ATASEVEN ENERJİ ÜRETİM A.Ş.

72 MWm/70 MWm

ATARES-1 WIND POWER PLANT

EIA REPORT

2022

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1.0 PROJECT DESCRIPTION

It is planned by Ataseven Enerji Üretim A.Ş. to establish Atares-1 Wind Power Plant (72 MWm/70 MWe) at Somak region in Bursa Province, Karacabey District.

Regarding the project, an “EIA is not Required” certificate dated 23.03.2010 and numbered 165 was given by the Bursa Provincial Directorate of Environment and Forestry.

Production license dated 17.06.2021 and numbered EU/10270-2/04970 was given by the Energy Market Regulatory Authority (EMRA) with the board decision dated 17.06.2021 and numbered 10270-2.

It has been reported with the letter dated 22.06.2021 and numbered E-48331039-220.02-11 67764, that the above mentioned “EIA is not required" certificate is valid for the unit powers and coordinates specified in the EMRA board decision dated 17.06.2021 and numbered 10270-2.

The project was originally planned as 34 turbines. However, due to both environmental sensitivity and the development of turbine technologies, the total number of turbines within the scope of the Project has been determined as 18.

In the letter of the Ministry of Environment, Urbanization and Climate Change dated 10.12.2021 and numbered 2369057, it was stated as "In accordance with subparagraph (d) of Article 24 of the EIA Regulation regarding the change in the number of turbines (from 34 to 18 turbines), there is no need to apply the provisions of the EIA Regulation."

Within the scope of the project, 18 turbines, switchyard and administrative buildings will be constructed. The total installed power of the project will be 70 MWe. Annual electrical energy production amount is 280.000.000 kWh. The size of the total license area of the Project is 3500 hectares.

1.1 Project Technology

The technical specifications of the turbines to be used within the scope of the Project are given in detail in the report. The electrical energy to be obtained from the wind turbines will be converted to medium voltage by the transformers to be installed for each unit.

The first planned activity in the Project area is the preparation of the land. At this stage, the areas where the wind turbines will be located will be excavated in appropriate dimensions.

Since the vegetable soil and excavation material to be produced during the preparation of the land will be used in the works of arranging the transportation roads within the activity area, it is expected that no excavation material will be created. However, the provisions of the "Excavation Soil, Construction and Demolition Waste Control Regulation" dated 18.03.2004 and numbered 25406 regarding possible excavation wastes will be complied with.

After the turbines are placed, underground wiring will be done. Cabling will be done underground in order to increase safety. Transmission cables will be passed underground at a minimum depth of 80 cm on the ground at the level of the roads.

In the final phase of the wind power plant construction, connection to the national electricity system will be made. The energy produced will be transferred to the national system in order to meet the energy needs of the region after the necessary controls are made. An energy transmission line will be constructed for this purpose.

The completion time of the construction works is expected as 38 months. The economic life of the power plant is envisaged as a minimum of 49 years.

The work flow chart of the Project is given below.

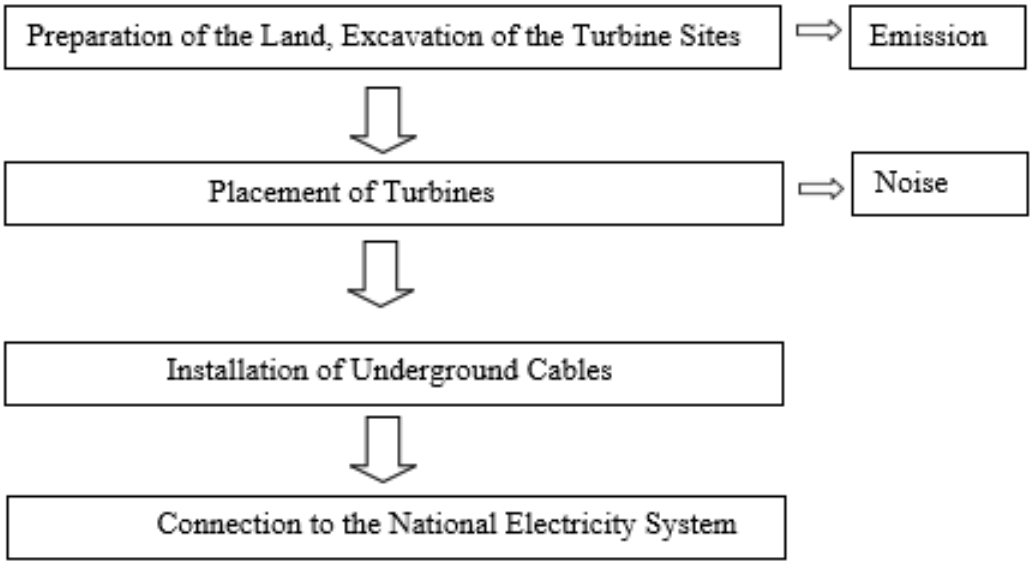


Figure 1-1 Work Flow Chart

Wind turbines can be monitored on a continuous monitor by means of microprocessor sensors. The wind speed and direction data coming from the sensors are detected by microprocessors and monitored continuously and automatically adjusts the wind angles of the turbine. If the wind speed is found to be sufficient as a result of at least 3 minutes of measurement for the system to start, the sensors warn the system to operate. When it starts to work, the rotors of the turbines come to the appropriate angle according to the wind direction.

The main parts that make up the wind turbines planned to be used within the scope of the Project are as follows:

1. Rotor: It converts the kinetic energy of the wind into mechanical energy.
2. Poultry: Three rotor blades are used in a wind turbine.
3. Hub It is used to connect the three rotor blades to the main shaft of the turbine.
4. Gear Box The gearbox in the wind turbine is designed to transfer the torsional resistance between the low-speed turbine rotor and the high-speed electric generator.
5. Bearings: The wing thrust bearing is designed to allow the wing to swing from one end to the other.

6. Brake System: The blade swing system acts as the main braking system of the wind turbine.
7. Generator It converts mechanical energy into electrical energy.
8. Route Assembly: The bed placed between the nacelle and the tower facilitates the course movement.
9. Tower The wind turbine is mounted on top of a cylindrical tower.
10. Nacelle: It protects the main components of the wind turbine generator.
11. Power Converter: The wind turbine uses a power converter system consisting of a rotor-side converter, a DC intermediate circuit, and a grid-side power inverter.

This system ensures that variable rotor speeds can be obtained by maintaining synchronization with the mains frequency.

12. Network Connection: Cable and electrical protection and control systems.

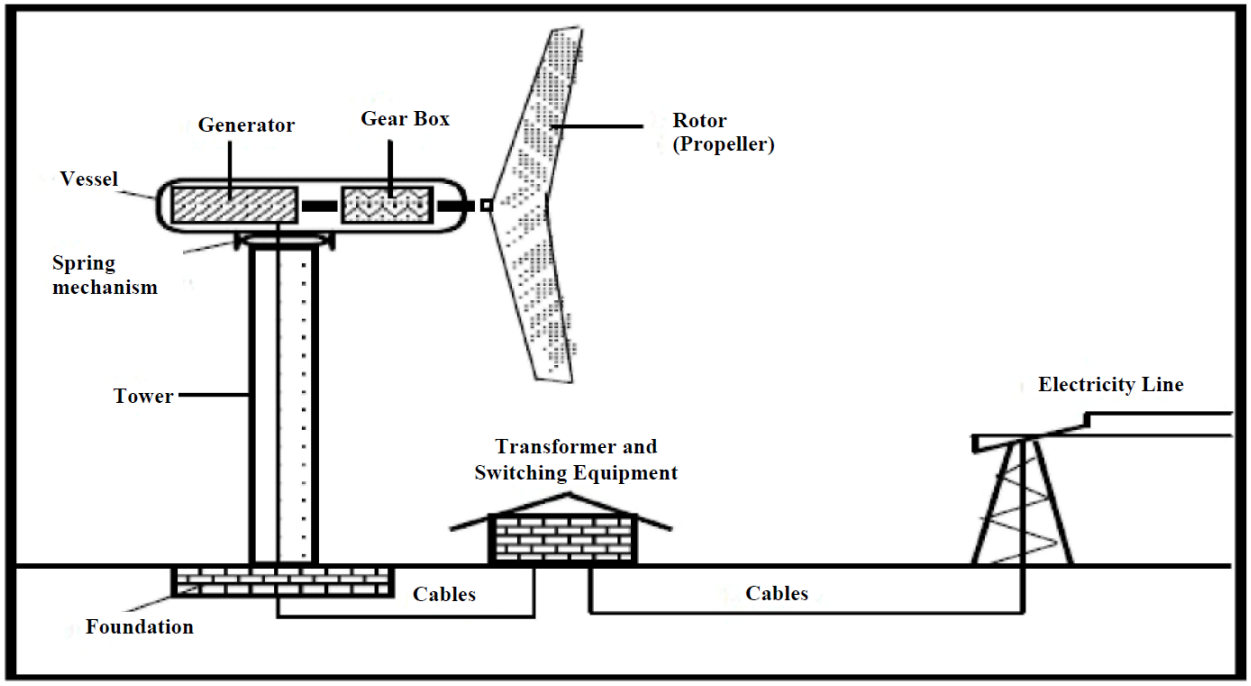


Figure 1-2 Main Elements of a Wind Turbine

The locations where the wind can occur in terms of meteorological and topography are listed below:

1. Regions with high pressure gradient;

2. Valleys where precipitation is parallel to the constantly blowing wind;
3. High, uneven hills and plateaus;
4. Plains with high pressure gradients and low-slope valleys with constant winds;
5. Hills and peaks under the influence of strong geostrophic wind fields;
6. Coastlines with geostrophic wind and geothermal gradient field.

The conversion of wind energy to electrical energy has many advantages. The most important of these advantages are:

1. The generator can be designed over a very large area with high efficiency, reliability and minimal maintenance.
2. The generated energy can be transmitted to the point of use with higher efficiency and lower cost compared to other sources.
3. Electrical energy can be more easily brought into other forms, modulated or converted.

One of the positive effects of wind turbines on the environment can be listed as reducing the use of fossil fuels and not causing the emission of pollutants (harmful gases, airborne ash) resulting from combustion. Wind turbines do not emit harmful gases such as carbon oxides, sulfur and nitrogen. Therefore, it does not cause greenhouse effect. According to the data of the American Wind Energy Association (AWEA), the emission amounts in the USA prepared for the existing energy sources are presented below.

The advantages and disadvantages of Wind Power Plants compared to other sources are mentioned below.

Advantages

- No emission of gases that pollute the atmosphere.
- Being a clean energy source.
- Its resource is not exhausted (as long as the sun, earth and atmosphere exist).
- Wind facilities are easier to install and operate than other facilities.
- Low energy production costs.
- Increased reliability.

- Being regional and therefore able to produce their own electricity.
- Reducing the use of finite fossil resources and supporting existing energy production resources.
- Small turbine sit area allowing the use of spaces between turbines.
- Ensuring efficient conversion of wind power to electricity
- It is easy to disassemble and remove turbines that have expired and can be reused in terms of land.
- Easy maintenance of wind turbines
- The noise of the engine blades 200 m beyond the turbines is completely masked by the noise created by the leaves of trees and shrubs.
- Reducing carbon emissions.
- Wind energy is the cheapest renewable energy source.
- Wind turbines only produce energy when the wind blows and the energy production changes with every move of the wind.
- Technological developments in aerodynamics, structural dynamics and micro-meteorology have resulted in a 5% increase in annual energy production per m^2 in the field of wind turbine engines. New technology is constantly being applied in new wind turbines
- Wind energy does not leave any waste such as harmful emissions to the environment.
- As a result, wind power plants are a healthy energy production source that does not cause acid rain and atmospheric warming, does not emit CO_2, does not consume oxygen, does not have radioactive effects, does not affect natural vegetation and human health.

Disadvantages

- In places where there is no continuity of the wind, the energy production value is not constant.
- Low energy production compared to the energy obtained from fossil and nuclear fuels.
- Potential to impact birds and Radio-TV signals.

Two types of noise occur in wind turbines. Mechanical noise is the noise created by the gearbox, generator and backup motors. Mechanical noise can be eliminated by using acoustic sheaths and special gears and covering the rotating parts with sound absorbing material. Aerodynamic noise, on the other hand, increases depending on the speed of the blades rotating in the air.

Wind turbines can have negative effects on bird life. These effects include death and injury of birds by striking towers or wings, or changing their nesting places and migration routes. But bird death due to wind turbines is rare. The tips of the turbines' blades will be painted orange/red. All necessary precautions will be taken to minimize the effects of birds on wind turbines. In addition, warning lights will be placed on the turbine tops for aircraft.

Wind turbines can also have a negative effect on interference in radio and television receivers.

It is planned to employ approximately 45 people during the construction phase. It is planned to employ 10 people during the operation phase.

Turbine specifications are given below.

Table 1-1 Technical Specification of the Turbines

ROTOR	
Wing Diameter	150 m
Height of Tower	105-125 m
Rotor Area	17460 m^2
Rotating speed	10.6 - 19.0 rpm
Direction of Rotation	Clockwise
Rotor Type	3 Blade Rotor
Orientation	Active Wind Direction
WINGS (BLADES)	
Number of Wings	3
Wing Length	75 m
Wing material :	Fiber glass and carbon fiber
Wings Connection	Gear Systems

GEARBOX (GEARBOX)	
Gearbox (type):	Multistage Planetary Spur Gear Stage
GENERATOR(GENERATOR)	
Generator type:	Asynchronous
Voltage	690 V
Frequency	50 Hz
TOWER FEATURES	
Type	Modular steel tower

1.2 Project Alternatives

Today, the fact that fossil fuels are predominantly used in electricity generation and that these fuels are in a consumable condition and that they cause harm to the environment have revealed the necessity of using an alternative energy source. Wind turbines are extremely important in reducing CO_2 emissions.

The widespread use of new and alternative energy sources, together with industrialization and economic development as a country, brings with it both relatively environmental pollution, economic necessity and reducing the weight of externally dependent energy production methods. In this context, WPP (Wind Power Plants), one of the alternative and clean energy production methods, also come to the fore. WPP facilities, where energy production can be met with natural resources and without causing waste of natural resources, have been rapidly becoming widespread in our country in recent years.

Ataseven Enerji Üretim A.Ş. aims to disseminate the applications of wind energy and electricity generation technology in Turkey, which is one of the most important "renewable energy sources" in overcoming the electricity energy bottleneck in our country. In this context, the owner of the Project evaluated the project area as having the potential to contribute to the increasing electrical energy need of the country with wind energy.

The following factors were taken into consideration in the turbine type and capacity selection.

- Wind characteristics,
- Turbine characteristics and performance,
- Economic lifetimes and warranties of turbines,
- Tried and working turbines and their performance,
- Connection features to the interconnected system,
- Price and performance,
- Minimum environmental impact,
- Economic life and ease of maintenance
- Technology

1.3 Project Location

Atares-1 Wind Power Plant Project is located at Somak region in Bursa Province, Karacabey District. Project location map and topographical map is provided below.

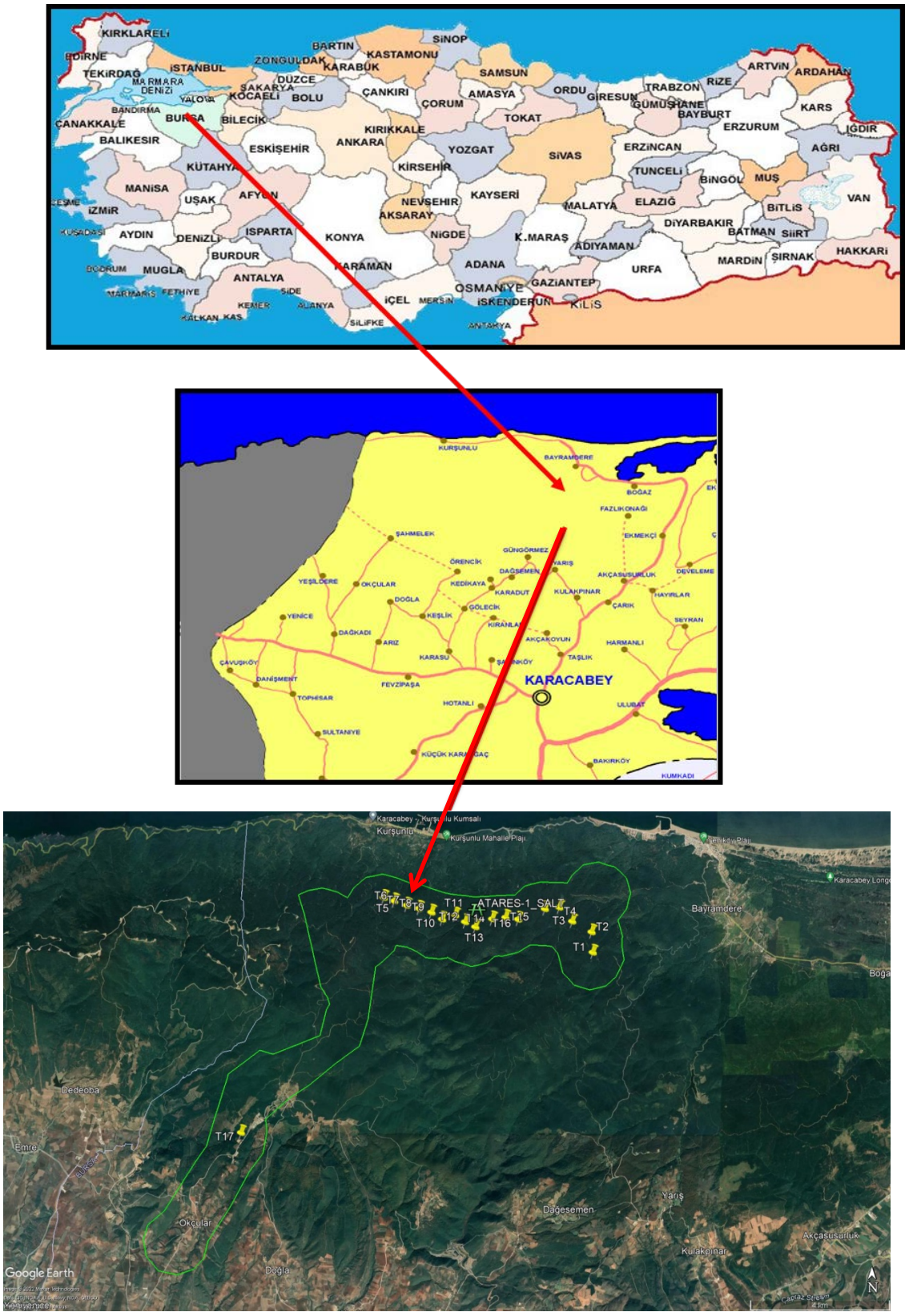


Figure 1-3 Project Location Map

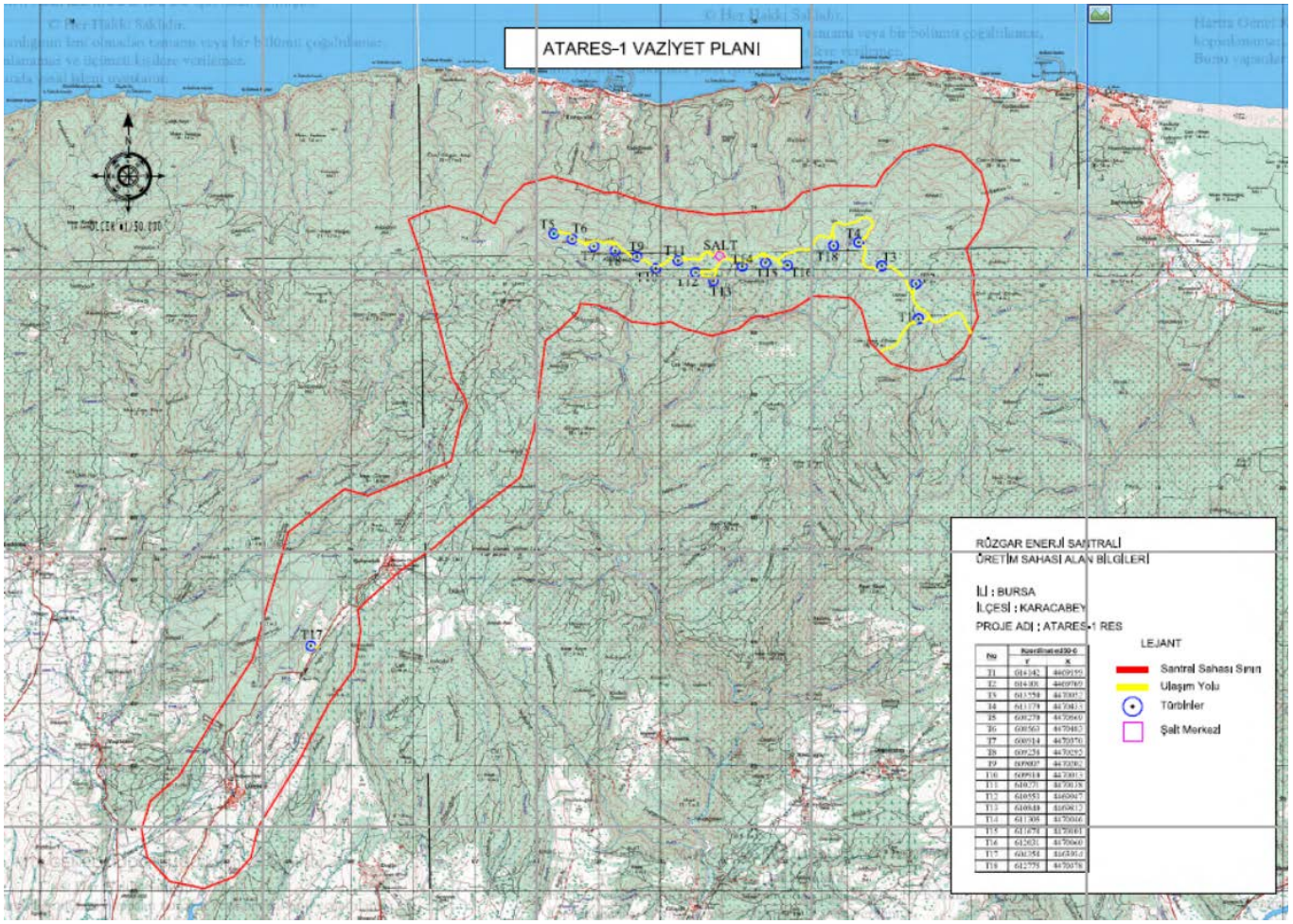


Figure 1-4 Topographical Map

There are no population-dense areas (schools, hospitals, dormitories, kindergartens, hotels, etc. sensitive settlements) in the project site and its impact area. Avalanche, landslide, rockfall, ground heave etc. hazards are not likely to occur in the activity area.

Coordinates of the turbines are provided below.

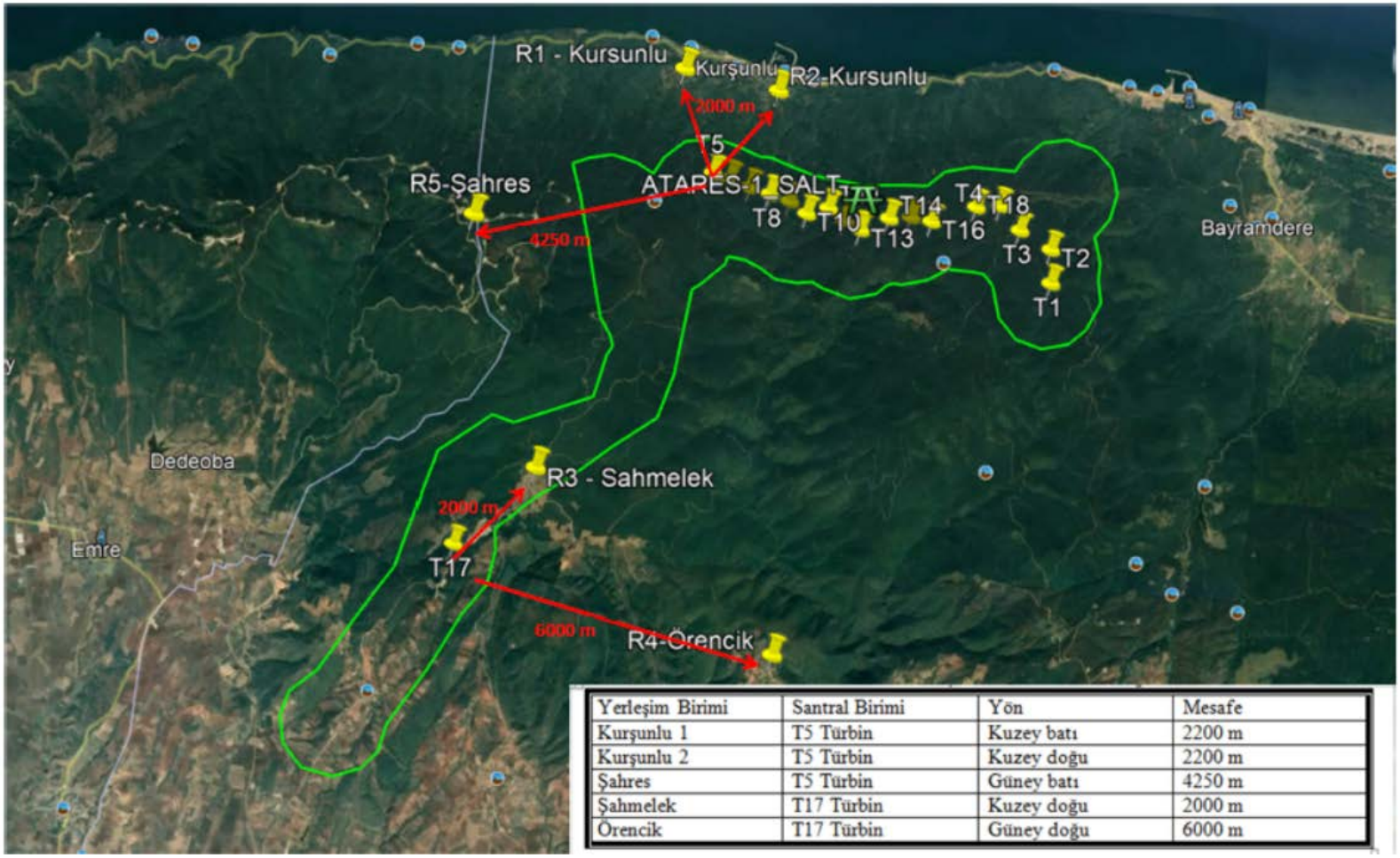
Table 1-2 Coordinates of the Turbines

Turbine No	Coordinate Order: Right, Up Datum : ED-50 Type : UTM ZCM: 27 Scale Factor: 6 degrees	Coordinate Order: Latitude, Longitude Date : WGS-84 Type : GEOGRAPHICAL Z.C.M. : -- Scale Factor: ----------
T1	614142 : 4469199	40.36387662 28.34383315
T2	614101 : 4469769	40.36901605 28.34345234
T3	613550 : 4470052	40.37164015 28.33701442
T4	613179 : 4470433	40.37512215 28.33271315
T5	608270 : 4470569	40.37699895 28.27492404
T6	608563 : 4470483	40.37618626 28.27836011
T7	608914 : 4470370	40.37512270 28.28247454
T8	609258 : 4470295	40.37440218 28.28651291
T9	609607 : 4470202	40.37351874 28.29060699
T10	609910 : 4470013	40.37177657 28.29414269
T11	610271 : 4470138	40.37285477 28.29841550
T12	610553 : 4469947	40.37109712 28.30170332
T13	610840 : 4469812	40.36984310 28.30505958
T14	611305 : 4470046	40.37188877 28.31057615
T15	611678 : 4470101	40.37233428 28.31497827
T16	612031 : 4470060	40.37191765 28.31912805
T17	604358 : 4463934	40.31773542 28.22776689
T18	612775 : 4470378	40.37468151 28.32794567

The closest turbine (T17) to the settlements from the construction site is located 2000 m southwest of Şahmelek District. The nearest settlements are listed in below table and the map showing the settlements is given below.

Table 1-3 The Nearest Settlements to the Project Units

Neighbourhood	**Turbine**	**Direction**	**Distance**
Kurşunlu 1	T05	Northwest	2200 m
Kurşunlu 2	T05	Northeast	2200 m
Şahres	T05	Southwest	4250 m
Şahmelek	T17	Northeast	2000 m
Örencik	T17	Southeast	6000 m



Yerleşim Birimi	Santral Birimi	Yön	Mesafe
Kurşunlu 1	T5 Türbin	Kuzey batı	2200 m
Kurşunlu 2	T5 Türbin	Kuzey doğu	2200 m
Şahres	T5 Türbin	Güney batı	4250 m
Şahmelek	T17 Türbin	Kuzey doğu	2000 m
Örencik	T17 Türbin	Güney doğu	6000 m

Figure 1-5 Map Showing the Nearest Settlements

2.0 ENVIRONMENTAL BASELINE CHARACTERISTICS

2.1 Population

The population of Karacabey District is 84,241 according to 2021. This population consists of 42,192 men and 42,049 women. As a percentage, 50.08% are men and 49.92% are women. Population of the district and the nearest neighbourhoods are provided below.

Table 2-1 Population of Karacabey and the Nearest Neighbourhoods

Settlement	Total Population	Male Population	Female Population
Karacabey	84.241	42.192	42.049
Kurşunlu	746	401	345
Şahmelek	221	119	102
Örencik	92	47	45

2.2 Land Use

The size of the project license area is approximately 3,500 ha.

According to the design studies, the Project area consists of 80% forest land, 18% private land and the remaining 2% consists of pasture and treasury parcels. The areas where the turbines will be installed are entirely within forest land. Land use map is provided below.

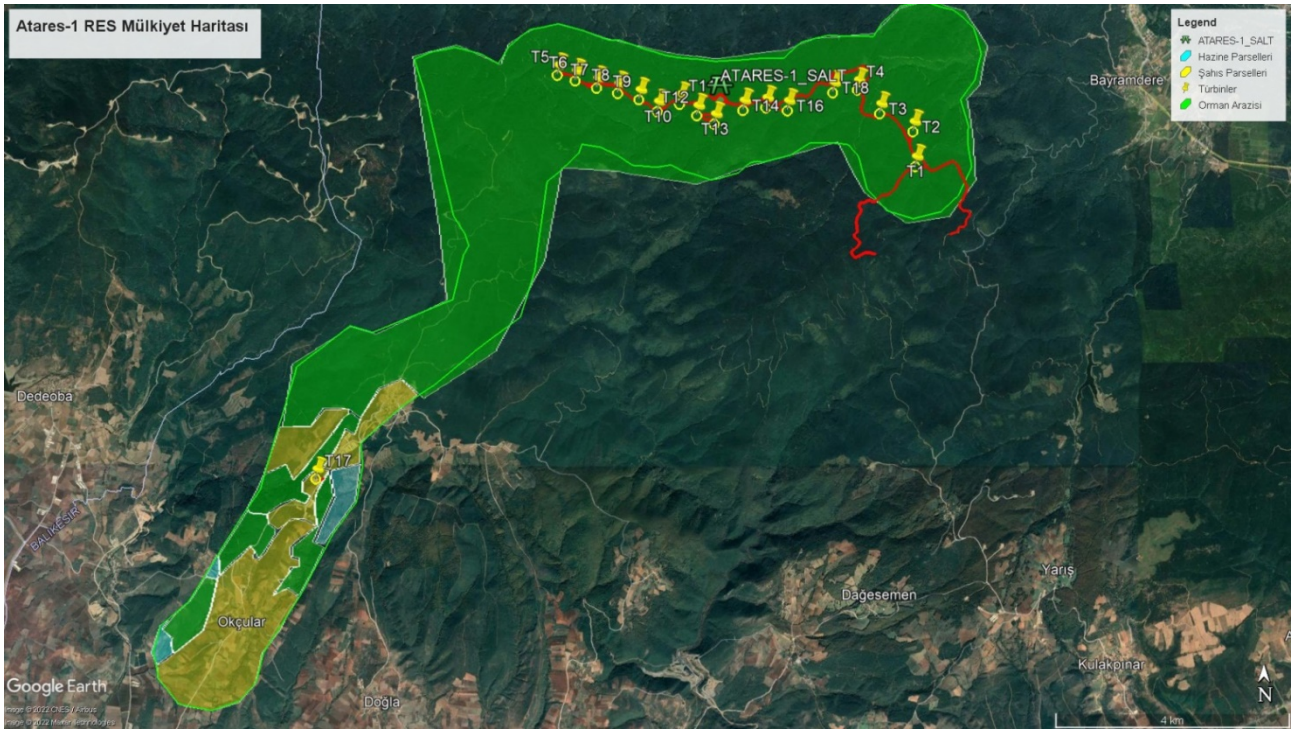


Figure 2-1 Land Use Map

Within the scope of the project, 18 turbines are planned to be located and circular foundation pits with a diameter of 23 m will be dug for each turbine. The excavation for a turbine is approximately 4,500 m³. In addition, an area of 14,000 m^2 will be reserved for the command, control building and switchgear area in the activity area.

It is expected that a total of 90,000 m^3 of excavation will be generated within the scope of the Project. The excavation material to be generated during the land preparation and construction processes will be used in the rearrangement of the access roads within the activity area.

Locations suitable for the topography and the opinions of the relevant institution will be selected in the Project area for the roads, temporary load unloading and crane settlement areas. The distances to be determined by the relevant authorities will be followed for the health protection bands to be left around the turbines and switchgear.

The land use capability map of the project area is given below. As can be seen on the map, the land assets are seen as the lands that are not suitable for cultivated agriculture or are suitable in a limited way and lands in forest regime.

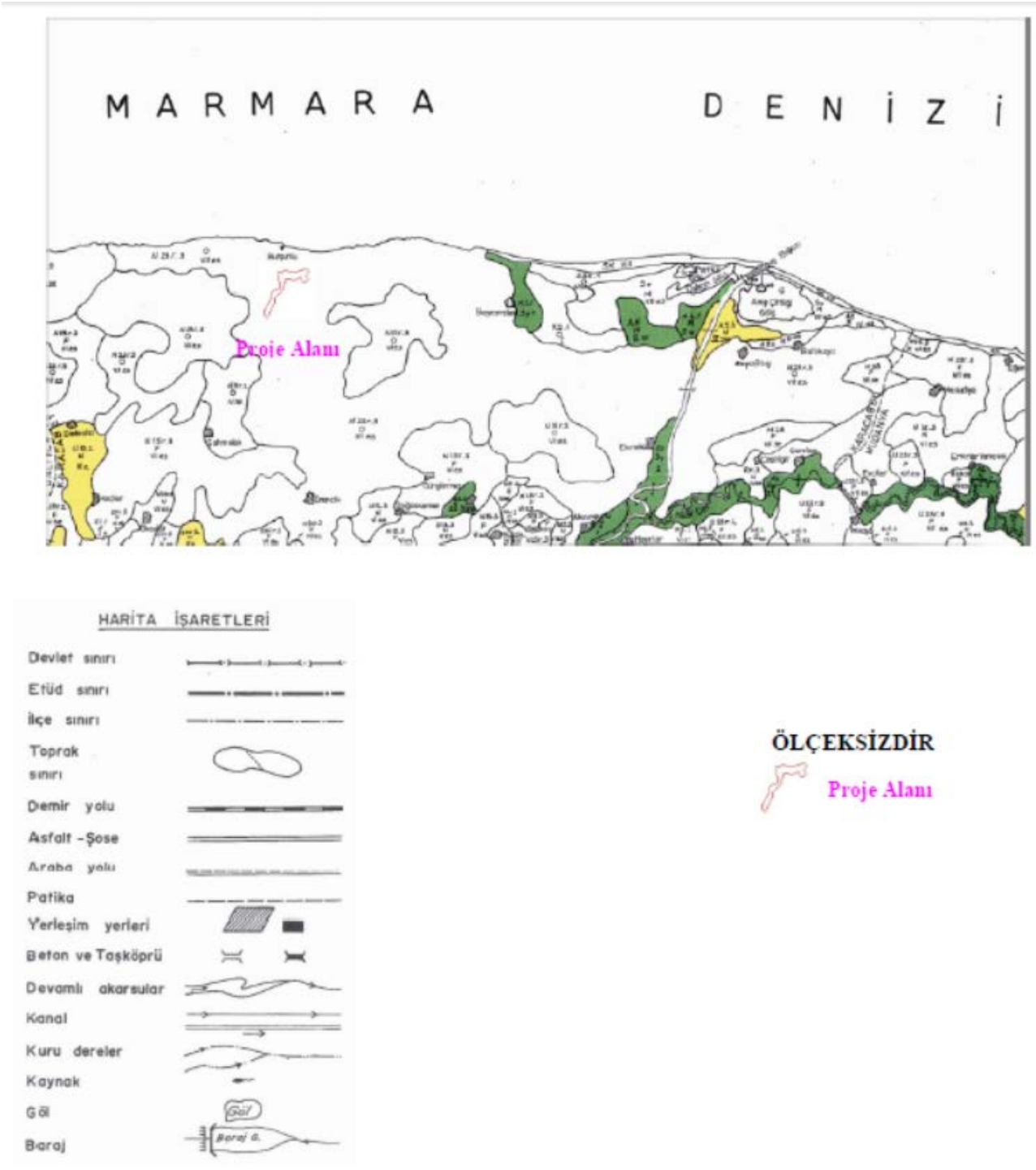


Figure 2-2 Land Use Capability Map

2.3 Geology

The Project area is located on the mountain range between Bandırma and Gemlik, which runs parallel to the southern coast of the Marmara Sea, approximately 20 km north of the Karacabey district center.

The topography, which rises rapidly with very steep slopes towards the south along the southern coast of the Marmara Sea, exceeds 800 m in a few km. The mountain ranges along the coast form a rugged topography with hills and ridges with very steep slopes.

Towards the south, the topography gradually decreases to 10 m around the Karacabey Plain and Manyas Lake.

The altitude of Kara Hill is around 833 m. Other important elevations in the study area are Doğca Hill, Gürgenlik Hill, Ihlamur Hill, Kurt Hill, Dikmen Hill, Yerköprü Hill, Dikilitaş Hill, Sarıyar Hill, Gölcüktarla Hill, Zeytin Hill and Bakacak Hill.

In the south of the Sea of Marmara, there are metamorphic, magmatic and sedimentary rock units of different ages and lithological characteristics from Paleozoic to Quaternary. In the study area, there are Paleozoic aged Fazlıkonağı Formation and granites, Jurassic Karakoca and Akçakoyun Formations, Neogene aged lake sediments and Quaternary aged alluviums.

The geological map of the facility area and its immediate surroundings is given below.

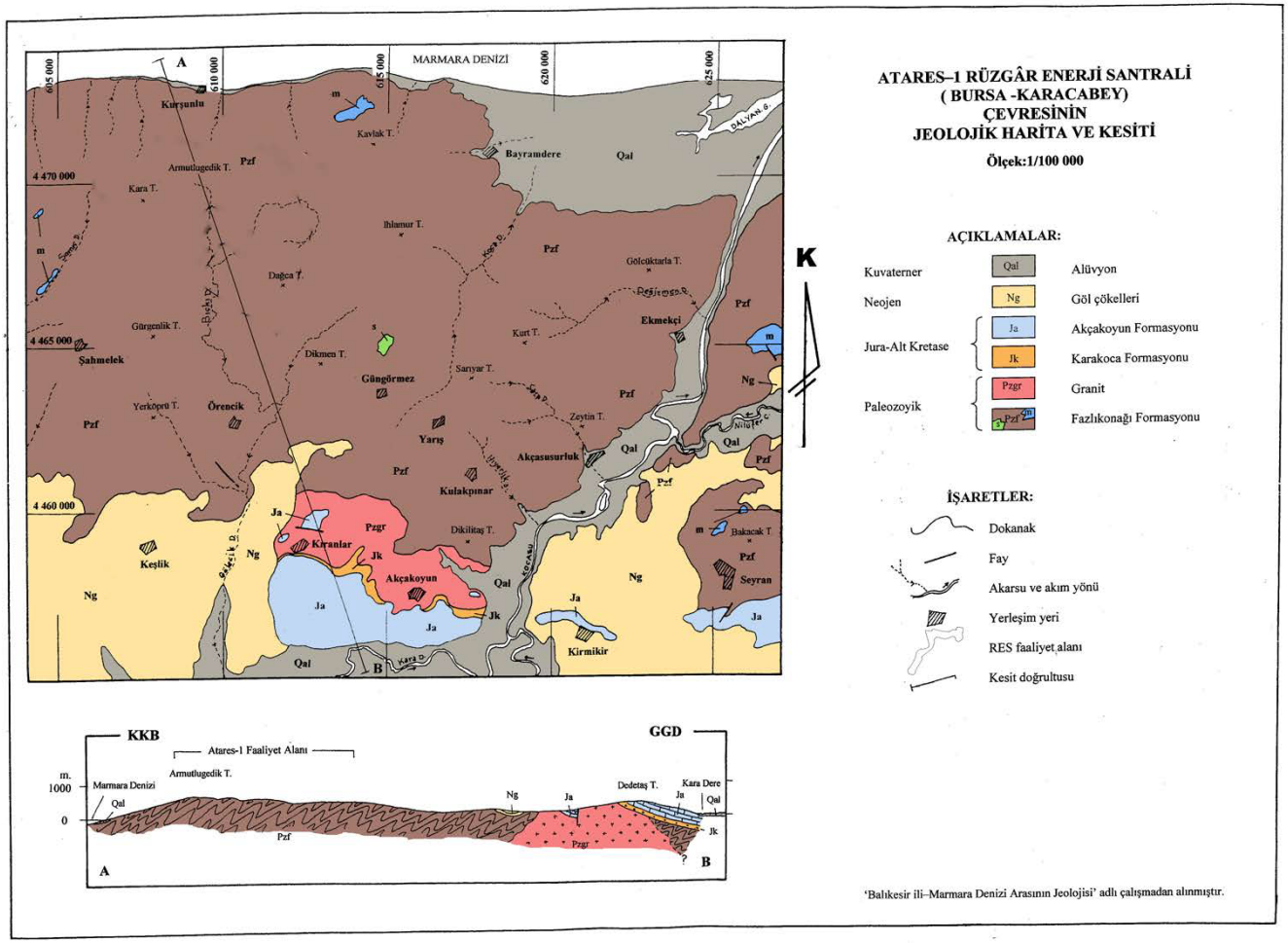


Figure 2-3 Geology Map

PALEOZOIC

Fazlikonagi Formation (Pzf):

The Fazlıkonağı Formation, which covers the entire activity area and a large part of the study area, consists of metamorphic schists and marble (m) and serpentinite (s) masses in the form of lenses and bands that can be seen from time to time.

Metamorphic schists are mottled colored, generally basic magmatic schists. The common feature of the rocks, which have undergone the same type of metamorphism and tectonism, is intense folds and fractures. Since it is covered by younger units, its lower and upper levels can be separated according to metamorphism conditions. Glaucophane-chlorite schist quartz-albite-chlorite-sericite schist quartz-albite-muscovite schist quartzite metasandstone and metacarbonates are common among the lithologies that are mostly intertwined, alternate and irregularly distributed. Although schistosity is occasionally prominent, it is usually not prominent.

Marbles are seen in the form of bands and lenses in metamorphic schists. The marble lenses, which have reached the size of the mappable scale, have been mapped with the pseudonym (m). Marbles; It is gray-white in color, has a sacchoroid texture, and is thin-medium bedded.

Serpentinite masses seen in the north of Güngörmez Village are in the form of lenses in metamorphic schists. Serpentinite masses have gained foliation by severe shearing from place to place. Chromite mineralization is observed from place to place within the serpentinite masses.

The thickness of the metamorphic rocks is uncertain due to the regular stacking and base of the rocks and isoclineal folding.

Considering the age and location of the unit, in which no organic pruritus was found due to metamorphism, and other studies in western Anatolia, it was accepted as Paleozoic. The unit was named as the Fazlıkonagi Formation around Balıkesir-Bandırma.

Granite (Pzgr):

It is seen in the south of the study area, around Kıranlar and Akçakoyun Villages. This pluton, which is a granodiorite-granite type intrusion, is gray colored, granular textured, coarse crystalline. In petrographic examinations, it was determined that it has a hypidiomorph granular texture, contains quartz feldspar biotite, less cornblende and very little opaque mineral. It usually shows mild pressure effects. The outer surfaces are highly weathered and arenaized. Lamprophyre microcrystalline granite, pegmatite and aplite formations are present in the developed cracks in the marginal zones.

This pluton, which was named Kapıdağ pluton in previous studies, cuts Paleozoic aged metamorphic schists and overlies the Triassic aged Karakaya Formation (outside the study area). Therefore, the age of pluto is accepted as Paleozoic (Pre-Tertiary).

MESOZOIC

JURA:

Karakoca Formation (Jk):

It is seen in the south of Kıranlar and Akçakoyun Villages in the south of the study area and its outcrops extend approximately in the east-west direction. The unit, which starts with a conglomerate at the base, is observed as sandstone, claystone, sandy limestone towards the top. It is usually colored red, brown, gray and green. Towards the top, it transitions to the upper Akçakoyun Formation with green clayey layers and limestone intercalations. Conglomerates are carbonate cemented, thick bedded, gravels 1–10 cm in diameter and angular-semi-rounded. The sandstones are medium-thick and distinctly bedded and contain carbonate levels in places.

The thickness of the unit varies from a few meters to 200 m. It has abundant micro and macro fossils. Jurassic age was given based on collected fossils.

Unit; It was named as Dağakça Formation around Mustafakemalpaşa and as Bayırköy Formation around Bursa-Bilecik.

Akçakoyun Formation (Ja):

It is seen in the south and southwest of the study area and its outcrops extend approximately in the east-west direction. The unit consists of white, cream, pink, dark yellow-colored limestones. It is medium-thick bedded. Fractures and joints are well developed and calcite veins are common. Melting and karst cavities are common. It should be hard and angular. In places, chert bands and nodules are observed.

The thickness of the Akçakoyun Formation, which offers different thicknesses in different locations, varies between 40 and 400 m. The unit contains abundant micro and macro fossils. According to the fossils collected, they are considered to be of Jurassic-Lower Cretaceous age.

Unit; It was named as İnatlar Limestone around Mustafakemalpaşa and as Bilecik Limestone around Bursa-Bilecik.

CENOZOIC

NEOGENE

Lake Sediments (Ng):

This unit, which is seen in very large areas in the southwest and southeast of the study area, is composed of conglomerate, sandstone, claystone, marl, clayey limestone and limestone alternations formed in the terrestrial environment (river, lake, lagoon). It is generally reddish brown, yellowish beige, off-white, occasionally less prominent, locally prominent, thin-medium bedded. The conglomerates are loosely attached and the pebbles are semi-rounded with blunt corners. The sandstones are loose in places, tightly attached in places, medium in size, cemented by tuff and calcite. Claystones and marls are locally laminated. The limestones are hard, fragmented and locally silicified.

The thickness of the lake sediments, which cover very large areas in Western Anatolia, varies in different basins, and it is known that the thickness reaches 1000 m in places.

The thickness of the lake sediments in the study area is estimated to be around a few hundred meters.

The lower contact of the unit is observed discordantly on the older units. Its upper contact is covered with alluvium.

Pollen analyses made from coal formations seen in places (outside the study area) in the lower levels of Neogene sediments, fossils in limestones seen in Middle Miocene and upper levels gave Pliocene age.

QUATERNARY

Alluvion (Qal)

Alluviums seen in the south and southeast of the study area, along Kocasu Stream and Kara Dere, and in the northeast, in the area where Kocasu Stream spills into the sea, consist of unconsolidated clay, silt, sand and gravel.

Alluvium thickness varies depending on the location of the river beds. It is estimated that the alluvium thickness in the study area is 20 m along the Kocasu (Susurluk Stream) and 50 m in the Kocasu Delta.

STRUCTURAL GEOLOGY AND EARTHQUAKECY:

Paleozoic aged metamorphic rocks in the study area are heavily fractured and folded and schistosity is evident in places. Granites are heavily fractured. The Karakoca Formation is medium-thick bedded and heavily fractured. The Akçakoyun Formation is medium-thick bedded, heavily fractured and has developed joint set. Stratification is towards south with 35-45 degrees. The Neogene aged lacustrine deposits are medium-thick and distinctly bedded, and the bedding is broadly corrugated, close to horizontal. The prominent fold axis cannot be observed.

Apart from a few minor faults, no major faults are observed in the study area. However, when the active fault map of Turkey is examined, it is seen that the activity area is between the North Anatolian fault, which causes destructive earthquakes, and the active Uluabat-Manyas fault. The

activity area is approximately 5 km from the North Anatolian Fault and approximately 35 km from the Uluabat-Manyas Fault.

Large-scale earthquakes that may occur in these fault zones will be effective in the activity area and its immediate surroundings. For this reason, the activity area and its surroundings are among the regions with high earthquake risk and are located in the first-degree earthquake zone in "Turkey earthquake zones map".

2.4 Hydrology and Hydrogeology

The most important streams in the study area are the Kocasu Stream (Susurluk River) and the Nilüfer Stream and Kara Stream that mix with this stream.

Kocasu Stream; Simav Stream, which joins with Koca Stream, which discharges excess water of Uluabat Lake, merges with Kara Stream, which discharges excess water from Lake Manyas in the north, to form Kocasu. Continuing its flow towards the north north east, Kocasu joins the Nilüfer Stream, which empties the waters of the Bursa Plain, a few kilometres further north and empties into the Marmara Sea in the north.

Kara Dere emerges from the southeast corner of Lake Manyas and turns its flow, which it continues to the southeast, to the northeast after Karaçalılık Village. The stream, which progresses by making wide meanders, passes through the north of Karacabey and joins with Kocadere in the northeast of Karacabey to form the Kocasu Stream.

Nilüfer Stream is the natural drainage of the Bursa Plain and saves the plain from being a closed basin. The Nilüfer Stream, originating from the southern skirts of Uludağ, takes all the streams in and around the Bursa Plain and merges with the Kocasu Stream in the north of the Karacabey District.

In addition, there are streams fed by small springs and precipitation, most of which are tributaries of Kara Stream and Kocasu Stream, and some of them flow directly into the Marmara Sea. The

important ones of these rivers, whose length is around 5-15 km; These are Cistern Stream, Bıçkı Stream, Koca Stream, Hıyarlık Stream, Sarp Stream and Değirmen Stream.

There ara no lakes near surroundings of the activity area. Uluabat Lake, which is the most important wetland area of the region, is located approximately 20 km southeast of the activity area, and Manyas Lake is located approximately 15 km southwest.

Lake Manyas wetland buffer zone is located 20 km southwest of the project area. The wetland buffer zone of Lake Uluabat is located 11 km southeast of it.

There are Keşnik and Dağkadı ponds built for irrigation purposes approximately 10 km south and southwest of the activity area. In addition, Bayramdere Pond is under construction, approximately 10 km east of the activity area.

Uluabat Lake: The lake is 25 km long and 14 km wide, with an average lake area of 160 km². The minimum water level is 2.5 m. The maximum water level is 8.0 m. The average storage volume is 300,000 x10 m³. Its most important recharge is from the southwest by the Mustafakemalpaşa Stream and its total drainage area is 10,413 km². The height of the lake from the sea is 5 m. Uluabat Lake empties its excess water into the Marmara Sea through Uluabat Stream and Kocasu during heavy rainy periods.

Manyas Lake: The surface of the lake, which is 19 km long and 11 km wide, is approximately 166 km². The deepest point of the lake is about 10 m and its height from the sea is 16 m. The lake is fed by Kocaçay from the south and discharges its excess water to Kocasu via Kara Dere and then to the Marmara Sea. The lake is under protection as a national park due to its rich bird population.

There are no aquifer-like rocks in the activity area and its immediate surroundings.

Since metamorphic schists and granites are in the character of impermeable rocks, some water can only be taken from the fractured and cracked zones.

Although the Karakoca formation in the study area is composed of clastic rocks, they do not show aquifer characteristics because they are cemented and consolidated. The Akçakoyun Formation

plays an important role in the transmission of surface waters to the ground because it is composed of limestones with abundant fractures and melting gaps, but they do not have a significant groundwater potential since they are at high elevations. Although the detrital levels of the lake sediments are aquifer-like in places, they do not constitute a significant groundwater potential due to lithology discontinuities formed by lateral and vertical transitions.

The most important aquifers in the study area are alluviums. Alluviums seen in very wide areas, especially in the depression areas of Manyas and Uluabat lakes, have an important underground water potential because their thickness exceeds 100 m in places.

The project area starts from 5 km south of Karacabey-Bandırma highway. Okçular and Şahmelek neighborhoods remain within the EIA area. Transportation to T1- T16, T18 turbines and switchyard will be provided from Güngörmez neighborhood road by using the access roads of Atares-2. Transportation to T17 turbine will be provided from the junction of Dağkadı and Okçular Neighbourhoods vie Bursa Bandırma road.

2.5 Ecology

2.5.1 Flora

The project area is located on a hilly area with an altitude of 130-680 m above sea level and consists of forest vegetation and rock vegetation that rises from the coast and whose geological structure consists of Paleozoic aged metamorphic series, whose bedrock structure belongs to the Permo-Triassic aged Karakaya Complex. The flora of the research area is very rich. Maquis plants and Black Sea (Euxine) plants coexist. This vegetation structure makes the area special.

In order to carry out floristic studies, an area of approximately 1000 ha in and around the project area was investigated as a study area. The Project and survey area starts from 130 m and rises to a height of approximately 680 m. Bushes and trees predominate at the foot and top of the rocks. The main ones are; Crataegus microphylla, Quercus coccifera, Laurus nobilis, Phillyrea latifolia, Styrax officinalis, Arbutus unedo, Rosa sempervirens, Ruscus aculeatus var. aculeatus is Rubus hirtus. Arbutus unedo, Viburnum lanata, Tilia argentea, Daphne pontica, Smilax excelsa are

examples of euxin elements. The upper parts, which are the continuation of the rocks, have the appearance of a forest formed by the combination of Quercus cerris, Carpinus betulus, Tilia tomentosa, Fagus orientalis trees.

As a result of the field studies and literature review carried out in the project area, it was determined that 269 taxa belonging to 71 families were distributed in and around the area.

The first 3 families containing the most species from these taxa are Asteraceae (19), Rosaceae (23) and Lamiaceae (16). No endemic or rare species were found in the area. In the literature, it was stated that only Hypericum aviculariifolium endemic species was grown.

When the distributions of taxa observed in the field according to phytogeographic elements are examined; 53 are Mediterranean / D Mediterranean elements, 42 are Euro-Siberian / Black Sea elements, 4 are Iranian Turan elements.

Of the species identified in the project area, 104 taxa are in the LC (Least Concern) category, and 3 taxa are in the DD (Data Insufficient) category.

There is no flora element in the project area in accordance with the BERN and CITES Convention.

At Atares-1 WPP project site, no endemic or rare species were found in the area. In the literature research, only *Hypericum aviculariifolium* endemic species was found to be grown. This species is located in different grid squares of Anatolia.

Among the plants in the IUCN Red List of Threatened Species TM (2020); “CR” Critical, “EN” Endangered and “VU” Sensitive categories were not found. It was seen that 3 taxa were in the DD (Data Deficient) and 104 taxa were in the LC (Least Concern) category. When taxa were evaluated according to the Red Data Book of Turkish Plants (2000), no danger categories of taxa were found.

The fact that almost all of the project area is a forest area and trees will be cut due to the project will increase the loss of natural habitat and, accordingly, biomass. There will be no irreversible damage due to the absence of plant taxa that need to be protected in the project site. However,

provided that the precautions specified in the report are taken, the impact on the ecosystem is expected to be low, except for biomass losses.

2.5.2 Fauna

Field observations were made in habitats suitable for the species in forest edges, water edges and areas where animals pass. In addition, indirect determinations were made by taking into account the traces of fauna elements (such as footprints, feces, feeding remains and nest structure).

In order to reveal the inventory of bird species living in the area, previous scientific studies of the area and its immediate vicinity were scanned. Field studies were started with daylight as much as possible and continued until the evening.

In invertebrate species, the insects were identified by collecting it from under the stone by hand, from the tree and bush with a Japanese umbrella, during the field observation. The presence of caves and tree cavities for bird and bat species in the project area and its immediate surroundings were also investigated. The project area consists of a dense forest layer and since it is a shelter and feeding area for birds, it has been investigated whether there are bird nests on the road network and the area where the turbines will be located.

The presence of caves and tree cavities for bird and bat species in the project area and its immediate surroundings were also investigated.

The project area consists of a dense forest layer and since it is a shelter and feeding area for birds, it has been investigated whether there are bird nests on the road network and the area where the turbines will be located.

According to field observations and literature review, 23 reptile species were identified in the project area. Of these species, *Testudo graeca* (The Tortoise) is in the Vu (Vulnerable) category. Therefore, Annex-II (Strictly Protected Fauna Species) in accordance with the BERN Convention category.

The other 22 species identified within the scope of the project are in the LC (Least Concern) category. According to the BERN Convention, 15 of the reptile species obtained as a result of field observation and literature review in the project area are in Annex-II and 8 species are in Annex-III.

In addition, as a result of field studies and literature review, 5 amphibian species, 23 reptile, 73 invertebrate, 31 mammal and 101 bird species were identified in the area. 257 bird species were identified in the region. By complying with the precautions specified in the report in the Atares-1 RES work site, the possible risks arising from the planned activity will be minimized and ecological protection works will be carried out as quickly as possible.

As a result of the construction works, vertebrate animals in the region will leave the area for a short time. Due to the presence of similar habitats in and around the area, these species will start to come back to the area and start nesting with the commissioning of the facility that will change the area. It will not cause a large-scale negative impact that will harm the biodiversity in the region.

It has been concluded that the measures to be taken within the scope of the project will not have a large-scale negative impact on the WPP site and the ecosystem in its immediate vicinity. The impact of the project in terms of amphibian, reptile, invertebrate and mammal species will be reduced by measures to be taken during the construction and operation stages.

It is recommended to carry out at least 2 seasons of Bird and Bat Monitoring Studies for 2 years between March and September in the Project site.

2.5.3 Protected Areas

The project area is located within the borders of Bursa province, Karacabey district. In this section, the activity area, population density, closest settlements and the natural environment around it are taken into consideration.

In the report, the flora and fauna structure of the project area and its immediate surroundings were examined in detail, and no endemic or exotic species were found in the region that were taken under strict protection in accordance with the "Bern Convention".

The type and characteristics of the wastes to be generated by the operation and the effects of these wastes on the nearest settlement are discussed in the relevant sections of the report. Population-dense areas and other settlements are not expected to be adversely affected due to the activity. In addition, avalanches, landslides, rockfalls, etc. in the project area and impact area. hazards do not occur.

There are no recorded places and recreation areas with high landscape value or areas with unique geological and geomorphological formations within the boundaries of the project area and its immediate surroundings.

In the immediate vicinity of the project area, there are no military forbidden zones, areas allocated to public institutions and organizations for certain purposes, and "Restricted Areas" with the decision of the Council of Ministers No. 7/16349.

It has been concluded that the type and characteristics of the wastes to be generated due to the operation during the project and that these wastes will not have a negative impact on the nearest settlements. There are no population-dense areas (schools, hospitals, dormitories, kindergartens, hotels, etc. sensitive settlements) in the activity area and impact area.

A part of the project area remains in the Kocaçay Delta wetland buffer zone. In addition, in the immediate vicinity of the project area, there are no fields such as national park, nature park, nature monument, nature protection area, wildlife protection areas, wild animal breeding areas, cultural assets, natural assets, sites and protection areas, areas under protection according to the Bosphorus Law, biogenetic reserve areas, biosphere reserves , special environmental protection zones, special protection areas, protection areas related to drinking and utility water resources, tourism zones and other protected areas.

Areas to be protected in accordance with Turkish national legislation

- There are no "National Parks", "Nature Parks", "Natural Monuments" and "Nature Protection Areas" defined in the 2nd article of the National Parks Law No. 2873 and determined in accordance with the 3rd article of this law.
- A part of the project area as "Wildlife Protection Areas and Wild Animal Settlement Areas" determined by the Ministry of Forestry in accordance with the Land Hunting Law No. 3167 remains within the Bursa Karacabey Karadağı-Ovakorusu Wildlife Development Area.
- 2 of the Law No. 2863 on the Protection of Cultural and Natural Assets. subparagraph 1 of article “a- Defines”., 2., 3. and 5. there are no areas defined as “Cultural Assets”, “Natural Assets”, “Site” and “Protected Area” in their subparagraphs and identified and registered in accordance with the relevant articles of the same law and law No. 3386 (Law No. 2863 on the Amendment of Some Articles of the Law on the Protection of Cultural and Natural Assets and the Addition of Some Articles to This Law).
- There are no “Aquaculture Employment and Breeding Sites” that are covered by the “Aquaculture Law” No. 1380.
- There are no areas defined in articles 18,19 and 20 of the Regulation on Water Pollution Control published in the Official Gazette dated 4/9/1988 and numbered 19919, as well as in Articles 17 and 1/7/1999 and 23742 published in the Official Gazette dated 1/7/1942.
- There are no “Sensitive Pollution Areas” defined in Article 49 of the “Regulation on the Protection of Air Quality” published in the Official Gazette dated 2.11.1986 and numbered 19269.
- There are no areas determined and declared as “Special Environmental Protection Areas” by the Council of Ministers pursuant to Article 9 of the Environmental Law No. 2872.
- There is no protected areas according to the Bosphorus Law No. 2960.
- In accordance with the Forestry Law No. 6831, 85% of the project area is located within the forest land, within the scope of the places considered as forest areas.

- According to the "Coastal Law" numbered 3621, there are no areas where a building ban is imposed.
- There are no areas specified in the Law No. 3573 on the "Breeding of Olive Cultivation and Vaccination of Wild Wildlife".
- Within the scope of the areas specified in the Rangeland Law No. 4342, 6% of the project area is pasture quality land.
- A part of the Project area, which is among the areas specified in the "Regulation on the Protection of Wetlands", which was published in the Official Gazette dated 17.05.2005 and numbered 25818, remains in the Kocaçay Delta Wetland Buffer Zone.

Areas to be protected in accordance with international conventions to which Turkey is a party

- There are no areas protected as per “Convention on Conservation of European Wildlife and Natural Habitats” (BERN Convention) published on the Official Gazette dated 20.2.1984 and numbered 18318 , "the 1st and 2nd Conservation Areas specified in Important Sea Turtle Reproduction Areas, "Habitats and Reproduction Areas of Mediterranean Seals ",
- There are no areas preserved as per “Convention on Protection of the Mediterranean Sea Against Pollution” (Barcelona Convention) which was published on the Official Gazette dated 12.6.1981 and numbered 17368,
- There are no areas designated as Special Protection Area in our country as per “Protocol on Protection of Special Conservation Areas in the Mediterranean Sea” published on the Official Gazette dated 23/10/1988 and numbered 19968,
- There are no areas listed in the 100 Historical Coastal Sites of Common Interest in the Mediterranean” published by the United Nations Environment Program pursuant to the Geneva Declaration dated 13.9.1985
- There are no coastal areas that are the living and feeding environment of the "Endangered Marine Species of the Mediterranean", which is included in the 17th article of the Bursa City Master Plan Genoa Declaration.

- There are no cultural, historical and natural areas to which “Cultural Heritage” and “Natural Heritage” statuses were given and which were preserved by the Ministry of Culture as per articles 1 and 2 of Convention on World’s Cultural and Natural Heritage published on the Official Gazette dated 14/2/1983 and numbered 17959,
- There are no areas preserved as per Convention on Conservation of Wetlands of International Importance, Especially as Waterfowl Habitat (RAMSAR Convention) published on the Official Gazette dated 17/05/1994 and numbered 21937 .

Areas to be protected

- In the Approved Environmental Plans, there are no areas (areas to be protected with natural characteristics, biogenetic reserve areas, geothermal areas, etc.)
- There aera agricultural lands: Agricultural development fields , areas which are irrigated and could be irrigated with land use capability classes of I, II, III and IV, class I and II used in the agriculture used for agriculture conditional upon rain fall and all of the special corps plantation areas.
- Wetlands: Natural or artificial, permanent or temporary, stagnant water or runny, sweet, bitter or salty, tidal movement of the sea depths not exceeding 6 feet in covering the withdrawal of the circuit, especially water birds, including all species of the water, which is of importance as a habitat, the coastal edge of this area with black reeds and Marsh turbidle from the line towards the side part of the project area in the buffer zone remains ecologically Kocaçay Delta wetland.
- Lakes, streams, groundwater operation sites: Detailed information about the lake, stream, groundwater enterprises located in the immediate vicinity of the facility is given in the “Location of the project” section.
- There are no areas having importance for the scientific researches and/or habitat for endangered or possibility endangered species and endemic species for our country, biosphere reserve, biotopes, biogenetic reserve areas and geologic and geomorphologic formations with unique characteristics.

2.6 Meteorology

2.6.1 General Climate Conditions of the Region

The climate of Bursa is located in the transition zone between the Mediterranean climate and the Black Sea climate. For this reason, it is possible to see the characteristics of both climates from place to place. In the province, where the winter months are not too harsh, the summer months are not too dry either.

The Mediterranean climate, which generally prevails in Bursa, has undergone some changes with the effect of the Black Sea and Central Anatolia climates. Since the climate in Bursa is a transitional climate, it is seen that one of these types of climates predominates from season to season or from year to year. Winters are sometimes harsh with the effect of the Central Anatolian climate, and sometimes warm with the effect of the Mediterranean climate.

"Bulletin of the Ministry of Agriculture and Forestry, General Directorate of Meteorology" has been used in this section.

2.6.2 Pressure

According to the observation records of Bursa meteorology station, the highest pressure value observed so far is 1,031.9 hPa and the lowest pressure value is 974.3 hPa.

Table 2-2 Pressure Values According to Bursa Meteorology Station Observation Records

Months	Average Pressure (hPa)	Maximum Pressure (hPa)	Minimum Pressure (hPa)
January	1,007.4	1,030.9	974.3
February	1,005.8	1,025.4	980.2
March	1,004.8	1,026.8	981.1
April	1,002.2	1,019.4	979.7
May	1,002.4	1,012.4	989.3
June	1,001.4	1,012.9	986.6
July	1,000.1	1,010.2	989.3

August	1,000.8	1,010.4	989.7
September	1,003.9	1,015.7	989.4
October	1,006.7	1,017.9	990.7
November	1,007.2	1,022.6	979,9
December	1,007	1,031.9	979,5
ANNUAL	**1,004.1**	**1,039.9**	**974.3**

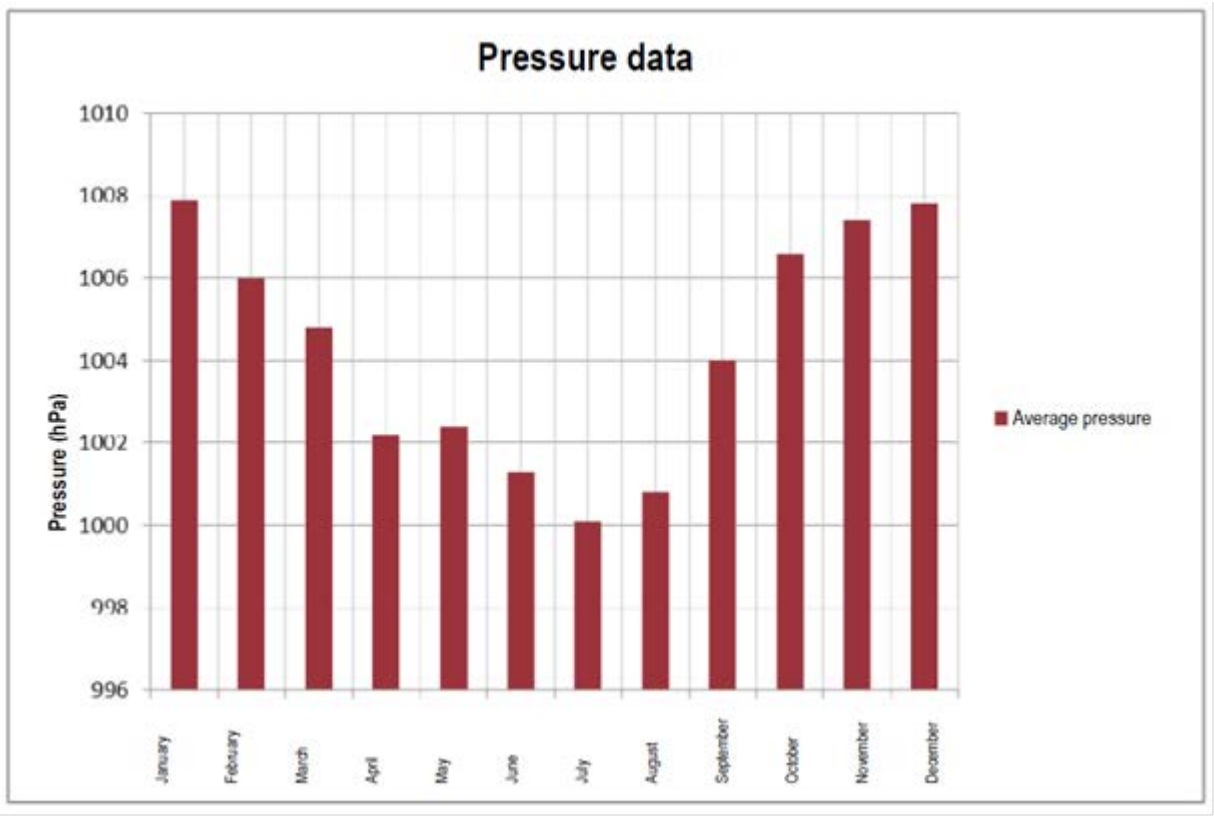


Figure 2-4 Graphical Display of Monthly Average Pressure Values

2.6.3 Temperature

According to the observation records of Bursa meteorology station, the highest temperature value observed so far is 43.8 ^{o}C, and the lowest temperature value is -19.2 ^{o}C. The annual average temperature value is 14.6 ^{o}C.

Table 2-3 Temperature Values According to Bursa Meteorology Station Observation Records

Months	**Average Temperature: °C**	**Maximum Temperature °C**	**Minimum temperature: °C**
January	5.3	23.8	-19.2
February	6.2	26.9	-16.8
March	8.4	30.6	-10.5
April	12.9	35.5	-3.1
May	17.6	35.9	1.6
June	22.2	41.3	5.2
July	24.5	43.8	9.0
August	24.2	41.9	8.6
September	20.1	38.9	5.0
October	15.3	37.3	-0.6
November	10.7	28.5	-4.4
December	7.4	26.2	-8.4
ANNUAL	**14.6**	**43.8**	**-19.2**

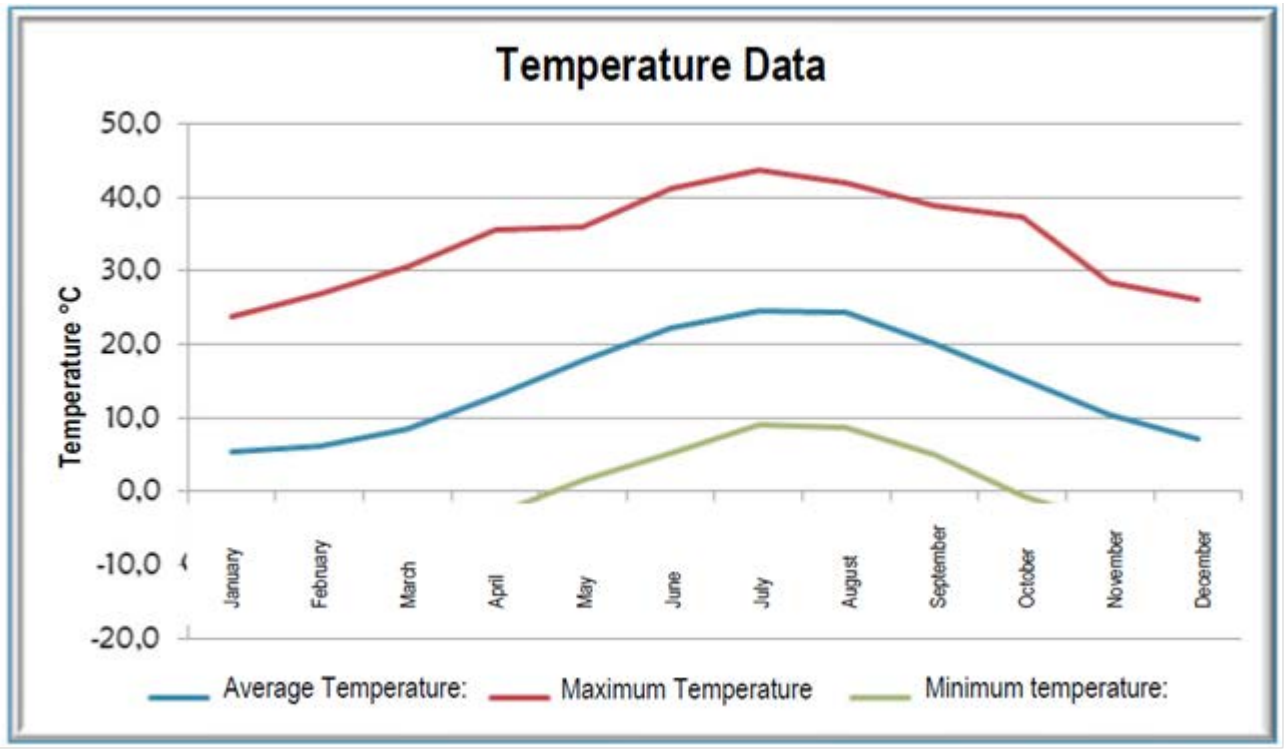


Figure 2-5 Graphical Display of Monthly Average Temperature Values

2.6.4 Rainfall

According to the observation records of Bursa meteorology station, the annual total precipitation average is 698.1 mm. The months with the most precipitation are November, December and January, while the least precipitation months are July and August. According to the observation records of Bursa meteorology station, the maximum daily precipitation observed so far was recorded in October with 114.4 mm.

Table 2-4 Precipitation Values According to Bursa Meteorology Station Observation Records

Months	**Total Average Rainfall (mm)**	**Maximum Rainfall (mm)**
January	79.5	56.7
February	72.2	72.3
March	66.8	41.4
April	65.6	55.0

May	44.6	49.2
June	34.6	47.2
July	17.7	55.0
August	16.6	47.2
September	41.1	79.4
October	75.3	114.4
November	83.2	79.7
December	100.9	66.4
ANNUAL	**698.1**	**114.4**

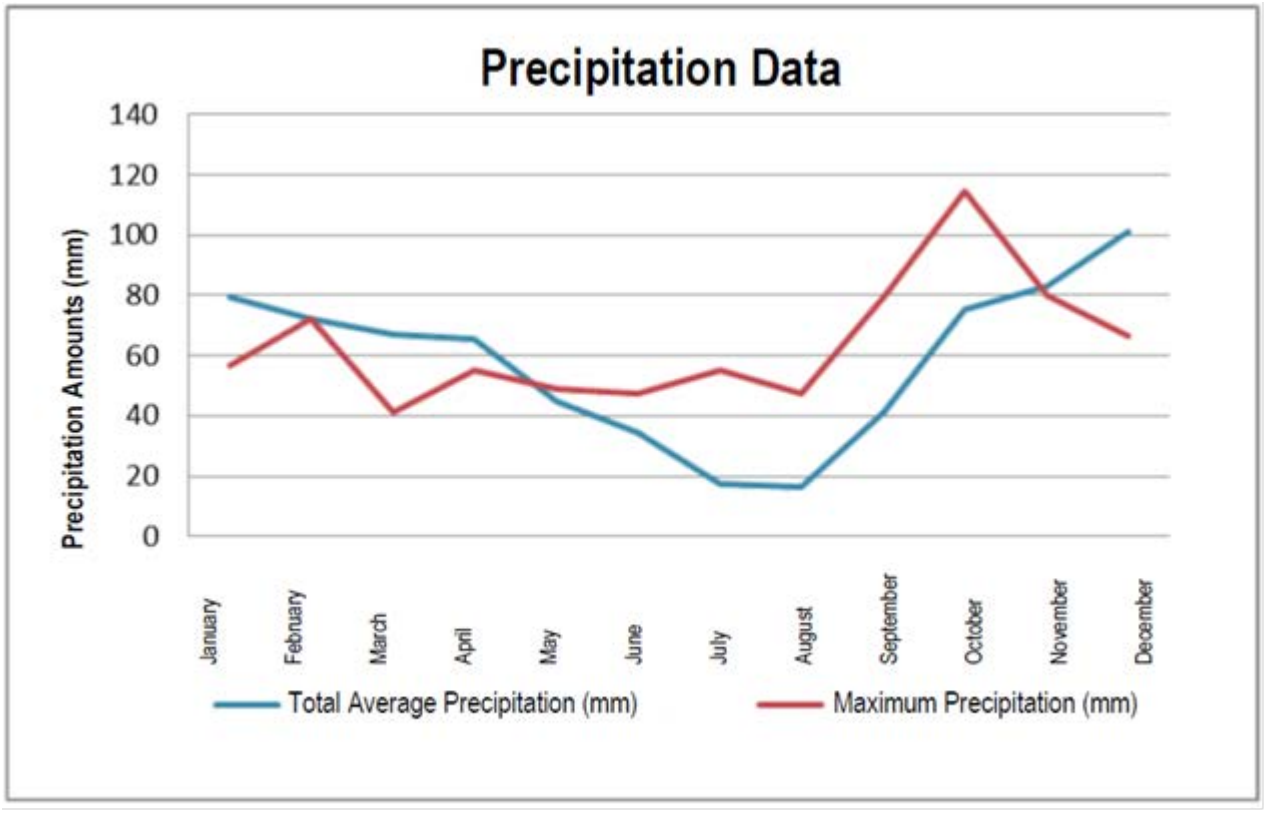


Figure 2-6 Graphical Display of Monthly Average Precipitation Values

2.6.5 Humidity

According to the observation records of Bursa meteorology station, the annual average humidity is 67.2%. According to the observation records of Bursa meteorology station, the lowest humidity value seen so far is 4%.

Table 2-5 Humidity Values According to Bursa Meteorology Station Observation Records

Months	**Average Humidity (%)**	**Minimum Humidity (%)**
January	71.7	16.0
February	70.3	10.0
March	69.8	7.0
April	68.0	9.0
May	65.4	5.0
June	59.3	4.0
July	58.1	10.0
August	60.4	8.0
September	65.8	7.0
October	72.1	9.0
November	72.9	8.0
December	72.5	22.0
ANNUAL	**67.2**	**4.0**

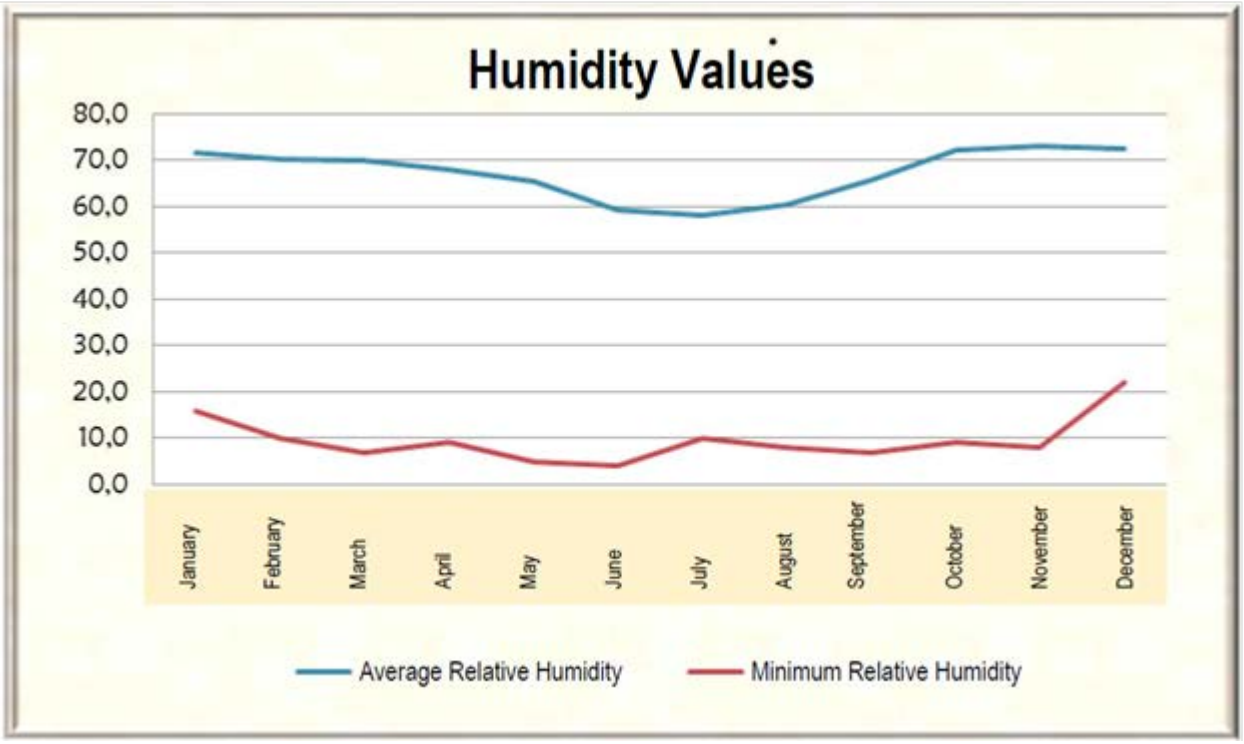


Figure 2-7 Graphical Display of Monthly Average Humidity Values

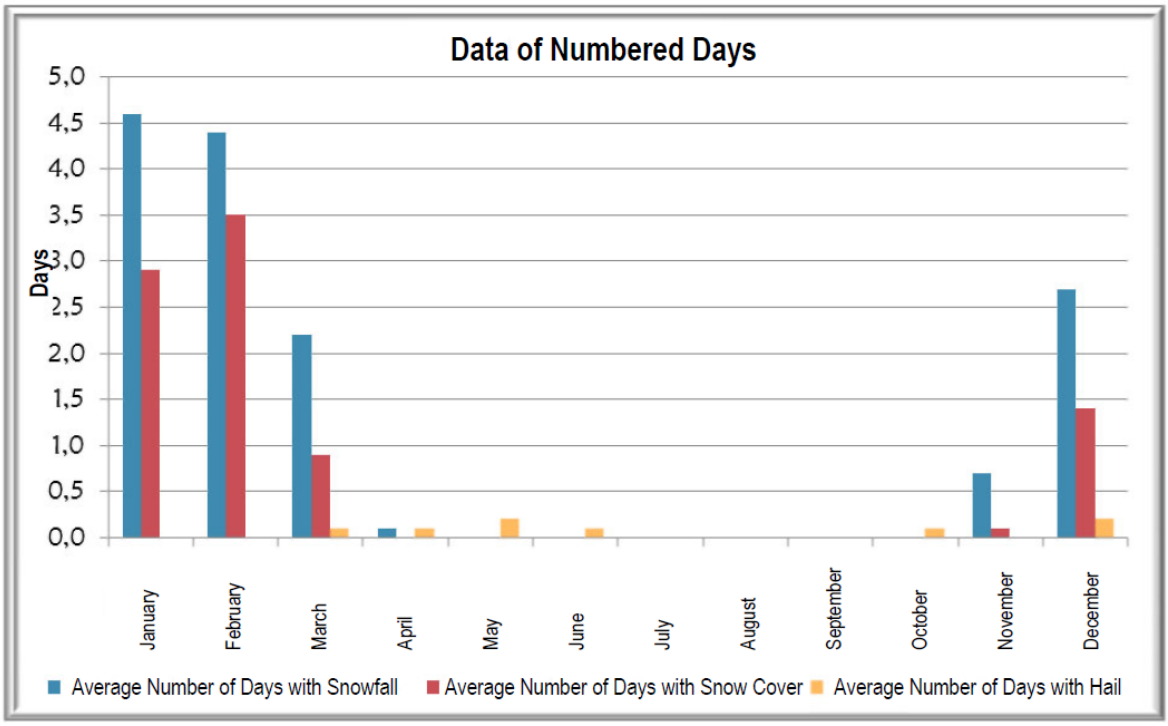
2.6.6 Specific Days

According to the observation records of Bursa meteorology station, the annual number of snowy days is 14.7 days. The annual number of snow-covered days is 8.8 days. In addition, the number of foggy days, the number of hail days, the number of frosty days and the total number of thunderstorm days can be seen in the table prepared according to the observation records of the Bursa meteorology station.

Table 2-6 Specific Days According to Bursa Meteorology Station Observation Records

Months	Number of Days with Snowfall	Number of Days with Snow Cover	Number of Foggy Days	Number of full days	Number of Days with Frost	Total number of thunderstorm days
January	4.6	2.9	2.8	0.0	6.0	0.3
February	4.4	3.5	2.3	0.0	4.8	0.6

Months	Number of Days with Snowfall	Number of Days with Snow Cover	Number of Foggy Days	Number of full days	Number of Days with Frost	Total number of thunderstorm days
March	2.2	0.9	2.0	0.1	4.7	0.9
April	0.1	0.0	1.4	0.1	0.9	1.9
May	0.0	0.0	1.0	0.2	0.0	3.0
June	0.0	0.0	0.3	0.1	0.0	3.4
July	0.0	0.0	0.1	0.0	0.0	1.8
August	0.0	0.0	0.2	0.0	0.0	1.6
September	0.0	0.0	0.7	0.0	0.0	1.7
October	0.0	0.0	2.7	0.1	0.4	1.6
November	0.7	0.1	4.1	0.0	3.7	1.0
December	2.7	1.4	3.5	0.2	5.7	0.7
Annual	**14.7**	**8.8**	**21.1**	**0.8**	**26.2**	**18.5**



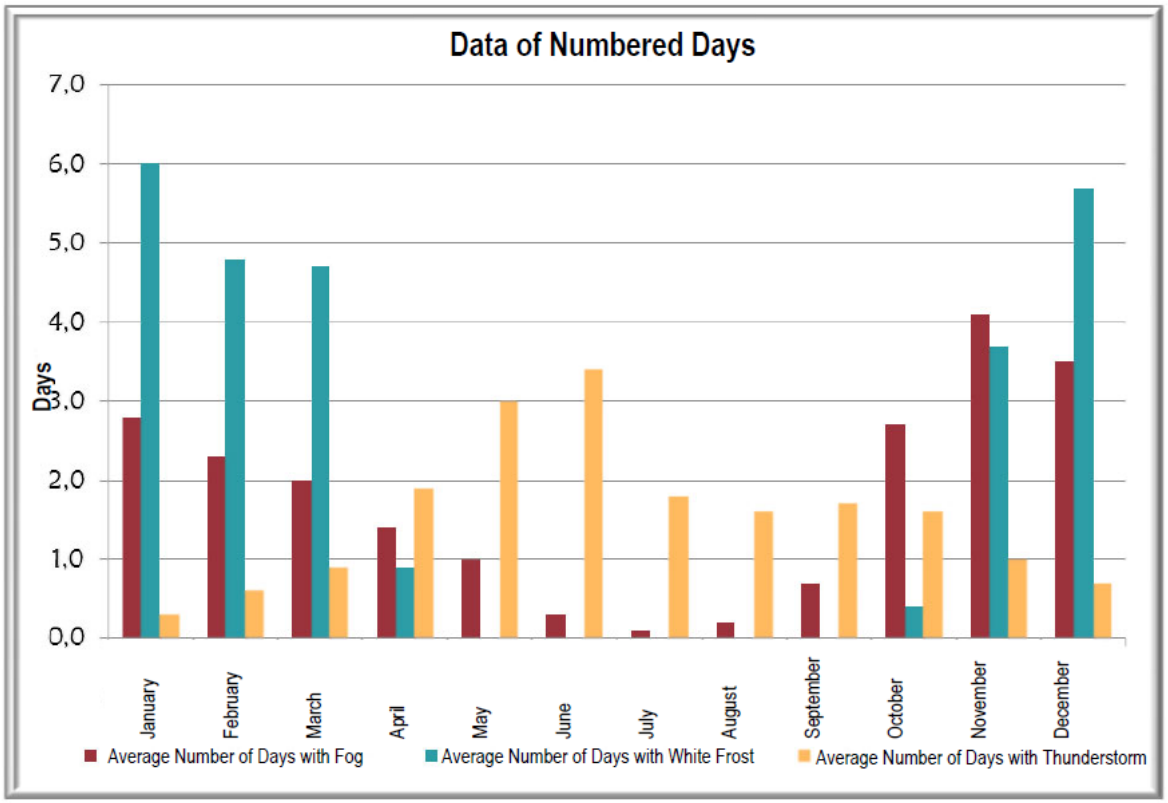


Figure 2-8 Graphical Display of Monthly Specific Days Data

2.6.7 Maximum Snow Thickness

According to the observation records of Bursa meteorology station, the annual maximum snow thickness observed so far is 66 cm.

Table 2-7 Maximum Snow Thickness Values According to Bursa Meteorology Station Observation Records

Months	**Maximum Snow Thickness (cm)**
January	28
February	66
March	21
April	0
May	1
June	0
July	0
August	0
September	0
October	0
November	2
December	13
ANNUAL	**66**

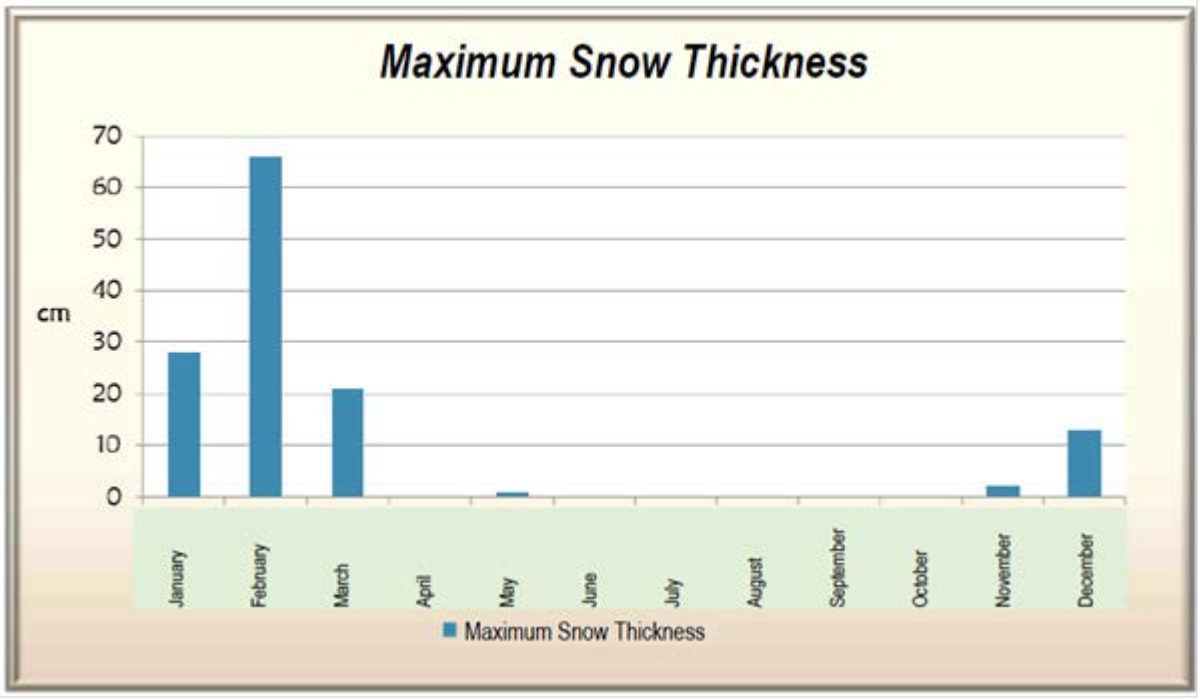


Figure 2-9 Graphical Display of Maximum Snow Thickness Data

2.6.8 Evaporation

According to the observation records of Bursa Meteorology Station, the annual average open surface evaporation is 1,278.7 mm. The annual maximum open surface evaporation was recorded as 20.1 mm.

According to the observation records of Bursa meteorology station, the maximum daily open surface evaporation observed to date was recorded in February with 20.1 mm.

Table 2-8 Maximum Snow Thickness Values According to Bursa Meteorology Station Observation Records

Months	**Average open surface evaporation (mm)**	**Maximum Free Surface Evaporation (mm)**
January	17.8	16.0
February	19.1	20.1
March	30.9	11.2
April	94.4	16.6

Months	Average open surface evaporation (mm)	Maximum Free Surface Evaporation (mm)
May	145.6	13.6
June	205.1	14.9
July	245.6	16.0
August	224.7	16.6
September	146.5	17.8
October	86.5	12.0
November	45.4	14.4
December	17.1	12.0
ANNUAL	**1,278.7**	**20.1**

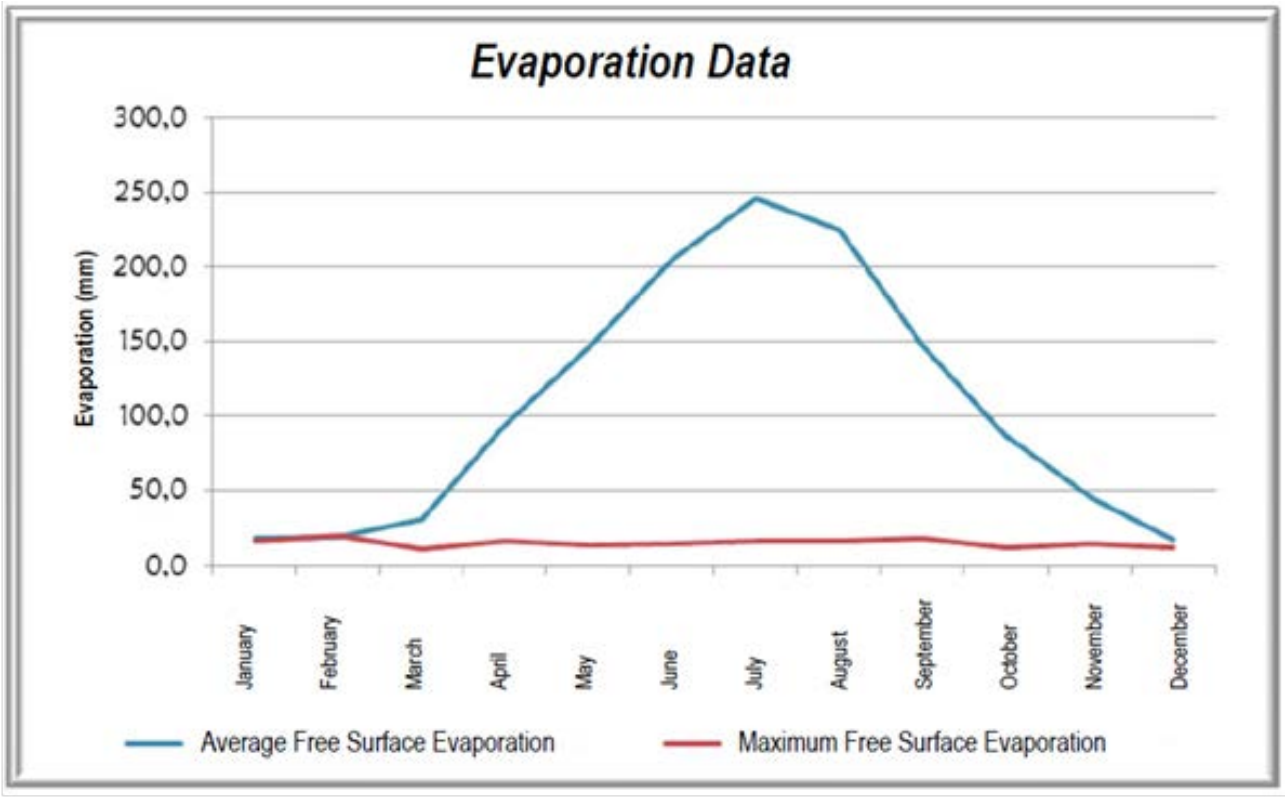


Figure 2-10 Graphical Display of Evaporation Data

2.6.9 Wind

In order to determine the prevailing wind direction of the region, the prevailing wind direction of the region was determined by using the meteorology bulletin of 53 years for many years.

Table 2-9 Wind Blow Numbers by Direction with 53 Years of Data

Wind Direction	Annual Total Blowing Numbers	
N	28,449	**1st Degree Dominant Wind Direction**
NNE	46,055	**ENE (East Northeast)**
NE	49,734	
ENE	60,992	
M	42,724	
ESE	27,649	**2nd Degree Dominant Wind Direction**
SE	7,904	**NE [Northeast)**
SSE	7,446	
S	10,277	
SSW	19,961	
SW	31,299	**3rd Degree Dominant Wind Direction**
WSW	39,964	**NNE (North northeast)**
W	25,755	
WNW	20,737	
NW	19,491	
NNW	25,391	

Seasonal and annual wind rose diagrams are given below.

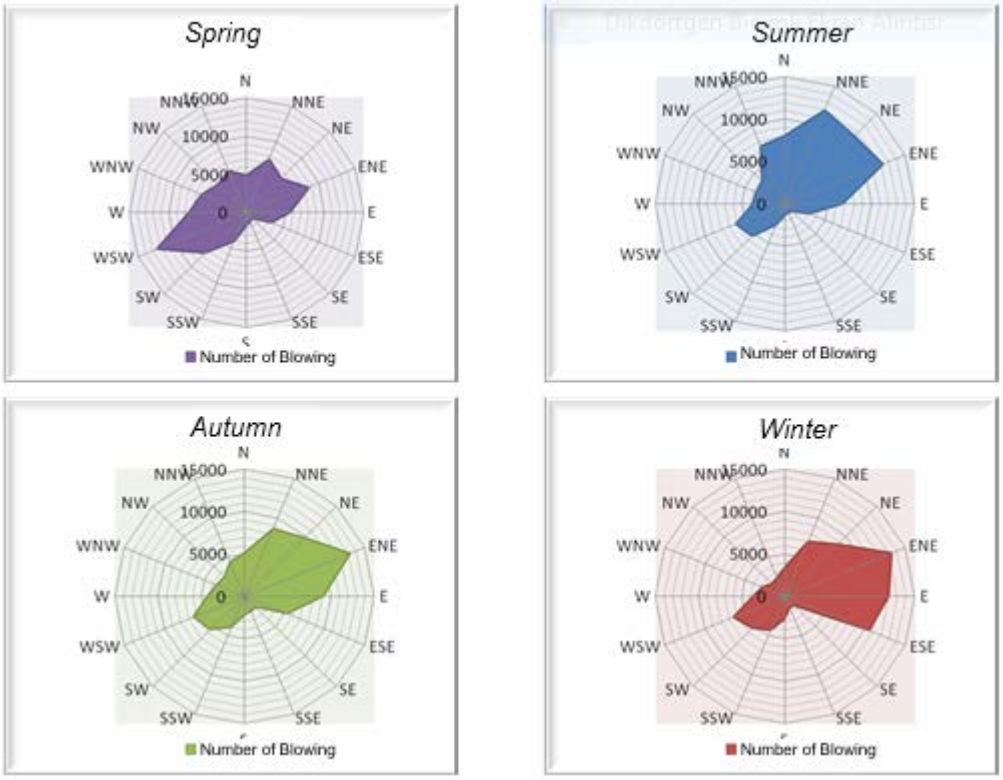


Figure 2-11 Seasonal Wind Roses

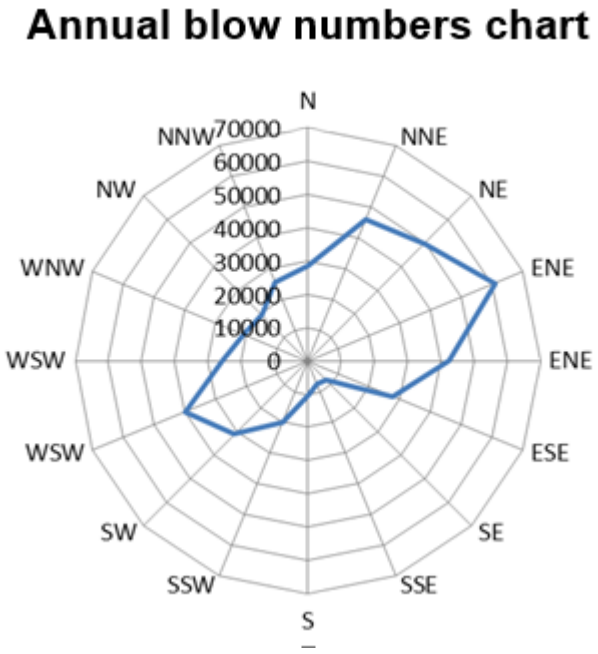


Figure 2-12 Annual Wind Roses

According to the observation records of Bursa meteorology station, the annual average wind velocity is 2 m-sec.

Table 2-10 Average Wind Velocities According to Bursa Meteorology Station Observation Records

Months	**Average Wind Velocity (m/sec)**
January	2.3
February	2.4
March	2.3
April	2.0
May	2.0
June	2.0
July	2.2
August	2.1
September	1.8
October	1.6
November	1.7
December	2.2
ANNUAL	**2.0**

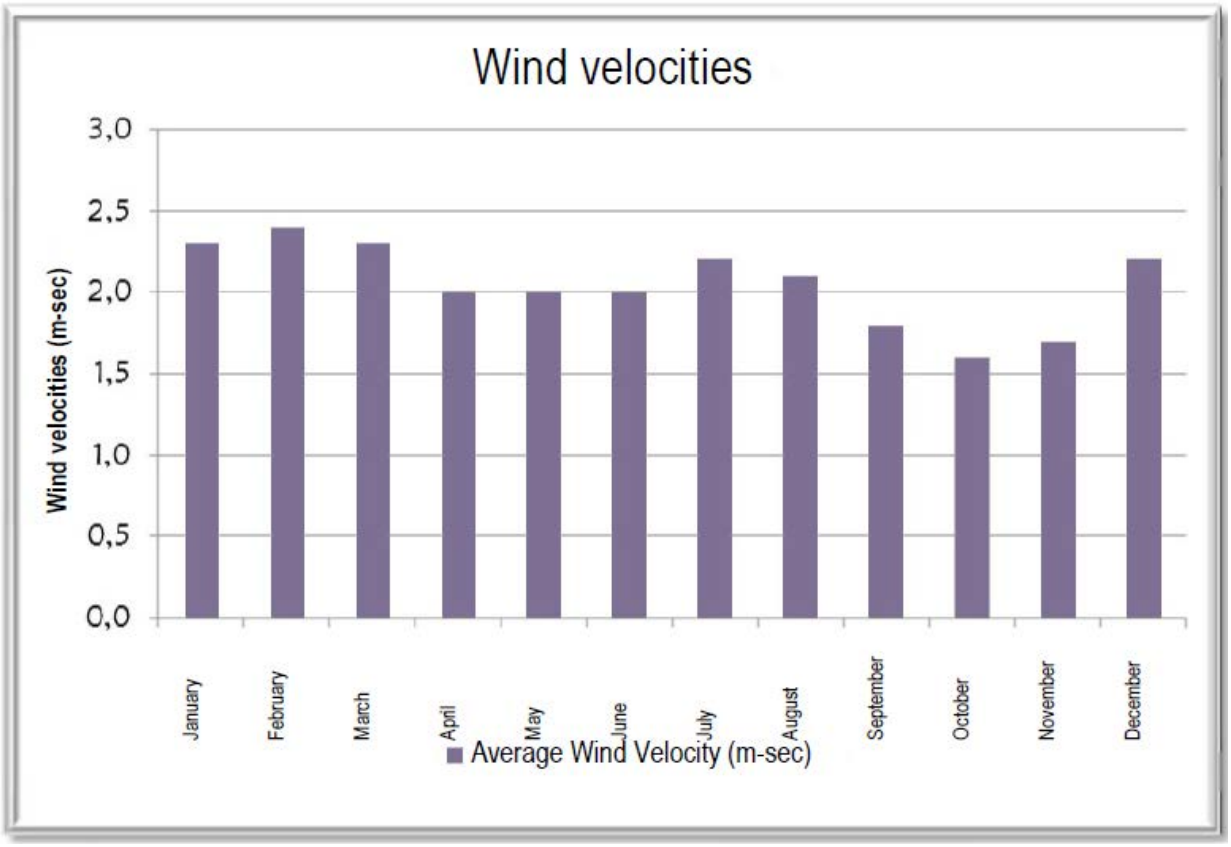


Figure 2-13 Graphical Display of Wind Speed Data

3.0 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

3.1 Water Use and Wastewater Generation

Water Usage; It is planned to employ approximately 45 people during the construction phase. It is planned to employ 10 people at the operational stage.

The use of water that the staff needs;

N: Number of employees in the facility q : When 150 lt/person.day is taken; (MUSLU, Y., 1994, Atıksuların Arıtılması, İTÜ, İSTANBUL)

Construction: Q = q x N = 150 lt/person.day x 45 person x 1.10-3 m3/lt = 6,75 m^3/day.

Business: Q = q x N = 150 lt/person.day x 10 person x 1.10-3 m3/lt = 1,5 m^3/day.

The drinking water required for the facility will be provided through the purchase and the used water will be transported by tankers.

During the construction and operation period, work will be carried out in accordance with the "Water Pollution Control Regulation", which was published in the Official Gazette dated 31.12.2004 and numbered 25687.

Domestic qualified wastewater that will be formed during the construction and operation phases will be collected in a sealed septic tank that will be made in accordance with the provisions of the "Regulation on Pits to be Built in Places Where the Construction of a Sewer Assembly is Impossible", published in the Official Gazette dated 19.03.1971 and Numbered 13783. The wastewater accumulated in the septic tank will be removed with a screw and disposed of by supplying it to the nearest sewage system.

During the operation period, work will be carried out in accordance with the "Water Pollution Control Regulation", which was published in the Official Gazette dated 31.12.2004 and numbered 25687.

3.2 Waste Generation

Solid wastes generated at the plant during operation, domestic qualified solid wastes, re-evaluable solid wastes (packaging materials, etc.) and hazardous wastes, we can examine under 3 main headings.

Domestic Solid Waste

Domestic solid waste, which will consist of the facility, will be collected from the daily needs of 45 people at the construction stage and a total of 10 people who will work at the operation stage (office, dining hall, etc.) will occur.

When the amount of solid waste to be generated per person is 1.15 kg/person.day (Turkish Statistical Institute www.tuik.gov.tr), in the facility;

K: N x k

N: Population, k: the amount of solid waste generated per capita

Construction $K_{personnel}$ = 1.15 kg/person.day x 45 people = 51,75 kg/day will consist of domestic solid waste.

Operation $K_{personnel}$ = 1.15 kg/person.day x 10 people = 11,5 kg/day will consist of domestic solid waste.

The domestic solid wastes that will be generated at the facility will be deposited in containers that comply with the standards with closed mouths as specified in the “Waste Management Regulation” published in the Official Gazette dated 02.04.2015 and numbered 29314 and will be collected by Municipal units at certain periods and forwarded to the solid waste storage site.

Recycled Solid Wastes

Recyclable packaging wastes (paper, cardboard, plastic, etc.), metal wastes (machine parts, etc.), recyclable solid wastes from the facility "Packaging Waste Control", which was published in the Official Gazette dated 26.06.2021 and numbered 31523. It will be collected separately from domestic wastes and given to environmental permit and licensed recycling facilities. It is envisaged that there will be 100 kg paper carton packaging per year in waste code 150101 and 50 kg plastic packaging in waste code 150102 at the construction stage of the facility. It is envisaged that there will be 50 kg of paper cardboard packaging in the annual waste code 150101 and 20 kg of plastic packaging in the waste code 150102 at the operation stage.

Hazardous Wastes

Contaminated Containers; Used containers of liquid and solid chemicals to be used at the facility will be collected separately from household and other solid waste and will be given to environmentally permitted and licensed recycling facilities in accordance with the “Waste Management Regulation” published in the Official Gazette dated 02.04.2015 and numbered 29314 and entered into force. During the construction phase, it is envisaged that there will be 100 kg of

contaminated containers in waste code 150110. At the operational stage, it is envisaged that there will be 20 kg of contaminated containers in the waste code 150110.

Contaminated Superstructures; Contaminated superstructures that will occur as a result of operations at the facility, etc. the wastes will be collected separately and will be given to environmental permit and licensed recycling facilities in accordance with the “Waste Management Regulation” published in the Official Gazette dated 02.04.2015 and numbered 29314 after temporary storage at the waste site. It is estimated that the amount of contaminated superstructure that will be formed at the construction stage of the facility will be 50 kg per year. It is estimated that the amount of contaminated superstructure that will be formed during the operation phase will be 10 kg per year.

Waste Oils

Maintenance, cleaning, etc. at the plant. waste oil will be collected separately from other waste and processes as a result of temporary storage after the date in the appropriate areas and which came into force after being published in the Official Gazette numbered 02.04.2015 29314 “30985 published in the Official Gazette numbered and date and the 21.12.2019 Waste Management Regulations, ”Regulations of the Management of Waste Oils”, and licensed in accordance with environmental permits will be given to recycling facilities. It is estimated that the waste oils that will be formed at the construction stage of the facility will be 100 kg per year. It is estimated that the waste oils that will be formed during the operation phase will be 20 kg per year.

Vegetable Waste Oil

Meals will be provided by purchasing from outside. Thus, it is unlikely that vegetable waste oil will be formed. However, if it occurs, vegetable waste oils will be collected from other wastes and given to environmental permit and licensed recycling facilities in accordance with the provisions of the “Regulation on the Control of Vegetable Waste Oils", published in the Official Gazette dated 06.06.2015 and Numbered 29378.

Waste Batteries and Accumulators

The waste batteries and accumulators that will be formed at the plant will be collected separately from other wastes and given to environmental permit and licensed recycling facilities in accordance with the "Regulation on the Control of Waste Batteries and Accumulators" published in the Official Gazette No. 25569 dated 31.08.2004 and entered into force. It is estimated that the amount of waste batteries and accumulators that are likely to be generated during the construction and operation period of the facility will be 1 kg per day.

Medical Waste

It is thought that 45 people will be employed at the facility during the construction period and 10 people will be employed during the operation period. In this case, by applying the Workplace Physician Agreement, the medical wastes that will arise due to the health needs of the personnel will be collected in special collection containers and special collection bags in accordance with the provisions of the "Medical Waste Control Regulation" dated 25.01.2017 and numbered 29959, and the collected medical wastes will be disposed of by giving them to environmental permit and licensed facilities. During the construction period of the facility, the waste code 180103 stipulates that medical waste will be 2 kg per year and 1 kg during the operation period.

3.3 Noise

Construction

During the construction phase, there will be no other equipment that makes noise, except for work machines. The operation of the machines will not be continuous, but in short periods of time. Within the scope of the project, many tools and machines will be used in the works starting from the preparation of the land and ending with the opening of the facility.

Considering the noise of building sites, published in the official gazette on 04/06/2010, "Regulation of Environmental Noise Assessment and Management "23-(1) article, a paragraph, No. 5 in the table which are designated for environmental noise limit values will not be exceeded in

cases where the site area, the working hours will be reduced. The operation of the machines will not be continuous, but in short periods of time. The environmental noise limit values determined for construction site areas are given in the table.

Table 3-1 Environmental Noise Limit Values for the Construction Site Area

TYPE OF ACTIVITY (CONSTRUCTION, DEMOLITION AND REPAIR)	**L_{DAY} TIME (dBA)**
Building	70
Road	75
Other Sources	70

Source: "Regulation on Evaluation and Management of Environmental Noise", which entered into force by was published in the Official Gazette dated 04/06/2010

For noise generated by the work equipment, all the values contained in this regulation have been taken into account as a limit. It will be ensured that the machines that will also be used for this will be new and qualified state-of-the-art products. For the sound levels of the equipment to be used within the scope of the project, the provisions of the "Regulation on Amending the Noise in the Environment Created by the Equipment Used in Outdoor" and the "Regulation on Noise Emission in the Environment" will be complied with.

Regarding the noise that may occur in the project area, the provisions of the "Regulation on Evaluation and Management of Environmental Noise", which was published in the Official Gazette on 04/06/2010, will be complied with.

The noise levels determined for the potential noise sources during the construction of the project are given in the below table.

Table 3-2 Noise Levels Determined for The Noise Sources to Be Used During the Construction Phase of The Project

NOISE SOURCE	NUMBER	NOISE LEVEL (Lw (dBA))
Grader	1	101
Road Roller	1	110
Carrier Trucks	1	101
Bulldozer	1	110
Excavator	1	105

The distribution of the sound power level of each noise source in the Dec octave bands between 500-4000 Hz is shown in the table by calculating the sound power level in each octave band.

$Lw(i) = 10* \log (10^{(Lw/10)} / 4)$

Lw= Sound power level of the source (dB)

Table 3-3 Distribution of Sound Power Levels of Noise Sources to be Used during the Construction Phase in Octave Bands

NOISE SOURCES	TOTAL	SOUND POWER LEVEL (dB)			
		500 Hz	1000 Hz	2000 Hz	4000 Hz
Grader	101	95	95	95	95
Road Roller	110	104	104	104	104
Carrier Trucks	101	95	95	95	95
Bulldozer	110	104	104	104	104
Excavator	105	99	99	99	99

It is assumed that the total sound power levels are evenly distributed over the 4 octave bands.

$Lp =(Lw + 10* \log Q / 4* \prod * r^2)$

Lpi =Noise pressure levels in the free space at a distance r of the sources(dB)

Lw = Sound power level of the source (dB)

Q = Directivity coefficient (considered as 2)

r= Distance from the source (meters)

Table 3-4 Sound Pressure Levels Depending on The Distance of Each Noise Source to Be Used During Construction

Noise Source	Distance (m)	Sound Pressure Level (dB)			
		500 Hz	1000 Hz	2000 Hz	4000 Hz
Grader	10	67.02	67.02	67.02	67.02
	50	53.04	53.04	53.04	53.04
	100	47.02	47.02	47.02	47.02
	250	39.06	39.06	39.06	39.06
	500	33.04	33.04	33.04	33.04
	1000	27.02	27.02	27.02	27.02
	1500	23.50	23.50	23.50	23.50
Road Roller	10	76.02	76.02	76.02	76.02
	50	62.04	62.04	62.04	62.04
	100	56.02	56.02	56.02	56.02
	250	48.06	48.06	48.06	48.06
	500	42.04	42.04	42.04	42.04
	1000	36.02	36.02	36.02	36.02
	1500	32.50	32.50	32.50	32.50
Carrier Trucks	10	67.02	67.02	67.02	67.02
	50	53.04	53.04	53.04	53.04
	100	47.02	47.02	47.02	47.02
	250	39.06	39.06	39.06	39.06
	500	33.04	33.04	33.04	33.04
	1000	27.02	27.02	27.02	27.02
	1500	23.50	23.50	23.50	23.50

Noise Source	Distance (m)	Sound Pressure Level (dB)			
		500 Hz	1000 Hz	2000 Hz	4000 Hz
Bulldozer	10	76.02	76.02	76.02	76.02
	50	62.04	62.04	62.04	62.04
	100	56.02	56.02	56.02	56.02
	250	48.06	48.06	48.06	48.06
	500	42.04	42.04	42.04	42.04
	1000	36.02	36.02	36.02	36.02
	1500	32.50	32.50	32.50	32.50

As a result of the calculation of correction factors and atmospheric swallowing values, sound levels are given below.

Table 3-5 Clear Sound Levels of Noise Sources to Be Used during the Construction Phase

Noise Source	Distance (m)	Sound Pressure Level (dB)				Total Sound Level (dBA)
		500 Hz	1000 Hz	2000 Hz	4000 Hz	
Grader	10	63.82	67.01	68.17	67.84	73.026
	50	49.83	52.98	54.01	53.12	58.759
	100	43.79	46.90	47.76	46.17	52.407
	250	35.79	38.77	39.11	35.44	43.611
	500	29.70	32.46	31.93	24.79	36.586
	1000	23.53	25.86	23.60	9.52	29.290
	1500	19.86	21.76	17.76	-3.25	24.875
Road Roller	10	72.81	76.01	77.17	76.84	82.025
	50	58.78	61.98	63.01	62.12	67.754
	100	52.70	55.90	56.76	55.17	61.395
	250	44.57	47.77	48.11	44.44	52.576
	500	38.26	41.46	40.93	33.79	45.501

		Sound Pressure Level (dB)				**Total Sound Level (dBA)**
	1000	31.66	34.86	32.60	18.52	38.076
	1500	27.56	30.76	26.76	5.75	33.505
Carrier Trucks	10	63.82	67.01	68.17	67.84	73.518
	50	49.83	52.98	54.01	53.12	59.282
	100	43.79	46.90	47.76	46.17	52.967
	250	35.79	38.77	39.11	35.44	44.275
	500	29.70	32.46	31.93	24.79	37.395
	1000	23.53	25.86	23.60	9.52	30.313
	1500	19.86	21.76	17.76	-3.25	26.066
Bulldozer	10	72.82	76.01	77.17	76.84	82.518
	50	58.83	61.98	63.01	62.12	68.282
	100	52.79	55.90	56.76	55.17	61.967
	250	44.79	47.77	48.11	44.44	53.275
	500	38.70	41.46	40.93	33.79	46.395
	1000	32.53	34.86	32.60	18.52	39.313
	1500	28.86	30.76	26.76	5.75	35.066
Excavator	10	67.82	71.01	72.17	71.84	77.026
	50	53.83	56.98	58.01	57.12	62.759
	100	47.79	50.90	51.76	50.17	56.407
	250	39.79	42.77	43.11	39.44	47.611
	500	33.70	36.46	35.93	28.79	40.586
	1000	27.53	29.86	27.60	13.52	33.290
	1500	23.86	25.76	21.76	0.75	28.875

the worst case is given in the following table by calculating the equivalent noise levels that will occur assuming that all machines are running at the same time.

$L_{daytime}$= Leq

$Leq = 10 \log \sum 10^{LT/10}$

Table 3-6 The Clear Sound Levels of The Noise Sources to Be Used in The Construction Phase According to The Distance

Distance (m)	**$L_{daytime}$ (dBA)**
10	86.34
50	72.09
100	65.75
250	57.00
500	50.02
1,000	42.79
1,500	38.41

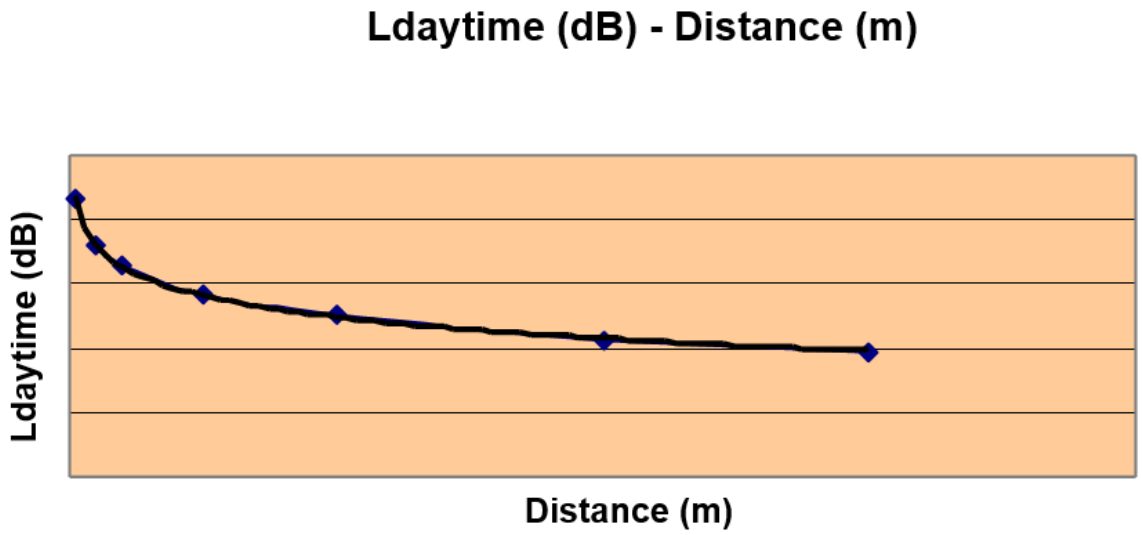


Figure 3-1 Graph of the Distribution of Noise Level by Distance

As can be seen in the calculations, the noise levels to be generated from the construction machinery in the activity area do not exceed the environmental noise limit values for the construction site determined in the Article 23-(1) of the Regulation on the Evaluation and Management of Environmental Noise, subparagraph a, table no. 5. The calculations were made with the assumption that the worst-case work machines are all running at the same time, and not all of the work machines in question will be running at the same time. During the construction activities, it is expected that the noise coming to the housing closest to the site and other receiving sources will remain below the limits specified in the regulation.

Regarding noise in industrial facilities, the provisions of the Labor Law No. 4857 and the "Regulation and Regulation on Occupational Health and Safety" issued pursuant to this law will be complied with.

In addition, the principles in the “Regulation on the Assessment and Management of Environmental Noise”, published in the Official Gazette No. 27601 dated 04/06/2010 and entered into force, will be followed.

The nearest T17 turbine from the construction sites to the settlements is located 2000 m southwest of the Şahmelek Neighborhood.

The noise level that will occur at this distance does not exceed the Environmental Noise Limit Values for the Construction Site determined in the Article 23, subparagraph a, table no. 5 of the Environmental Noise Assessment and Management Regulation.

Working in accordance with the provisions of the "Regulation on the Evaluation and Management of Environmental Noise" published in the Official Gazette dated 04.06.2010 and numbered 27601 and the Regulation on Business Opening and Operating Licenses published in the Official Gazette dated 10.08.2005 and numbered 25902, in particular, employees will be provided with personal protective equipment (earplugs, plugs, etc.) in areas where noise is high in the enterprise.

Background noise measurements of the project area made on 19-20.01.2022. As a result of measurements made at 5 separate measurement stations, the limit values are 55 dBA for the day and 45 DBA for the night time period. The limit values are in accordance with the measurement results of 2 different locations in Kurşunlu, Şahmelek, Örencik and Şahres which are 5 locations. The measurement results are given in the table below.

Table 3-7 Background Noise Measurement Results

Number	Place of Measurement	Measurement Location	Measurement Result Daytime (dBA)	Measurement Result Nighttime (dBA)
1	R.1 - Kurşunlu	40.393371, 28.267396	46,8	38,6
2	R.2 - Kurşunlu	40.391167, 28.286701	48,2	38,8
3	R.3 - Şahmelek	40.330173, 28.243377	49,2	40,4
4	R.4 - Örencik	40.304063, 28.293391	45,8	39,8
5	R.5 - Şah RES Yakını	40.367818, 28.227945	51,5	41,9

The following measures shall be taken to control the noise arising from all these construction activities and the equipment to be used to perform them:

- Information about the construction shall be planned for the receivers in the nearest residential areas, where current due diligence measurements are also to be made using the methods specified in the SEP.
- The planning shall also be notified to sensitive recipients using SEP methods (e.g., posting on the website and making it available at the office for submission when requested). Local people shall be reminded of the details of the use of the complaints mechanism when making the notification.

- Speed limitations shall be applied in all transport operations (transport of turbines, transport of materials or transport of personnel).
- Basic equipment and vehicle operators listed above shall be given training on both complying with speed limits and creating minimum noise during their activities.
- If there is a change in the construction schedule planning due to any force majeure (adverse weather conditions, traffic conditions, any factors that will affect occupational and community health), sensitive receivers shall be informed in advance by implementing the methods determined in the SEP (e.g., updating the website).
- All transportation activities within the scope of the construction of the Project shall be carried out as far away from the determined sensitive receptors as possible.

3.4 Air Emissions

The main dust emission sources within the scope of the construction phase of the Project are as follows:

- Works to be performed for the construction of access roads, internal roads and switchyard
- Construction of turbine foundations
- Construction of other auxiliary plants such as switchyard
- The wind blowing of the material in the storage areas
- Loading and unloading works to be carried out during the construction of the turbine areas
- Any kinds of shipping works

Preventive and mitigating measures shall be implemented to prevent possible effects of these dust emissions and minor and exhaust emissions from construction machinery and equipment on residential areas near the license area, residential areas near the site access road, agricultural activities near turbines, etc.

<u>Measures Regarding Excavation Storage Areas</u>

- The upper layers of the stored excavation material shall be kept as moist as possible.
- The material storage height shall be kept as minimum as possible.

- Loose materials in the vehicle and area shall be checked and cleaned before material is stored.
- Slopes in the bulk storage areas shall be reduced by taking into account the prevailing wind direction.

Measures Regarding Excavation and Earthmoving Works

- Loading and unloading of material shall be carried out without scattering.
- A small amount of excavation material shall be used in backfilling operations.
- Trucks shall not be loaded beyond their capacity.
- The transported material shall be kept moist to prevent dust formation.

Measures Regarding Excavation and Earthmoving Works

- Dust suppression methods such as watering with water trucks shall be implemented to access roads and internal roads (as required during dry seasons).
- The availability of roads shall be checked before vehicles and trucks move.
- The topsoil stored during the excavations shall be laid on the slopes of the existing roads that have been newly opened or arranged in the site, and it shall be ensured that the natural vegetation of the area is to be regenerated.
- Speed limits shall be applied for vehicles.

Measures Regarding Construction Machinery, Trucks and Personnel Transport Vehicles

- Construction vehicles shall not be allowed to keep their engines running while they are waiting to enter or stay in the site.
- Fuel-efficient vehicles with adequate maintenance shall be used, and the regular maintenance of these vehicles shall be carried out with a maintenance plan to be prepared with the recommendations of the supplier companies.
- In order to minimize air emissions from construction machinery, trucks and personnel carriers, the respective provisions of the Regulation on the Control of Industrial Air

Pollution, Regulation on Exhaust Gas Emission Control and Regulation on Air Quality Evaluation and Management shall be complied with.

- All drivers shall be given training (e.g., avoiding unnecessary movements and behaviours that will increase fuel consumption) within the scope of speed limit and prevention of unnecessary exhaust emissions.

Other Measures

- Project-related emissions shall be monitored, and additional actions shall be developed and implemented as needed during the construction phase.
- Stakeholder Engagement Plan shall be implemented to collect complaints and suggestions through the established complaints mechanism. After investigating any respective complaints, additional actions shall be developed and implemented as needed.

3.5 Health and Safety

Occupational and community health and safety is an important topic specifically during the construction phase and relevant mitigation measures should be taken to prevent any damage.

Occupational health and safety hazards during the construction phase of the Project include the hazards that may arise in any construction Project, as well as the specific hazards that may arise during the construction of wind energy projects. Specific hazards can be listed as lifting operations, working at height and working in remote areas.

Proposed mitigation measures are provided below.

Table 3-8 Mitigation Measures Related to Occupational Health and Safety

Hazards & Hazardous Construction Works	**Mitigation Measures / Administrative Actions**
Lifting Operations	Lifting operations shall be subject to a work permit. Personnel carrying out the lifting operations shall receive the necessary training and be competent in their work. Before the lifting operation, all parties that will carry out the operation shall participate in the preparation of the lifting plan. All numerical and spatial information about the load to be lifted shall be provided in advance. Attention shall be paid to the capacity, robustness and periodical control of the lifting equipment. The area under the lifting operation shall be restricted in line with the respective standards. The limits related to weather conditions of the lifting equipment shall never be exceeded. During the lifting operation, lifting supervisors and riggers shall definitely be present in the work area. If severe weather conditions occur before and during lifting operation, an Emergency Action Plan shall be applied.
Working at Height	Working at height operations shall be subject to a work permit. All personnel who will work at height shall receive the necessary training. As far as possible, assembly operations shall be performed on the ground. Only personnel who are competent in working at height shall carry out this work. Protective equipment such as safety net and air net shall be used. Fall protection systems shall be used as much as possible. If lifting equipment is used, it shall be checked before the work starts. If severe weather conditions occur before and during working at height, an Emergency Action Plan shall be referred. The area under the working at height operation shall be restricted in line with the respective standards.

Hazards & Hazardous Construction Works	**Mitigation Measures / Administrative Actions**
	Equipment used by personnel working at height shall be properly fixed.
Working in remote areas	Before working in remote areas, the business plan shall be prepared in detail. Works to be performed in remote areas shall not be done alone. The destination, departure time and return time of the personnel to be employed shall be specified. Necessary communication equipment shall be provided for personnel working in remote areas. The personnel working in remote areas will be kept in touch and guide them as necessary. There shall be a first responder in the personnel team that will work in as remote areas as possible.
Alcohol and drug use	Alcohol and drug use is strictly prohibited at the construction site, in all construction areas and related auxiliary facilities. Project employees and visitors shall be warned in detail in this regard. Random drug and alcohol testing shall be performed when necessary (if suspected).
Compressed Air Tanks	Equipment complying with the Project Standards shall be used. All compressed air tanks shall be in good working condition, and their statutory periodical inspections shall not be interrupted. All compressed air tanks shall be recorded.

Hazards & Hazardous Construction Works	**Mitigation Measures / Administrative Actions**
	All compressed air tanks shall be securely fixed.
Dust	Since the construction works are not carried out in closed areas, the measures presented in the Air Quality Management Plan shall be applied. Respective PPE shall be used during works producing heavy dust.
Noise	Since the construction works are not carried out in closed areas, the measures presented in the Noise Management Plan shall be applied. Respective PPE shall be used during works producing loud noise.
Manual lifting	The need for manual lifting shall be minimized while preparing the business plan. Lifting works shall be planned in advance and carried out under supervision. Manual lifting operations shall be carried out in accordance with the physical characteristics of the employee. Before the operation, the work area shall be checked, and any obstacles shall be removed. If possible, auxiliary equipment shall be used. If the object to be lifted is long compared to the height of the personnel, a break shall be given in the middle of the road where the load is to be taken, and the transport position shall be changed. When lifting loads, you should use your legs, not your back. The shoulders should be kept backward and bent outward, and the legs should be hunched.
Hazardous Substances	Hazardous Substance Management Plan shall be applied. Respective PPE shall be used when working with hazardous substances.

Hazards & Hazardous Construction Works	Mitigation Measures / Administrative Actions
Electrical Works	Only trained and authorized personnel shall be allowed to carry out electrical works. Other employees shall be prohibited from reaching the place where the power lines are located. Active power systems shall be turned off before starting work. Worn-out cables and equipment shall not be used. Respective PPE shall be definitely used. Just in case, all employees shall receive training on electrical risks and electric shocks.
Excavation Works	No excavation work shall be performed without permission. All resources that may pose a danger shall be determined before excavation. All excavations shall have an access point. The excavated soil shall be kept at least 1 meter away from the excavation area.
Construction Vehicle Traffic	Heavy construction machinery shall be used by persons licensed in this field. Traffic training shall be given to all personnel members. Hazards related to construction traffic shall be included in visitor trainings. Speed limit shall be applied. Periodic checks of vehicles and construction machinery shall not be interrupted.

3.6 Shadow Flicker

Wind turbines cast shadows directly to the places within sight every time the blades turn. Shadow flicker effect changes depending on the position of the sun during a day. Hence, shadow flicker occurs specifically and for a short time. And, shadow flicker effect differs around the year.

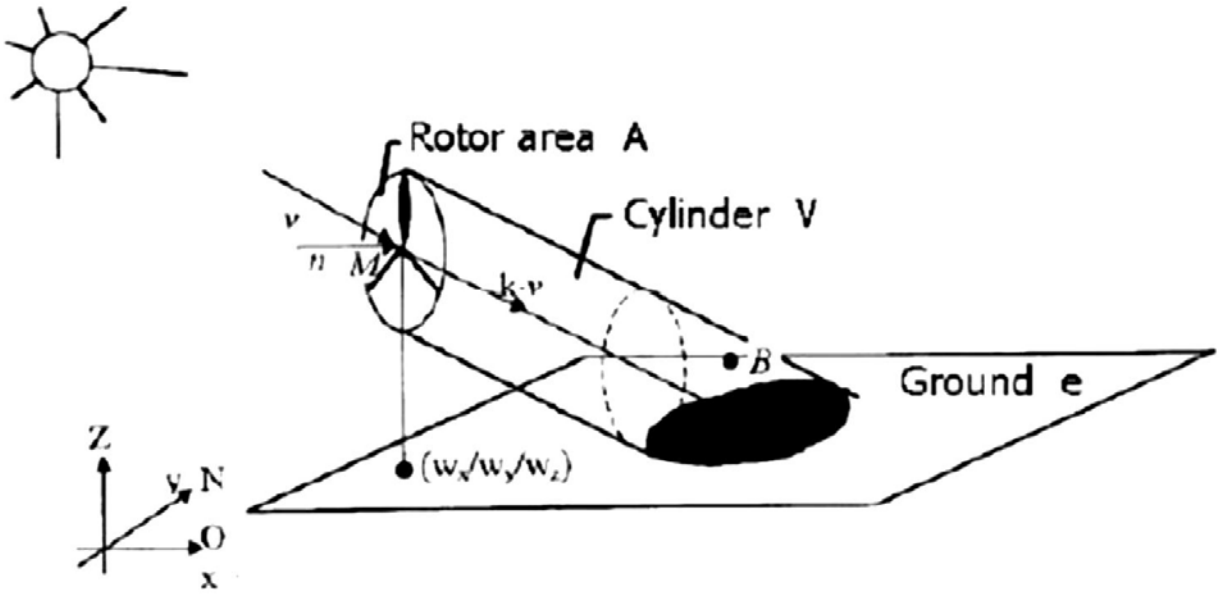


Figure 3-2 Shadow Flicker Occurrence

WindPro software is used for the Shadow Flicker Impact Assessment. This study aims to calculate the frequency and the exact time of shadow effects that are formed by one or more wind turbines to the immediate environment or vicinity. Worst-Case Scenario assessment is conducted within these shadow flicker studies. The Worst-Case Scenario is based on the cases;

- A day with a clear sunny day without for or cloud,
- The sun, turbine rotor and receptors are in the same field of view throughout the day,
- The turbines work all day long and blades turn,
- Receptors are completely made up of windows,

There is no obstacle between the turbine and the receptor.

Also, shadow flicker intensity was not taken into consideration. The flicker time is recorded even if the shadow is very weak. The Worst-Case Scenario results are presented on the analysis.

Therefore, the modeling here is on the very safe side and the actual shadow flicker times will be negligible.

Nordex N149/4.0 - 4.5 MW turbine model was selected for Atares-1 Wind Farm and the project turbine layout was made with 18 turbines. Based on this turbine layout, the three closest residential areas that could be affected by shadows were considered and this report was prepared according to the worst-case scenario.

Therefore, this assessment includes 18 N149/4.0 - 4.5 MW turbines with a hub height of 125 m, a blade diameter of 149 m and a total height of 200 m. The project turbine layout of 18 turbines has been designed considering all natural, environmental and legal conditions. The turbines will be located in the most appropriate way to the site.

The most important part of the shadow flicker assessment is the technical details of the turbines. These details; are the size of the turbine, cut in and cut/out speeds and rotor speed. The turbine sizes are used to calculate the flicker effect, the wind speeds are used to prepare the real case simulations during the turbine operating process, and the rotor speed is used to calculate the flicker frequency.

As part of the preparation of shadow flicker analysis, the analysis is finalized through the software by placing receptors in the dwelling units closest to the project turbines.

In the preparation of this analysis; shadow receptors have been placed at the dwelling units closest to the 18 wind turbines of Atares-1 Wind Farm.

A total of 3 receptors were determined for this study, and the worst-case conditions were calculated with these receptors.

A- A Dwelling from Kurşunlu Neighbourhood B-Dwelling from Kurşunlu Neighbourhood C- A Dwelling from Şahmelek Neighbourhood

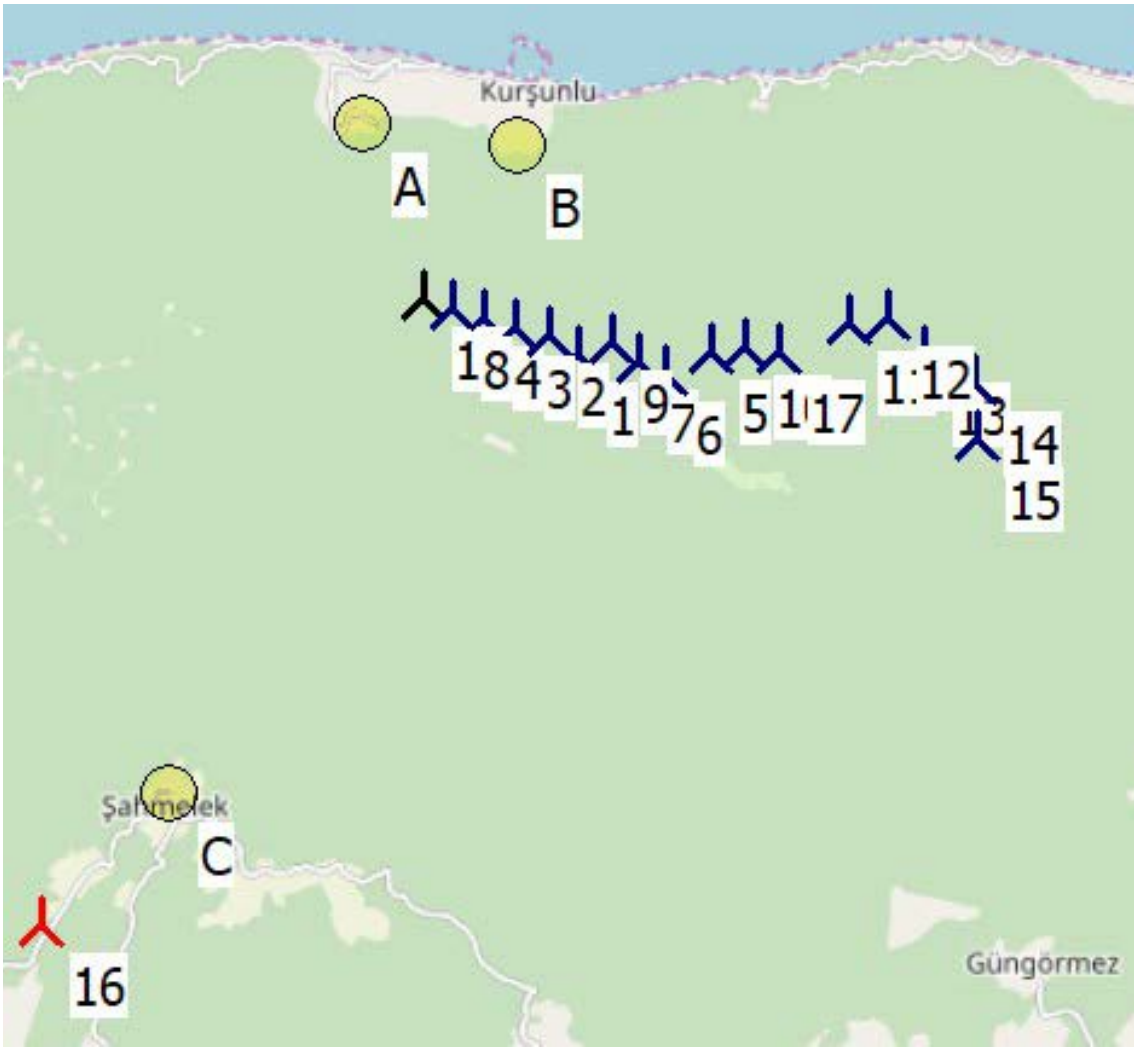


Figure 3-3 WindPro Image Showing Turbines and Receptors

The closest residential areas to the turbines were determined as shadow receptors. The dwelling closest to the T7 turbine in Kurşunlu Village is at a distance of 1814 m. The shadow flicker map as per the Worst-Case Scenario is shown in below figures.

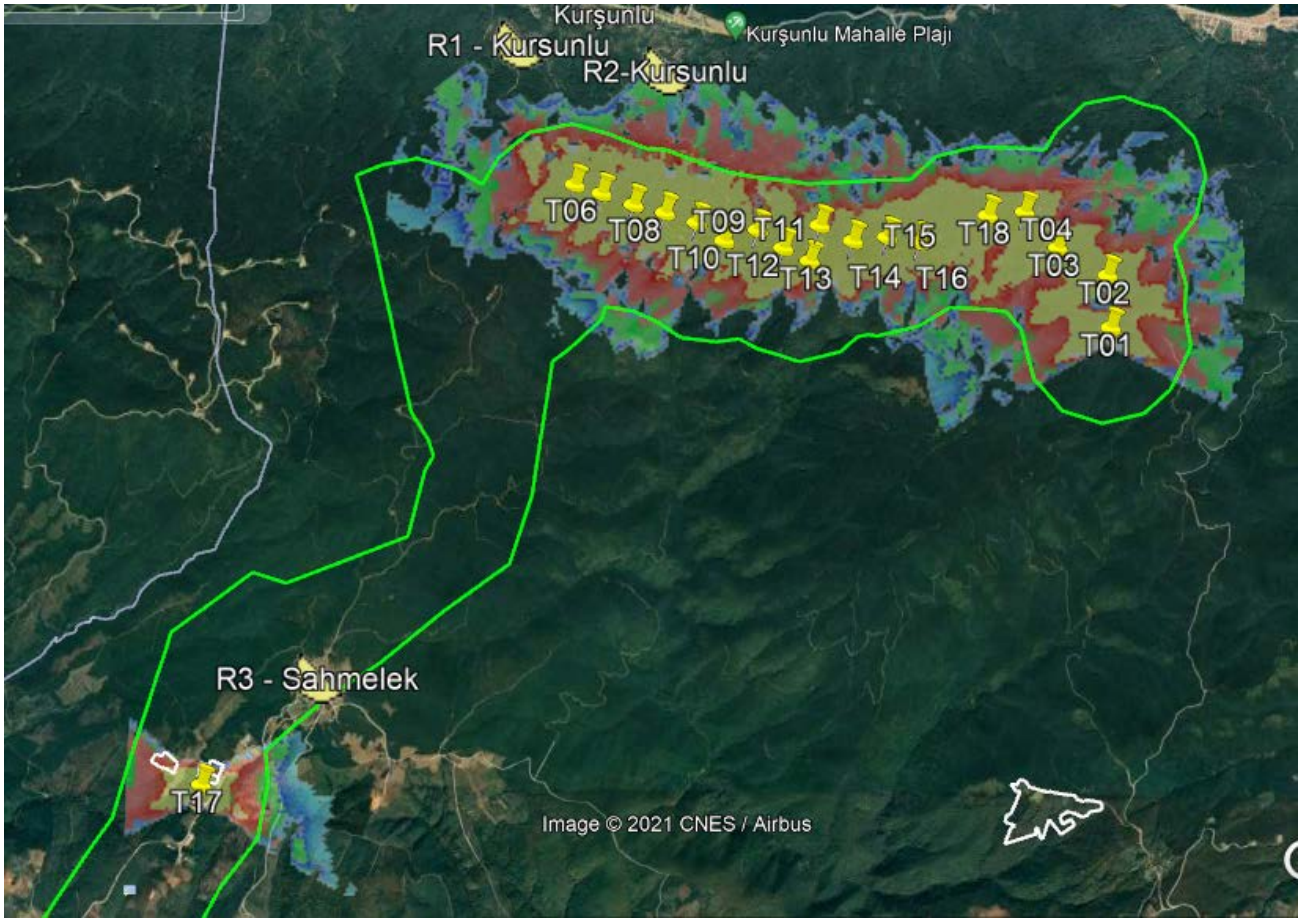


Figure 3-4 Google Earth Image of Shadow Flicker Map

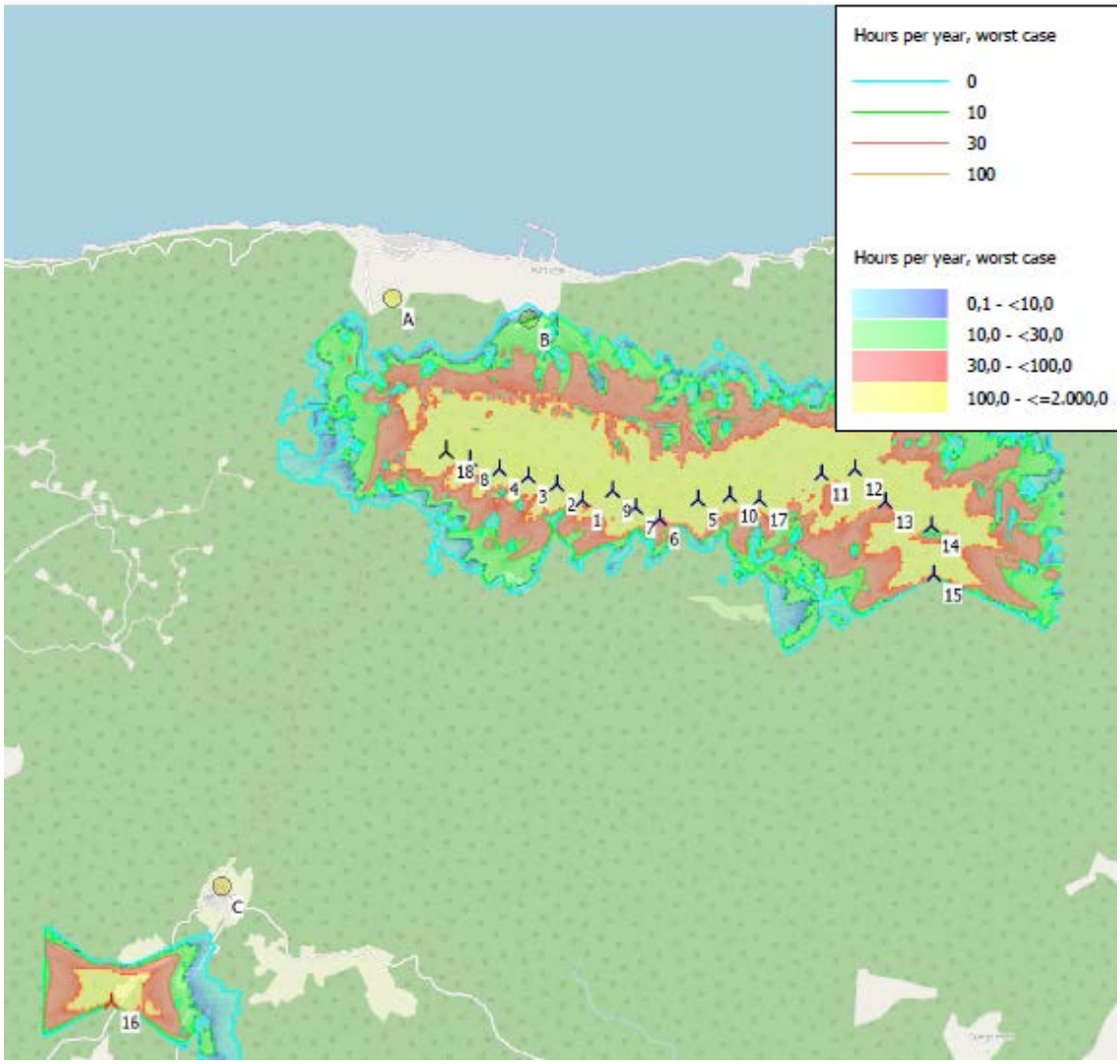


Figure 3-5 WindPro Image of Shadow Flicker Map

According to the modelling study, maximum shadow flicker time is calculated as 8 hours 52 minutes per year, 18 minutes per day for the closest building to the T7 turbine at the distance of 1814 meters as per the Worst-Case Scenario, and it is less than 30 hours per year and 30 minutes per day specified in German Standards.

3.7 Visual Impacts

A visual impact assessment has been conducted in scope of this report. The aim of the assessment is to realistically represent the landscape with wind turbines from various visual perspectives

around the project site. The closest residential areas to Atares-1 Wind Power Plant are Kurşunlu and Şahmelek Neighbourhoods. For this reason, since the most visual impact is expected to be in this area, the analysis was made for these neighbourhoods. In the analysis, three-dimensional wind turbines, towers and blades were modeled and used to represent N149/4.0-4.5 model wind turbines.

In general, the photographs used in the visual impact assessment were taken from an area 3 to 5 km from the project boundary. However, some photo locations used in this analysis are beyond this range to give a greater representation of the visual impact of the project. Also, based on the project configuration, several visualizations are used from the same point of view.

The coordinates of the 3 points where Visual Analysis is made and the turbine numbers to be seen from this point are given in the below figure.

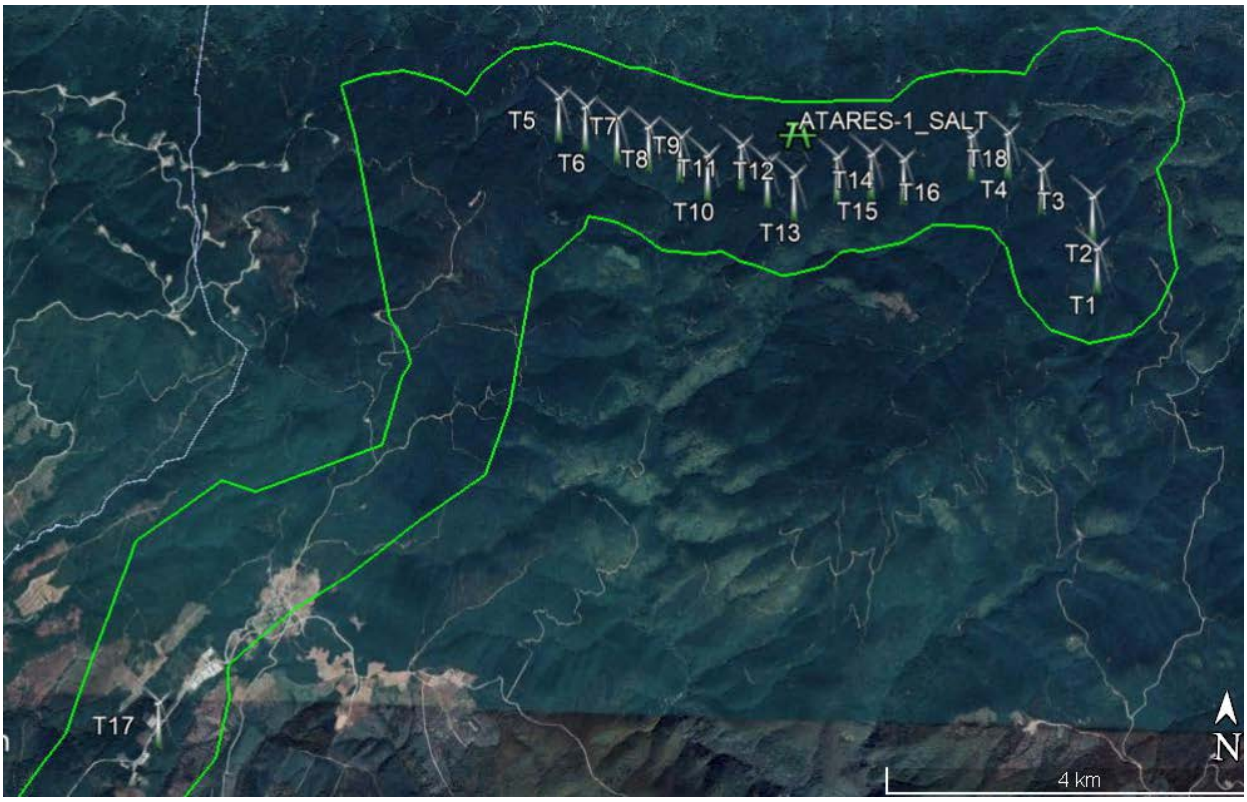


Figure 3-6 Visual Impact Assessment Receptors

When viewed from the F1 point towards the power plant, turbines numbered T1, T2, T3, T18 and T4 will be seen, respectively.

Figure 3-7 View from F1 Point

When looking towards the power plant from the F2 point, turbines numbered T1, T2, T3, T4 and T18 will be seen respectively from left to right.

Figure 3-8 View from F2 Point

Photographs were taken at 3 different angles, looking towards the switchboard from the F3 point. In the first of these photographs, which are side by side, turbines numbered T16, T15, T14, T13, T12, T11 and T10 will be seen from left to right, respectively.

Figure 3-9 View from F3 Point -1

In the second angled photograph taken from point F3, turbines T10, T9, T8 and T7 will be seen from left to right, respectively.

Figure 3-10 View from F3 Point -2

In the third angled photograph taken from point F3, turbines T6 and T5 will be seen from left to right, respectively.

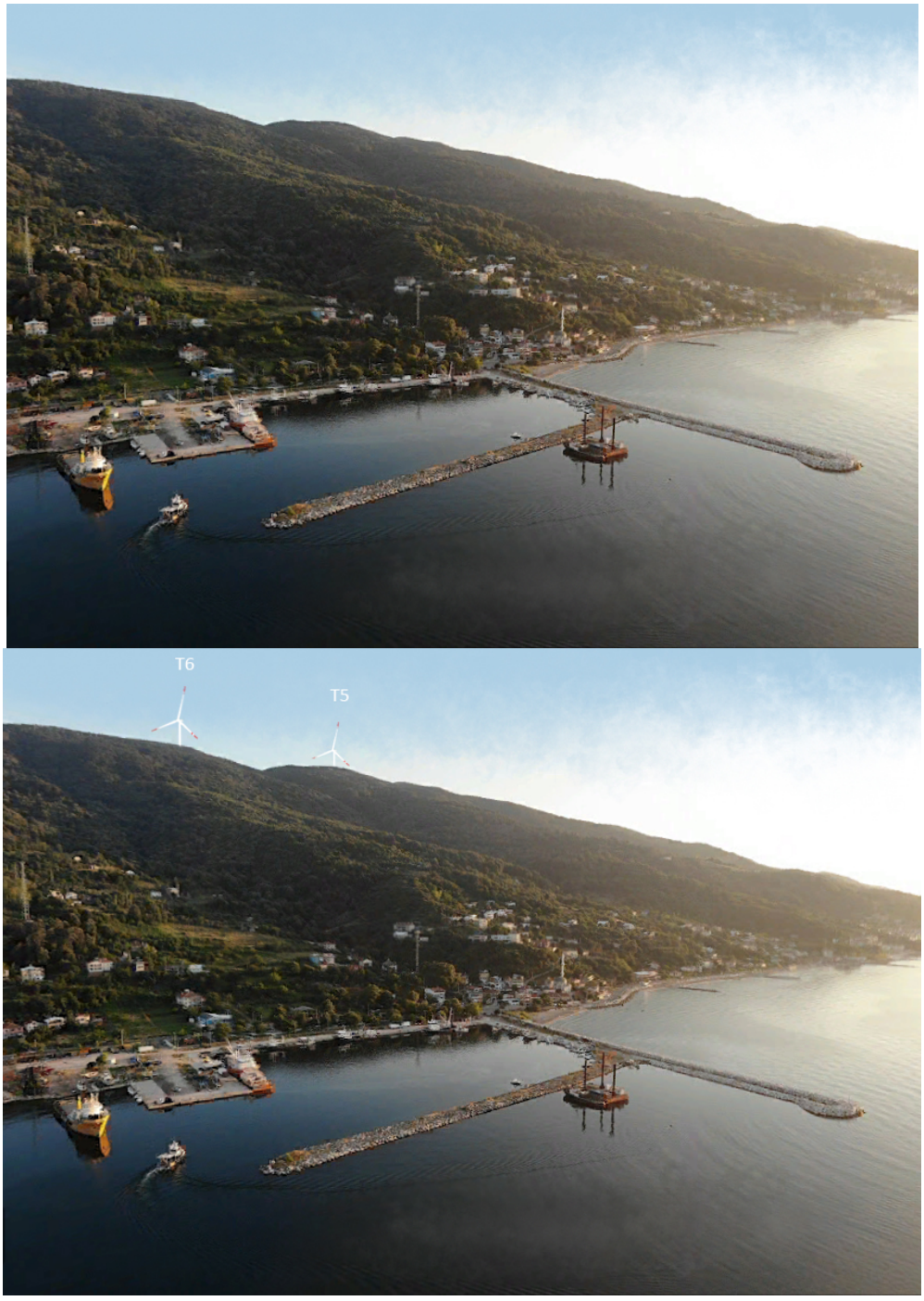


Figure 3–11 View from F3 Point -3

3.8 Ice/Blade Throw

A safety distance has been calculated for Nordex N149-4.0-4.5 turbines for blade launch risk management. In this calculation, the safety distance was determined as 1.5xTurbine Type Height as 270-300 meters. There are no settlements or residences at these determined distances of the turbines within the scope of the project. Therefore, there is no risk of Wing/Ice launch within the scope of Atares-1 WPP project.

However, it is necessary to take mitigation measures in order to prevent possible effects for the personnel who will work at the power plant and for the people who will be in the project site for any reason.

Mitigation measures are provided below:

- Care will be taken to ensure that all design parameters are applied correctly;
- Care will be taken to ensure that the lightning protection system in turbines is properly installed and maintained regularly;
- Blade maintenance will be carried out regularly and any deterioration that will affect blade integrity will be promptly repaired;
- When the vibration sensors in the turbines detect an imbalance in the blades, the relevant turbine will be stopped if necessary.
- When icing is detected in the turbine, the turbine will be stopped, if required;
- Ice throwing warning signs will be placed at a distance of at least 150 m from the turbines;
- Warning signs will be placed at the plant entrance.
- Necessary precautions will be taken before the maintenance personnel enter the field in icy conditions.
- Unauthorized access to turbines will be prevented.

3.9 Biodiversity

The management controls to be implemented and the measures to be taken in order to prevent / minimize the impacts on biodiversity are as follows:

- In the pre-construction period, additional field studies determined within the scope of Biodiversity Management Plan shall be carried out to set forth the biodiversity value of the area, biodiversity impact assessment shall be carried out, and related measures shall be determined in accordance with the zero-net-loss principle by applying a hierarchy of mitigation measures specific to habitat and species.
- Collision risk modelling shall be made with field studies determined within the scope of BMP in accordance with PS6 and international guideline documents in order to assess the field use characteristics of bird and bat species and the risks arising from the Project for these species.
- In line with the results of additional field studies including bird and bat studies and other biodiversity elements and habitats, construction period monitoring parameters and operational period adaptive management strategies with target species shall be determined.
- Vegetation cleaning in natural habitats shall be limited to the construction platform area.
- Necessary permits shall be obtained in accordance with the legal regulations before cutting of trees.
- Breeding and nesting periods of priority fauna elements shall be considered in the planning of land preparation works.
- In particular, before the old trees are cut down, necessary measures shall be taken by examining the animal nest and perch areas. Cutting of trees with nests on them shall be restricted.
- Flora and fauna specialists shall be assigned for vegetation cleaning operations in natural habitats.
- Equipment storage shall be made using degraded areas of construction facilities such as offices, access roads as much as possible.
- Areas suitable for the passage of animals shall be provided in the construction projection areas.

- Before starting the site works, daily inspections shall be carried out to ensure that the animals are moved or removed from their places.
- On-site speed limits shall be applied.
- If any pit or excavation area remains open after daily site work, it shall be ensured that it is safely closed and, if possible, ramps are installed for animal passages.
- Following the completion of the construction works, the electricity transmission line and the natural habitats outside the construction areas shall be restored and rehabilitated using natural and zone-specific plant species.
- After the construction, vegetation around the turbines or any other activities that may attract animals to the area and the use of colored equipment shall be avoided.
- Appropriate lighting methods shall be used in the working areas, and additional protectors shall be used in cases where there is direct lighting.
- All Project personnel members shall be provided with training on the importance of biodiversity in the area. Protocols to be implemented in case of encountering wildlife shall be prepared.
- Project-related waste and impacts on water resources shall be minimized through the implementation of the Waste / Wastewater Management Plan.
- Management of emergency cases such as natural disasters, fire and leak shall be handled in line with the Emergency Action Plan.
- Noise and vibration related disturbances shall be managed in line with the Noise Management Plan requirements.
- A Biodiversity Monitoring and Evaluation Program shall be developed and implemented specifically for the Project in order to evaluate the success of mitigation measures and to make the necessary management interventions.
- An Invasive Pest Species Management Procedure setting out the actions to be taken in the event of accidental introduction and spread of invasive pest species, in accordance with the following principles, shall be prepared and implemented:

- Investigating for the presence of invasive species before the start of field work,
- Controlling all vehicles and equipment entering the Project sites against the risk of invasive pest species.
- Prohibiting bringing animals from outside to the Project sites,
- Restoring degraded topsoil and plant matter,
- Using natural and zone-specific plant species in the restoration, and continuing regular maintenance activities during the operation period.
- If invasive pest species cannot be prevented from entering the site, implementing necessary control methods to prevent their spread,
- Not using pesticides and fire for control purposes in the fight against invasive pest species. Applying herbicide in line with the Project standards.

4.0 CONCLUSION

Each of the project components has been associated to one or more impact factor for every Project phase. Impacts have been assessed considering the correct application of a set of standard mitigation measures that are drawn from good industry practice. Additional site or issue specific mitigation measures have been identified to address areas where high residual impacts are likely to occur, in order to ensure the impacts after additional mitigation measure are kept at an acceptable level.

The mitigation measures to be in place for the minimisation of environmental and social impacts of the project is detailed in appropriate sections of the report.

The mitigation measures should be applied in a structured environmental management system with an organization chart.