | <ul style="list-style-type: none"> Biodiversity Action Plan Waste Management Plan |

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|---|---|---|---|--|---|
| | | Nests/breeding/roosting sites of small mammals, birds and bats within the Project License Area | <ul style="list-style-type: none"> Clear vegetation before nesting seasons of animals As per the breeding bird survey results, ensure resident birds are not impacted by construction activities through minimizing the area of construction to limit habitat loss and fragmentation, proper disposal of on-site waste, restore disturbed areas and apply other good construction techniques. Nests of small mammals identified during field surveys to be checked by biodiversity experts at pre-construction and experts to be involved if removal of nests/animals are required. Train on-site employees to be aware of nests, avoid any displacement without an expert opinion on the status of the nests | <ul style="list-style-type: none"> Training records as per BAP | <ul style="list-style-type: none"> Wastewater Management Plan Habitat Restoration (Rehabilitation) Plan |
| | | Temporary water bodies where amphibians can reside and breed within the Project License Area | <ul style="list-style-type: none"> Temporary water bodies identified at the Project Area to be checked by biodiversity experts at pre-construction phase and depending on the construction program at or around such areas measures to avoid impacts on fauna elements to be put in place including carriage of susceptible fauna elements to suitable habitats or rescheduling works around such temporary water bodies. During construction phase care should be taken to avoid direct impact on temporary water bodies through disturbance/contamination Train on-site employees to avoid any impacts on the temporary water bodies | <ul style="list-style-type: none"> Training records as per BAP | |
| Damage to/loss of flora species due to Project construction activities | Land Preparation and Construction Phase | <u>Potential CH trigger, regional endemic</u> <i>Centaurea hermannii</i> | <ul style="list-style-type: none"> Careful siting of temporary facilities to avoid direct impact As an ex-situ measure seed collection completed, seeds are sent to Turkey Seed Gene Bank. As an in-situ measure, in October-November 2019, the species will be further collected at areas where they are identified to be spread and to be directly affected by Project activities (around T28, T29, T32 and T33) by an expert botanist and be translocated to suitable habitats near the operating turbines to be identified by the expert botanist. The success of the translocation will further be monitored in May-June 2020 as part of the Project BAP. | <ul style="list-style-type: none"> Seeds collected and sent to Turkey Seed Gene Bank Submission records to Turkey Seed Gene Bank Translocation of the species (around T28, T29, T32 and T33) by an expert botanist to suitable habitats near operating turbines Translocation and monitoring records and photos | Biodiversity Action Plan |
| | | <u>Regional endemic species:</u> <i>Cirsium baytopae</i> <i>Euphorbia amygdaloides</i> var. <i>robbiae</i> <i>Crocus olivieri</i> subsp. <i>istanbulensis</i> | <ul style="list-style-type: none"> Careful siting of temporary facilities to avoid direct impact As an ex-situ measure seed collection completed, seeds are sent to Turkey Seed Gene Bank. For the flora species (<i>Crocus olivieri</i> subsp. <i>istanbulensis</i>) collect bulb during the topsoil stripping at the identified locations within the Project Area, properly store the topsoil and reinstate in line with the Project BAP. | <ul style="list-style-type: none"> Seeds collected and sent to Turkey Seed Gene Bank Submission records to Turkey Seed Gene Bank Bulbs collected during soil stripping with the support of the expert botanist at locations where the specific species is observed | |
| | | <u>Priority Biodiversity Features</u> <i>Ferulago confuse</i> <i>Symphytum tuberosum</i> subsp. <i>Nodosum</i> | <ul style="list-style-type: none"> Careful siting of temporary facilities to avoid direct impact As an ex-situ measure seed collection completed for <i>Ferulago confuse</i> and seeds are sent to Turkey Seed Gene Bank. As the flowering period (May-June 2019) of <i>Symphytum tuberosum</i> subsp. <i>Nodosum</i> was very wet seed collection to be further conducted as per the Project BAP. | <ul style="list-style-type: none"> Seeds collected and sent to Turkey Seed Gene Bank Submission records to Turkey Seed Gene Bank | |
| Disturbance to and direct mortality of fauna species due to Project construction activities | Land Preparation and Construction Phase | <u>Istranca Mountains KBA qualifying species + Priority Biodiversity Feature</u> <i>Testudo graeca</i> (Common tortoise) <i>Testudo hermanni</i> (Hermann's tortoise) <u>Priority Biodiversity Feature</u> <i>Emys orbicularis</i> (European pond turtle) <u>Istranca Mountains KBA qualifying species + Nest inside soil</u> <i>Talpa levantis</i> (Levantine mole) <u>Nest inside soil</u> <i>Apodemus agrarius</i> (Striped field mouse) <i>Apodemus flavicollis</i> (Yellow-necked field mouse) <i>Apodemus sylvaticus</i> (Long-tailed field mouse) Other terrestrial fauna species | <ul style="list-style-type: none"> Speed limits will be implemented for construction vehicles. Workers to be trained for avoidance of direct/indirect impacts on fauna elements Fauna species with low mobility to be relocated to suitable habitats by fauna experts | <ul style="list-style-type: none"> Traffic management measures in place Fauna expert to monitor susceptible locations prior to land preparation and construction and to relocate (to suitable habitats) fauna elements with low mobility prior to site activities Site records by the fauna expert Training records as per BAP | <ul style="list-style-type: none"> Transport and Traffic Management Plan Biodiversity Action Plan |

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|--|---|---|--|---|--|
| Disturbance to flora/fauna species due to emissions of dust/noise from Project construction activities | <ul style="list-style-type: none"> Land Preparation and Construction Phase | <p><u>Potential CH trigger, regional endemic</u></p> <p><i>Centaurea hermannii</i></p> <p><u>Regional endemic species:</u></p> <p><i>Cirsium baytopae</i> <i>Euphorbia amygdaloides</i> var. <i>robbiae</i> <i>Crocus olivieri</i> subsp. <i>Istanbulensis</i></p> <p><u>Priority Biodiversity Features</u></p> <p><i>Ferulago confuse</i> <i>Symphytum tuberosum</i> subsp. <i>Nodosum</i></p> <p>Other flora species identified at the Project License Area</p> <p><u>Istranca Mountains KBA qualifying species</u> + <u>Priority Biodiversity Feature</u> <i>Testudo graeca</i> (Common tortoise) <i>Testudo hermanni</i> (Hermann's tortoise)</p> <p><u>Priority Biodiversity Feature</u> <i>Emys orbicularis</i> (European pond turtle)</p> <p><u>Istranca Mountains KBA qualifying species</u> + <u>Nest inside soil</u> <i>Talpa levantis</i> (Levantine mole)</p> <p><u>Nest inside soil</u> <i>Apodemus agrarius</i> (Striped field mouse) <i>Apodemus flavicollis</i> (Yellow-necked field mouse) <i>Apodemus sylvaticus</i> (Long-tailed field mouse)</p> <p>Other terrestrial fauna species</p> | <ul style="list-style-type: none"> Implement dust and noise mitigation measures to minimize impacts Implement species-specific ex-situ and in-situ measures for flora species at pre-construction phase as per Project BAP. | <ul style="list-style-type: none"> Dust and noise mitigation measures in place Seeds collected and sent to Turkey Seed Gene Bank Submission records to Turkey Seed Gene Bank Translocation of <i>Centaurea hermannii</i> species (around T28, T29, T32 and T33) by an expert botanist to suitable habitats near operating turbines Translocation and monitoring records and photos | <ul style="list-style-type: none"> Air and GHG Management Plan Noise Management Plan Biodiversity Action Plan |
| Accidental introduction of invasive alien species | <ul style="list-style-type: none"> Land Preparation and Construction Phase | <p>EUNIS Habitat G1.A: Meso- and eutrophic oak, hornbeam, ash, sycamore, lime, elm and related woodland</p> <p>EUNIS Habitat E2.1: Permanent mesotrophic pastures and aftermath-grazed meadows</p> | <ul style="list-style-type: none"> Undertake a pathway analysis to identify existing and future potential pathways of IAS invasion relevant to the project. This would consider the project location, the likely sources of equipment or materials for the project and what species (both native and IAS) are present at those source sites which could become IAS at the project site. The presence and spread of invasive flora species will be monitored as part of BAP monitoring during the vegetative season, with attention to disturbed areas. If spreading of invasive species is observed, an appropriate eradication program will be developed and implemented | <ul style="list-style-type: none"> Pathway analysis in place for potential accidental introduction of IAS BAP monitoring records Eradication program in place (if spreading of invasive species is observed) | <ul style="list-style-type: none"> Biodiversity Action Plan |
| Collision of birds/bats with turbines and blades leading to injury or mortality | <ul style="list-style-type: none"> Operation Phase | <p><i>Ciconia ciconia</i> (White Stork), <i>Pernis apivorus</i> (European Honey-Buzzard), <i>Buteo buteo</i> (Common Buzzard), <i>Aquila heliaca</i> (Imperial Eagle), <i>Ciconia nigra</i> (Black Stork), <i>Circus macrourus</i> (Pallid Harrier), Other recorded migratory and resident bird species</p> | <ul style="list-style-type: none"> Implement habitat management and maintenance practices at the site level to reduce the risk of attracting collision-prone birds such as avoiding establishing ponds or waste sites within the development. Continue bird activity monitoring throughout construction phase of the Project including at least the first two years of operation. Continue carcass study at the existing WPP and extend it to the Capacity Extension Project when it becomes operational. Evaluate the collision risks associated with the specific bird species identified as specific receptors in light of their specific sensitivities. Depending on the outcome of the updated risk assessment implement active turbine management strategy include shut-down on demand to ensure risks are mitigated associated with the turbines leading to injury or mortality of bird species. | <ul style="list-style-type: none"> Bird activity monitoring reports Bird carcass monitoring reports Independent Ornithology Expert (IOE) assigned Assessment report by the IOE in place Active turbine management strategy developed including shut-down on demand protocol Shut-down on demand protocol implemented | <ul style="list-style-type: none"> Biodiversity Action Plan |

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|---|--|--|--|--|---|
| | | <i>Pipistrellus pipistrellus</i> (Common Pipistrelle), <i>Pipistrellus nathusii</i> (Nathusius' Pipistrelle), KBA qualifying bat species recorded at the Project Area | <ul style="list-style-type: none"> Continue bat activity monitoring throughout construction phase of the Project including at least the first two years post-construction as part of Project BAP. Continue carcass study at the existing WPP and extend it to the Capacity Extension Project when it becomes operational. Depending on the outcome of the updated risk assessment implement mitigation measures in line with EUROBATS Guidance including increase of cut-in speed of turbine blades associated with bat injury or mortality to ensure risks are mitigated. | <ul style="list-style-type: none"> Bat activity monitoring reports Bat carcass monitoring reports Independent Ornithology Expert (IOE) assigned Assessment report by the IOE in place Active turbine management strategy developed including measures as per EUROBATS | <ul style="list-style-type: none"> Biodiversity Action Plan |
| Bat mortality due to barotrauma caused by rapid air pressure reduction near moving turbine blades | <ul style="list-style-type: none"> Operation Phase | <i>Pipistrellus pipistrellus</i> (Common Pipistrelle), <i>Pipistrellus nathusii</i> (Nathusius' Pipistrelle), KBA qualifying bat species recorded at the Project Area | <ul style="list-style-type: none"> Continue bat activity monitoring throughout construction phase of the Project including at least the first two years post-construction as part of Project BAP. Continue carcass study at the existing WPP and extend it to the Capacity Extension Project when it becomes operational. Depending on the outcome of the updated risk assessment implement mitigation measures in line with EUROBATS Guidance including increase of cut-in speed of turbine blades associated with bat injury or mortality to ensure risks are mitigated. | <ul style="list-style-type: none"> Bat activity monitoring reports Bat carcass monitoring reports Independent Ornithology Expert (IOE) assigned Assessment report by the IOE in place Active turbine management strategy developed including measures as per EUROBATS | <ul style="list-style-type: none"> Biodiversity Action Plan |
| Barrier effect for preferred migratory routes/flight corridors of birds/bats, displacement from habitats used by birds/bats, fragmentation of landscape which can reduce the ability of an area to support bird/bat populations | <ul style="list-style-type: none"> Operation Phase | <p><i>Ciconia ciconia</i> (White Stork), <i>Pernis apivorus</i> (European Honey-Buzzard), <i>Buteo buteo</i> (Common Buzzard), <i>Aquila heliaca</i> (Imperial Eagle), <i>Ciconia nigra</i> (Black Stork), <i>Circus macrourus</i> (Pallid Harrier), Other recorded migratory and resident bird species</p> <p><i>Pipistrellus pipistrellus</i> (Common Pipistrelle), <i>Pipistrellus nathusii</i> (Nathusius' Pipistrelle), KBA qualifying bat species recorded at the Project Area</p> | <ul style="list-style-type: none"> Impacts are variable and are likely to be species, site and season specific including presence of other wind farms in the vicinity of the Project Area. The Before-After Control Impact approach should be used, and post-construction monitoring data compared with pre-construction will feed into development of adaptive management strategies that will be further integrated into Project BAP and Habitat Restoration Plan to be developed and implemented. | <ul style="list-style-type: none"> Bird/bat activity monitoring reports Bird/bat carcass monitoring reports Independent Ornithology Expert (IOE) assigned Assessment report by the IOE in place BAP and Habitat Restoration Plan implemented | <ul style="list-style-type: none"> Biodiversity Action Plan Habitat Restoration (Rehabilitation) Plan |
| Visual | | | | | |
| Visual impact due to land preparation and construction works | <ul style="list-style-type: none"> Land preparation and construction Closure | Local communities in Kiyikoy and Kislacik | <ul style="list-style-type: none"> Good housekeeping practices will be instituted at all construction/work sites. Topsoil management measures (see "Land Use") will be implemented. Habitat Restoration (Rehabilitation) Plan will be started following the completion of the construction works. Waste Management Plan will be implemented. Artificial illumination will be provided only when necessary to promote workers' safety and health and enable safe equipment operation. | <ul style="list-style-type: none"> Topsoil management measures in place Good housekeeping and waste management measures in place Habitat restoration (rehabilitation) measures implemented | <ul style="list-style-type: none"> Waste Management Plan Habitat Restoration (Rehabilitation) Plan Stakeholder Engagement Plan |
| Visual impact due to operational turbines | <ul style="list-style-type: none"> Operation | <ul style="list-style-type: none"> VP1: Kiyikoy Town Centre VP2: Kiyikoy Beach VP3: Closest residential building to the wind turbines in Kiyikoy VP4: Pabucdere Dam Operation Building VP5: Vize-Kiyikoy Road VP6: Bahcekoy-Kiyikoy Road VP7: Saray-Kiyikoy Road VP8: Building Close to T15 VP9: Unoccupied Coastline in the Northeast of T21, T22 VP10: Police Beach VP11: Kislacik Village Centre | <ul style="list-style-type: none"> One (1) of the twenty-one (21) planned turbines will be eliminated as a result of the ongoing final design process. The Project will be implemented with the design including 20 capacity extension turbines. The existing 154 kV ETL line of the Kiyikoy WPP will be utilised to avoid additional infrastructure that may cause visual impact. The existing substation will be utilised after necessary improvement/ refurbishment works. Habitat Restoration (Rehabilitation) Plan, including the reforestation as permitted by the forestry authorities, will be implemented throughout the operation phase. It will be ensured that the colour of the towers and blades of the existing and planned turbines are consistent to the extent possible. Aviation obstruction lights (white during the day and twilight; red during the night) will be optimised where approved by the aviation safety authorities to minimise landscape and visual impacts whilst satisfying health and safety or navigation requirements. Project-specific Stakeholder Engagement Plan will be implemented to address any grievance related to visual impacts and plan/take corrective actions, where necessary and doable. | <ul style="list-style-type: none"> No grievances received for visual impacts | |

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|--|--|---|---|---|---|
| | | <ul style="list-style-type: none"> VP12: Hamidiye Village Centre VP13: Aksicim Village Centre People engaged in touristic, recreational, forestry and other outdoor activities for the landscape beauties of the area | | | |
| Socio-economic Environment | | | | | |
| Impacts on Population | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> Local Communities (Kiyikoy town's neighbourhoods, Kislacik, Vize district and other settlements in the vicinity of the License Area) | <ul style="list-style-type: none"> The Project SEP will be implemented. The Contractor and Supply Chain Management Plan will be implemented. Contractors will be contractually required to maximise use of local workforce, especially by utilising the experienced and qualified workforce available in Kiyikoy. | <ul style="list-style-type: none"> Local employment numbers within the total workforce | <ul style="list-style-type: none"> Stakeholder Engagement Plan Contractor and Supply Chain Management Plan |
| Impacts on Local Economy as a result of Employment and Procurement of Required Goods, Materials and Services | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> Local Communities (Kiyikoy town, Kislacik, Vize district, Saray district and other settlements in the vicinity of the License Area) | <ul style="list-style-type: none"> The Project Contractor and Supply Chain Management Plan including the local employment and procurement procedures will be implemented. The SEP will be implemented. The goods and services to be provided from the local will be determined together with the contractor company/companies. Consultations will be held with businesses in Kiyikoy town to inform them about the potential local procurement of goods and services. Contractor procurement will be monitored by the Project Company by monthly reports. In case any issues arise with procurement and employment, the grievance mechanism will be operated. | <ul style="list-style-type: none"> Contractor procurement records and monthly reports Local procurement records within total procurement | <ul style="list-style-type: none"> Contractor and Supply Chain Management Plan Stakeholder Engagement Plan |
| Impacts on Forest Land | <ul style="list-style-type: none"> Land Preparation and Construction, Operation | <ul style="list-style-type: none"> Local Communities in Kiyikoy and Kislacik, which have a total forest land of 12,139 ha | <ul style="list-style-type: none"> The Project SEP including the grievance mechanism will be implemented. The Project Livelihood Restoration Plan (LRP) will be prepared for land acquisition. The Project Habitat Restoration (Rehabilitation) Plan will be implemented. The mukhtars, forest users, members of Kiyikoy and Kislacik Development Cooperatives, livestock producers, and owners of the impacted lands will be informed about land acquisition process. The remaining part of the pasture parcel 319/1 (in Kiyikoy) will be improved to mitigate adverse economic impacts on the households involved in animal husbandry. | <ul style="list-style-type: none"> LRP measures in place LRP budget allocated and disbursed as per the LRP Stakeholder engagement and information exchange records in place regarding land acquisition process Measures as per Habitat Restoration (Rehabilitation) Plan in place No grievance received from associated PAPs | <ul style="list-style-type: none"> Stakeholder Engagement Plan Livelihood Restoration Plan Habitat Restoration (Rehabilitation) Plan |
| Impacts on Pastureland | | <ul style="list-style-type: none"> Local Communities in Kiyikoy, which has a registered pasture area of 429 da (19 parcels) and Grazing Area within the Forest Land | | | |
| Impacts on Private Land | | <ul style="list-style-type: none"> Parcel no. 319/1 in Kiyikoy Owners/ users of the following parcels: Parcel no. 129/31 registered in Kiyikoy and located along the main access road of the Project, -Parcel no. 129/27 registered in Kiyikoy and located along the main access road of the Project, -Parcel no.101/206 registered in Kislacik and located at the footprint of the foundation of T15. | | | |
| Impacts on Forestry Activities | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> Forest workers in Kiyikoy and Kislacik | <ul style="list-style-type: none"> The Project Company will implement the SEP and consult with the forestry authorities and the forestry cooperative. | <ul style="list-style-type: none"> Consultation records | <ul style="list-style-type: none"> Stakeholder Engagement Plan |
| Impacts on Livestock Activities on Affected Pasture Parcel | <ul style="list-style-type: none"> Land Preparation and Construction, Operation | <ul style="list-style-type: none"> Livestock households using Parcel no. 319/1 registered in Kiyikoy | <ul style="list-style-type: none"> The Project SEP including the grievance mechanism will be implemented. The Project LRP will be implemented. 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. The ovine and bovine breeders will be informed about the construction activities. | <ul style="list-style-type: none"> LRP measures in place LRP budget allocated and disbursed as per the LRP Stakeholder engagement and information exchange records with ovine/bovine feeders in place No grievance received from ovine/bovine feeders | <ul style="list-style-type: none"> Stakeholder Engagement Plan Livelihood Restoration Plan |
| Impacts on Beekeeping | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> Beekeepers | <ul style="list-style-type: none"> The Project SEP including the grievance mechanism will be implemented. Prior to start of construction phase, the Project Company will collaborate with the mukhtars, related authorities and agencies in order to inform the local beekeepers will be notified about the construction areas and schedule. During the construction period, if beehives are identified and in case required in the vicinity of the construction areas, the beehive owners will be contacted to provide for the relocation of beehives. | <ul style="list-style-type: none"> Stakeholder engagement and information exchange records for local beekeepers in place Relocation of beehives if encountered in the vicinity of construction areas No grievance received from local beekeepers | <ul style="list-style-type: none"> Stakeholder Engagement Plan |

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|---|---|---|---|---|---|
| Impacts on Mushroom Gathering | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> Women mushroom collectors and sellers in Kislacik | <ul style="list-style-type: none"> The Project SEP including the grievance mechanism will be implemented The Project LRP will be prepared. Construction schedule and sites will be shared with the women mushroom collectors in Kislacik LRP will be implemented. | <ul style="list-style-type: none"> LRP measures in place LRP budget allocated and disbursed as per the LRP Stakeholder engagement and information exchange records with women mushroom collectors in place No grievance received from women mushroom collectors | <ul style="list-style-type: none"> Stakeholder Engagement Plan Livelihood Restoration Plan |
| Impacts on Fishery | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> Local Fishers in Kiyikoy | <ul style="list-style-type: none"> The Project SEP including the grievance mechanism will be implemented to inform fisheries about the Project construction activities. | <ul style="list-style-type: none"> Stakeholder engagement and information exchange records with local fishers in Kiyikoy in place No grievance received from local fishers | <ul style="list-style-type: none"> Stakeholder Engagement Plan |
| Impacts on Tourism | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> Local businesses | <ul style="list-style-type: none"> The Project Transportation and Traffic Management Plan will be implemented. The Project Company will improve the existing road providing access to the License Area and ensure that the Project-related traffic uses this improved access road only; place necessary warning signs and visible instructions at the diverging points in order to ensure that the Project-related traffic is diverted to the improved access road and local traffic is diverted to the existing Kiyikoy access road. The Project Company will collaborate with the authorities to ensure that the roads in the vicinity of the License Area are closed to local traffic during the transportation of oversized and heavy turbine components. The Project Company will schedule concrete works at hours where local traffic volumes are normally at their lowest during the day and if allowed by the related authorities, supply concrete from the existing concrete plant of Turk Stream Project (located at the southeastern boundary of the Project License Area) in order to avoid or minimize external traffic due to concrete supply from local concrete plans. The Project Company will schedule the traffic to avoid the peak hours on the local road network wherever practicable (e.g. early in the morning with the daylight). The Project SEP including the grievance mechanism will be implemented. Scheduling information and planned traffic disruptions will be communicated to all related parties including authorities, local communities and nearby businesses in advance of the start of relevant activities. | <ul style="list-style-type: none"> Main access road to License Area improved Warning signs and visible instructions in place to ensure Project-related traffic is diverted to the improved access road Stakeholder engagement and information exchange records with local people and local businesses in place regarding traffic arrangements for the transportation of concrete supply, oversized and heavy turbine components No grievance received from local communities and local businesses | <ul style="list-style-type: none"> Transportation and Traffic Management Plan Stakeholder Engagement Plan |
| Impacts on Public Education and Health Services | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> Local Communities | <ul style="list-style-type: none"> The Project SEP including the grievance mechanism will be implemented. The Project Contractor and Supply Chain Management Plan will be implemented. On-site Infirmary service will be provided for employees during the construction phase. | <ul style="list-style-type: none"> On-site infirmary service in place during construction phase No grievances received from local communities | <ul style="list-style-type: none"> Stakeholder Engagement Plan Contractor and Supply Chain Management Plan |
| Impacts on Vulnerable Groups | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> The disabled vulnerable PAP, living in the house located in the north of T15 within the Project's License Area. | <ul style="list-style-type: none"> The Project Company will engage with the vulnerable PAP residing at the building located in the north of T15 prior to the start of and during the construction activities to be conducted at this location in order to inform the user about the scope and duration of the activities and mitigate the potential impacts for the period of construction at this turbine site. | <ul style="list-style-type: none"> Consultation records with the PAP | <ul style="list-style-type: none"> Stakeholder Engagement Plan |
| | <ul style="list-style-type: none"> Operation | | | <ul style="list-style-type: none"> Consultation records with the PAP Noise and air quality mitigation measures in place Shadow flicker and ice throw mitigation measures in place Depending on the outcome of the consultation RAP to be developed and implemented No grievances received from the PAP | <ul style="list-style-type: none"> Air Quality and GHG Management Plan Noise Management Plan Community Health and Safety Management Plan |

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|--|---|---|--|--|--|
| <p><u>If the PAP is unwilling to relocate:</u></p> <ul style="list-style-type: none"> Projects-specific noise management and mitigation measures (including monitoring) described in Chapter 6 ("Noise") of this ESIA Report will be implemented. Projects-specific measures for the management of shadow flicker impact and ice throw risk of the Project will be implemented as described in Chapter 14 ("Community Health and Safety"). The Project Company will continue engagement with the vulnerable PAP through face to face meetings to be undertaken monthly in the first year of operation, quarterly in the second and third years of operation and semi-annually after the third year of operation until the end of financing period. Project Grievance Mechanism will be implemented throughout the operation to address any noise-related grievance and plan/take corrective actions, where necessary. The Air Quality and GHG Management Plan, the Noise Management Plan and the Community Health and Safety Management Plan will be implemented during the construction and operation phases of the Project. Noise and air quality monitoring will be conducted at the relevant receptor to verify compliance with Project standards and in case of receipt of noise-related grievances in line with the frequencies specified in these management plans. | | | | | |
| Impacts on Hunting Activities | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> Local hunters in Kiyikoy and Kislacik | <ul style="list-style-type: none"> The Project SEP will be implemented. The Vize Association of Hunters management team and members will be informed about the Project activities. | <ul style="list-style-type: none"> Stakeholder engagement and information exchange records with the management of Vize Association of Hunters in place No grievance received from local hunters in Kiykoy and Kislacik | <ul style="list-style-type: none"> Stakeholder Engagement Plan |
| Labour and Working Conditions | | | | | |
| Impacts due to workers contractual arrangements | <ul style="list-style-type: none"> Land Preparation and Construction Operation Closure | <ul style="list-style-type: none"> Project personnel | <ul style="list-style-type: none"> Implement Contractor and Supply Chain Management Plan. Implement SEP and the Grievance Mechanism. Ensure all workers are aware of the duration and scope of their work and all conditions to be explicitly written in their written contracts. Ensure all contractual arrangements are in line with Project Standards for contractors and sub-contractors as well. | <ul style="list-style-type: none"> Contractual arrangements in line with Project Standards in place All contracts to explicitly include duration, scope of work and conditions of the contract All workers are communicated on the conditions of their contract | <ul style="list-style-type: none"> Stakeholder Engagement Plan Contractor and Supply Chain Management Plan |
| Incidents/accidents due to on site H&S risks and H&S practices (e.g. working at height, lifting operations) | <ul style="list-style-type: none"> Land Preparation and Construction Operation Closure | <ul style="list-style-type: none"> Project personnel | <ul style="list-style-type: none"> Implement Emergency Preparedness and Response Plan. Implement Contractor and Supply Chain Management Plan. Implement SEP and the Grievance Mechanism. Always ensure correct PPE use. Provide general and job specific OHS trainings and first aid trainings. Personnel that conduct work at height and lifting operations to be properly trained on the specific job type and competent. Fall protection systems in place during works at height (e.g. fall arrest equipment, etc.). Set and maintain appropriate exclusion zones below any working at height activities to avoid incidents/accidents due to falling objects. All tools and equipment to be appropriately positioned whilst working at height to avoid falling of objects. Major on-site operations as lifting operations to be scheduled and planned well in advance taking into account the weather conditions and details of the operation to be communicated to all site personnel on time. Do not conduct work at height and lifting activities during heavy rain/storm and other poor/extreme weather conditions. Ensure all equipment are checked and maintained regularly. Implement limits on manual lifting/handling. Install guard rails, signs. Ensure sufficient illumination. Conduct regular visual checks and maintenance/clean-up of excavation debris and other potential risk sources such as cables and ropes. Restrict operation of heavy machinery to those that are trained and competent (licensed if required). Conduct periodic medical checks for personnel. | <ul style="list-style-type: none"> OHS and first-aid training records in place Job specific training records in place Appropriate PPE use in place Fall protection systems in place Exclusion zones identified below working at height activities Major on-site activities not to be scheduled during poor weather conditions Equipment maintenance records in place Medical check records of personnel in place | <ul style="list-style-type: none"> Emergency Preparedness and Response Plan Contractor and Supply Chain Management Plan Stakeholder Engagement Plan |

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|--|---|---|---|---|---|
| Health risks due to emissions to air and noise/vibration generation | <ul style="list-style-type: none"> Land Preparation and Construction Closure | <ul style="list-style-type: none"> Project personnel | <ul style="list-style-type: none"> Implement Air Quality and GHG Management Plan and Noise Management Plan. Ensure use of related PPEs as required. Consider changing equipment or implementing time limits in case of a grievance regarding vibration. | <ul style="list-style-type: none"> Appropriate PPE use in place Air quality and noise related mitigation measures in place No internal grievances received due to air emissions and noise/vibration generation | <ul style="list-style-type: none"> Air Quality and GHG Management Plan Noise Management Plan |
| Incidents/accidents due to on site traffic | <ul style="list-style-type: none"> Land Preparation and Construction Closure | <ul style="list-style-type: none"> Project personnel | <ul style="list-style-type: none"> Implement the Transportation and Traffic Management Plan. Restrict operation of heavy vehicles to those that are trained and competent. Provide traffic trainings for all personnel and provide specialised trainings to personnel that will operate industrial vehicles. Install and maintain signage and other traffic regulating means. Set speed limits and implement right of way practices. Conduct periodic vehicle maintenance. | <ul style="list-style-type: none"> Job specific training records in place On-site speed limits implemented Signage and right of way practices implemented Vehicle maintenance records in place | <ul style="list-style-type: none"> Transportation and Traffic Management Plan |
| Impacts on local communities due to off-site accommodation of Project's construction workforce | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> Local communities (Vize, Saray and Cerkezkoy district and Kiyikoy town) | <ul style="list-style-type: none"> The Project Company will ensure that all the direct and contracted workers are provided with trainings on BEE's corporate Social Guidelines at the beginning of employment (individually or collectively). These trainings will also cover the code of conduct for accommodation, as well as general moral, cultural and ethical rules required from all Project workers. The Project Company will analyse 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 centres in order to ensure safe travel of the Project workers to the Project site and minimise Project-related traffic in the region. Ensure compliance with Workers' accommodation: processes and standards (IFC and EBRD, 2009) for facilities (canteen, sanitary facilities). An Off-site Accommodation Management Plan will be developed and implemented for the construction phase. | <ul style="list-style-type: none"> Training records on BEE's Corporate Social Guidelines including code of conduct, moral, cultural and ethical rules required in place at the beginning of employment Off-site accommodation management plan developed and implemented Facilities at the off-site accommodation to comply with Worker's accommodation (IFC, EBRD 2009) standards No external grievance received from local communities | <ul style="list-style-type: none"> Off-site Accommodation Management Plan |
| Impacts due to worker's on-site accommodation conditions (in case of on-site accommodation) | <ul style="list-style-type: none"> Land Preparation and Construction Operation Closure | <ul style="list-style-type: none"> Project personnel | <ul style="list-style-type: none"> Implement SEP and the Grievance Mechanism. Implement Contractor and Supply Chain Management Plan and Camp Site Management Plan. Implement the Waste Management Plan. Ensure compliance with Workers' accommodation: processes and standards (IFC and EBRD, 2009) for on-site facilities (canteen, sanitary facilities). Ensure potable water and domestic purpose water to be supplied on site meet the requirements of the Turkish Regulation on Water Intended for Human Consumption. Ensure proper first aid equipment is kept on site, at various related locations. Provide trainings to personnel on general waste management, good housekeeping and first aid. Conduct visual checks on site to ensure proper housekeeping. | <ul style="list-style-type: none"> Potable water quality monitoring results in line with Project Standards First aid equipment available on-site at various locations Facilities at the on-site accommodation to comply with Worker's accommodation (IFC, EBRD 2009) standards Training records (first-aid, waste management etc.) of project personnel in place | <ul style="list-style-type: none"> Camp Site Management Plan (in case of on-site accommodation) Contractor and Supply Chain Management Plan Waste Management Plan Stakeholder Engagement Plan |
| Community Health and Safety | | | | | |
| Abnormal Load Transportation and Traffic Load | <ul style="list-style-type: none"> Land Preparation and Construction Closure | <ul style="list-style-type: none"> Local Communities on the Transport Route Local Communities in the Vicinity of the Project Road Users Road Infrastructure | <ul style="list-style-type: none"> The Transport and Traffic Management Plan, 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 authorities (i.e. General Directorate of State Highways, local police force), particularly for the transportation of oversized and heavy vehicles. The Project Company 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. Police escort will be ensured at all critical locations (e.g. pinch points) where other traffic is to be stopped or traffic flow is to be diverted into reverse direction. 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 | <ul style="list-style-type: none"> Transportation and Traffic Management Plan implemented Main access road to License Area improved Warning signs and visible instructions in place to ensure Project-related traffic is diverted to the improved access road Stakeholder engagement and information exchange records with local people and local businesses in place regarding traffic arrangements for the transportation of concrete | <ul style="list-style-type: none"> Transport and Traffic Management Plan Stakeholder Engagement Plan |

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|--|---|---|---|--|--|
| | | | <p>disruptions will be communicated well in advance to all related parties including authorities, local communities and nearby businesses.</p> <ul style="list-style-type: none"> 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 on the environment, local communities and Project personnel. Construction contractors will be required to arrange buses/services for the transportation of Project personnel to minimizing external traffic. The Project Company will ensure that the adjustments and improvements identified in the Road Survey Report (covering the physical arrangements required to be done at the existing road intersections, traffic islands, lighting poles and traffic signs; improvements on existing roads; adjustment of ground levels; and providing necessary design structure for the passage of existing infrastructure) are completed prior to the start of Project-related transportation. The Company will consult with the related governmental authorities (e.g. General Directorate of Highways, local police forces, etc.) prior to the start of transportation activities and ensure that all the necessary permits/approvals are in place. 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. The Project-related traffic will use this improved access road in order to avoid any disruption for the Kiyikoy residents and the visitors of the settlement/tourists using the existing access road of the Kiyikoy town. Necessary warning signs and visible instructions will be placed at the diverging points in order to ensure that the Project-related traffic is diverted to the improved access road and local traffic is diverted to the existing Kiyikoy access road. The Project Company will consult with the TurkStream Project officials for the scheduling of transportation activities. During the construction phase of the Project (including the transportation period), two flagmen will be positioned during material and equipment transport at each side of the existing bridge located in the south of the License Area. Concrete works will be planned at hours where local traffic volumes are normally at their lowest during the day. If allowed by the related authorities, concrete is planned to be supplied from the existing concrete plant of TurkStream Project located at the southeastern boundary of the Project License Area in order to avoid or minimize external traffic due to concrete supply from local concrete plans. 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. All Project personnel/drivers, including the contractors and subcontractors, will be provided with training on the implementation of the Transportation and Traffic Management Plan. These trainings will emphasize safety aspects among drivers. All the operators and vehicle drivers will have valid operator/driver licenses and competency to use heavy machineries. The Project Company will identify the requirements for defensive driving and road safety trainings and ensure that required personnel are provided with these trainings at the start of work. Refreshment trainings will be planned in consideration of the Project Schedule. A regular maintenance and inspection programme will be developed to ensure that all heavy and light construction machinery, vehicles, service buses and are operating safely and effectively. Drivers and operators of each vehicle will be required to conduct daily visual inspection and fill an inspection checklist before using light or heavy vehicle. Periodic servicing of the vehicles will be required and the vehicles which are broken or have missing equipment will not be accepted inside the work site. Tires will be monitored, recorded and replaced when necessary. Project-specific 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 duration of such restrictions. | <p>supply, oversized and heavy turbine components</p> <ul style="list-style-type: none"> Two flagmen to be positioned during material and equipment transport Training records in place Maintenance and inspection records of construction equipment, machinery and vehicles No grievance received from local communities and local businesses | |
| Impacts on local communities due to off-site accommodation of Project's construction workforce | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> Local communities (Vize, Saray and Cerkezkoy district and Kiyikoy town) | <ul style="list-style-type: none"> The Project Company will ensure that all the direct and contracted workers are provided with trainings on BEE's corporate Social Guidelines at the beginning of employment (individually or collectively). These trainings will also cover the code of conduct for accommodation, as well as general moral, cultural and ethical rules required from all Project workers. The Project Company will analyse the accommodation options preferred/selected by non-local workers in collaboration with the Contractors' management and ensure that service buses are provided for the | <ul style="list-style-type: none"> Training records on BEE's Corporate Social Guidelines including code of conduct, moral, cultural and ethical rules required in place at the beginning of employment | <ul style="list-style-type: none"> Off-site Accommodation Management Plan |

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|---|---|--|---|---|--|
| | | | <p>non-local workers accommodating in the nearby district and town centres in order to ensure safe travel of the Project workers to the Project site and minimise Project-related traffic in the region.</p> <ul style="list-style-type: none"> Ensure compliance with Workers' accommodation: processes and standards (IFC and EBRD, 2009) for facilities (canteen, sanitary facilities). An Off-site Accommodation Management Plan will be developed and implemented for the construction phase. | <ul style="list-style-type: none"> Off-site accommodation management plan developed and implemented Facilities at the off-site accommodation to comply with Worker's accommodation (IFC, EBRD 2009) standards No external grievance received from local communities | |
| Exposure to Disease | <ul style="list-style-type: none"> Land Preparation and Construction Closure | <ul style="list-style-type: none"> Local Communities | <ul style="list-style-type: none"> The Project Company will ensure that necessary medical checks for all direct and contracted employees are in place at the time of hiring, which would be repeated as necessary. The Project Company will ensure that legally required basic occupational health and safety (OHS) trainings, covering the general and health related subjects (e.g. workplace hygiene and good housekeeping, principles for protection from sickness and protection techniques, biological and psychosocial risk factors), are provided to all direct and contracted employees at the time of hiring, which would be repeated as necessary. The Project Company will closely monitor potential diseases among the Project employees (direct and contracted) throughout the construction phase. Hygienic working conditions at all work sites (belonging to the Project Company and the contractors) will be ensured throughout the construction phase. Potable and sanitary water will be supplied in line with the requirements of the national legislation. Necessary laboratory analysis will be conducted by accredited laboratories in line with the frequencies set by the relevant legislation and the Project Company will review the results to ensure compliance with applicable standards. On site facilities such as sanitary facilities and medical/first aid facilities will meet the requirements of IFC and EBRD's Guidance Note on Worker's Accommodation Processes and Standards. The Waste Management Plan will be implemented. The Wastewater Management Plan will be implemented Project-specific Stakeholder Engagement Plan will be implemented to address any relevant grievance and plan/take corrective actions in line with the Grievance Mechanism, where necessary. | <ul style="list-style-type: none"> Medical checks and legally required OHS trainings in place upon employment of all direct and contracted employees Medical check records Potable water quality monitoring results in line with Project Standards On-site facilities to comply with Worker's accommodation (IFC, EBRD 2009) standards No external grievance received from local communities | <ul style="list-style-type: none"> Waste Management Plan Wastewater Management Plan Stakeholder Engagement Plan |
| Emergency Preparedness and Response and Fire Risk | <ul style="list-style-type: none"> Land Preparation and Construction Operation Closure | <ul style="list-style-type: none"> Local Communities Project Personnel | <ul style="list-style-type: none"> The Emergency Preparedness and Response Plan (covering both on-site and off-site issues) will be implemented. Smoke Detection System including multiple smoke detection sensors placed in the nacelle (above the disc brake), in the transformer compartment, in main electrical cabinets in the nacelle and above the high voltage (HV) switchgear in the tower base will installed and maintained for the Capacity Extension turbines. The existing SCADA system at the control centre will be improved. Each Capacity Extension turbine will be equipped with Lightning Protection System (LPS) covering the blades, nacelles, hubs and the towers, meeting the design requirements of the relevant IEC standards. Handheld carbon dioxide (CO2) fire extinguishers, first aid kits and fire blankets will be provided in the nacelle during the operation period. | <ul style="list-style-type: none"> Smoke Detection System in place LPS in place for Vestas turbines Existing SCADA system improved Handheld CO2 fire extinguishers, first aid kits and fire blankets in place | <ul style="list-style-type: none"> Emergency Preparedness and Response Plan |
| Public Access (access restrictions to the construction sites) | <ul style="list-style-type: none"> Land Preparation and Construction Closure | <ul style="list-style-type: none"> Local Communities | <ul style="list-style-type: none"> Access to the construction sites and routes will be temporarily restricted by using appropriate separation techniques to avoid potential health and safety risks (due to use of heavy vehicles, construction vehicles causing site traffic, earthworks, electrocution hazards due to cabling works, etc.) on local community members using the forest lands within the License Area. The security officers will monitor the construction sites and routes closely in order to prevent any unauthorised access to the restricted sites. The Transport and Traffic Management Plan, describing general traffic rules and measures and driving safety measures will be implemented. Project-specific Stakeholder Engagement Plan will be implemented to address any relevant grievance and plan/take corrective actions in line with the Grievance Mechanism, where necessary. | <ul style="list-style-type: none"> Appropriate measures in place to temporarily restrict access to construction sites and routes No unauthorized access to restricted sites No external grievances from local communities | <ul style="list-style-type: none"> Transport and Traffic Management Plan Stakeholder Engagement Plan |
| Security Personnel | <ul style="list-style-type: none"> Land Preparation and Construction Operation Closure | <ul style="list-style-type: none"> Local Communities | <ul style="list-style-type: none"> The Project Company will continue receiving services from reputable and certified Private Security Contractor Firms. The agreements with the Private Security Contractor Firms will include provisions related to Project Company's requirements for the appointment of certified officers, who received basic trainings for private security officers, were subject to necessary security inquiries and fulfills the age and education standards specified by the Company. The Project Company will continue monitoring the legal and special trainings provided to the private security officers and ensure that these officers receive periodical trainings on adequate use of force, appropriate conduct towards the Project employees and the local communities, gender sensitivities, cultural sensitivities (if required) and human rights in line with the requirements of national legislation as well as EBRD PR2 and PR4. The security management measures will be covered in the Community Health and Safety Management Plan to be prepared and implemented for the Project. | <ul style="list-style-type: none"> Agreement with a reputable and certified Private Security Contractor Firm in place | <ul style="list-style-type: none"> Community Health and Safety Management Plan Stakeholder Engagement Plan |

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|--------------------------|---|--|--|--|---|
| Shadow Flicker | <ul style="list-style-type: none"> Operation | <ul style="list-style-type: none"> Residential receptor (vulnerable PAP) within the setback distance of T15 | <ul style="list-style-type: none"> Project-specific Stakeholder Engagement Plan will be implemented to address any potential risk that may be related to the acts of the private security officers employed in the Project in line with the Grievance Mechanism, where necessary. The Project Company will further engage with the vulnerable PAP living in the setback distance of T15 during the ESIA public disclosure period regarding relocation and inform the PAP on the potential operational shadow flicker impacts of the Project based on the findings of the ESIA and the proposed mitigation measures including the option for relocation during the construction and operation. In case the vulnerable PAP declares his unwillingness to relocate during the ESIA disclosure period, the Project Company will recognise the right of the PAP to choose relocation until the end of second year of operation. <p><u>If the PAP is willing to relocate:</u></p> <ul style="list-style-type: none"> If the PAP is willing to relocate, a RAP will be prepared in line with EBRD PR5, submitted to Lenders for approval and implemented for the vulnerable PAP living in the setback distance of T15. The RAP will ensure that the operational shadow flicker impact on the vulnerable PAP is avoided at the resettlement site, which will provide adequate housing with improved living conditions, where the PAP would feel himself comfortable to stay (considering his vulnerability) and continue his current economic activities, if there is any. <p><u>If the PAP is unwilling to relocate:</u></p> <ul style="list-style-type: none"> If the PAP is unwilling to relocate, the Project Company will regularly (e.g. at least monthly) engage with the vulnerable PAP regarding his experience on shadow-flicker throughout the first year of operation (except the months May, June and July when there is no shadow flicker impact anticipated) and inform the PAP about the Project Grievance Mechanism so that the PAP can convey his grievance in case of shadow flicker impacts. The regular engagement outcomes will be evaluated on a monthly basis and corrective measures will be developed and implemented progressively at the end of each monthly monitoring campaign (implementation of corrective measures will be completed within 3 months following the monthly monitoring). The complete set of the engagement outcomes (consisting of documents on monthly engagement with the vulnerable PAP) obtained throughout the first year of operation) will be evaluated collectively at the end of the first year of operation. Based on the outcomes of the on-going engagement, the Project Company will develop corrective measures in consultation with the vulnerable PAP and the owner of the building and implement these measures with a mutually agreed method that will be approved by Lenders (implementation of corrective measures will be completed within 3 months after the end of the first year of operation, whenever technically feasible). These measures will include the following: <ul style="list-style-type: none"> Fitting the windows of affected rooms with sun blinds. Landscaping/provision of vegetation screening if this is proved to be effective in avoiding shadow flicker impact at this specific location (effectiveness will be technically evaluated by the Company) The Project Company will continue engagement with the vulnerable PAP through face to face meetings to be undertaken quarterly in the second and third years of operation and semi-annually after the third year of operation until the end of financing period. Project-specific Stakeholder Engagement Plan and the Project Grievance Mechanism will be implemented throughout the operation to address any noise-related grievance and plan/take corrective actions, where necessary. | <ul style="list-style-type: none"> Consultation records with the PAP Shadow flicker mitigation measures in place Depending on the outcome of the consultation RAP to be developed and implemented No grievances received from the PAP | <ul style="list-style-type: none"> Stakeholder Engagement Plan |
| Blade and Ice Fall/Throw | <ul style="list-style-type: none"> Operation | <ul style="list-style-type: none"> Residential receptor (vulnerable PAP) within the setback distance of T15 | <ul style="list-style-type: none"> In case the vulnerable PAP living in the setback distance of T15 is unwilling to relocate, the Project Company will monitor the ice throw risk by means of 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 afterwards as necessary and/or if required by the Lenders. The Project Company will develop and implement an Ice Throw Risk Assessment and Management Procedure that will be approved by Lenders. As part of this Procedure, an ice monitoring station will be established at the best representative turbine to be determined at the Project Area. Thus, when icing is detected at this specific turbine, an alarm signal will be transmitted to the operator through the SCADA system. The chief operator will appoint an authorized control team to visit the turbine locations and conduct visual checks at a safe distance by using binoculars to ensure occupational health and safety of the control team. If the control team identifies ice throw risk, they report the risk to the chief operator and the shut-down decision is taken until the risk is alleviated to acceptable levels. The procedure will identify the setback distances around the turbines and the measures to be taken within these distances (e.g. putting warning signs). | <ul style="list-style-type: none"> In the first year of operation monthly reporting on icing at the WPP starting from December up until end of March to evaluate ice throw potential. Reporting and evaluation to continue as necessary and/or if required by the Lenders. Ice Throw Risk Assessment and Management Procedure in place Ice monitoring station established at the best representative turbine Periodic blade inspection and repair records in place | <ul style="list-style-type: none"> Ice Throw Risk Assessment and Management Procedure Stakeholder Engagement Plan |

| Impact Description | Project Phase | Receptor | Proposed Mitigation Measures | Monitoring/KPIs | Implementation Plan |
|--|--|--|---|--|---|
| | | | <ul style="list-style-type: none"> The Project Company will ensure that periodic blade inspections and repair of defects that could affect blade integrity are performed and recorded. | | |
| | | <ul style="list-style-type: none"> Users of the forests for forestry, grazing and mushroom collection activities (from Kiyikoy and Kislacik settlements) Recreational users of the forest land within the License Area | <ul style="list-style-type: none"> Necessary warnings will be installed and additional precautions during the days of the year when there is risk of ice throw in consideration of the fact that public access to the License Area will not be restricted during the operation phase. | <ul style="list-style-type: none"> Necessary warnings for public in place for ice throw risk | <ul style="list-style-type: none"> Stakeholder Engagement Plan |
| Cultural Heritage | | | | | |
| Physical disturbance due to land preparation and construction activities | <ul style="list-style-type: none"> Land Preparation and Construction | <ul style="list-style-type: none"> Non-registered Potential Site on the access road to T18 (Kiremitlimandira Archaeological Area) (spread over a total area of 3,200 m2) or chance finds currently buried under ground | <ul style="list-style-type: none"> Project-specific Cultural Heritage Management Plan (CHMP) including the Chance Find Procedure will be implemented by the Project Company and the contractors (through contractual requirements). Prior to the start of land preparation and construction activities, the information and data belonging to the potential non-registered archaeological site will be processed in all Project documents. The site boundaries will be marked by using proper materials (e.g. safety strips, fence, information signs, etc.) and all Project personnel (including direct and contracted workers) will be informed on the actions to be taken for the protection of this site by means of relevant trainings. | <ul style="list-style-type: none"> CHMP and Chance Find Procedure in place Information on potential non-registered archaeological site processed in all related project documentation for Project personnel before land preparation and construction works Boundaries of the potential non-registered archaeological site marked with appropriate materials | <ul style="list-style-type: none"> Cultural Heritage Management Plan |
| Restrictions to traditional production activities used by the local people for economic purposes | <ul style="list-style-type: none"> Land Preparation and Construction Operation | <ul style="list-style-type: none"> Oak charcoal production and lumbering activities conducted by Kiyikoy residents | <ul style="list-style-type: none"> The Project Company will ensure that there will be no permanent access restrictions (other than health and safety purposes) within the License Area The Stakeholder Engagement Plan (SEP) including the Grievance Mechanism will be implemented throughout the Project life. | <ul style="list-style-type: none"> No permanent access restrictions within the License Area for local people No grievances received related to access restrictions | <ul style="list-style-type: none"> Stakeholder Engagement Plan |

GEM

www.gemtr.com