TÜRKİYE ORGANIZED INDUSTRIAL ZONES PROJECT
CONSULTANCY SERVICES FOR PREPARATION OF ENVIRONMENTAL AND SOCIAL ASSESSMENT STUDIES FOR SUB-PROJECTS (GROUP-3)

İSTANBUL BİRLİK ORGANIZED INDUSTRIAL ZONE SOLAR POWER PLANT PROJECT (265.95 kWp)

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

CNR-PLN-TOIZP-IST-SPP-ESMP-001
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AC	Alternating Current
ACNAC	Acceptable to consumers and no abnormal change
AFAD	Disaster and Emergency Management Presidency
AoI	Area of Influence
AQMS	Air Quality Monitoring Station
CFC	Chlorofluorocarbons
CITES	Convention on the International Trade in Endangered Species of Wild Flora and Fauna
CLO	Community Liaison Officer
COC	Code of Conduct
CORINE	Coordination of Information on the Environment
CR	Critically endangered
Csa	Hot-Summer Mediterranean Climate
dB(A)	Decibel A
DGIZ	Directorate General for Industrial Zones
DWTP	Drinking Water Treatment Plant
E&S	Environmental and Social
EDAŞ	Electricity Distribution Inc.
EHS	Environmental, Health, and Safety
EIA	Environmental Impact Assessment
EKAT	High Voltage Electrical Facilities
EMRA	Energy Market Regulatory Authority
EN	Endangered
ERP	Emergency Response Plan
ESF	Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMR	Environmental and Social Monitoring Report
ESPR	Environmental and Social Progress Report
ESR	Environmental and Social Report
ESS	Environmental and Social Standards
EU	European Union
EUNIS	The European Nature Information System
GBV	Gender-Based Violence
GM	Grievance Mechanism
GMR	Grievance Mechanism Report
GRS	Grievance Redress Service
H&S	Health and Safety
IBA	Important Bird Areas

IBRD	International Bank for Reconstruction and Development
ILO	International Labor Organization
IPA	Important Plant Areas
İSKİ	General Directorate of Istanbul Water and Sewerage Administration
IUCN	International Union for Conversation of Nature
KBA	Key Biodiversity Areas
LC	Least Concern
LED	Light-Emitting Diode
Lit	Literature
LM Plan	Labor Management Plan
LMP	Labor Management Procedure
M	Magnitude
MAK	Central Game Commission
MoEUCC	Ministry of Environment, Urbanization and Climate Change
MoIT	Ministry of Industry and Technology
MoTAT	Mobile Waste Tracking System
MoTF	Ministry of Treasury and Finance
NAC	Acceptable to consumers and no abnormal change
NAFZ	North Anatolian Fault Zone
NE	Not Evaluated
NGO	Non-governmental organizations
NTU	Nephelometric Turbidity Unit
Obs.	Observation
OG	Official Gazette
OHS	Occupational Health and Safety
OIZ	Organized Industrial Zone
PAP	Project Affected Parties
PBB	Polybrominated biphenyls
PBDE	Brominated diphenyl ethers
PFS	Protected Fauna Species
PGA	Peak Ground Acceleration
PID	Project Identification Document
PIU	Project Implementation Unit
PM	Particulate matter
POPs	Persistent Organic Pollutants
PPE	Personal Protective Equipment
PV	Photovoltaic
RDB	Red Data Book
SDS	Safety Data Sheet
SEA/SH	Sexual Exploitation and Abuse and Sexual Harassment

SEF	Stakeholder Engagement Framework
SPFS	Strictly Protected Fauna Species
SPP	Solar Power Plant
SRC	Driver Certificate
TEDAŞ	Türkiye Electricity Production Inc.
TOIZP	Türkiye Organized Industrial Zones Project
ToR	Terms of Reference
TSE	Turkish Standards Institute
TSS	Total Suspended Solid
TurkStat	Turkish Statistical Institute
UNESCO	United Nations Educational, Scientific and Cultural Organization
USGS	United States Geological Survey
VU	Vulnerable
WB	World Bank
WBG	World Bank Group
WHO	World Health Organization
WWTP	Wastewater Treatment Plant

EXECUTIVE SUMMARY

The Ministry of Industry and Technology (MoIT), in coordination with the Ministry of Treasury and Finance (MoTF), has secured funding from the World Bank (WB) for the implementation of the Türkiye Organized Industrial Zones Project (TOIZP). The WB will support the TOIZP through an International Bank for Reconstruction and Development (IBRD) loan, appointing the MoIT as the relevant Ministry responsible for its execution.

"İstanbul Birlik Organized Industrial Zone (OIZ) Solar Power Plant Project (the project)" will be established within İstanbul Birlik OIZ as a sub-project of “TOIZP”, which is carried out with MoIT as the implementing agency providing the loan to İstanbul Birlik OIZ (Project Owner / Birlik OIZ), which is the sub-borrower and the Project Owner.

Birlik OIZ will establish five roof-top solar power plants with a total power of 265.95 kWp to meet its own electricity consumption with renewable sources. This will both lower its emissions and also increase its supply security. All of the electricity generation will be primarily consumed at the OIZ’s consumption points. Surplus energy will be purchased by the Incumbent Retail Sales Company in line with the 5346 Numbered Law on the Use of Renewable Energy Sources for Electricity Generation. There will be no additional land required for the project.

The project is not included in the scope of the Annex-1 and Annex-2 lists of the Environmental Impact Assessment (EIA) Regulation (Official Gazette dated 29.07.2022 and numbered 31907) and therefore, the projects planned on the roofs of buildings in administrative and service areas are not subject to EIA process. In line with this, İstanbul Governorship Provincial Directorate of Environment, Urbanization and Climate Change has issued an 28.11.2022 dated and 5093939 numbered "EIA Exemption Letter” for the project (see Annex-1). The project is assessed as “moderate risk” as per Environmental and Social Standard 1 (ESS1).

The project area is located within the borders of the Birlik OIZ. Birlik OIZ is located in the Tuzla district of İstanbul, right on the border between İstanbul and Kocaeli. The solar panels to be installed within the scope of the project will be located on the rooftops of five (5) different buildings which are:

- Banks-1 (6608/1[1] parcel),
- Bank (6617/18 parcel),
- Banks-2 (6617/1 parcel),
- Market (6616/10 parcel) and
- OIZ Administrative Building (6615/11 parcel).

The environmental and social AoI of the project has been determined as 150 m-radius from rooftop SPP areas. The 150-meter radius impact area has been determined considering environmental and social impacts of the project.

Akademi Gurme Restaurant located adjacent to the OIZ Administrative Building is within the AoI. There is also a Caribou Coffee Company under the Banks-2 building, this cafe is in the project AoI. Restaurant and cafe are not considered as sensitive receptor. These are considered as businesses in the AoIs.

There are only facilities and businesses in AoIs of Projects There are no sensitive receptors such as schools, mosques, health centers, etc. in AoIs of Project . There are no educational institutions within the boundaries of Birlik OIZ. The nearest educational institution to the project area is “Şekerpınar Primary School” approximately 3,2 kilometers away by air distance. There is a Vocational Training Center Liaison Office in the OIZ Administrative Building, but it is not

[1] Block Number / Parcel Number

used. There are educational institutions in Tuzla district where the project area is located, however, these institutions are not within the project's impact area and are located at far distances. There is an "OSB Mosque" within the OIZ. The distance of this mosque to the closest project area (Market Building) is 260 meters. There is no park in AoIs of project areas.

The electricity generated at SPP points will be delivered to the main distribution panels located at the relevant points through cable trays and ducts without the need for excavation. Transmission from the main distribution panels to the transformers will be provided by individual low voltage supply cables belonging to the relevant points. Therefore, no excavation will be carried out within the scope of the project. The inverters are planned to be positioned next to the existing transformers due to the limited space on the roofs. Solar panels will be transported to the roofs of the buildings with the help of a crane. The transportation process by crane will take approximately one (1) day for each of the project areas.

Only exhaust gas emissions will be generated from the vehicles. Since the crane lifting will be for a short term and limited, no negative impact in terms of environmental noise is expected provided necessary precautions are taken. In case of complaints related with environmental noise and air quality from stakeholders, relevant measurements will be carried out by accredited laboratories. Additionally, relevant mitigation measures will be put in place (see Section 8).

Project areas, which currently have "industrial or commercial units" according to Coordination of Information on the Environment (CORINE) data, do not have any flora and fauna, therefore it is expected that there will be no soil and/or flora and fauna loss.

Installation of rooftop SPPs will take place on existing administrative and service area buildings of Birlik OIZ, hence no land acquisition will be required for this project.

The project implementation period will be around eight (8) months from the connection consent of the authority to the acceptance of the plant (commercial operation date). The installation of the solar panels will take between 7-10 days depending on the building.

Ten (10) personnel will be employed during the construction phase[2]. No additional personnel will be employed during the operation phase of the project.

The project's anticipated environmental and social impacts/risks will relate to air quality (exhaust gas emissions), noise, waste, the socioeconomic environment, occupational health and safety, as well as community health and safety. The project will follow the Environmental and Social Management Framework (ESMF) of the TOIZP, good international industry practice, including WB Environmental and Social Standards (ESSs), World Bank Group (WBG) General Environmental, Health and Safety (EHS) Guidelines, WBG EHS Guidelines for Electric Power Transmission and Distribution and standards of the national legislation.

This Environmental and Social Management Plan (ESMP) identifies the potential risks and impacts that may arise during pre-construction, construction and operation phases of the Project and outlines appropriate mitigation measures to effectively address these risks and impacts. An assessment of the environmental and social impacts of the project is included in Section 7. Section 8 and Section 9 summarize the measures to be taken to avoid/mitigate the identified impacts and monitoring activities for the pre-construction, construction and operation phases of the project.

The TOIZP builds on an existing technical assistance relationship between the MoIT and the WB that helped develop a national framework for Green OIZs in Türkiye and carried out preliminary assessments of the potential impact of OIZ investments. MoIT will be the

[2] **Source:** İstanbul Birlik OIZ SPP Project Environmental and Social Screening Form

implementing agency for the project and will provide the loan to İstanbul Birlik OIZ, as the sub-borrower and the Project Owner. İstanbul Birlik OIZ will be responsible for the implementation of the project at the local level. The OIZ PMU will be responsible for monitoring and evaluating the performance of the services provided by the Contractor. The Contractor will carry out the project activities in line with the approved design documents and will be responsible for implementing and applying the mitigation measures given in this ESMP during the construction phase. The Contractor will adhere to its responsibilities specified in this ESMP for compliance with national regulations and the WB Environmental and Social Framework (ESF) and the Environmental and Social Management Framework (ESMF) for the TOIZP.

The ten (10) ESSs contained in the WB ESF are designed to support Borrowers' projects through the requirements relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by the WB. Out of these, six (6) ESSs establish the standards that Borrower and projects must follow throughout the project lifecycle:

- ESS1 Assessment and Management of Environmental and Social Risks and Impacts
- ESS2 Labor and Working Conditions
- ESS3 Resource Efficiency and Pollution Prevention and Management
- ESS4 Community Health and Safety
- ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources
- ESS10 Stakeholder Engagement and Information Disclosure

ESS7 "Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities" and ESS9 "Financial Intermediaries" are not relevant to this project as there are no indigenous groups in Türkiye that meet the definition provided in ESS7 and the project does not involve a Financial Intermediary. When any OIZ's area is being determined, the Ministry of Culture and Tourism gives an opinion about the cultural and historical situation of the planned OIZ area. If any cultural and historical area is in that area, those areas are cut off from OIZ's area. In addition, any project that will have adverse impacts on cultural heritage is considered ineligible and screened out from TOIZP. Therefore, "ESS 8: Cultural Heritage" is not relevant within the project, but chance find procedure is included considering the risk of chance finds during construction works (see Annex-7). Additionally, ESS5 "Land Acquisition, Restrictions on Land Use and Involuntary Resettlement" will not be relevant for this project since there is no land acquisition. The other six (6) ESSs are directly related to the project. Scope and aim of the ESS's related to the project are explained in Section 3.2.

Additionally, all national standards and relevant regulations that will be applied within the scope of the project are given in Section 3.

This ESMP document includes mitigation, monitoring, and institutional measures to be implemented during the pre-construction, construction, and operation phases of the Projects based on the ESMF of TOIZP. These measures are designed to eliminate, balance, or reduce adverse environmental and social risks and impacts to acceptable levels. The ESMP document primarily focuses on the following topics:

- Identifying environmental and social baseline conditions,
- Identifying potential environmental and social impacts and risks for pre-construction, construction, and operation phases,
- Detailing mitigation measures,
- Outlining monitoring activities,
- Defining roles and responsibilities for implementing mitigation measures and monitoring activities,

- Establishing the institutional structure for project management,
- Conducting interviews with stakeholders and
- Evaluating budget for implementation of ESMP.

The environmental and social impacts addressed within the ESMP, along with the key mitigation measures are summarized in Table 1.

Table 1. Key Mitigation Measures for the Project Implementation

Potential Environmental and Social (E&S) Impacts	Key Mitigation Measures	
	Construction phase	**Operation Phase**
Air Quality	• Regular maintenance of machinery and equipment • Minimize dust from work sites by applying water spraying on the ground regularly during dry season (if necessary) • Construction activities are carried out at different times in different parts of the project area • Consultation with stakeholders and planning construction activities during periods that will result in least disturbance	• Regular maintenance of operation phase vehicles and equipment will be applied
Noise	• Regular maintenance of machinery and equipment • Consultation with stakeholders and planning construction activities during periods that will result in least disturbance. • Construction activities are carried out at different times in different parts of the project area	• Regular maintenance of operation phase vehicles and equipment will be applied
Water and wastewater	• Not damaging groundwater and other water resources • Minimization of water use for personnel needs	• Not damaging groundwater and other water resources • Minimization of water use for personnel needs and solar panel cleaning
Wastes	• Compliance with the waste management hierarchy (prevention-reduction-reuse-recycling-energy recovery-disposal) • Use of hazardous and non-hazardous waste storage areas • Recycling/disposal of waste by licensed companies • Keeping the project area clean • Storage of broken/ damaged solar panels in the OIZ's waste storage area and delivery of these panels to the licensed recycling/disposal company or producer depending on the agreement	• Compliance with the waste management hierarchy (prevention-reduction-reuse-recycling-energy recovery-disposal) • Use of hazardous and non-hazardous waste storage areas • Recycling/disposal of waste by licensed companies • Keeping the project area clean • Storage of broken/ damaged and end of life solar panels in the OIZ's waste storage area and delivery of these panels to the licensed recycling/disposal company or producer depending on the agreement • Raising personnel awareness on proper disposal of solar panels, specifically avoiding disposal of panels near water bodies
Soil Pollution	• Work machine and vehicle maintenance and repair operations will not be carried out in the project area. These operations will be carried out at the authorized services	• Waste and wastewater management activities will be followed as described in this ESMP • Response kits / spill kits to be used in emergency situations will be kept on site

Potential Environmental and Social (E&S) Impacts	Key Mitigation Measures	
	Construction phase	**Operation Phase**
	• Waste and wastewater management activities will be followed as described in this ESMP • Periodic maintenance and repairs of vehicles will be carried out regularly. • Response kits / spill kits to be used in emergency situations will be kept on site	• proper maintenance of solar panels to avoid pollution to be caused by broken/ damaged solar panels
Biological Environment	• No damage to natural life in and surrounding the project area • No cutting of trees or destruction of vegetation except project area	• No damage to natural life in and surrounding the project area
Labor Conditions	• Providing transparent, non-discriminatory, equal recruitment opportunities with respect to ethnicity, religion, language, gender and sexuality • Providing Labor Management Plan (LM Plan) provisions compliant with Labour Management Procedures of the TOIZP, ESS2 and national law and provision of written contracts to workers • Providing trainings on environment, social, occupational health and safety, labor conditions, Grievance Mechanism (GM), gender-based violence (GBV) and sexual exploitation and abuse and sexual harassment (SEA/SH) • Implementation of Grievance Mechanism • Proper adaptation of human rights policy and labor rights	• Providing transparent, non-discriminatory, equal recruitment opportunities with respect to ethnicity, religion, language, gender and sexuality • Providing trainings on environment, social, occupational health and safety, labor, GM, GBV and SEA/SH • Implementation of Grievance Mechanism • Proper adaptation of human rights policy and labor rights
Traffic	• Traffic scheduling • Compliance with traffic rules and speed limits • Usage of appropriate traffic signage • Traffic safety and minimum traffic flow disruptions by providing alternative routes • Control driving speed of vehicles particularly when passing through community or nearby school, health center or other sensitive areas	• Compliance with traffic rules and speed limits • Usage of appropriate traffic signage
Community Health and Safety	• Hanging warning signs in and around the project area • Consultation with stakeholders and planning construction activities during periods that will result in least disturbance • Building temporary pedestrian walkways for safety in compliance with the requirements for the passage of individuals with physical challenges and other vulnerable/disadvantaged individuals/groups, such as pregnant, elderly, children • Rope off construction area and secure materials stockpiles/ storage areas from the public and display warning signs including at unsafe locations. Do not allow children to play in construction areas	• Hanging warning signs in and around the project area • Restricted access

Potential Environmental and Social (E&S) Impacts	Key Mitigation Measures	
	Construction phase	**Operation Phase**
	• Ensure structural openings are covered/protected adequately • Fill in all earth borrow-pits once construction is completed to avoid standing water, water-borne diseases and possible drowning	
Occupational Health and Safety	• Surrounding work areas with barriers • Ensuring that the use of construction equipment is carried out by certified persons • Ensuring that personnel use personal protective equipment (PPE) • Precautions to be taken especially against working at height and fire risk • Safe working procedures • Equipment maintenance • Preparation of an OHS plan, risk assessments and sitespecific procedures	• Hanging warning signs • Precautions to be taken especially against working at height and fire risk • Safe working procedures • Equipment maintenance • Implementation of necessary mitigation measures especially related with working at height for panel cleaning and repair/maintenance activities during operation phase
Stakeholder Engagement	• Consultation with stakeholders on project and E&S instruments and establishment of public GM	• Continued Implementation of GM

The implementation of mitigation measures will be followed by the monitoring activities presented in Section 9 and the intentions of these activities are to follow adverse environmental and social impacts/risks, and to measure the effectiveness of the mitigation measures, including responsibilities and schedule for implementing the monitoring activities.

1. INTRODUCTION

Türkiye is advancing with the “Türkiye Organized Industrial Zones Project (TOIZsP)", funded by the World Bank (WB) and overseen by the Ministry of Industry and Technology’s (MoIT) Directorate General for Industrial Zones (DGIZ), focusing on improved infrastructure and sustainable technologies.

The TOIZsP will involve comprehensive investments in primary infrastructure, such as the establishment and improvement of roads, water and gas pipelines, power lines, and logistics facilities. These investments are intended to support the Organized Industrial Zones functioning and growth, thereby contributing to their efficiency, environmental sustainability and competitiveness.

Additionally, the TOIZsP significantly emphasizes “green” infrastructure, which is pivotal for fostering environmental sustainability. Investments will be made in advanced technologies that will improve energy and water efficiency facilities, foster the development of advanced wastewater treatment plants, encourage the construction of energy-efficient buildings, and replace conventional lighting systems with Light-Emitting Diode (LED) street lighting.

Furthermore, in line with the global trend towards renewable energy sources, the TOIZP includes provisions for the establishment and expansion of renewable energy assets. These will encompass a variety of renewable technologies, such as solar, wind, and biomass, thus facilitating the transition towards a more sustainable and low-carbon industrial sector.

The MoIT, in coordination with the Ministry of Treasury and Finance (MoTF), has secured funding from the WB for the execution of the TOIZP. The WB will support the OIZs through an International Bank for Reconstruction and Development (IBRD) loan, and the MoIT as the relevant Ministry will be responsible for its execution.

The specific objectives of the TOIZP are as follows:

- Energy savings from OIZ investments in basic and green infrastructure (MWh per year)
- Water savings from OIZ investments in green infrastructure (cubic meters per year)
- Reduction in CO_2 emissions due to supported investments (metric tons per year)
- Share of OIZs that attract new investments.

Therefore, “İstanbul Birlik OIZ Solar Power Plant Project (the Project)" will be established within the boundaries of “İstanbul Birlik OIZ”/ “Birlik OIZ” (Project Owner) in Tuzla district of İstanbul province, as a sub-project of the TOIZP, which is carried out in cooperation with the MoIT and the WB. MoIT, being the implementing agency for the project, will provide a loan to Birlik OIZ, as the sub-borrower and the Project Owner. The Industrial Zones Directorate in MoIT will be the responsible Project Implementation Unit (PIU). The Project Owner is Birlik OIZ.

Per Annex-1 of the EIA Regulation (Official Gazette dated 29.07.2022 and numbered 31907), an EIA is mandated only for specialized OIZs during the establishment phase. As Birlik OIZ is classified as a mixed zone, it is exempt from the national EIA requirement. Furthermore, Article 24, subparagraph c, of the Regulation specifies that the EIA process for projects planned in Organized Industrial Zones will be determined by the Ministry of Environment, Urbanization, and Climate Change (MoEUCC).

The same EIA Regulation states that solar power plants (SPPs) with a capacity of 10 MW_m or more, or those covering an area of 20 hectares or more, fall under Annex 1, making them subject to the EIA procedure. Additionally, SPPs with a capacity of 1 MW_m or more, or covering an area of 2 hectares or more, are listed in Annex 2, necessitating pre-examination and environmental impact assessment. According to this regulation, solar photovoltaic (PV) facade and roof systems are not subject to the EIA process. Consequently, the projects planned on the roofs of buildings in administrative and service areas are not subject to EIA. In line with this, İstanbul Governorship Provincial Directorate of Environment, Urbanization and Climate

Change has issued an 28.11.2022 dated and 5093939 numbered "EIA Exemption Letter" for the project (see Annex-1).

Under the scope of this project, screening studies have been completed and the related risk assessment has been conducted. As a result of this assessment, the project is classified as "Moderate" under the World Bank Environmental and Social Framework (ESF) and Environmental and Social Standard 1 (ESS1).

Therefore, this ESMP has been prepared by Çınar Engineering and Consulting Inc. (ÇINAR) for the Birlik OIZ as part of the environmental and social impact and risk assessment studies for the project. The ESMP has been prepared in compliance with the World Bank's Environmental and Social Framework, including the Environmental and Social Standards (ESSs), the Environmental and Social Management Framework, Labor Management Procedures and Stakeholder Engagement Plan (SEP) of TOIZP and the prevailing national legislation in Türkiye.

1.1 Purpose

The ESMP is designed to systematically identify, assess, and manage the potential environmental and social (E&S) impacts and risks associated with the pre-construction, construction, and operation phases of the project. This document outlines a comprehensive strategy for evaluating these risks and impacts and implements a suite of mitigative measures aimed at either preventing or minimizing any adverse effects.

The purpose of the ESMP is to provide a practical plan for mitigating, managing and monitoring environmental and social risks and impacts and to provide the necessary management tools to ensure compliance with project standards in achieving environmental and social objectives. Additionally, hazards, social and environmental repercussions anticipated to arise throughout the pre-construction, construction and operation phases are identified. The project's potential effects are outlined, along with the steps that must be taken to minimize and/or reduce risks and/or consequences at their source. The responsible project stakeholders are identified, and monitoring and control actions are decided upon over the project lifespan to prevent and mitigate the consequences detailed in this ESMP.

The main objectives of this ESMP are as follows:

- To cover;
  - Project description including location,
  - Compliance with relevant laws and regulations,
  - Initial assessment of surrounding environment and community,
  - Organizational structure for project implementation
  - Strategies to address and oversee environmental and social impacts
  - Engagement and addressing concerns of involved parties
  - Process for addressing stakeholder complaints
- To provide an overview of the environment, ecological, health and safety, socio-economic and cultural heritage policies, standards and legal legislation that the Project is obliged to comply with,
- To ensure that pre-construction, construction and operation activities are properly checked to be in compliance with national standards, ESMF of the TOIZP, WB ESSs and WB Group's (WBG) EHS Guidelines requirements,
- To determine the roles and responsibilities of Project' parties to ensure compliance with the relevant requirements during the pre-construction, construction and operation phases of the project,
- To establish an E&S baseline for the project area and plans E&S mitigation measures,
- To ensure reporting systems are developed and streamlined to deliver the relevant requirements (national standards and WB ESSs) compliance performance,
- To follow the progress in achieving the environmental and social objectives and targets and to make improvements.

1.2 Scope

This ESMP covers the project description, legal framework, environmental and social baseline conditions, environmental and social impacts, mitigation management and monitoring plans, institutional arrangements, for the "Birlik OIZ Solar Power Plant Project". The project aims to create a renewable energy infrastructure by installing SPPs on the roofs of buildings in administrative and service areas of the Birlik OIZ. There are five (5) buildings where the proposed solar panels will be located. The ESMP defines the requirements to the responsible parties with a set of mitigation measures to be conducted during all stages of the project, including pre-construction, construction, and operation phases to avoid potential adverse environmental and social impacts.

2. PROJECT DESCRIPTION

2.1 Objectives of the Project

The primary goal of this project is to install rooftop solar power plants to address the increasing electrical energy demand at Birlik OIZ. Technology advancements play a significant role in determining energy demand. Additionally, both nationally and regionally, the industrial sector plays a significant role in overall energy use. The power demand at Birlik OIZ is expected to keep rising.

Currently, Birlik OIZ relies on grid electricity. Therefore, OIZ management aims to use renewable energy systems to reduce emissions. Increasing the use of renewable energy is an expressed target of the government but, more importantly, an applicable solution for any organization to reduce the amount of energy purchased from the grid. The SPPs of this project will reduce energy consumption, cost, and increase supply security.

In 2022, Birlik OIZ's annual electricity consumption was 364.9 MWh, while the SPPs are expected to produce 346 MWh/year. Therefore, around 95% of the self-consumption will be met by this project.

Once the SPPs are operational, Birlik OIZ will meet nearly all of its electricity needs from renewable sources. Additionally, increasing public awareness and mentoring companies interested in renewable energy are important objectives for OIZ management.

2.2 Project Location

The project area is located within the borders of the Birlik OIZ. Birlik OIZ is located in the Tuzla district of İstanbul, right on the border between İstanbul and Kocaeli. The solar panels to be installed within the scope of the project will be located on the rooftops of five (5) different buildings (see Figure 1). Project areas are:

- Banks-1 (6608/1[3] parcel),
- Bank (6617/18 parcel),
- Banks-2 (6617/1 parcel),
- Market (6616/10 parcel) and
- OIZ Administrative Building (6615/11 parcel).

The environmental and social AoI of the project has been determined as 150 m-radius from rooftop SPP areas (see Figure 24-Figure 28). The 150-meter radius impact area has been determined considering environmental and social impacts of the project.

Akademi Gurme Restaurant located adjacent to the OIZ Administrative Building is within the AoI. There is also a Caribou Coffee Company under the Banks-2 building, this cafe is in the project AoI. Restaurant and cafe are not considered as sensitive receptor. These are considered as businesses in the AoIs.

There are only facilities and businesses in AoIs of project areas. There are no sensitive receptors such as schools, mosques, health centers, etc. in AoIs of project areas. There are no educational institutions within the boundaries of Birlik OIZ. The nearest educational institution to the project area is “Şekerpınar Primary School” approximately 3,2 kilometers away by air distance. There is a Vocational Training Center Liaison Office in the OIZ Administrative Building, but it is not used. There are educational institutions in Tuzla district

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where the project area is located, however, these institutions are not within the project's impact area and are located at far distances. There is an "OSB Mosque" within the OIZ. The distance of this mosque to the closest project area (Market Building) is 260 meters. There is no park in AoIs of project areas.

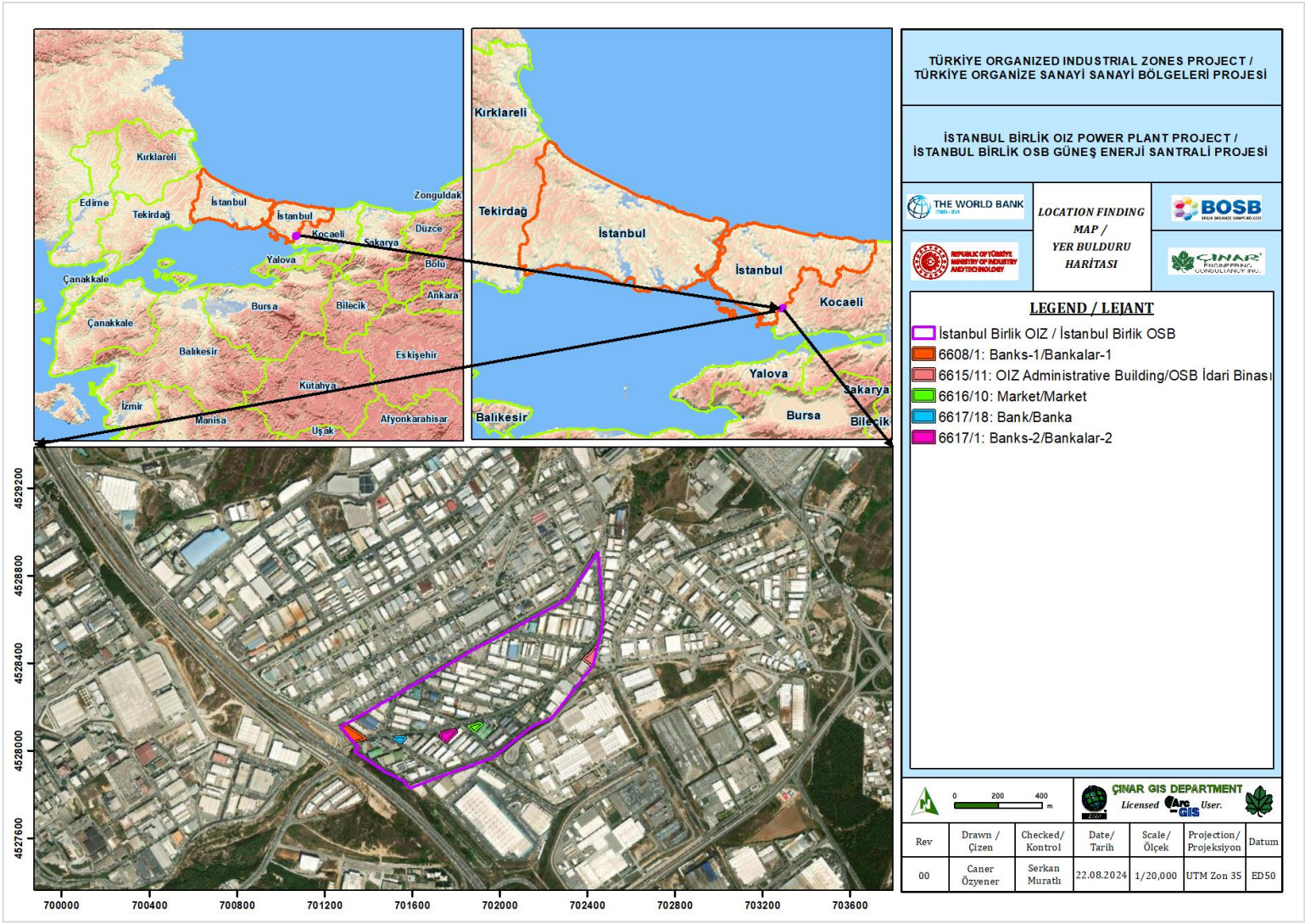

Figure 1. Project Location Map

2.3 Project Components

Birlik OIZ will establish five roof-top solar power plants with a total power of 265.95 kWp to meet its own electricity consumption with renewable sources. This will both lower its emissions and also increase its supply security. All of the electricity generation will be primarily consumed at the OIZ's consumption points. Surplus energy will be purchased by the Incumbent Retail Sales Company in line with the 5346 Numbered Law on the Use of Renewable Energy Sources for Electricity Generation.

Investment budget of the project is estimated as around TL 9,409,853.49 which is approximately €248,906.25 as of 22.08.2024. Birlik OIZ will cover the investment cost by 10% equity and 90% loan. Because the project areas are owned by the OIZ, there will be no expropriation process and cost. The project will start to provide cash savings following the first month of its operation, therefore the working capital requirement will be negligible.

The expected electricity generation of the project is 346 MWh/year. Therefore, around 95% of the consumption will be met by the SPPs.

The works to be conducted within the scope of the Project are as follows:

- Supply and installation of rooftop solar panel system,
- Connection of solar panels to inverters and transformers by existing electric lines and
- Repair and maintenance in the operation phase.

The size of the project areas and their installed capacity on an area basis are given in Table 2.

Additionally, there are no associated facilities that will be related to the project.

Table 2. Size and Installed Capacity of SPP Locations

No	Location	Parcel Number	Module Area (m^2)	Installed Capacity (kWp)
1	Banks-1	6608/1	296.0	61.2
2	Banks-2	6617/1	315.6	65.25
3	Bank	6617/18	291.7	60.3
4	Market	6616/10	82.7	17.1
5	OIZ Administrative Building	6615/11	300.4	62.1
Total			**1,286.4**	**265.95**

Ten (10) personnel will be employed during the construction phase. No additional personnel will be employed during the operation phase of the project. There will be no accommodation during the construction and operation phases of the project.

2.4 Project Timeline and Number of Employees

The project implementation period will be around eight (8) months from the positive connection opinion to the acceptance of the plant (commercial operation date). The 8-month period covered the pre-construction and construction phases of the project (obtaining permits and construction of SPPs). The construction works of the project will take three (3) months. The project will be implemented under the supervision of the technical department of Birlik OIZ.

The time schedule is presented in Table 3. The installation of the solar panels will take between 7-10 days depending on the building[4].

Table 3. Project Time Schedule[5]

Task	Months							
	1	2	3	4	5	6	7	8
Technical Assessment of the Proposed Locations								
Grid connection opinion of the EDAŞ (Electricity Distribution Inc.)								
Application to Türkiye Electricity Production Inc. (TEDAŞ) for electrical project approval								
Connection agreement with the EDAŞ								
Construction of the plant								
Acceptance of the plant by the EDAŞ or TEDAŞ								
Signing of the System Usage Agreement with the EDAŞ								
Commercial Operation of the Plant								

Ten (10) personnel will be employed during the construction phase[6]. No additional personnel will be employed during the operation phase of the project.

2.5 Permits and Management System of the OIZ

2.5.1 Management Systems of the OIZ

Birlik OIZ has an "Energy Policy"[7]. Quality certificates (see Annex-3) of Birlik OIZ and their validity dates are given in Table 4.

Table 4. Management System Certificate of Birlik OIZ

Certificate	Valid Until
ISO 9001: Quality Management System	11.02.2025
ISO 14001: Environmental Management System	16.07.2025
ISO 45001: Occupational Health and Safety Management System	11.02.2025
ISO 50001: Energy Management System	18.08.2025

2.5.2 Permits

Organized industrial zones are regulated by the OIZ Law (Law No: 4562 Date: 12.04.2000), to ensure the structuring of the industry in ready-to-use industrial areas, to prevent environmental and health problems, to use resources rationally, to benefit from information and information technologies.

The procedure to be applied for the projects planned to be built in organized industrial zones is determined by the Ministry of Environment, Urbanization and Climate Change in accordance with Article 24, subparagraph c, of the Regulation on EIA, which came into force after being

[4] **Source:** Birlik OIZ Authorities
[5] **Source:** İstanbul Birlik OIZ SPP Project, Project Identification Document
[6] **Source:** İstanbul Birlik OIZ SPP Project Environmental and Social Screening Form
[7] **Source:** https://www.birlikosb.org.tr/enerji-politikamiz

published in the Official Gazette dated 29.07.2022 and numbered 31907. According to Annex-1 of the Regulation on EIA, at the establishment phase, EIA is required only for the specialized OIZs. Since the type of Birlik OIZ is mixed, EIA was not required for Birlik OIZ.

The project is exempt from the EIA Regulation and the EIA Exemption Letter issued by MoEUCC for the Project is presented in Annex-1.

Wastewater discharge permit obtained from İstanbul Metropolitan Municipality (per the General Directorate of Istanbul Water and Sewerage Administration (İSKİ) Regulation on Discharge of Wastewater to Sewerage), Birlik OIZ will obtain a time-based discharge permit with a five-year validity period. Until that, the existing permit is valid (see Annex-1).

There is an EIA Exemption Letter dated 30.06.2014 and numbered E-2014133 from the (Repealed) Provincial Directorate of Environment and Urbanization regarding the activities of the OIZ Management (see Annex-1).

There has been an authority visit for EHS compliance in the last five years. The minutes of the inspection carried out by MoEUCC on 27.10.2020 are presented in Annex-11. There was no non-compliance found during the inspection.

The Right to Establish, Use and Operate Infrastructure Facilities

According to Article 20 of the OIZ Law no. 4562, OIZs have right to establish and operate infrastructure and general service facilities such as electricity, water, sewerage, natural gas, treatment facilities, roads, communication and sports facilities within the approved borders of the OIZ. Since the subproject is within the border of OIZ, Birlik OIZ has right to establish and operate the subproject.

The services of the OIZ are summarized below.

Water: The water demand within the Birlik OIZ is supplied from the Ömerli Drinking Water Treatment Plant (DWTP) operated by İSKİ.

Wastewater: Wastewater generated in the OIZ is discharged to "İSKİ Tuzla Advanced Biological Wastewater Treatment Plant (WWTP)" via sewerage system.

Domestic Wastes: Domestic wastes of the OIZ are collected twice a week by the Tuzla Municipality. In İstanbul province, there are two sanitary landfills: Silivri Seymen and Şile Kömürcüoda. Domestic waste is delivered to the appropriate one of these two sanitary landfills.

Relevant Legislations

The main regulations related to the design, construction and operation phases of the project are listed below:

- Electricity Market Law (No.6446: Date:14.03.2013)
- Renewable Energy and Electric Energy Generation (Law No: 5346 Date: 10.05.2005)
- Presidential Decision (No: 1044 Date: 09.05.2019)
- Regulation on Unlicensed Electric Generation (Official Gazette (OG) No: 31044 Date: 19.02.2020)
- Electrical Installations Project Regulation (OG No: 29221 Date: 30.12.2004)
- Regulation on Technical Evaluation of Solar Energy-Based Electricity Generation Application (OG No: 30110 Date: 30.06.2017)
- Energy Market Regulatory Authority (EMRA) Board of Directors Meeting Decision (OG No: 8666, Date: 20.06.2019)
- EMRA Board of Directors Meeting Decision (OG No: 31920 Date: 11.08.2022)
- Environmental Impact Assessment Regulation (OG No: 31907 Date: 29.07.2022)
- Occupational Health and Safety (Law No: 6331 Date: 20.06.2012)
- Social Insurances and General Health Insurance Law (Law No: 5510 Date: 31.05.2006)
- Labor Code (Law No: 4857 Date: 22.05.2003)

The Electricity Market Law No. 6446 states that a license must be obtained from the EMRA for electricity generation to the market. The condition of license holders to be limited liability or joint stock companies has been introduced by the Turkish Commercial Code.

Organized Industrial Zones Law (Law No: 4562), which entered into force after being published in the Official Gazette dated 15.04.2004 and numbered 24021, contains the following statements:

"*Article 4- Representatives of the metropolitan municipality, provincial municipality, district municipality, town municipality, chamber of industry established in accordance with the Law on the Union of Chambers and Commodity Exchanges of Türkiye and Chambers and Commodity Exchanges dated 18.5.2004 and numbered 5174, or chamber of commerce and industry, or chamber of commerce, or chamber of commerce, special provincial administration or investment monitoring and coordination presidency, representatives of relevant professional organizations and organizations may take part in the OIZ establishment based on the Ministry's approval. Upon the approval of the establishment protocol signed by the representatives of the institutions and organizations involved in the establishment of the OIZ and the governor by the Ministry and its registration in the registry, the OIZ becomes a legal entity.*

Article 23-The OIZ establishment protocol shall be prepared by the institutions or organizations participating in the establishment of the OIZ and approved by the Ministry."

In this context, the "establishment protocol" is required for the OIZ to gain legal entity and start its activities. The establishment protocol (Birlik OIZ Main Agreement) and authorization certificate of the Birlik OIZ are presented in Annex-1.

Permits belonging to OIZ is listed below:

- Establishment Protocol
- Authorization Certificate
- İstanbul Metropolitan Municipality Wastewater Discharge Permit

All necessary permits for the operation of the OIZ are in place. OIZ has provided all necessary permits according to the existence of the establishment protocol.

3. LEGAL FRAMEWORK

3.1 National Legal Framework

The National Legislation applicable to the management of environmental, social, health and safety aspects of the proposed Project is presented in this section.

Turkish Environmental Law No. 2872, which was published in the Official Gazette No. 18132 on 11.08.1983, describes the fundamental principles required to protect the environment in accordance with sustainable development and sustainable environmental goals. Environmental Law provides a legal framework for the development of environmental regulations in accordance with national and international standards. Following its first publication date of 1983, various amendments have been made.

Significant developments in the field of health and safety in the national context took place with the entry into force of the Occupational Health and Safety Law No. 6331 on 30.06.2012. With the entry into force of the law, detailed regulations on safety and health were made and a road map was drawn. Occupational health and safety legislation in Türkiye has been structured in line with the Constitution. Regulations on occupational health and safety are included in Section 7.2.8 and Annex-6.

In addition to Environmental Law and associated regulations, several laws in relation to environmental protection, pollution prevention and control, human rights, health and safety are listed in Annex-6.

3.2 International Standards

The methodology to be used for characterization of environmental and social impacts/risks arising from the implementation of the Project will be developed based on the methodologies described in the WB Environmental and Social Framework.

Within the ESF, risk categorization is a method used to evaluate projects or programs, identifying their potential environmental and social risks and impacts. This process is essential for customizing the extent of environmental and social assessment, planning, and supervision necessary for each project, taking into account its characteristics and potential risks.

WB classifies all projects into one of four classifications: High Risk, Substantial Risk, Moderate Risk or Low Risk. Based on detailed assessments conducted in the preliminary stages, and considering the potential risks and impacts associated with the project, it has been concluded that this project falls under the category of 'moderate risk'.

WB ESF consists of ten (10) Environmental and Social Standards (ESSs) that are designed to support Borrowers' projects through the requirements relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by WB (see Figure 2). Out of the 10 ESSs, six (6) establish the standards the Borrower and the projects must adhere to throughout the lifecycle of this project.

The main objectives of the ESSs, gaps between the Turkish EIA Regulation and World Bank's ESF and environmental and social studies conducted/to be conducted to fill the gap are summarized in Table 5.

Figure 2. Environmental and Social Standards (ESSs) of ESF

Other guidelines and principles to be followed within the scope of this project are as follows:

- World Bank Group (WBG) General EHS Guidelines (2007)
- WBG EHS Guidelines: Electric Power Transmission and Distribution (2007)

International standards and conventions related with occupational health and safety are listed in below:

- International Labor Organization (ILO) Conventions
  - Convention No. 155 on Occupational Safety and Health, 1981

Convention No. 155 on Occupational Safety and Health, 1981, requires the development, implementation, and periodic review of a consistent national policy concerning occupational safety, health, and the work environment. The aim of this policy is to minimize, to the extent possible, accidents and injuries related to work or arising in the course of work and to prevent occupational hazards present in the work environment.

  - Convention No. 187 on the Promotion of Occupational Safety and Health Framework. 2006,

Convention No. 187 on the Promotion of Occupational Safety and Health Framework, 2006, To gradually establish an effective framework for creating a safe and healthy working environment through national systems and programs on occupational health and safety, contribute to the continuous improvement of occupational health and safety by developing national policies, systems, and programs to prevent workplace accidents, occupational diseases, and fatalities, and aim to sustain efforts at all levels regarding the right to a safe and healthy working environment.

  - Convention No. 161 on Occupational Health Services, 1985,

Convention No. 161 on Occupational Health Services, 1985, Occupational Health Services are services responsible for advising the employer, workers, and their representatives on establishing and maintaining a safe and healthy work environment at a level that meets the most appropriate physical and mental health conditions related to work, aiming to provide employees with a healthy and safe working environment.

  - Convention No. 167 concerning Safety and Health in the Construction Industry, 1988

Convention No. 167 concerning Safety and Health in the Construction Industry, 1988, This Convention applies to all construction activities, including any processes, operations, or transport on the construction site, from the preparation of the site to the completion of the

project, encompassing all types of construction work, building construction, construction engineering, and construction and demolition activities.

- WBG General EHS Guidelines (2007)
  - 2.0 Occupational Health and Safety
  - 3.0 Community Health and Safety
  - 4.0 Construction and Decommissioning

Table 5. Relevance of WB ESSs with the Project

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	E&S Requirements & Measures to Be Followed in this Project to Bridge the Gap
ESS1 Assessment and Management of Environmental and Social Risks and Impacts	Evaluating the consequences of the Project's construction and operation phases on the physical, biological, and social environments. The environmental and social risks and impacts will be identified, and necessary actions and mitigation measures will be determined to avoid or minimize these risks to acceptable levels.	The main gaps between the national EIA and the ESS1 are as follows: • The process of integrating social impact assessment into the Turkish EIA has started in recent years. Especially with the EIA Regulation published in the Official Gazette dated 29.07.2022 and numbered 31907, social impact assessment has started to be included in Turkish EIA. Turkish EIA is currently open for improvement but requires a fully integrated process to reach WB ESS1 standards. • In addition, the requirement to address cumulative impacts of other concurrent projects is limited in Turkish EIA legislation. Under WB ESS1, cumulative impact assessment is in a more emphasized position. • The preparation of Environmental and Social Management Plans has been included in Turkish legislation with the latest regulation. However, the management plans prepared are less comprehensive than the ones required under WB ESS1. • There is limited emphasis on the associated facilities in the national EIA legislation.	Project specific Environmental and social assessment studies will be prepared in accordance with ESS1. In this context, the ESMF approved by the World Bank for the TOIZP will be the building block of the environmental and social assessments. This ESMP has been prepared in line with ESS1 to bridge the gap. The environmental and social assessment will cover cumulative impacts as defined in ESS1. Depending on the level of impacts and proposed mitigation measures, necessary additional documents such as a chance finding procedure will be included in the ESMP.
ESS2 **Labor and Working Conditions**	Implementing appropriate working conditions to ensure the safety of those working during the construction and operation phases. Risks to the employees will be identified, and preventive measures, including training, personal protective equipment, measurements, and analysis, will be applied.	Turkish national laws and regulations are generally close to the requirements of ESS2. The grievance mechanism for workers is the most important gap between the two parties. There are no specific requirements for the establishment and implementation of a grievance mechanism in Turkish national legislation.	The Labor Management Procedure (LMP) of the TOIZP will be followed, and Contractor will prepare its own LM Plan in line with TOIZP's LMP. A Grievance Mechanism for workers' will be established. The grievance mechanism and guidelines for its implementation have been included in this project specific ESMP.
ESS3 **Resource Efficiency and Pollution Prevention and Management**	Promoting the efficient use of natural resources within the project scope. Plans and procedures will be established and monitored to minimize unnecessary resource use during the Project's construction and operation phases.	Most Turkish national laws and regulations are in line with European Union (EU) directives. There is no major gap between ESS3 and Turkish national legislation. National EIA process is quite successful in identifying impacts. With the EIA Regulation published in the Official Gazette dated 29.07.2022 and numbered 31907, sub-management plans and monitoring plans that provide more detailed mitigation methods have been included in the scope of national EIA. Furthermore, there is no major gaps between the mitigation methods in the national legislation on major environmental issues such as waste, air pollution, water resources and wastewater, noise level and WB ESS3. Mitigation methods defined by national environmental legislation are mostly in line with the WB ESS3.	The project phase specific mitigation and monitoring programs included in this ESMP will be effective in addressing the minor gaps between Turkish legislation and WB ESS3.
ESS4 **Community Health and Safety**	Ensuring the local community is not adversely affected in terms of health and safety during the projects. Necessary precautions will be implemented, and the local community will be kept informed about the projects.	In Turkish national legislation, the general principles of community health and safety are fragmented under different regulations. The general principles are similar to WB ESS4. However, labor influx and gender impacts and violence-based risks are more prominent under the WB ESS4.	The differences mentioned in the ESS4 will be covered in detail in this ESMP document and the gap will be addressed.
ESS6 **Biodiversity Conservation and Sustainable Management of Living Natural Resources**	Preserving the existing biodiversity in and around the projects area. Measures will be taken to identify and protect any endemic species and to prevent harm to the surrounding biodiversity.	Internationally recognized areas of high biodiversity value such as Key Biodiversity Areas (KBA) are not completely assessed under national legislation. However threatened species in these areas are protected according to the requirements of General Directorate of Nature Conservation and National Parks. There is no habitat assessment and critical habitat assessment requirement in national legislation.	As the project area is located within the boundaries of the OIZ, the assessments made within the scope of this ESMP will be limited considering the location of the project and distance to the legally protected and internationally recognized areas of high biodiversity value. Additionally, this ESMP has eliminated the gaps between the national legislation and WB standards by considering the requirements stipulated in ESS6.
ESS10 **Stakeholder Engagement and Information Disclosure**	Engaging and informing organizations and individuals who might be affected by the projects. This includes establishing a mechanism for suggestions and complaints and ensuring stakeholders are well-informed throughout the Project's lifespan.	In the Turkish EIA legislation, EIA Report for the projects in the list of Annex-I will be made available to the public opinion at the headquarters of MoEUCC or provincial directorates. Following MoEUCC's final assessment of the EIA report, the Governor's Office will disclose its reasoned decision publicly. For the projects in the list of Annex-II, the final Project Introduction File (PIF) will be disclosed publicly at the Provincial Directorates. Similarly, public information and consultation meetings are held only the projects listed in Annex-I of the Turkish EIA Regulation.	The TOIZP contains a Stakeholder Engagement Framework, on which basis a stakeholder management and grievance mechanism will be prepared for this project. Draft and final version ESMP document will be disclosed toand consulted with the public through Project Owner's website, and as hard copies in the Project Owner's and relevant mukhtar offices throughout the project lifetime.

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	E&S Requirements & Measures to Be Followed in this Project to Bridge the Gap
		However, according to WB ESS10, public/stakeholder consultation meetings (at least once) and information disclosure activities are performed regardless of the category of the project.	

ESS7 "Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities" and ESS9 "Financial Intermediaries" are not applicable to these Projects. There are no indigenous groups in Türkiye that fit the definition provided in ESS7, and the projects does not involve a Financial Intermediary.

When finalizing any OIZ area, the Ministry of Culture and Tourism provides information on cultural and historical areas. If any cultural or historical sites are present, they are excluded from the OIZ area. Therefore, "ESS 8: Cultural Heritage" does not apply to this project, although "chance find" procedures are incorporated due to the risk of chance finds during construction activities.

3.3 Project Standards

Project Standards are determined by considering the most stringent of the national legislation and international standards and guidelines as given in Table 6. The Project Standards provide in Table 4 will be complied with during the implementation of the project.

Table 6. Project Standards

Environmental Standards						
No	**Topic**	**National Standards/Requirements**	**Limit Values in national legislation**	**International Standards/Requirements**	**Limit Values in International legislation**	**Project Standards**
1	Noise	Regulation on Environmental Noise Control (Official Gazette (OG) Date/ Number: 30.11.2022/32029) Annex- 2 “Table-1 Limit Values for environmental noise level”	Industrial Facilities, Transportation: Day time (07:00-19:00): $LA_{eq,\ 5\ min.}$< 65 dB(A) Evening time (19:00-23:00): $LA_{eq,\ 5\ min.}$< 60 dB(A) Nighttime (23:00-07:00): $LA_{eq,\ 5\ min.}$< 55 dB(A)	WBG General EHS Guidelines: Environmental Noise Management Table 1.7.1 – Noise Level Guidelines Noise impacts should not exceed the levels specified in the Table 1.7.1 or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.	Residential; institutional, educational: Day time (07:00-22:00): One Hour L_{Aeq} dB(A) < 55 dB(A) Nighttime (22:00-07:00): One Hour L_{Aeq} dB(A) < 45 dB(A) Industrial, commercial: Day time (07:00-22:00): Nighttime (22:00-07:00): One Hour L_{Aeq} dB(A) < 70 dB(A)	Residential; institutional, educational[8]: Day time (07:00-22:00): One Hour L_{Aeq} dB(A) < 55 dB(A) Night time (22:00-07:00): One Hour L_{Aeq} dB(A) < 45 dB(A)
2	Air Quality	Regulation on Air Quality Assessment and Management (OG Date/ Number: 06.06.2008 / 26898) Annex-1 B) Limit values, assessment and warning thresholds Regulation on Control of Industrial Air Pollution	**PM_{10}** 24 Hours: 50 µg/m^3 (not exceeded more than 35 times in one year) Annual: 40 µg/m^3 **SO_2** Hourly: 350 µg/m^3 (not exceeded more than 24 times in one year) 24 Hours:125 µg/m^3 Annual and winter period (October 1-March 31): 20 µg/m^3 **NO_2** Hourly: 200 µg/m^3 (not exceeded more than 18 times in one year) Annual: 40 µg/m^3 **Regulation on Control of Industrial Air Pollution** (These limits are for exhaust gas emissions from the working of construction machinery during the construction phase.) Dust: 1 kg/hour Carbon monoxide: 50 kg/hour Hydrocarbons: 3 kg/hour Nitrous oxides: 4 kg/hour Sulfoxides: 6 kg/hour	WBG General EHS Guidelines: Air Emissions and Ambient Air Quality Table 1.1.1: World Health Organization (WHO) Ambient Air Quality Guidelines Emissions should not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and standards by applying national legal standards or in their absence, the current WHO Air Quality Guidelines or other internationally recognized sources.	**PM_{10} (µg/m^3)** **1-year** 70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline) **24 Hours** 150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline) **$PM_{2.5}$ (µg/m^3)** **1-year** 35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline) **24 Hours** 75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline) **Sulfur dioxide (SO_2) (µg/m^3)** **24 Hours** 125 (Interim target-1) 50 (Interim target-2) 20 (guideline) **10 minute (µg/m^3)** 500 (guideline) **Nitrogen dioxide (NO_2) (µg/m^3)** **1-year** 40 (guideline)	**PM_{10}** 24-Hour: 50 µg/m^3 (not exceeded more than 35 times in one year) Annually: 20 µg/m^3 **SO_2** Hourly: 350 µg/m^3 (not exceeded more than 24 times in one year) 24 Hours: 20 µg/m^3 **NO_2** Hourly: 200 µg/m^3 (not exceeded more than 18 times in one year) Annual: 40 µg/m^3 **$PM_{2.5}$ (µg/m^3)** **1-year** 35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline) **24 Hours** 75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline) **Ozone (µg/m^3)** **8-hour daily maximum** 160(Interim target-1) 100 (guideline) **Regulation on Control of Industrial Air Pollution** Dust: 1 kg/hour

[8] Residential; institutional, educational has been selected due to availability of sensitive receptors such as mosque and school within the area of influence.

Environmental Standards						
No	**Topic**	**National Standards/Requirements**	**Limit Values in national legislation**	**International Standards/Requirements**	**Limit Values in International legislation**	**Project Standards**
					1-hour 200 (guideline) **Ozone (µg/m³)** **8-hour daily maximum** 160(Interim target-1) 100 (guideline)	Carbon monoxide: 50 kg/hour Hydrocarbons: 3 kg/hour Nitrous oxides: 4kg/hour Sulfoxides: 6 kg/hour
3	Water	Regulation on Water Intended for Human Consumption (OG Date/ Number 17.02.2005 / 25730) Annex-1 Parameters and Limit Values a) Microbiological Parameters b) Chemical Parameters c)Indicator Parameters There are limit values for many parameters within the scope of the Regulation. However, the parameters that must be monitored for drinking and potable water are determined according to "Table A. Control Monitoring Parameters" in Annex-2 of the Regulation.	**Control Monitoring Parameters:** Coliform Bacteria: 0 cfu/100 ml E. coli: 0 cfu/100 ml Enterococci: 0 cfu/100 ml C.perfringens (including spores): 0 cfu/100 ml Acrylamide: 0.1 µg/L Antimony: 5.0 µg/L Arsenic: 10 µg/L Benzene: 1 µg/L Benzo (a) pyrene: 0.01 µg/L Boron: 1 mg/L Bromate: 10 µg/L Cadmium: 5 µg/L Chromium: 50 µg/L Copper: 2 mg/L Cyanide: 50 µg/L 1,2-dichloroethane: 3 µg/L Epichlorohydrin: 0.1 µg/L Fluoride: 1.5 µg/L Lead: 10 µg/L Mercury: 1 µg/L Nickel: 20 µg/L Nitrate: 50 mg/L Nitrite: 0.5 mg/L Total Pesticides: 0.5 µg/L Polycyclic Aromatic Hydrocarbons: 0.1 µg/L Selenium: 10 µg/L Tetrachloroethene: 10 µg/L Trichloroethene: 10 µg/L Total Trihalomethanes: 100 µg/L Vinyl Chloride: 0.5 µg/L Aluminum: 200 µg/L Ammonium: 0.5 mg/L Chloride: 250 mg/L Color (Pt-Co): Acceptable to consumers and no abnormal change (ACNAC) Conductivity: 2,500 µS/cm^{-1} pH: ≤9.5-6.5≤ Iron: 200 µg/L Manganese: 50 µg/L Odor: ACNAC Sulphate: 250 mg/L Sodium: 200 mg/L Taste: ACNAC Total Organic Carbon: No abnormal change (NAC) Turbidity: 1 Nephelometric Turbidity Unit (NTU) Tritium: 100 Bq/L Total Indicative Dose: 0.1 mSv/year	World Health Organization (WHO) Drinking Water Guideline (Fourth edition incorporating the first and second agenda)[9] Table 7.10 Guideline values for verification of microbial quality (Page: 162) Table A3.3 Guideline values for chemicals that are of health significance in drinking-water (Page: 525)	The WHO Drinking Water Guideline include many parameters and limit values for drinking and potable water. The main parameters and limit values are given below: Nitrite: 3 mg/l Nitrate: 50 mg/l Arsenic: 10 µg/L Barium:1300 µg/L Benzene: 10 µg/L Boron: 2.4 mg/l Cadmium: 3 µg/L Chromium: 50 µg/L Fluoride: 1.5 mg/L Mercury: 6 µg/L Selenium: 40 µg/L E. coli: 0/100 ml Coliform bacteria: 0/100 ml Acrylamide: 0.5 µg/L Antimony: 20 µg/l Benzo (a) pyrene: 0.7 µg/l Bromate: 10 µg/L Copper: 2 mg/L Epichlorohydrin: 0.4 µg/L Lead: 10 µg/L Nickel: 70 µg/L Tetrachloroethene: 100 µg/L Trichloroethene: 8 µg/L Vinyl Chloride: 0.3 µg/L Turbidity: ≤0.2 Nephelometric Turbidity Unit (NTU)	Coliform Bacteria: 0 cfu/100 ml E. coli: 0 cfu/100 ml Enterococci: 0 cfu/100 ml C.perfringens (including spores): 0 cfu/100 ml Acrylamide: 0.1 µg/L Antimony: 5.0 µg/L Arsenic: 10 µg/L Benzene: 1 µg/L Benzo (a) pyrene: 0.01 µg/L Boron: 1 mg/L Bromate: 10 µg/L Cadmium: 3 µg/L Chromium: 50 µg/L Copper: 2 mg/L Cyanide: 50 µg/L 1,2-dichloroethane: 3 µg/L Epichlorohydrin: 0.1 µg/L Fluoride: 1.5 µg/L Lead: 10 µg/L Mercury: 1 µg/L Nickel: 20 µg/L Nitrate: 50 mg/L Nitrite: 0.5 mg/L Barium:1300 µg/L Total Pesticides: 0.5 µg/L Polycyclic Aromatic Hydrocarbons: 0.1 µg/L Selenium: 10 µg/L Tetrachloroethene: 10 µg/L Trichloroethene: 8 µg/L Total Trihalomethanes: 100 µg/L Vinyl Chloride: 0.3 µg/L Aluminum: 200 µg/L Ammonium: 0.5 mg/L Chloride: 250 mg/L Color (Pt-Co): ACNAC Conductivity: 2,500 µS/cm^{-1} pH: ≤9.5-6.5≤ Iron: 200 µg/L Manganese: 50 µg/L Odor: ACNAC Sulphate: 250 mg/L Sodium: 200 mg/L Taste: ACNAC Total Organic Carbon: No abnormal change (NAC) Turbidity: ≤0.2 NTU

[9] **Source:** https://www.who.int/publications/i/item/9789241549950

Environmental Standards						
No	**Topic**	**National Standards/Requirements**	**Limit Values in national legislation**	**International Standards/Requirements**	**Limit Values in International legislation**	**Project Standards**
						Tritium: 100 Bq/L Total Indicative Dose: 0.1 mSv/year
4	Wastewater	İSKİ Regulation on Discharge of Wastewater to Sewerage, Table 1, Sewerage Systems Wastewater Infrastructure Facilities Resulting in Full Treatment[10]	Temperature: 50 °C pH: 6-12 Total Suspended Solid (TSS): 500 mg/L Oil and Grease: 150 mg/L Chemical Oxygen Demand: 800 mg/L Sulphate: 1,700 mg/L Total Sulphur: 2 mg/L Phenol: 10 mg/L Total Phosphorus: 10 mg/L Total Nitrogen: 100 mg/L Arsenic: 3 mg/L Total cyanide: 10 mg/L Total Lead: 3 mg/L Total Cadmium: 2 mg/L Total Chromium: 5 mg/L Total Mercury: 0.2 mg/L Total Copper: 5 mg/L Total Nickel: 5 mg/L Total Zinc: 10 mg/L Color: 280 Pt-Co Chloride: 15,000 mg/L Surfactants reacting with methylene blue (mg/L): It is forbidden to discharge substances whose biodegradation does not comply with the standards of the Turkish Standards Institute (TSE).	The WB EHS Guidelines do not specify limit values for discharge to sewerage but include indicative values for treated sanitary sewage discharges.	-	Temperature: 50 °C pH: 6-12 Total Suspended Solid: 500 mg/L Oil and Grease: 150 mg/L Chemical Oxygen Demand: 800 mg/L Sulphate: 1,700 mg/L Total Sulphur: 2 mg/L Phenol: 10 mg/L Total Phosphorus: 10 mg/L Total Nitrogen: 100 mg/L Arsenic: 3 mg/L Total cyanide: 10 mg/L Total Lead: 3 mg/L Total Cadmium: 2 mg/L Total Chromium: 5 mg/L Total Mercury: 0.2 mg/L Total Copper: 5 mg/L Total Nickel: 5 mg/L Total Zinc: 10 mg/L Color: 280 Pt-Co Chloride: 15,000 mg/L Surfactants reacting with methylene blue (mg/L): It is forbidden to discharge substances whose biodegradation does not comply with the standards of the Turkish Standards Institute.
Occupational Health and Safety Standards						
1	Noise	28.07.2013 dated 28721 numbered Regulation on Protection of Employees from Risks Related to Noise	Minimum exposure action values: 80 dB(A). Maximum exposure action values: 85 dB(A). Exposure limit values: 87 dB(A).	Word Bank Group Environmental, Health, and Safety Guidelines	No employee should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).	Minimum exposure action values: 80 dB(A). Maximum exposure action values: 85 dB(A). Exposure limit values: 87 dB(A).
2	Vibration	22.08.2013 dated 28743 numbered Regulation on Protection of Employees from Risks Related to Vibration	For hand-arm vibration: Daily exposure limit value for an eight-hour working period: 5 m/s². Daily exposure action value for an eight-hour working period: 2.5 m/s². For whole-body vibration: Daily exposure limit value for an eight-hour working period: 1.15 m/s². Daily exposure action value for an eight-hour working period: 0.5 m/s².	Word Bank Group Environmental, Health, and Safety Guidelines	For hand-arm vibration: Daily exposure limit value for an eight-hour working period: 5 m/s². Daily exposure action value for an eight-hour working period: 2.5 m/s². For whole-body vibration: Daily exposure limit value for an eight-hour working period: 1.15 m/s².	For hand-arm vibration: Daily exposure limit value for an eight-hour working period: 5 m/s². Daily exposure action value for an eight-hour working period: 2.5 m/s². For whole-body vibration: Daily exposure limit value for an eight-hour working period: 1.15 m/s².

[10] **Source:** https://www.iski.gov.tr/web/assets/SayfalarDocs/Mevzuat%20ve%20Y%C3%B6netmelikler/%C4%B0SK%C4%B0%20ATIKSULARIN%20KANAL%C4%B0ZASYONA%20DE%C5%9EARJ%20Y%C3%96NETMEL%C4%B0%C4%9E%C4%B0.pdf

Environmental Standards						
No	**Topic**	**National Standards/Requirements**	**Limit Values in national legislation**	**International Standards/Requirements**	**Limit Values in International legislation**	**Project Standards**
					Daily exposure action value for an eight-hour working period: 0.5 m/s².	Daily exposure action value for an eight-hour working period: 0.5 m/s².
Social Standards						
No	**Topic**	**National Laws / Regulations**	**International Standards**	**Project Standards**	**Non-Compliances / Corrective Actions**	**Targets**
1	Stakeholder Engagement, Grievance Mechanism and Information Disclosure	Constitution Article 74 Laws on the Right to Information (No. 4982) Regulation on the Principles and Procedures for the Enforcement of the Law on the Right to Information Law on Use of the Right to Petition (3071) Law on the Protection of Personal Data Environmental Law	World Bank ESS1, ESS2, ESS4 and ESS10	Social procedures and issues will be carried out in compliance with the relevant WB ESSs.	-	100% compliance with the WB ESSs

4. METHODOLOGY

Desktop Study

Within the scope of desktop study, the agreement between ÇINAR and MoIT on the project was examined in detail and the necessary work was determined. The Project Identification Document (PID) and Screening Reports prepared during the project preparation phase were evaluated. An opening meeting was held with the OIZ prior to the site visit to ensure that the information in the studies was up to date.

Data Collection

The following reports & data were requested from the OIZs to be able to provide the services demonstrably committed as per the Terms of Reference (ToR):

- Information provided by OIZ,
- Approved E&S Screening Forms and Screening Report (prepared by MRC Türkiye & ACE Consulting and Engineering),
- PID (prepared by MRC Türkiye & ACE Consulting and Engineering),
- Digital data for mapping studies,
- Permits and licenses,
- Official correspondence with the relevant state authorities,
- Zoning plan,
- Documents and permits related to waste management,
- Number of workers to work for the project,
- Timeline of the project,
- Number and type of vehicles/work machines to be used during the project implementation.

Area of Influence Definition and Justification

The impact area of the project is determined as a circle with a radius of 150 meters from the project areas. The 150-meter radius impact area has been determined considering environmental and social impacts of the project for each project area. AoIs of project areas includes businesses / facilities.

Akademi Gurme Restaurant located adjacent to the OIZ Administrative Building is within the AoI. There is also a Caribou Coffee Company under the Banks-2 building, this cafe is in the project AoI. There are only facilities and businesses in AoIs of project areas. There are no sensitive receptors such as schools, mosques, health centers, etc. in AoIs of project areas. There are no educational institutions within the boundaries of Birlik OIZ. The nearest educational institution to the project area is “Şekerpınar Primary School” approximately 3,2 kilometers away by air distance. There is a Vocational Training Center Liaison Office in the OIZ Administrative Building, but it is not used. There are educational institutions in Tuzla district where the project area is located, however, these institutions are not within the project’s impact area and are located at far distances. There is an “OSB Mosque” within the OIZ. The distance of this mosque to the closest project area (Market Building) is 260 meters. There is no park in AoIs of project areas.

Site Visits and Surveys

Site visit was conducted on 11.07.2024 (see Photograph 1 and Photograph 2) during the preparation of ESMP. The site visit within the scope of the ESMP covers the inspection of project areas and AoIs. The participation form for the site visit scheduled for 11.07.2024 is provided in Annex-14.

For the preparation of ESMP, interviews were conducted with the businesses and companies located in the buildings where the Project will be operated, the nearby building and the nearby

residential area. In addition, OSB Mosque and Doruk OSGB are not in the AoI's but are considered as stakeholders and also interviewed. Detailed photographs of the immediate vicinity of the project areas and photographs taken during interviews with stakeholders are presented in Annex-5.

Photograph 1. Site Visit Opening Meeting (11.07.2024)

Photograph 2. Site Visit Participants (11.07.2024)

Interviews with Stakeholders

WB ESS 10 sets out the following objectives/actions concerning interviews with stakeholders:

- To carry out a consultation process that gives the stakeholders a chance to voice their opinions on the project's risks, impacts, and mitigation measures, and that enables the Project Owner to take those opinions into consideration and respond.
- To consider the outcomes of the consultation process with the stakeholders when identifying project-related risks and consequences.

Regarding the interviews were conducted to engage in meaningful dialogue with stakeholders, gather input on analysis and proposed plans, address concerns, and provide information to inform the Borrower' s decisions, where appropriate. Security and accessibility considerations were prioritized when designing the consultation program, particularly in fragile and conflict-affected contexts. In line with this methodology, the mentioned interviews were successfully completed. For further details, please refer to Table 41 under Section 0.

ÇINAR was responsible for organizing and conducting stakeholder interview meeting(s) to inform the public about the outputs, results, and impacts of the sub-project. At least one (1) stakeholder interview will be conducted within the scope of ESMP following the clearance of its draft version.

Impact Assessment Methodology

The primary objective of conducting an environmental and social impact assessment is to identify and evaluate potential risks and adverse effects that may arise from the activities of the project on both the natural environment and the socio-economic well-being of the local and regional population, including the community and workforce. This assessment takes into consideration the characteristics and activities of the project as well as the existing conditions in the project area.

Following the assessment, relevant mitigation measures are devised to prevent, minimize, alleviate, or offset significant adverse impacts while also enhancing beneficial effects. Additionally, the assessment evaluates the significance of any residual adverse effects on the environment and community that may persist even after implementing the mitigation

measures. Lastly, the assessment outlines planned monitoring activities aimed at assessing the effectiveness of the proposed mitigation measures.

Throughout the pre-construction, construction and operation phases of the project, there is a potential for environmental and social impacts or risks stemming from the project activities. During the construction phase, these impacts are typically short-term with low to medium magnitude but can be locally significant. They may involve issues such as traffic, noise, vibration, air quality, soil disturbance and contamination, waste management, community health and safety, as well as labor and working conditions, including occupational health and safety.

While adverse environmental impacts during the operation phase are not expected to be significant due to the project's public interest nature, noise, air related impacts on sensitive receptors, as well as occupational health and safety risks, may arise, particularly during maintenance and repair activities. Maintenance and repair works may result in minor environmental impacts like soil contamination and increased noise levels, which are local and short-term in nature with low significance.

To appropriately address these potential impacts, both positive and negative effects must be identified and assessed, leading to the definition of relevant mitigation measures. The evaluation of environmental and social impacts and risks is conducted based on specific criteria given below:

- The nature/type of impact (positive or negative, direct, indirect, cumulative),
- Extent/area of impact (on-site/project footprint, local, regional, national),
- Duration of impact (short-term, mid-term, long-term, permanent), and
- Likelihood of impact occurrence (very likely/certain, likely, unlikely).

The severity of adverse impacts is assessed using these criteria, along with the sensitivity of receptors or sources exposed to the impact, whenever possible. The significance of impacts is evaluated both without mitigation measures and with proposed mitigation measures in place. This evaluation helps determine the significance of residual impacts, which refers to impacts that remain after implementing mitigation measures.

The following impact significance matrix (see Table 7) depending on the estimated magnitude of the impact and reversibility of the change due to the impact has been used to determine the significance of the environmental, social, health and safety impacts of the project activities during the pre-construction, construction and operation phases.

Table 7. Impact Significance Matrix[11]

Significance of Impact				
Reversibility of the Change	**Magnitude of Impact**			
	High	**Medium**	**Low**	**Negligible/None**
Irreversible	Very High	High	Moderate	Negligible/None
Partially Reversible	High	Moderate	Minor	Negligible/None
Highly Reversible	Moderate	Minor	Minor	Negligible/None
Fully Reversible	Negligible/None	Negligible/None	Negligible/None	Negligible/None

[11] **Reversibility:** The degree to which the change caused by the impact can be restored to its original state or condition.
Magnitude: The scale or intensity of the impact, measured by its extent, duration, and likelihood.
Impact Significance Level: The overall rating of the impact, based on its reversibility and magnitude, as well as the sensitivity of the receptors or sources affected by the impact.

The terms regarding the significance of an impact can be described as follows:

- **Very High:** An impact that causes irreversible and large-scale change, affecting a highly sensitive receptor or source, with a very likely or certain occurrence. For example, permanent loss of biodiversity or cultural heritage, or severe violation of human rights or labor standards.
- **High:** An impact that causes partially reversible and large or medium-scale change, affecting a moderately sensitive receptor or source, with a likely or probable occurrence. For example, significant degradation of air or water quality.
- **Moderate:** An impact that causes highly reversible and medium-scale change, affecting a lowly sensitive receptor or source, with an unlikely or possible occurrence. For example, moderate increase of noise or traffic levels.
- **Minor:** An impact that causes fully reversible and negligible change, affecting a non-sensitive receptor or source, with a very unlikely or improbable occurrence. For example, slight increase of dust or odor emissions, or minor improvement of social infrastructure or services.
- **Negligible/None:** An impact that causes no discernible change or has a positive effect that outweighs any negative effect. For example, no impact or net benefit on the environment or the community.

The impact assessment methodology was structured to comprehensively identify and evaluate the potential environmental and social risks and impacts arising from the Projects' activities. These assessments covered the primary activities of the projects and also included the related operations. By adopting this comprehensive approach, it was aimed to thoroughly analyze every aspect of the projects for potential risks, providing a holistic understanding and ensuring that effective mitigation strategies are in place.

Approach to Define the Mitigation Measures for the Impacts

ESMPs include measures and actions in accordance with the mitigation hierarchy that aim to reduce potential adverse environmental and social impacts to acceptable levels. The impacts of the project are covered in detail in this plan. Following the identification and definition of the impacts, mitigation measures are planned that aim to achieve the most practical and effective reduction of the adverse impacts.

5. ENVIRONMENTAL BASELINE OF THE PROJECT

5.1 Project Location

The project areas are located in İstanbul province, which is located in the Marmara Region and is a bridge connecting the Europe and Asia continents. Project areas are located within the borders of the Birlik OIZ. Birlik OIZ is in the Tuzla district of İstanbul, right on the border between İstanbul and Kocaeli. Project areas are in “Aydınlı Neighborhood”.

The solar panels to be installed within the scope of the project will be located on the rooftops of five (5) different buildings (see Figure 1).

The environmental and social AoI of the project has been determined as 150 m-radius from rooftop SPP areas (see Figure 24-Figure 28). The 150-meter radius impact area has been determined considering environmental and social impacts of the project.

Views from the project areas are given in between Photograph 3 and Photograph 7. Detailed photographs of the immediate vicinity of the project areas are presented in Annex-5.

Photograph 3. Banks-1 Area

Photograph 4. Banks-2 Area

Photograph 5. Bank Area

Photograph 6. Market Area

Photograph 7. OIZ Administrative Building Area

According to the project areas, the closest dwelling is Şekerpınar Neighbourhood, located on the OIZ's southeast border. The distances of the project areas (to the nearest settlement and sensitive receptors) are given in Table 8 and Figure 3.

Table 8. Distances of Project Areas to the Dwellings

Location	Approximate Distance (km)
Şekerpınar Neighborhood (Kocaeli)	2.2
Balçık Neighborhood (Kocaeli)	2.8
Orta Neighborhood (Tuzla / İstanbul)	3.0
Tepeören Neighborhood (Tuzla / İstanbul)	3.4
Anadolu Neighborhood (Tuzla / İstanbul)	3.5
Orhanlı Neighborhood (Tuzla / İstanbul)	3.7
Mescit Neighborhood (Tuzla / İstanbul)	4.0
Aydınlı Neighborhood (Tuzla / İstanbul)	4.4
Akse Neighborhood (Kocaeli)	4.6

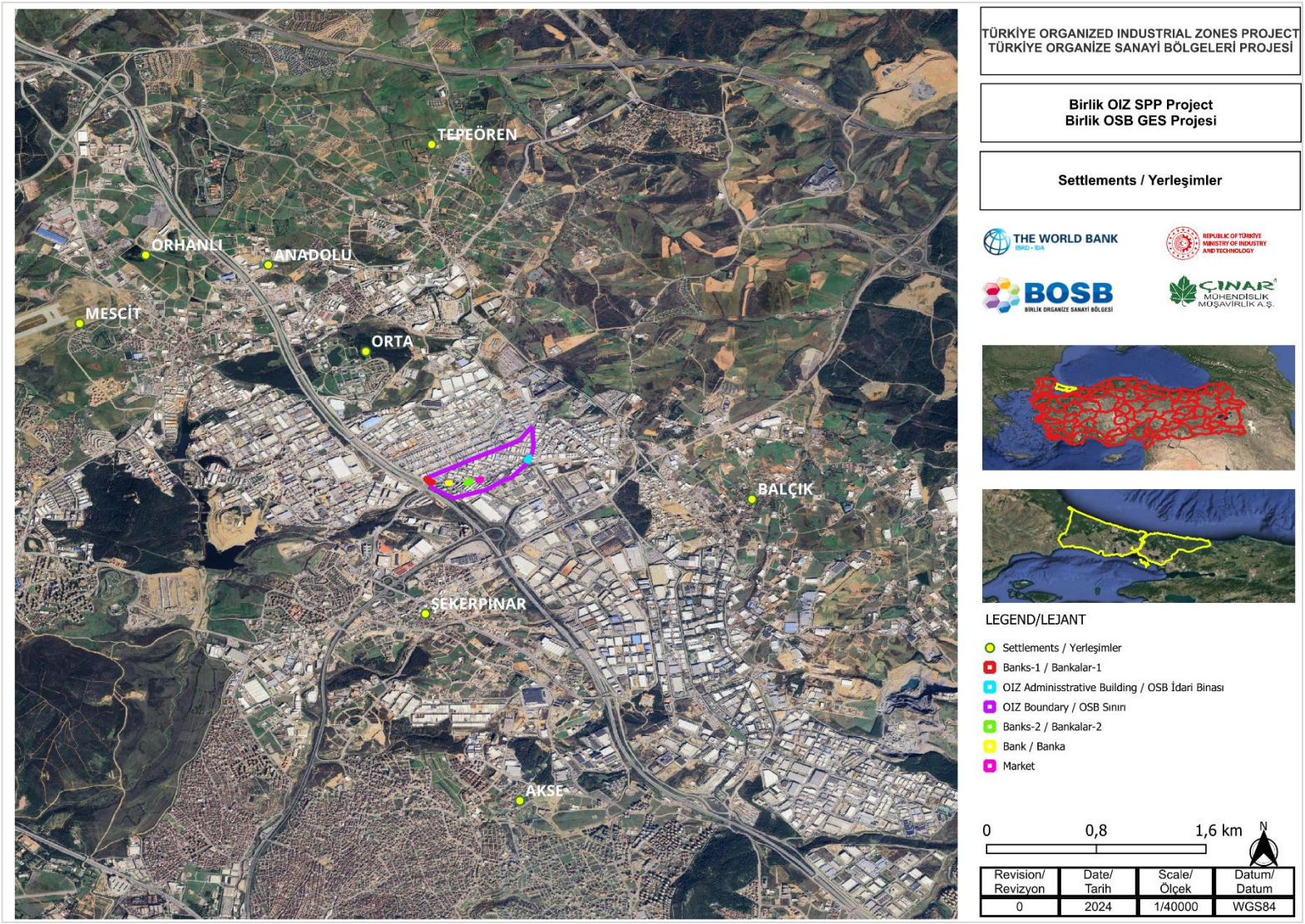

Figure 3. Settlements Map

5.2 Land Use and Topography

The total area of Birlik OIZ is 511,977 m^2 and consists of 84 industrial parcels. The occupancy rate of the Birlik OIZ is 97.62% as of September 2023 (See Table 9). The spatial plan of the OIZ was approved on 16.05.2019 and is given in Annex-13.

Table 9. Parcel Activity Status Distribution

Activity Status of the Industrial Parcels	Number of Parcels	Ratio (%)
Production	82	97.62
Construction	0	0
Project	0	0
Empty Plot	2	2.38
Total	**84**	**100**

Approximately 74.72% of the total area is used for industrial purposes, and the remaining 25.28% is used for other facilities. Table 10 provides the distribution of land use. The project is planned on the OIZ's administrative facility and social areas.

Table 10. Land Use Distribution

Types of Land Uses	Area (m^2)	Percentage (%)
Industrial Area	382,563.98	74.72
Administrative Facility and Social Areas	18,359.02	3.59
Park Area	7,464.11	1.46
Religious Facility Area	1,255.47	0.25
Health Facility Area	894.29	0.17
Transformer Area	1,656.04	0.32
Roads and Carparks Area	99,784.74	19.49
Total	**511,977.65**	**100.00**

SPP systems will be installed on building rooftops. Sizes of SPP areas are given in Table 11.

Table 11. Land Use for Project Areas

No	Location	Parcel Number	Module Area (m^2)
1	Banks-1	6608/1	296.0
2	Banks-2	6617/1	315.6
3	Bank	6617/18	291.7
4	Market	6616/10	82.7
5	OIZ Administrative Building	6615/11	300.4
Total			**1,286.4**

A land use map of the region was prepared using the 2020 CORINE data and accordingly, all of the five (5) project locations are defined as "industrial and commercial units" (see Figure 5). The project areas are the rooftops of the OIZ's administrative and service area buildings Topographic map indicating the project areas and OIZ boundary is given in Figure 6.

According to the Istanbul 1/100,000 Environmental Plan (adopted and still in effect since 2009) shown in Figure 4 land use around the OIZ borders is a mixture of industrial and residential areas.

The 1/1,000 scale Birlik OIZ Revised Implementation Zoning Plan is given in Annex-13.

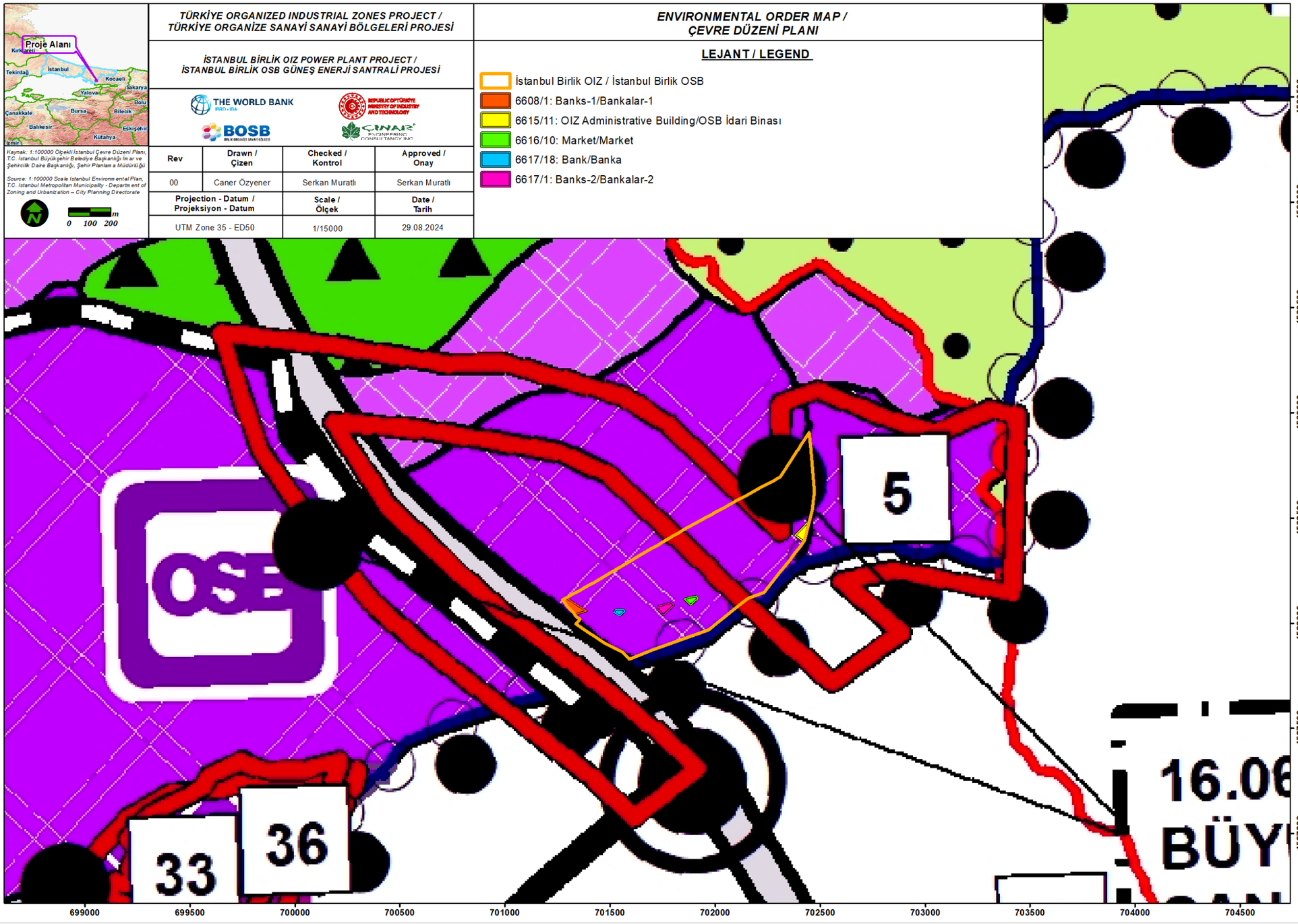

Figure 4. Environmental Map Showing the Project Area

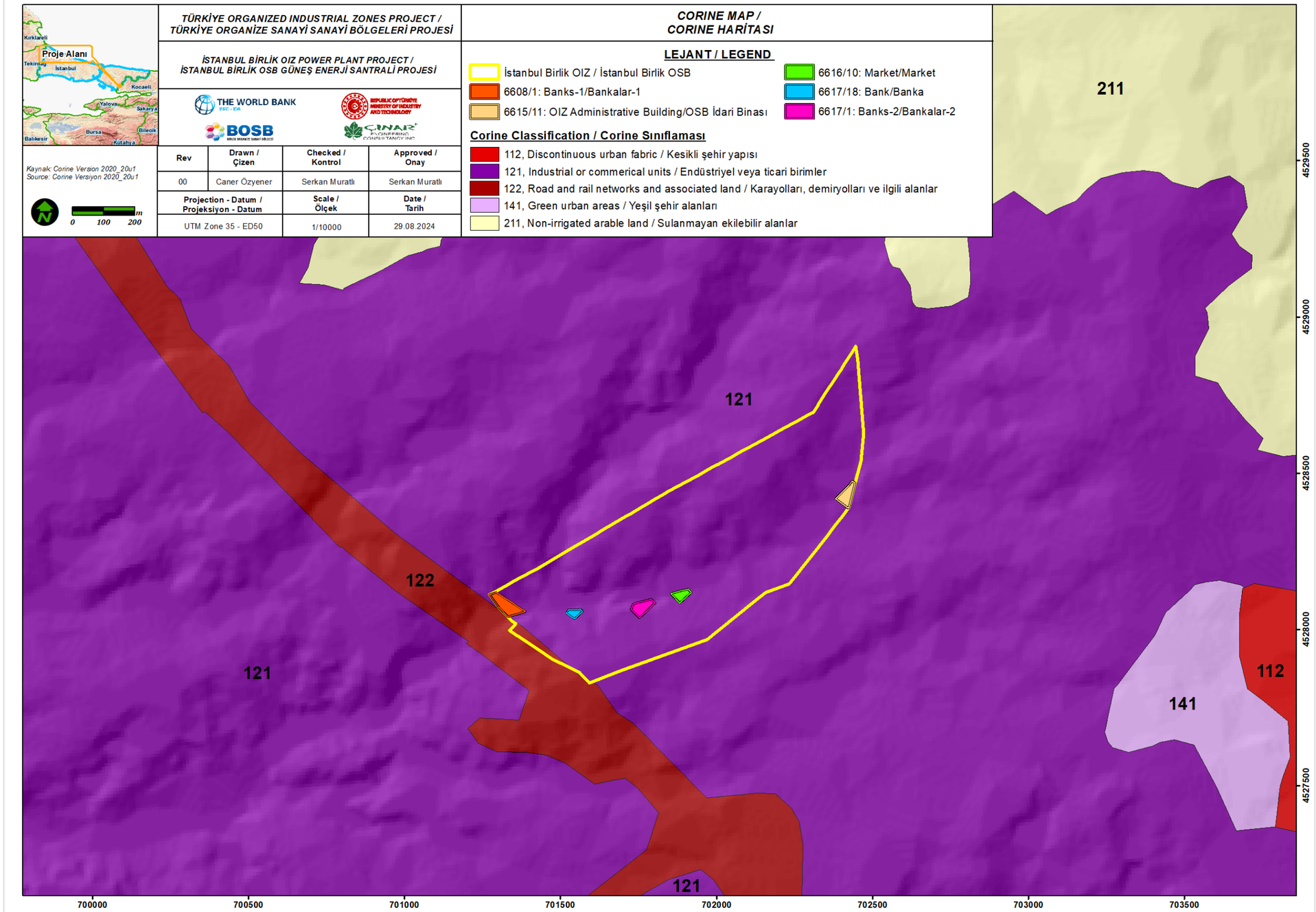

Figure 5. CORINE Map Showing the Project Area

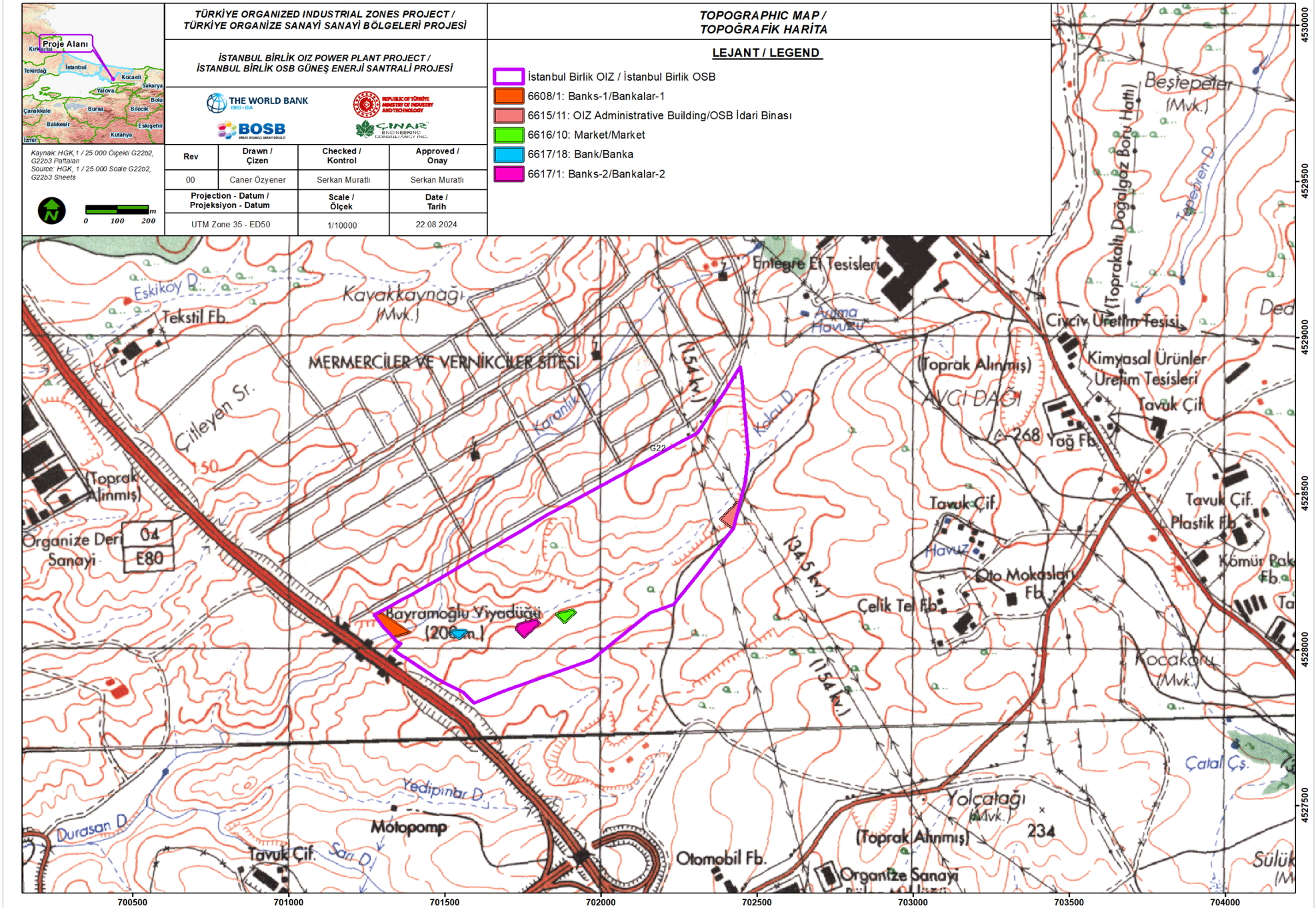

Figure 6. Topographic Map Showing the Project Area

5.3 Geology

Geology of Project Area

The ground of the project areas located within the Istanbul Birlik Organized Industrial Zone, where location selection has been made before, consists of Permian aged Sancaktepe granite (Psg), which surfaces in large areas in the region. Sancak Tepe granite, which has a depth rock character, is generally altered on the surface and is commonly cut by aplite, pegmatite and quartz veins. In lower elevation areas in the region, the Kayalıtepe formation (PgNomk), which consists of Upper Oligocene-Lower Miocene aged fluvial sediments, and alluviums, which are Quaternary sediments, crop out.

There are no protected geological sites or unique geological or geomorphological structures within the project area and its immediate surroundings. The geological units and lithological features in the project area and its surroundings are given below, from oldest to youngest and the geological map is given in Figure 7.

Stratigraphy

Paleozoic

Permian

Sancaktepe Granite (Psg)

The pink-colored pluton outcropping in the north-northwest of Gebze has been named "Sancaktepe granite".

Macroscopically, the unit is characterized by a deep-seated rock with pink-colored orthoclase and quartz. The granite, which is highly altered on the surface, shows abundant quartz and colored minerals alongside large orthoclase crystals. The unit, classified as biotite quartz monzonite, consists of primary minerals such as biotite, plagioclase (oligoclase), K-feldspar, and quartz. Secondary minerals include zircon, apatite, and the opaque mineral magnetite.

The unit, which intrudes the country rocks with aplite, pegmatite, and quartz veins as apophyses, is also extensively intersected by aplite, pegmatite, and quartz veins.

Age determinations performed on the granite (mineral and whole rock) using the Rb-Sr isochron method yielded an age of 255±5 million years, while the K-Ar method applied solely on biotite minerals gave an age of 254 million years. Additionally, using the U-Pb zircon analysis method crystallization age of Sancaktepe pluton is obtained as 253.7±1.75 million years. Based on these data, the Sancaktepe granite dates to the Permian period.

Senozoic

Paleogene-Neogene

Kayalıtepe Formation (PgNomk)

Weakly cemented quartz sandstones and conglomerates have been named as the "Kayalıtepe" formation.

The formation consists of poorly cemented, cross-bedded sandstones and conglomerates, which are white, pale yellow, and occasionally red-pink in color, with weathered sections appearing yellowish red-brown. The grains in the unit, which are poorly sorted, consist of 80-90% quartz and quartzite. The grains are rounded, semi-rounded, and angular.

The formation's thickness is approximately 100 meters at its thickest point. It is conformably transitional with the overlying Meşetepe formation and unconformably overlies the older units beneath it. Since no fossil evidence has been found in the unit, and it is conformably transitional with the Meşetepe formation above and laterally, it is considered Late Oligocene-Early Miocene in age (The formation is represented by fluvial sediments).

Quaternary

Alluvium (Qal)

It consists of gravel, sand, silt, clay and mud deposits developed in riverbeds, valley floors and plains. The unit is poorly graded and unconsolidated.

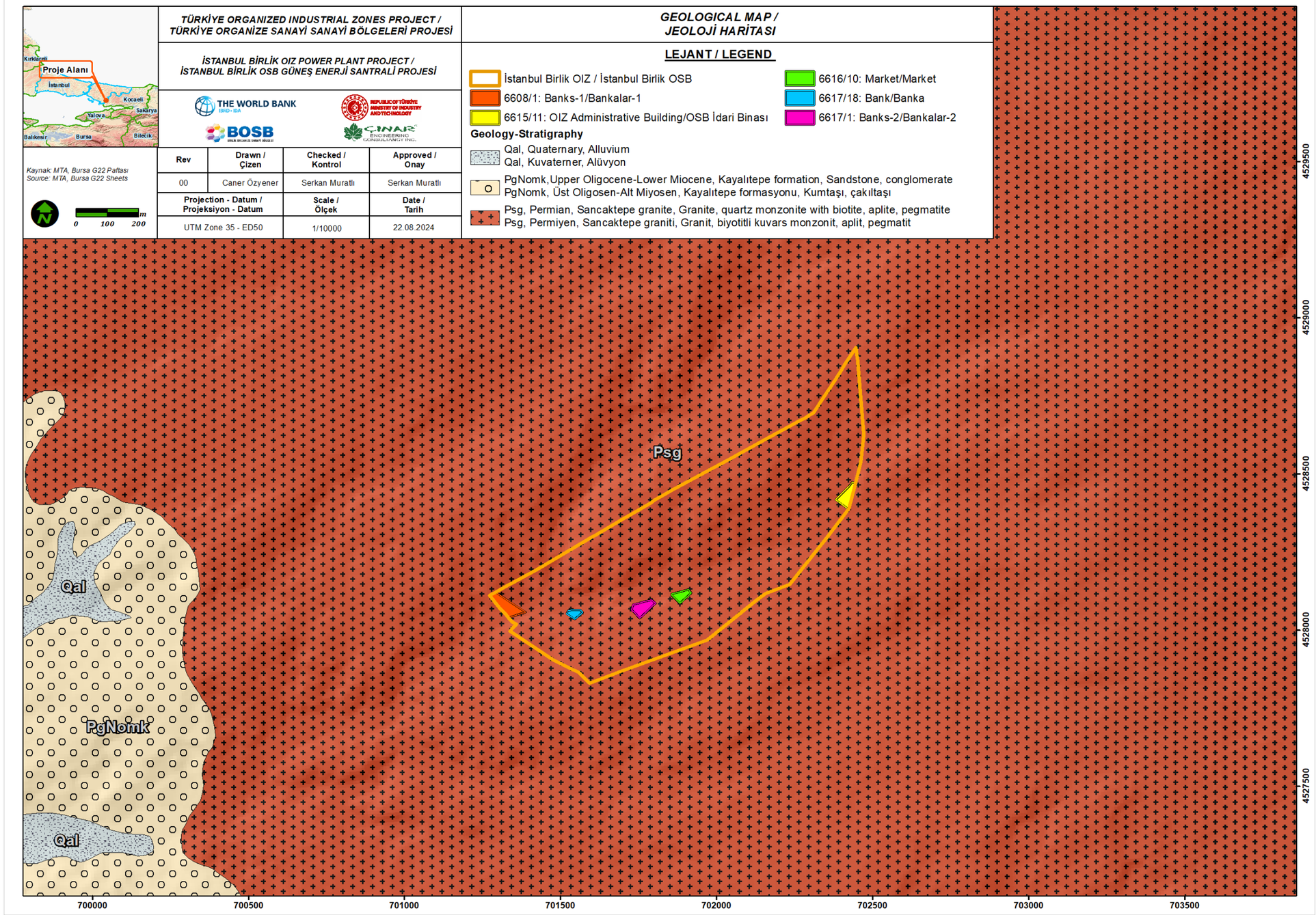

Figure 7. Geological Map of Project Area

5.4 Climate

The Köppen-Geiger map is globally used in climate studies. As shown in Figure 8, İstanbul province, where the Project area is located, is classified as Hot-summer Mediterranean climate (Csa) climate type (mild in winter, very hot and dry in summer (Mediterranean climate)) according to the Köppen Climate Classification rules[12]. According to this climate type, the average temperature is minimum 22ºC and higher than 22ºC for all months.

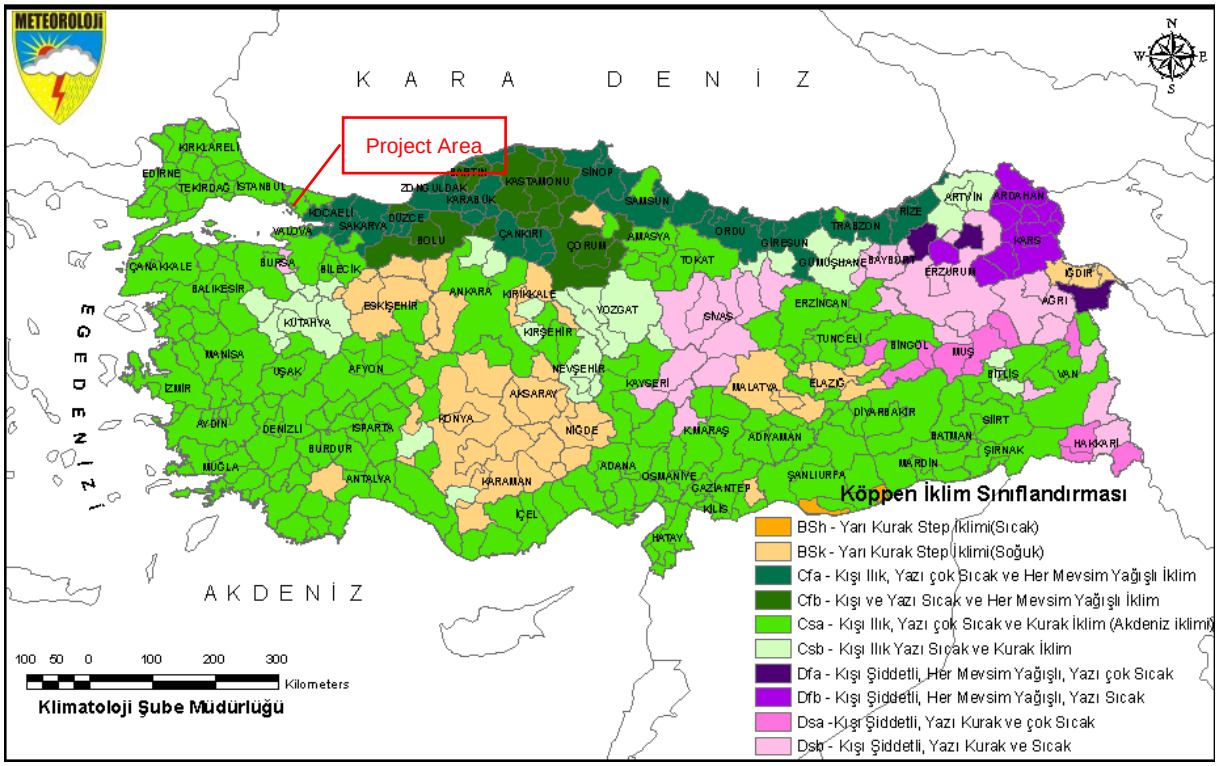

Figure 8. Türkiye's Climate According to Köppen Climate Classification[13]

In İstanbul, the summers are warm, sometimes humid, sometimes dry, and clear and the winters are long, cold, windy, and partly cloudy. According to meteorological data, the highest monthly average temperature was 19.3°C and the lowest monthly average temperature was 11.9°C (see Figure 9).

The average annual precipitation is 662.5 mm and the average number of rainy days is 116.5 in İstanbul region between 1950 and 2023.

[12] **Source:** MaF, GDoM, Climate of Türkiye According to Köppen Climate Classification, January 2016.Link: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.mgm.gov.tr/FILES/iklim/iklim_siniflandirmalari/koppen.pdf

[13] **Source:** https://www.mgm.gov.tr/iklim/iklim-siniflandirmalari.aspx?m=%C4%B0STANBUL

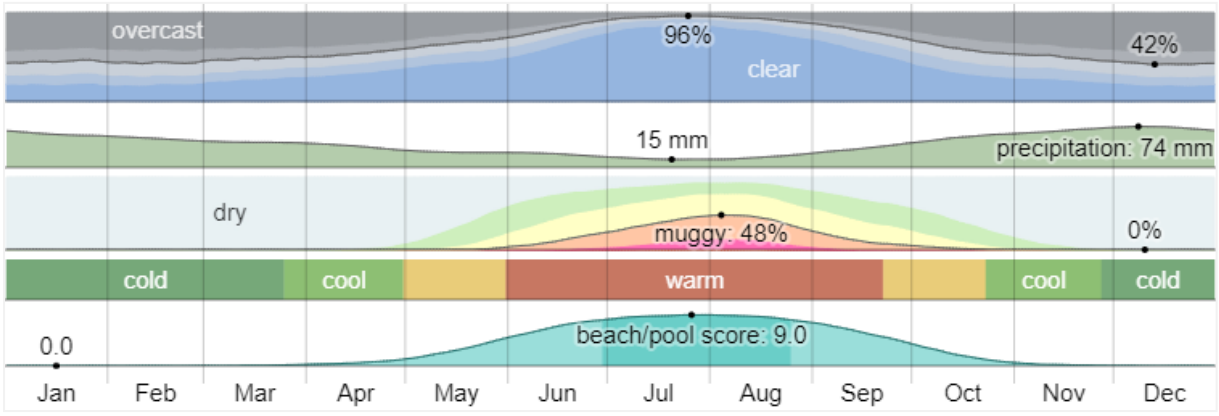

Figure 9. İstanbul Region Monthly Weather (Average between 2016-2024)[14]

The annual average temperature in the province is 15.3°C. The highest temperature value is 40.6°C and the lowest temperature is -9.0°C. The hottest month is July, and the coldest month is February. Temperature change of İstanbul region between 2016 and 2024 is shown in Figure 10.

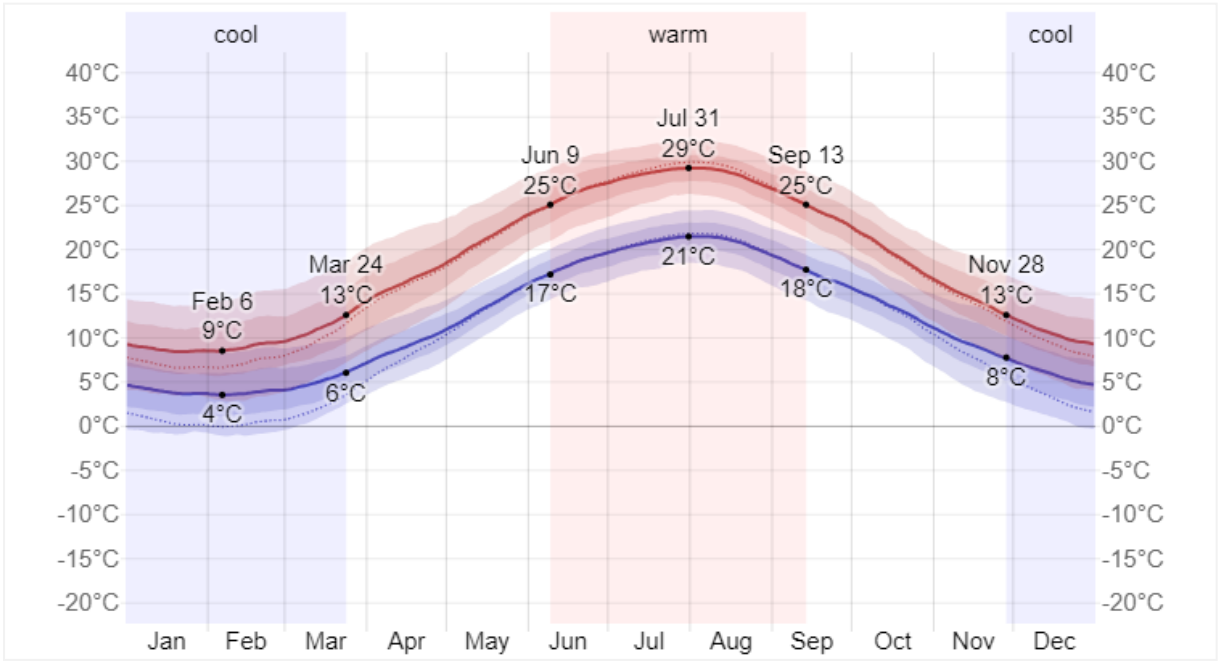

Figure 10. İstanbul Region Temperature Change (Average between 2016 and 2024)[15]

[14] **Source:** https://weatherspark.com/y/95434/Average-Weather-in-%C4%B0stanbul-Turkey-Year-Round
[15] **Source:** https://weatherspark.com/y/95434/Average-Weather-in-%C4%B0stanbul-Turkey-Year-Round

5.5 Soil Quality

The existing soil structure under the buildings where the rooftop SPP systems will be located is backfill material due to the land arrangement and infrastructure works carried out during the establishment of the OIZ. As the project areas are on the roofs of the buildings, there is no natural vegetation and soil structure. Solar panels will not be in contact with the soil structure. No soil pollution was detected in OIZ during the site visit.

5.6 Air Quality

Birlik OIZ is a “mixed” OIZ with facilities operating in different industrial sectors. Domestic and foreign companies are involved in the paint and varnish sectors and other business areas (machinery, chemistry, metal, automotive, plastic, etc.). In this context, air emissions are generated from existing facilities/business.

In İstanbul province, there are 36 national air quality monitoring stations under the supervision of MoEUCC. The closest air quality monitoring stations to the project area are “İstanbul Tuzla Air Quality Monitoring Station (AQMS) (8 kilometers to the project area)” and “Kocaeli Gebze OIZ AQMS (4 kilometers to the project area)”.

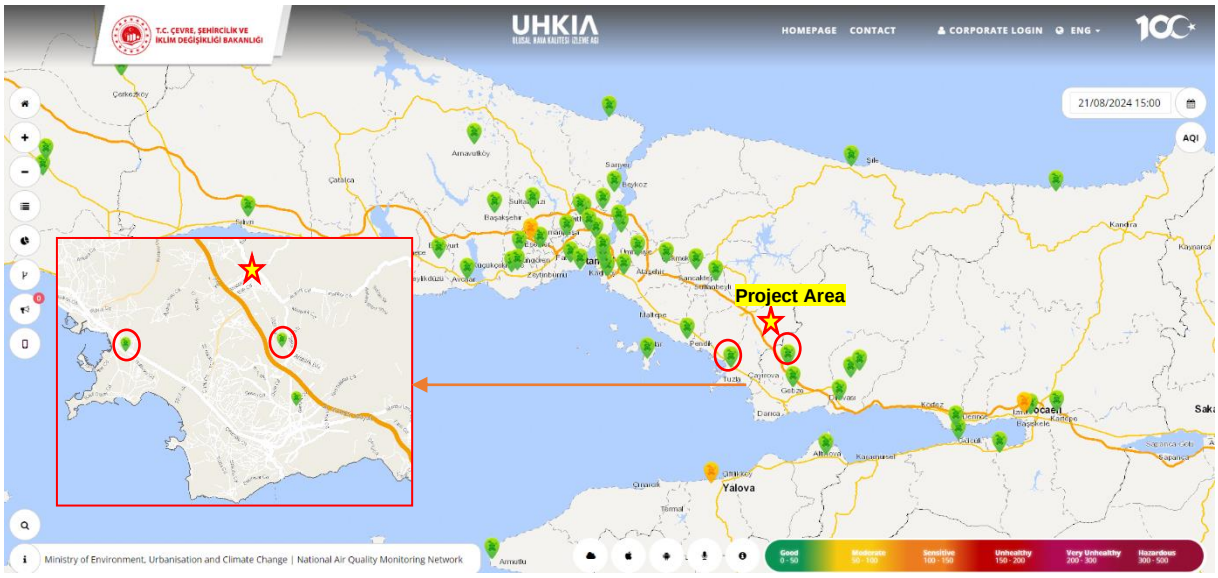

Figure 11. Air Quality Monitoring Stations in İstanbul Province (22.08.2024)[16]

The current data obtained from the National Air Quality Monitoring Network for İstanbul Tuzla AQMS and Kocaeli Gebze OIZ AQMS on 28.08.2024 are given in Table 12. When the data are analyzed, it is seen that the air quality is characterized as "good", and measured parameters comply with Project Standards limit values. The definition of “good” is as follows (according to MoEUCC National Air Quality Monitoring Network): Air quality is good[17].

[16] **Source:** MoEUCC National Air Quality Monitoring Network, https://www.havaizleme.gov.tr/
[17] **Source:** MoEUCC National Air Quality Monitoring Network, https://www.havaizleme.gov.tr/

Table 12. AQMSs Measurement Values (28.08.2024)[18]

Parameter	İstanbul Tuzla AQMS[19] (µg/m³)	Kocaeli Gebze OIZ AQMS[20] (µg/m³)	Project Standard (µg/m³)
PM_{10}	41.96	-	50 (24 Hours Average)
$PM_{2.5}$	-	17.48	25 (24 Hours Average)
SO_2	-	3.48	20 (24 Hours Average)
CO	361.93	-	-
NO_2	39.89	-	200 (Hourly Average)
O_3	31.91	-	100 (8-hour daily maximum)

5.7 Noise

The project areas are located within the boundaries of the OIZ. In this context, the potential sources of noise in areas and their vicinity are the production facilities within the OIZ. Since the production activities are mostly conducted in closed facilities, it is thought that there is not a high level of noise in the project areas and their vicinities.

There are only facilities and businesses in AoIs of project areas. There are no sensitive receptors such as schools, mosques, health centers, etc. in AoIs of project areas. There are no educational institutions within the boundaries of Birlik OIZ. The nearest educational institution to the project area is “Şekerpınar Primary School” approximately 3,2 kilometers away by air distance. There is a Vocational Training Center Liaison Office in the OIZ Administrative Building, but it is not used. There are educational institutions in Tuzla district where the project area is located, however, these institutions are not within the project’s impact area and are located at far distances. There is an “OSB Mosque” within the OIZ. The distance of this mosque to the closest project area (Market Building) is 260 meters. There is no park in AoIs of project areas.

There will be no excavation within the scope of the project and solar panels will be transported to the roof of the buildings with the help of a crane. The transportation process will take approximately one (1) day for each of the project areas.

Since the installation activities will be short-term and minor, and considering that the project areas are within the boundaries of OIZ, it is considered that no noise baseline measurements are required.

5.8 Water Resources and Use

The project area is located in the Marmara Basin, one of the water basins allocated throughout Türkiye, within the Birlik OIZ, where location selection has been made before. There is no surface water source in and around the project areas, and the water flows (creeks) within the İstanbul Birlik OIZ have been rehabilitated and taken under control. The closest surface water in the region is the Karanlık Stream (190 meters to the Banks-1 Building, see Figure 12), which flows at lower elevations approximately 190 m southwest of the nearest project area, outside the Birlik OIZ. Distances of project areas to Derince Creek and Umur Creek are shown in Figure 12 and Figure 13.

[18] **Source:** https://sim.csb.gov.tr/STN/STN_Report/StationDataDownloadNew
[19] Approximately 8 kilometers to the project area.
[20] Approximately 4 kilometers to the project area.

There are no groundwater resources in AoIs of project areas.

Apart from İstanbul Birlik OIZ, there are three (3) treatment ponds around the Istanbul Leather OIZ Treatment Plant, approximately 1.9 - 2.7 km west of the nearest project area. Apart from this, Ömerli Dam, which was built for drinking water purposes in the region, is located approximately 19 km north of the nearest project area (see Figure 14), and the project areas are not within the protection area of any surface water source that provides drinking and utility water.

The hydrological map of the project area and its surroundings is given in Figure 12.

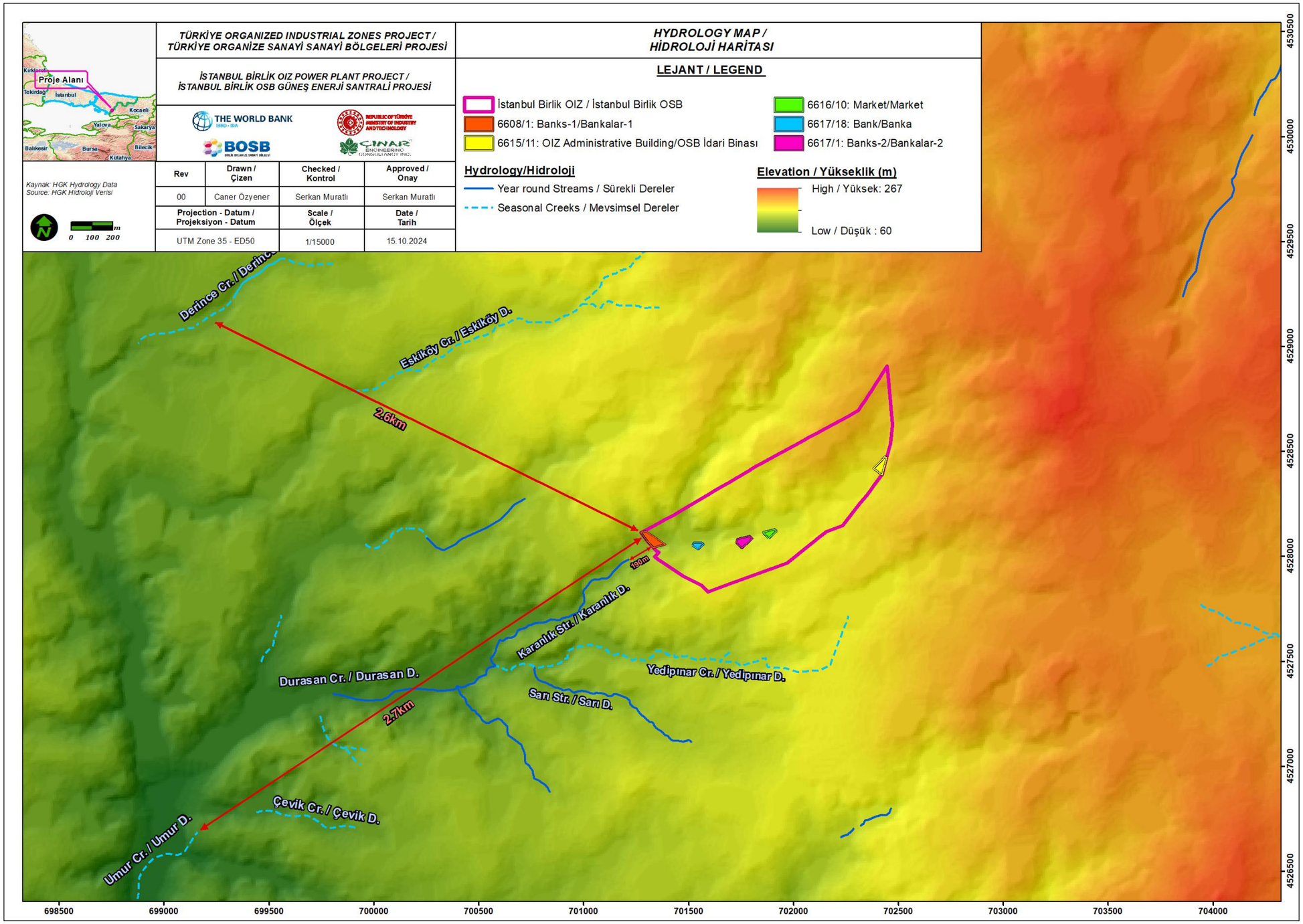

Figure 12. Hydrological Map of Project Area and Its Surrounding

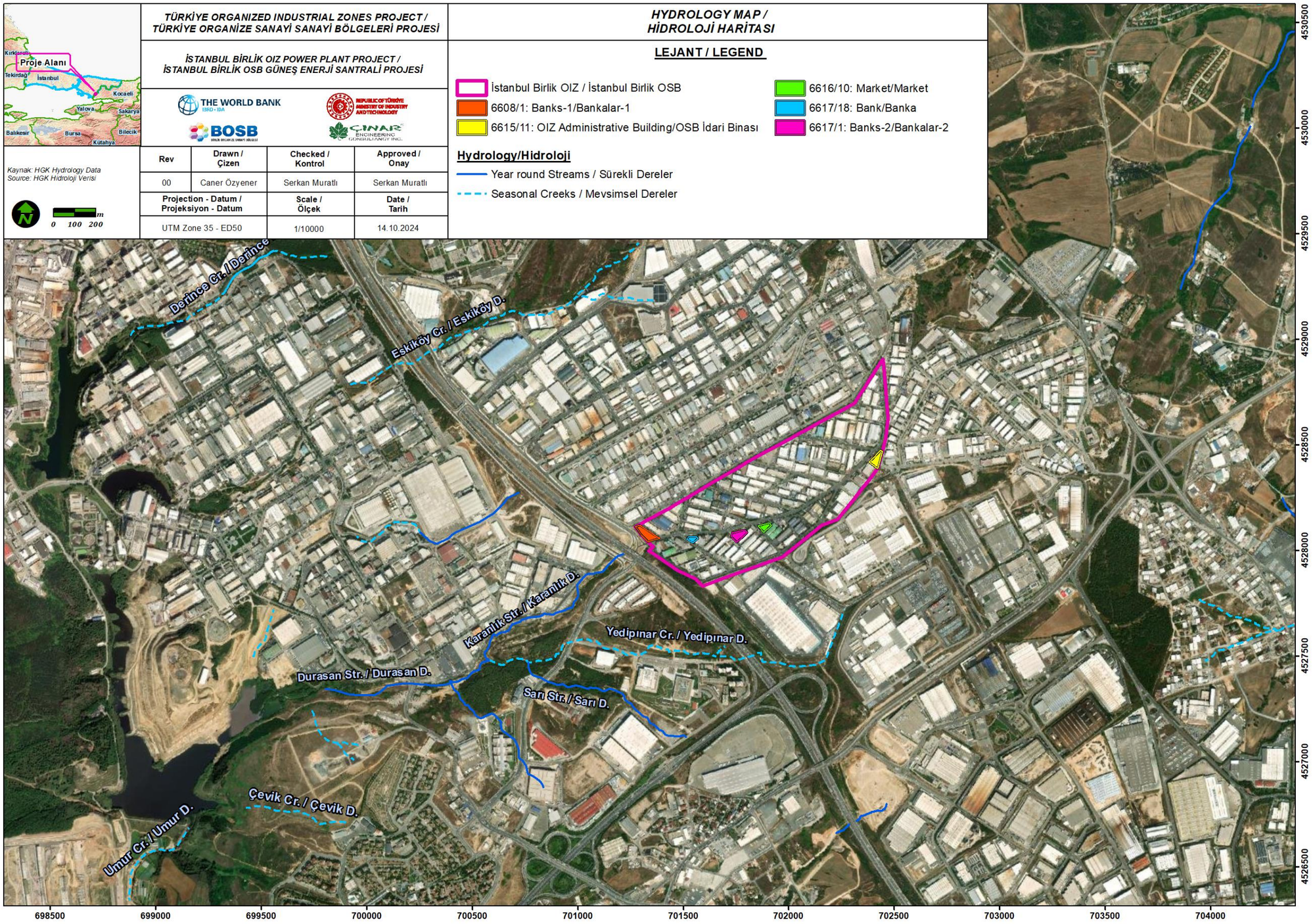

Figure 13. Hydrological Map of Project Area and Its Surrounding (Google Earth)

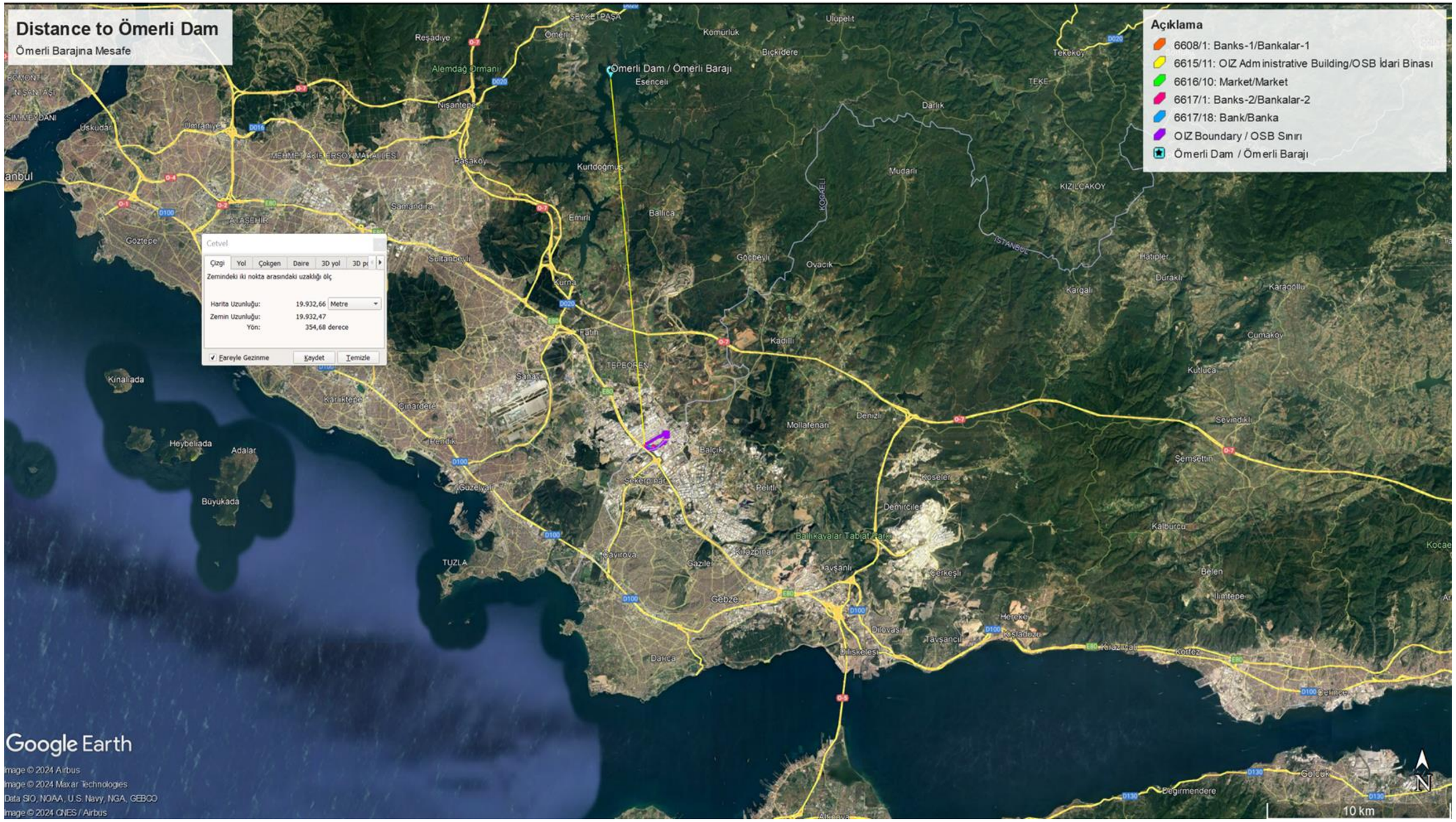

Figure 14. Distance to Ömerli Dam

The water demand within the Birlik OIZ is supplied from the Ömerli Drinking Water Treatment Plant (DWTP) operated by İSKİ (see Figure 15). Utility water comes from the Ömerli DWTP first to Tepeören storage tank and then to the OIZ water distribution line.

Ömerli DWTP consists of four plants: Orhaniye, Muradiye, Osmaniye and Emirli (Yavuz Sultan Selim).

The raw water sources of Ömerli DWTP are Ömerli and Darlık Dams and Sungurlu-İsaköy Regulator. An annual average of 600 million m³ of water is taken from the Ömerli Dam to the Ömerli DWTP. An annual average of 150 million m³ of water is taken from the Darlık Dam to the Ömerli DWTP. The regulators in the Sungurlu-Kurfallı (İsaköy) Region can supply 145 million m³ of water annually to the Ömerli DWTP[21].

Figure 15. Ömerli Drinking Water Treatment Plant[22]

Results of potable water analysis for July 2024 that are obtained from İSKİ's official website and their comparison with project standards are given in Table 13.

[21] **Source:** https://iski.istanbul/kurumsal/iski-tesisleri/icme-suyu-aritma-tesisleri/oemerli-icme-suyu-aritma-tesisleri
[22] **Source:** https://iski.istanbul/kurumsal/iski-tesisleri/icme-suyu-aritma-tesisleri/oemerli-icme-suyu-aritma-tesisleri

Table 13. İSKİ Drinking Water Analysis (July)[23]

Parameter	Unit	Ömerli					Project Standard
		1	2	3	4	5	
Coliform Bacteria	cfu/100 ml	0	0	0	0	0	0
E. coli	cfu/100 ml	0	0	0	0	0	0
Enterococci	cfu/100 ml	0	0	0	0	0	0
C.perfringens (including spores)	cfu/100 ml	0	0	0	0	0	0
Acrylamide	µg/L	<0.03	<0.03	<0.03	<0.03	<0.03	0.1
Antimony	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	5.0
Arsenic	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	10
Benzene	µg/L	<1	<1	<1	<1	<1	1
Benzo (a) pyrene	µg/L	<0.007	<0.007	<0.007	<0.007	<0.007	0.01
Boron	mg/L	0.03	0.03	0.03	0.03	0.02	1
Bromate	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	10
Cadmium	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	3
Chromium	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	50
Copper	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	2
Cyanide	µg/L	<30	<30	<30	<30	<30	50
1,2-dichloroethane	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	3
Epichlorohydrin	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Fluoride	mg/L	0.09	0.08	0.09	0.09	0.08	1.5
Lead	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	10
Mercury	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	1
Nickel	µg/L	<2.0	<2.0	<2.0	3.80	<2.0	20
Nitrate	mg/L	1.46	1.57	1.50	1.92	2.01	50
Nitrite	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	0.5

[23] **Source:** https://iski.istanbul/abone-hizmetleri/laboratuvar-hizmetleri/su-kalite-raporlari/2024-yili-su-kalite-raporlari

Parameter	Unit	Ömerli					Project Standard
		1	2	3	4	5	
Total Pesticides	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Polycyclic Aromatic Hydrocarbons	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Selenium	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	10
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1	10
Trichloroethene	µg/L	<1	<1	<1	<1	<1	8
Total Trihalomethanes	µg/L	33.0	16.7	25.0	17.0	17.0	100
Vinyl Chloride	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.3
Aluminum	µg/L	130.8	59.9	111.4	<20	28.7	200
Ammonium	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.5
Chloride	mg/L	27.5	28.4	27.9	52.8	28.2	250
Color (Pt-Co)	mg/L	<2.0	<2.0	<2.0	<2.0	<2.0	ACNAC
Conductivity	µS/cm^{-1}	335	337	332	343	330	2,500
pH	-	7.19	7.06	7.24	6.62	7.05	≤9.5-6.5≤
Iron	µg/L	<20	<20	<20	22.6	<20	200
Manganese	µg/L	14.3	<10	14.1	<10	22.6	50
Odor	-	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	ACNAC
Sulphate	mg/L	34.2	41.0	32.9	16.2	31.7	250
Sodium	mg/L	18.4	18.3	18.7	14.9	14.1	200
Taste	-	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	ACNAC
Total Organic Carbon	-	2.82	2.58	2.70	2.01	2.36	NAC
Turbidity	NTU	0.30	0.22	0.24	0.20	0.10	0.2
Tritium	Bq/L	<2.0	<2.0	<2.0	<2.0	<2.0	100
Total Indicative Dose	mSv/year	<0.1	<0.1	<0.1	<0.1	<0.1	0.1

5.9 Wastewater Management

The Birlik OIZ does not have a Wastewater Treatment Plant (WWTP) and has an infrastructure system. Wastewater generated in the OIZ is transferred to İSKİ Tuzla Advanced Biological WWTP via infrastructure system. "İSKİ Tuzla Advanced Biological WWTP" is in operation in Tuzla district where the project areas are located. Wastewater generated within the OIZ is transferred to this plant through sewerage system. Wastewater is accepted in accordance with the limit values of the İSKİ Regulation on Discharge of Wastewater to Sewerage.

İSKİ Tuzla Advanced Biological WWTP was constructed in stages in line with the need to treat wastewater from Tuzla, Pendik, Kartal and Maltepe districts. The capacity of the 1st stage of the plant is 150.000 m³/day and was taken into operation in 1998, the capacity of the 2nd stage is 100.000 m³/day and was taken into operation in 2009, the capacity of the 3rd stage is 400.000 m³/day and was taken into operation in 2022. With a total capacity of 650,000 m³/day, the plant treats wastewater from approximately 2.6 million equivalent population[24].

Figure 16. İSKİ Tuzla Advanced Biological WWTP

The İstanbul Metropolitan Municipality has been taking samples from the wastewater discharging to the Municipality's wastewater system twice in a month. The latest sampling was performed on 04.06.2024 (see Table 14) and no noncompliance was detected. Since sampling takes place twice a month, no other inspections have been performed by the authorities.

[24]**Source:** https://iski.istanbul/kurumsal/iski-tesisleri/atik-su-aritma-tesisleri/tuzla-ileri-biyolojik-atik-su-aritma-tesisi/

Table 14. Wastewater Analysis Results (04.06.2024)

Parameter	Unit	Analysis Result	Project Standard[25]
Total Suspended Solids	mg/L	403.5	500
Chemical Oxygen Demand	mg/L	649.87	800
pH	-	7.47	6-12
Total Sulphur	mg/L	0.492	2
Oil and Grease	mg/L	99.75	150

OIZ's wastewater management system is adequate to manage wastewater generated by the project.

5.10 Waste Management

As stated in Annex-1 of the Zero Waste Regulation published in the Official Gazette dated 12.07.2019 and numbered 30829, OIZs are obliged to establish a zero-waste management system.

In this context, Birlik OIZ has a "Zero Waste Certificate (Basic Level)" valid between 16.11.2020-16.11.2025 (see Annex-8). In line with the zero-waste management system, there are waste boxes in the OIZ administrative building (see Annex-5).

There is a temporary hazardous and non-hazardous waste storage area belonging to Birlik OIZ for the storage of wastes generated by OIZ administrative units. This area is not suitable as it is within the OIZ administration building (inadequate ventilation, emergency risk, etc.). The waste storage area should be placed outside the administrative building. The Industrial Waste Management Plan prepared for this area is given in Annex-8.

There are zero waste collection centers, domestic waste containers and waste boxes for recyclable wastes at various points within the OIZ (see Annex-5).

The recyclable wastes are delivered to the contracted company of Tuzla Municipality. Hazardous wastes are sent to disposal as less than 50 kg on a tender basis. Birlik OIZ has contracted with “Atıksan Entegre Atık Yönetimi Ltd. Şti.” for hazardous wastes.

In the province of İstanbul, each of the 39 district municipalities has its own waste collection system within their boundaries. These systems collect waste from containers placed at specific points on the streets and transport it to the Solid Waste Transfer Stations operated by the Istanbul Metropolitan Municipality using compaction waste collection vehicles. The waste collected by the district municipalities is transferred to one of the eight solid waste transfer stations located throughout İstanbul, where it is transferred to sanitary landfills and the waste disposal process is carried out.

In İstanbul province, there are two sanitary landfills: Silivri Seymen and Şile Kömürcüoda.

Tuzla Municipality collects domestic solid wastes, and licensed private firms collect other types of waste (i.e., hazardous, recyclable) that are required to be collected by licensed private firms. Tuzla Municipality has contracted with “Atıksan Entegre Atık Yönetimi Ltd. Şti.” for recyclable wastes. Domestic wastes are collected twice a week by the Tuzla Municipality.

[25] **Source:** İSKİ Regulation on Discharge of Wastewater to Sewerage, Table 1, Sewerage Systems Wastewater Infrastructure Facilities Resulting in Full Treatment

Wastes generated in accordance with OIZ's waste declaration for 2023 is given in Annex-8 and Table 15.

Table 15. Hazardous Waste List (2022)

Waste Code	Waste Definition	Generated Waste Amount (kg)	Licensed Company
150106	Mixed Package	1,905.00	Atıksan Entegre Atık Yönetimi Ltd. Şti.
150107	Glass Package	700.00	

OIZ's waste management system is not adequate to manage hazardous waste generated by the project, however it is adequate for non-hazardous waste.

5.11 Natural Disaster Potential

In İstanbul, earthquakes, floods, fires, forest fires, meteorological disasters, drought due to climate change, and infectious diseases are at the forefront as possible disasters and emergencies that have occurred throughout history. Due to its geological location, İstanbul has been exposed to major earthquakes in historical and instrumental periods and has been significantly affected by major earthquakes produced by faults connected to the North Anatolian Fault System; It is a city that has experienced important disasters, especially fires, floods, landslides in certain regions, and maritime accidents[26].

Seismicity

The renewed "Türkiye Earthquake Hazard Map", published in the Official Gazette dated 18.03.2018 and numbered 30364 (duplicate) and entered into force as of 01.01.2019, is given in Figure 17 and marked on the project area. The project area was examined on the interactive earthquake hazard map published by Disaster and Emergency Management Presidency (AFAD), and the (peak/largest ground acceleration value) (Peak Ground Acceleration (PGA) 475) for the 475 Year Recurrence Period was determined as 0.435 g (see Figure 18).

[26] **Source:** İstanbul Provincial Disaster Risk Reduction Plan, İRAP, AFAD, 2021

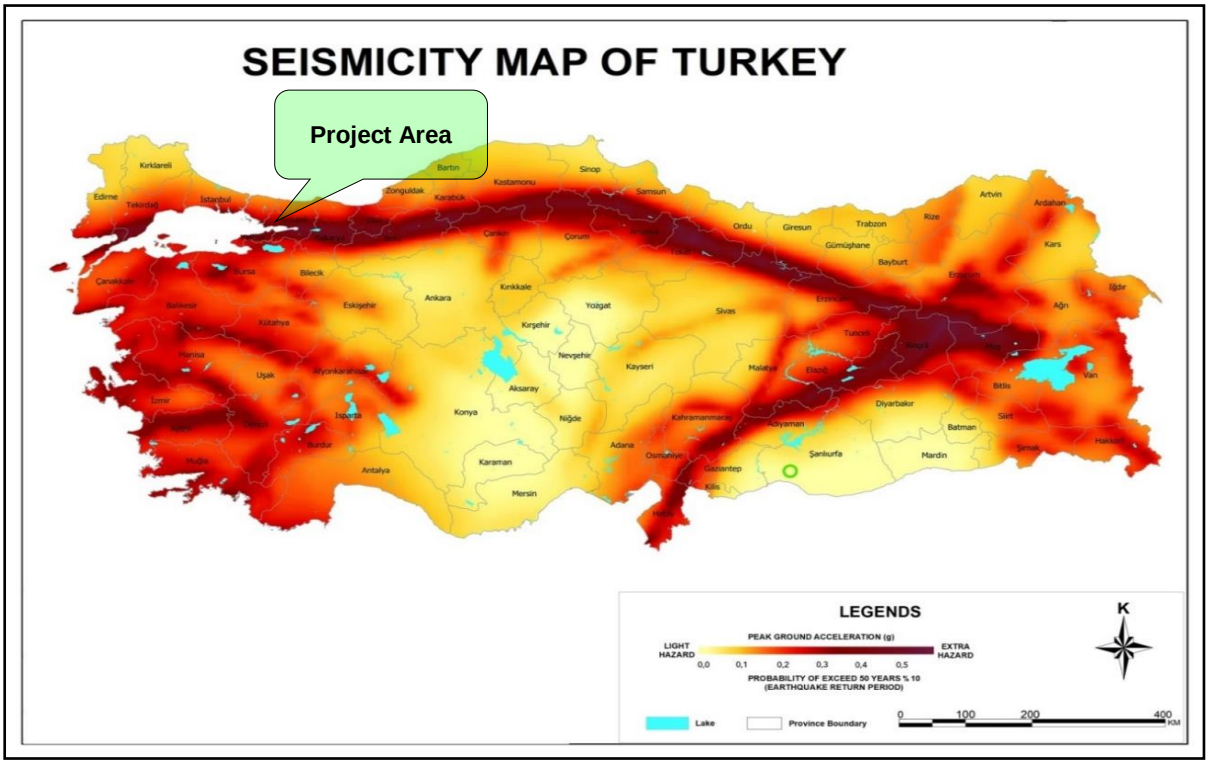

Figure 17. Earthquake Hazard Map of Türkiye[27]

İstanbul is under the influence of the main branches of the North Anatolian Fault Zone (NAFZ) passing through the Sea of Marmara. The main northern branch of the North Anatolian Fault extends to the Gulf of Izmit and passes through the Marmara trenches, reaching the Ganos Fault and from there to the Aegean Sea. The southern branch passes through the south of Lake İznik and reaches the Gemlik Gulf and then to the southern Marmara.

In the historical period (1800 BC - 1900 AD), damaging earthquakes with intensity values in the range of Io=IX-X occurred on the main branches of the NAFZ, especially in the south of Istanbul. In the instrumental period (after 1900), in the south of Istanbul Damaging earthquakes with magnitudes in the range of M = 7.0-7.9 have occurred on the main branches of the NAFZ.

The region, which is under the influence of the NAFZ, has experienced three major earthquakes in the last century. These are the earthquakes of 20 June 1943, 22 July 1967, 17 August 1999 and 12 November 1999. Among these, the center of the 1943 earthquake was near Adapazarı, its focal depth was 10 km, and its magnitude (M) was 6.6. The 1967 earthquake occurred in the Mudurnu valley.

[27] **Source:** AFAD, 2018, Türkiye Earthquake Hazard Map

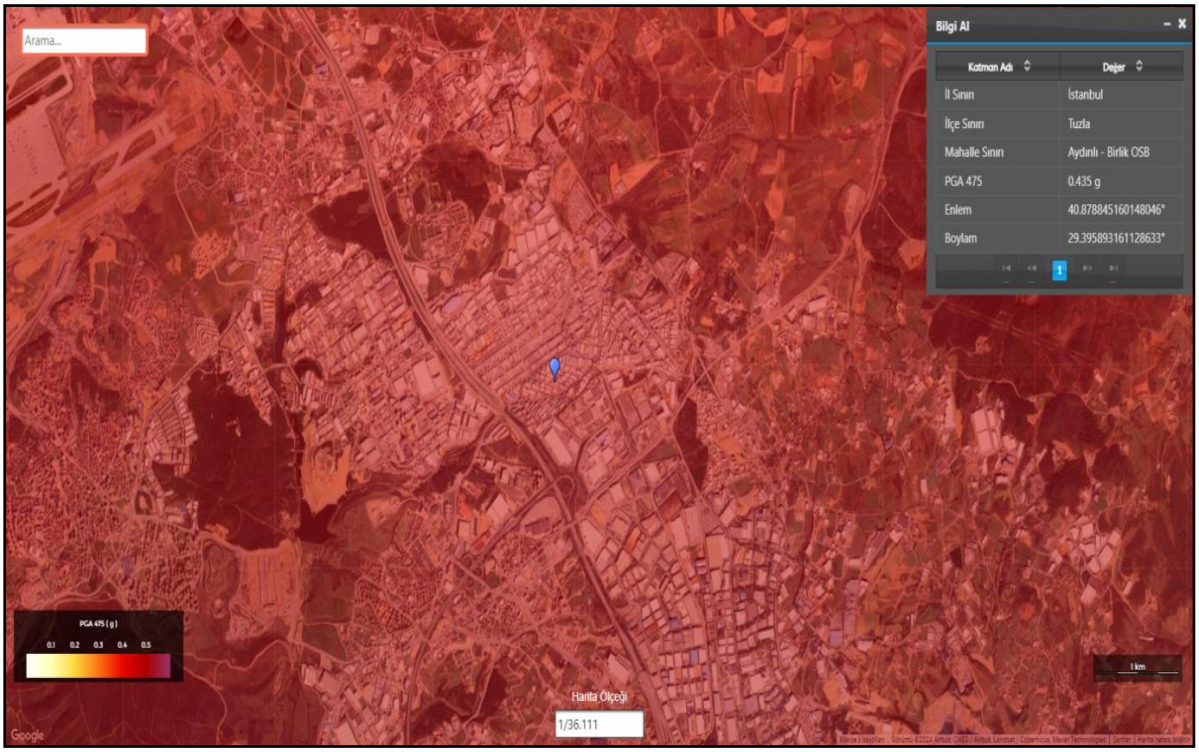

Figure 18. Project Area Maximum Ground Acceleration (PGA 475)[28]

The 17 August Earthquake occurred in the east of the Marmara Sea. The most important effects were seen around Adapazarı, İzmit, Gölcük and Yalova. This earthquake was the largest urban earthquake ever experienced in Türkiye. The earthquake occurred on 17 August 1999 at 03:08 local time (GWT 00.08). The magnitude of the earthquake was first reported as M 6.8. later, it was given M 7.8 by the United States Geological Survey (USGS).

Although just over two months had passed since the Kocaeli earthquake, another severe earthquake (M 7.2) occurred, this time at 18:57 on November 12, 1999, affecting Düzce and its immediate surroundings. This earthquake, which affected Bolu, Düzce, Kaynaşlı and their surroundings in the western part of the North Anatolian Fault Zone, was felt in a very wide area, more than 800 people lost their lives and around 2500 people were injured. According to USGS data, the epicenter of the Düzce earthquake with a magnitude of M 7.2 was located in an area where 40,768 north latitude and 31,148 east longitudes intersect.

All kinds of structures to be built within the scope of the project must comply with the principles of the "Regulation on Buildings to be Built in Disaster Areas" published in the Official Gazette dated 14.07.2007 and numbered 26582 of the Repealed Ministry of Public Works and Settlement and published in the Official Gazette numbered 30364 dated 18.03.2018 and published on 01.01.2019. The provisions of the "Turkish Building Earthquake Regulation" of the Disaster and Emergency Management Presidency, which came into force in 2019, will be strictly adhered to.

Ground survey reports of the five (5) project buildings are presented in Annex-12.

[28] **Source:** Interactive Earthquake Risk Map, AFAD, (https://tdth.afad.gov.tr/)

5.12 Biodiversity and Protected Areas

The topics covered under the biological environment are the legally protected and internationally recognized areas of high biodiversity value, habitat classification, terrestrial flora and fauna, and critical habitat assessment.

Methodology for Biological Environment

Data Collection

The baseline data for the biological environment of the project area and project AoI are gathered from previously published scientific work, literature information on habitats and species, field surveys and expert judgement. The ecological study was conducted with the following objectives:

- Using various standard techniques, assess the status of major floral and faunal components of all terrestrial habitats present in the Project AoI;
- Data collection and compilation on the status of floral and faunal components and habitats;
- Provide quantitative data on various floral and faunal components.
- Identification and listing of floral and faunal species of conservation significant (Critically endangered (CR), Endangered (EN), Vulnerable (VU) and threatened and endemic species in accordance with the International Union of Conservation for Nature (IUCN) RED List) in the project AoI; and
- Identification of conservation-sensitive areas (Protected Areas: National Parks, Nature Parks, Nature Reserves, Wildlife Development Area, Special Environmental Protection Area, Wetlands, Biosphere Reserves) in the project AoI.

Some of the general methodologies for field surveys can be listed as the following:

- In determining vantage points, locations that represent different habitat types and those that had been identified to be significant to species were considered.
- Some of the flora and fauna species were recorded through direct observations.

Field surveys were conducted in July 2024.

Area of Influence (AoI) for Biological Environment

Since the project area is completely located within the OIZ, the border of the OIZ is accepted as AoI for biological environment (see Figure 19).

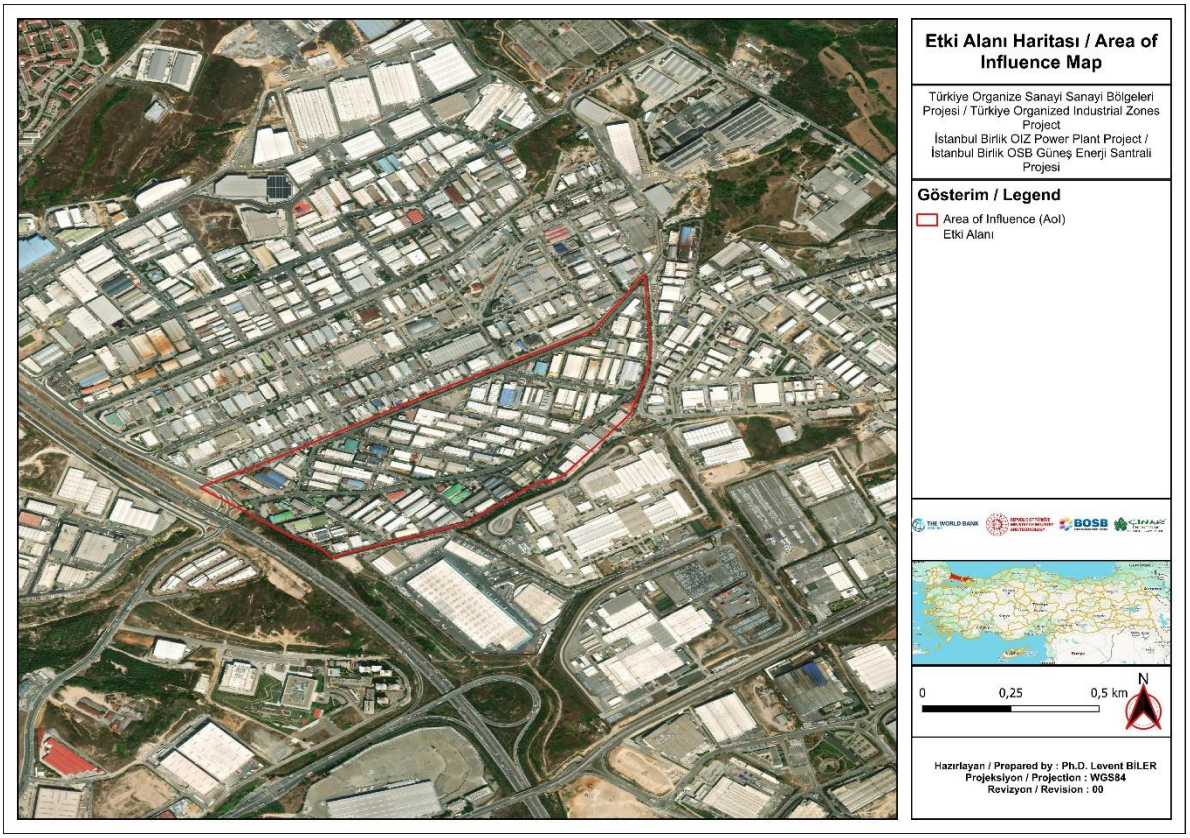

Figure 19. Biological Area of Influence Map

Habitat Classification

The European Nature Information System (EUNIS) puts forward a system for identification and classification of European habitat types. Classification area is quite large including the entire European mainland and seas including islands that are close to the mainland (except for Cyprus, Iceland and Greenland), EU states' archipelagos (Canary Islands, Madeira Islands and Azore Islands) and the European mainland to the west of Ural Mountains that cover Türkiye and the Caucasus. The main objective of the EUNIS habitat classification is to create a European reference set of habitat types including a description of all types and hierarchical classification.

Habitats within the project AoI are evaluated in accordance with the EUNIS classification, which is useful in terms of not only relating the national classifications to international level, but in terms of corresponding EUNIS habitats to habitats listed in Annex I of Habitats Directive for "designation of special areas of conservation" and the European Red List of Habitats for the critical habitat assessment.

The only habitat type at the project area and AoI is "J1.4 Urban and suburban industrial and commercial sites still in active use", which is a modified habitat.

Terrestrial Flora

No plant species have been found in the area due to the SPP project will be realized on the existing buildings within the current OIZ. But identified species in the AoI are showed in Photograph 8-Photograph 13 and listed in Table 16. 10 plant species were identified. 2 Species were listed as "LC (Least Concern)", 1 species "DD (Data Deficient)", and 7 species "NE (Not Evaluated)" according to the IUCN. None of the identified species were endemic and rare.

Photograph 8. ***Anagallis arvensis*** **L.**

Photograph 9. ***Convolvulus arvensis*** **L.**

Photograph 10. *Crepis sancta* (L.) Bornm.

Photograph 11. *Cupressus sempervirens* L.

Photograph 12. ***Trifolium repens*** **L.**

Photograph 13. ***Cichorium intybus*** **L.**

Table 16. Flora species in the AoI

Family	Species	Turkish Name	Common Name	Endemism	IUCN	CITES	BERN	Obs./Lit.
Asteraceae	*Cichorium intybus*	Hindiba	Common Chicory	-	LC	-	-	Site Obs./Lit.
Asteraceae	*Cota tinctoria*	Boyacı Papatyası	Golden Marguerite	-	NE	-	-	Lit.
Asteraceae	*Crepis sancta*	Yaban Kıskısı	-	-	NE	-	-	Site Obs./Lit.
Asteraceae	*Taraxacum gracilens*	Demirçıtlık	Red-Seed Dandelion	-	NE	-	-	Lit.
Asteraceae	*Taraxacum hellenicum*	Leblebiotu	Dandelion	-	NE	-	-	Lit.
Convolvulaceae	*Convolvulus arvensis*	Tarla Sarmaşığı	Field Bindweed	-	NE	-	-	Site Obs./Lit.
Cupressaceae	*Cupressus sempervirens*	Servi	Mediterranean Cypress	-	LC	-	-	Site Obs./Lit.
Fabaceae	*Trifolium repens*	Ak Üçgül	White Clover	-	NE	-	-	Site Obs./Lit.
Platanaceae	*Platanus orientalis*	Çınar	Oriental Plane	-	DD	-	-	Site Obs./Lit.
Primulaceae	*Anagallis arvensis*	Farekulağı	Scarlet Pimpernel	-	NE	-	-	Site Obs./Lit.

Terrestrial Fauna

Due to the absence of any open water sources in the project area and the presence of intense human activity and traffic, only bird species could be identified among the fauna species. The observations revealed that only eurasian magpie and house sparrow species, accustomed to human activities and having wide distributions, were observed in the area. However, based on the results of literature searches, the following species that may occur in the area are listed below.

According to the surveys and literature research one reptile, 7 birds, and 2 mammal species were identified (see Table 17). None of the species were under threat and in any threatened category according to the IUCN (see Photograph 14). Galerida cristata, Columba livia, Streptopelia *decaocto*, and C*orvus cornix* were in Annex-III according to the Bern Convention.

Photograph 14. *Pica pica* (Eurasian magpie)

Table 17. Fauna Species at the Project Area[29]

Class	Family	Species	Türkish Name	Common Name	Endemism	IUCN	CITES	BERN	Hunting Law	Status	RDB	Site Obs./Lit.
Aves	Alaudidae	*Galerida cristata*	Tepeli Toygar	Crested Lark	-	LC	-	Ann-III	Ann-I	Local	A.3	Lit.
Aves	Columbidae	*Columba livia*	Kaya Güvercini	Rock Dove	-	LC	-	Ann-III	Ann-II	Local	A.5	Site Obs. +Lit.
Aves	Columbidae	*Streptopelia decaocto*	Kumru	Eurasian Collared-Dove	-	LC	-	Ann-III	Ann-I	Local	A.5	Lit.

[29] ***BERN (Bern Convention)***
Appendix - II: Strictly Protected Fauna Species (SPFS)
Appendix - III: Protected Fauna Species (PFS) IUCN (International Union for Conservation of Nature and Natural Resources) Red List Categories (Version 2009.1)
IUCN
LC (Least Concern): Widespread and abundant species.
NE (Not Evaluated): Species that has not yet been evaluated against the criteria.
Central Game Commission (MAK) Decrees
Appendix-I: List of game animals protected by MAK.
Appendix-II: List of game animals whose hunting is allowed for certain periods
RDB (Red Data Book) Categories for birds, Kiziroğlu, 2012
A.3= The populations of these species nationwide in Türkiye generally range between (52-500) individuals in the observed regions. These are also species with a sensitivity that could be depleted, posing a high risk of extinction in the wild.
A.5= There is currently no situation of decline or extinction threat in the observed populations of these species.

Class	Family	Species	Türkish Name	Common Name	Endemism	IUCN	CITES	BERN	Hunting Law	Status	RDB	Site Obs./Lit.
Aves	Corvidae	*Corvus cornix*	Leş Kargası	Hooded Crow	-	NE	-	Ann-III	-	Local	A.5	Lit.
Aves	Corvidae	*Pica pica*	Saksağan	Eurasian Magpie	-	LC	-	-	Ann-II	Local	A.5	Site Obs.+Lit.
Aves	Passeridae	*Passer domesticus*	Serçe	House Sparrow	-	LC	-	-	Ann-II	Local	A.5	Site Obs.+Lit.
Aves	Sturnidae	*Sturnus vulgaris*	Sığırcık	Common Starling	-	LC	-	-	Ann-I	Winter visitor	A.5	Lit.
Mammalia	Muridae	*Mus musculus*	Ev Faresi	House Mouse	-	LC	-	-	-	Local		Lit.
Mammalia	Muridae	*Rattus rattus*	Sıçan	House Rat	-	LC	-	-	-	Local		Lit.

Legally Protected and Internationally Recognized Areas of High Biodiversity Value Project Area of Influence

There are identified two different types of protected areas; Legally Protected Areas and Internationally Recognized Areas of high biodiversity value. Legally Protected Areas as defined by ESS6 are those that meet the IUCN definition for a protected area, while Internationally Recognized Areas are those that are exclusively defined as United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Natural Sites, UNESCO Man and Biosphere Reserves, Key Biodiversity Areas, Important Bird Areas Alliance for Zero Extinction Sites and wetlands designated under the Ramsar Convention. When a project is located within a legally protected or internationally recognized area, WB ESS6 sets requirements in addition to those that are related to critical habitat. Accordingly, it is required to;

- demonstrate that the proposed development in such areas is legally permitted
- act in a manner consistent with any government recognized management plans for areas
- consult and involve protected area sponsors and managers, project-affected parties, indigenous peoples and other interested parties on planning, designing, implementing, monitoring, and evaluating the proposed project, as appropriate; and
- implement additional programs, as appropriate, to promote and enhance the conservation aims and effective management of the area.

In line with this approach, areas that have been designated a status under the Turkish protected area system, as well as areas internationally recognized areas of high biodiversity values such as Key Biodiversity Areas (KBA), Important Bird Areas (IBA) and Important Plant Areas (IPA) were screened.

Legally Protected Areas

Legally protected areas around the project areas are given in Table 18 and a map showing the locations of the protected areas with respect to the project area is presented in Figure 20. Considering the distances between the project areas and the legally protected areas in the region, there will be no project-related impacts on these areas.

Table 18. Legally Protected Areas near the Project Area

Protected Area	Air Distance to the Project Area (km)
Marmara Sea and Islands Special Environmental Protection Area	8.48 km
Çamlıköy Nature Park	129.60 km
Çilingöz Nature Park	121.01 km
Danamandıra Nature Park	107.55 km
Şamlar Nature Park	59.29 km

Protected Area	Air Distance to the Project Area (km)
Göktürk Nature Park	55.38 km
Ayvabendi Nature Park	52.82 km
Kömürcübent Nature Park	51.05 km
Fatih Rıfkı Atay Nature Park	49.87 km
Neşetsuyu Nature Park	48.60 km
Bentler Nature Park	47.75 km
Fatih Çeşmesi Nature Park	49.12 km
Irmak Nature Park	48.67 km
Kirazlıbent Nature Park	47.97 km
Mehmet Akif Ersoy Nature Park	45.58 km
Marmaracık Nature Park	47.58 km
Fatih Sultan Mehmet Nature Park	41.98 km
Türkmen Başı Nature Park	41.98 km
Park Orman Nature Park	40.74 km
Mihribat Nature Park	35.52 km
Göztepe Nature Park	32.37 km
Elmas Burnu Nature Park	41.16 km
Polonezköy Nature Park	27.88 km
Avcıkoru Nature Park	24.23 km
Hacetderesi Nature Park	4.55 km
Büyükada Nature Park	22.23 km
Dilburnu Nature Park	22.98 km
Değirmenburnu Nature Park	24.34 km
Beykoz Göknarlık Nature Reserv	39.28 km
Feneryolu Wildlife Development Area	43.83 km
Çilingöz Wildlife Development Area	101.41 km

Internationally Recognized Areas of High Biodiversity Value

Internationally Recognized Areas of high biodiversity value are defined as "areas of recognized importance to biodiversity conservation but are not always legally protected" by ESS6. These include UNESCO World Heritage Natural Sites, UNESCO Man and Biosphere Reserves, Key Biodiversity Areas, Important Bird Areas, Alliance for Zero Extinction Sites and wetlands within the scope of Ramsar Convention on Wetlands of International Importance. Guidance Note 6 also addresses that internationally recognized areas of high biodiversity value will often qualify as critical habitat; for instance, areas that meet the criteria of the IUCN's Protected Area Management Categories Ia, Ib and II, or the majority of KBAs, which encompass, among others, Important Bird and IBAs.

In Türkiye, besides the Ministry's official work, there are various non-governmental organizations (NGOs), academic entities, as well as individual researchers and professionals who work in collaboration or independently to better understand Türkiye's natural resources and put forward impactive conservation strategies to ensure survival of habitats and species, some of which constitute unique ecosystems of global conservation value.

Doğa Derneği, published an inventory on Key Biodiversity Areas (KBAs) in Türkiye in 2006 in collaboration with then the Ministry of Environment and Forestry, integrating survey results

across the country with expert opinions[30]. The preparation of the inventory was the first time the KBA approach was applied on a national scale, which was based on principles developed by BirdLife International for bird species in their “Important Bird Areas” studies. One of the fundamental functions of the inventory is defined as “providing resource for areas and species that should be worked upon to reach zero extinction”.

All Internationally Recognized Areas are located outside the AoI (see Figure 21). Because of the high level of human activity in the area and its designation as an Industrial Zone, no effects are anticipated on the KBA.

Critical Habitat Assessment

The proposed Project is located within an established industrial zone. This site has a minimal environmental sensitivity and suitability for renewable energy development. The assessment herein evaluates the potential for critical habitats and the presence of sensitive flora and fauna species at the project site.

The project area is situated within a heavily modified industrial zone characterized by a lack of natural or semi-natural habitats. Historical land use for industrial activities has resulted in significant habitat alteration. A desktop review and field survey conducted as part of this assessment confirm the absence of protected areas, Key Biodiversity Areas (KBAs), or Important Bird and Biodiversity Areas (IBAs) within or near the project site.

No threatened, endemic, or otherwise significant species of flora or fauna were recorded during the field surveys. Vegetation is largely sparse. The site does not meet any of the criteria for critical habitat as defined by the Environmental and Social Standard 6 (ESS6). Specifically, no globally or regionally significant biodiversity features are present, no habitat supporting migratory or congregatory species has been identified, and no unique ecosystems or areas of ecological importance exist within the project boundary.

The Critical Habitat Assessment concludes that the proposed solar power plant project site does not contain or impact any critical habitats, protected areas, or species of conservation concern. The project is not anticipated to result in significant biodiversity impacts and aligns with environmental sustainability objectives for renewable energy development.

[30] **Source:** Eken, G., Bozdogan, M., Isfendiyaroglu, S., Kılıç, D.T.& Lise, Y. 2006. Turkiye'nin Onemli Doga Alanlari. Ankara: Doğa Derneği

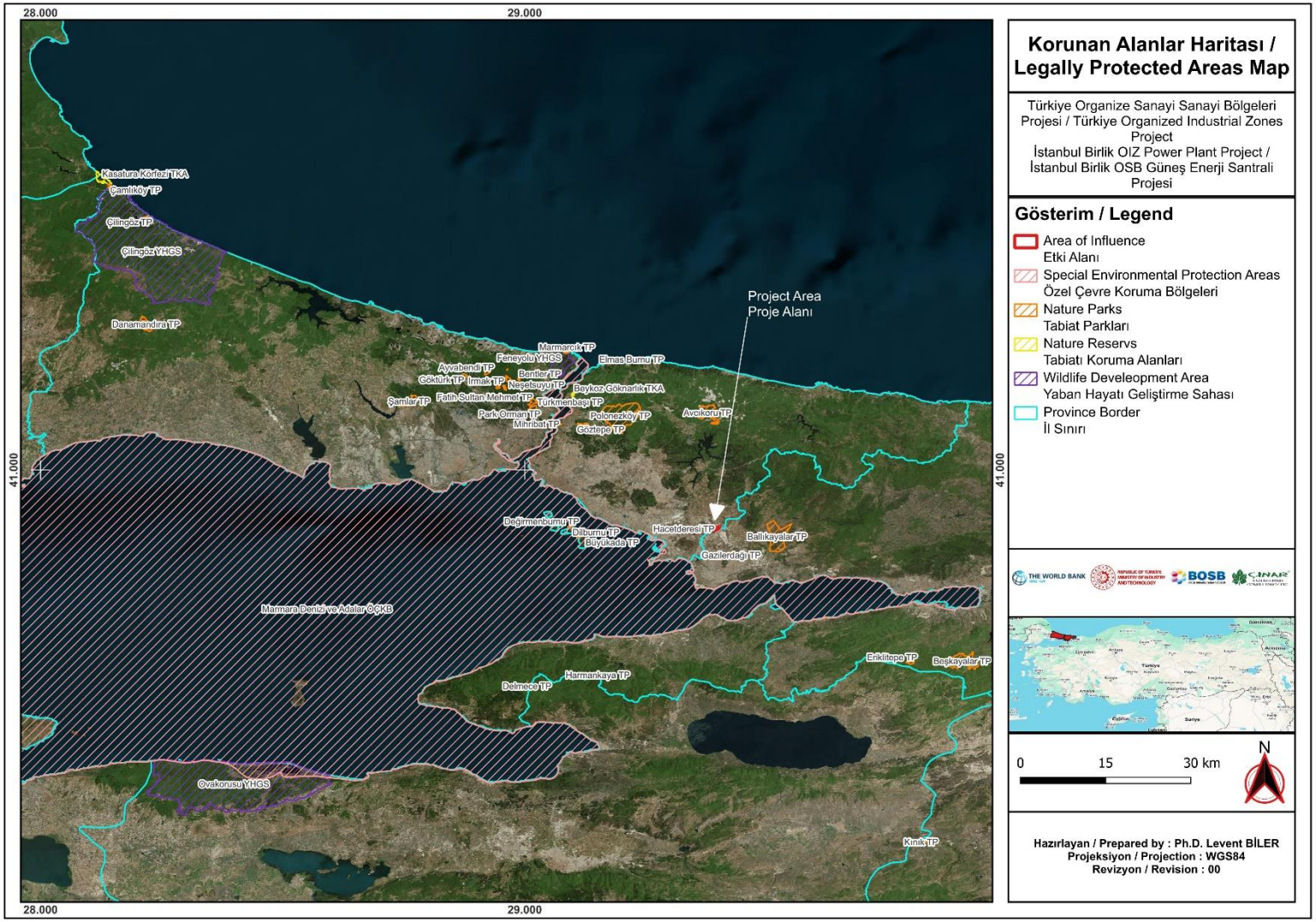

Figure 20. Legally Protected Areas

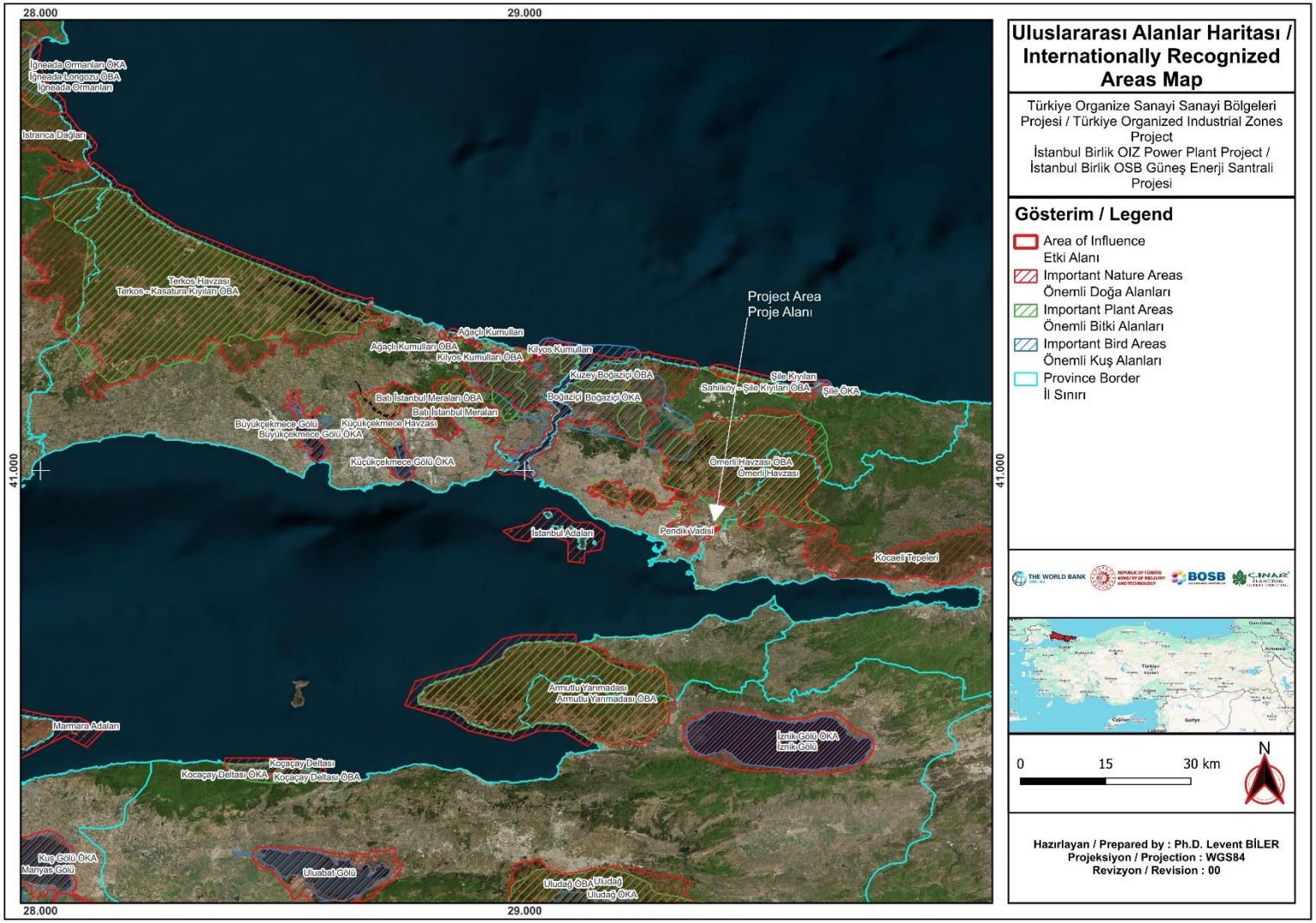

Figure 21. KBAs and the Project Area

6. SOCIAL BASELINE OF THE PROJECT

6.1 Demography and Population

İstanbul has 39 districts and is Türkiye's most populous city (15,655,924 people). Esenyurt district has the most population (978,007 people). Esenyurt is followed by Küçükçekmece, Pendik and Ümraniye, respectively. Tuzla is ranked 26th among the 39 districts with 293,604 people. The least population is observed for Adalar (16,325 people)[31].

The population of Tuzla is 293,604 with 148,950 men and 144,654 women. The population change of Tuzla district is illustrated in Table 19.

Table 19. Population of Tuzla District over the years, TURKSAT 2023

Years	Population	Man Population	Woman Population
2023	293,604	148,950	144,654
2022	288,878	146,978	141,900
2021	284,443	145,258	139,185
2020	273,608	139,481	134,127
2019	267,400	136,758	130,642
2018	255,468	130,360	125,108
2017	252,923	129,641	123,282
2016	242,232	123,941	118,291
2015	234,372	120,703	113,669
2014	221,620	114,589	107,031

According to the interview with the mukhtar of Aydınlı neighborhood, there are approximately 20,000 households in the neighborhood and the population is 70,400. The population change of Aydınlı neighborhood is illustrated in Table 20.

Table 20. Population of Aydınlı Neighborhood Over the Years, TurkStat 2023

Years	Population
2023	69,836
2022	68,777
2021	65,954
2020	62,965
2019	59,736
2018	56,882
2017	55,493
2016	52,847
2015	49,712
2014	45,811

6.2 Cultural Heritage

The project area is located within the boundaries of Birlik OIZ. During the site visit on 11.07.2024, it was confirmed that the project areas are currently used as administrative and

[31]**Source:** Turkish Statistical Institute, Address Based Population Registration System, 2023, https://biruni.tuik.gov.tr/medas/?locale=en. Access Date: September 2024.

service area buildings. Therefore, it is considered that there are no known cultural assets or archaeological artifacts in the project area.

6.3 Livelihood and Employment

İstanbul has been the center of Türkiye's economic life due to its location as an international crossroads of land and sea trade routes. The economy of İstanbul Province is based on industry, finance and tourism[32].

Tuzla is a place where many industrial establishments are gathered and the largest share in the industrial areas of the district is the Shipbuilding Industry and the Organized Leather Industry. Therefore, the employed population is mostly composed of workers employed in factories and industrial establishments. This is followed by service sector workers, self-employment groups and those engaged in agriculture/livestock/fishing[33].

Table 21. Major Economic Activities in Settlements Located in the Project AoI

Settlement	Primary Economic Activity	Secondary Economic Activity
Aydınlı Neighborhood	Paid Employment within the businesses located within the OIZ.	Agriculture Livestock

In Aydınlı neighborhood, where the OIZ is located, people are generally employed in the industrial zone. Apart from this, agriculture and animal husbandry activities are also carried out. Agricultural activities are limited to the cultivation of vegetable crops such as parsley, purslane and beetroot, and seedling cultivation. Small cattle and cattle breeding activities are also carried out and there is a slaughterhouse.

The distribution of companies in the industrial zone where the project area is located is approximately as follows according to sectors by alphabetical order[34]:

- Automotive industry (5 companies)
- Building sector (3 companies)
- Chemical industry (11 companies)
- Defense industry (1 company)
- Electricity sector (5 companies)
- Foreign trade sector (1 company)
- Furniture manufacturing (2 companies)
- Import firms (1 company)
- Machinery industry (7 companies)
- Maritime sector (2 companies)
- Medical products manufacturing (1 company)
- Metal industry (10 companies)
- Paper industry (2 companies)
- Petroleum industry (2 companies)
- Plastic product manufacturing (5 companies)
- Printing industry (1 company)
- Textile and textile products industry (1 company)
- Vegetable oil industry (3 companies)

[32] **Source:** https://www.istka.org.tr/1345/media/pdf/VNo5VAgI6bjyDMq3BAeAQCUzeIAvahY2DP8bryb4ir7UC9wDGQTR.pdf
[33] **Source:** http://nek.istanbul.edu.tr:4444/ekos/TEZ/41106.pdf
[34] **Source:** https://www.birlikosb.org.tr/firmalar/ Access Date: September 2024.

6.4 Education and Health Services

There are no educational institutions within the boundaries of Birlik OIZ. The nearest educational institution to the project area is "Şekerpınar Primary School" approximately 3.2 kilometers away. There is a Vocational Training Center Liaison Office in the OIZ Administrative Building, but it is not used. There are educational institutions in Tuzla district where the project area is located, however, these institutions are not within the project's impact area and are located at far distances.

The nearest hospital to the project area is "Tuzla State Hospital" approximately 8 kilometers away by air distance. In case of emergency, outpatient treatment services are provided by the "Doruk Joint Health and Safety Unit[35]" in Birlik OIZ.

6.5 Vulnerable/Disadvantaged Individuals/Groups and Social Equity

As per ESS10, Disadvantaged or Vulnerable Individuals or Groups (DVIG) encompass those who encounter obstacles or difficulties in fully engaging with society or are more susceptible to risks and vulnerabilities. These challenges may stem from factors like gender, economic situation, social origins, age, disability, or other conditions. Addressing their needs may necessitate tailored assistance, support, or safeguarding measures to safeguard their rights, welfare, and access to equal opportunities.

The comprehensive methodology used in the identification of DVIG can be summarized as follows:

- Considering all parties involved or affected,
- Reviewing all risks in the context of E&S specifically for vulnerable groups,
- Conducting stakeholder consultations conducted before the project, including PMU and PIU,
- Identifying gaps, if any, between national and international standards,
- Including parties that could positively benefit from the project in the category of vulnerable groups.

Disadvantaged/vulnerable individuals/groups are examined in the interviews (see Annex-18). The findings are given in Table 22.

Table 22.Distribution of DVIG by the Interviewed Companies

Stakeholder	Number of Disabled Employee	Number of Female Head of Household	Number of Foreign Employee
Kuveyt Türk	1	-	-
Vakıfbank	-	1	-
Vakıfbank – Regional Directorate	-	3	-
Schneider Electric	-	-	1
Bartek	3	10	-
BİYOSAD	-	1	-
Siyah Plan Proje	-	3	-
Akbank	-	3	-
Akademi Gurme Restaurant	2	-	-

As detailed in the table, there are disadvantaged individuals/groups such as disabled employee, female head of household or foreign employee in the interviewed stakeholders.

[35] Doruk OSGB

However, there are no disadvantaged/vulnerable individuals/groups that will be affected by the activities to be carried out within the scope of the Project AoI. Besides, it has been gathered by the interview with the mukhtar of Aydınlı neighborhood the people (around 3,000) who received social assistance has been considered as vulnerable. However, there are no disadvantaged/vulnerable individuals/groups that will be affected by the activities to be carried out within the scope of the Project AoI, too.

6.6 Land Requirement

The solar panels to be installed within the scope of the project will be located on the rooftops of five (5) different existing buildings. Project areas are:

- Banks-1 (6608/1 parcel),
- Bank (6617/18 parcel),
- Banks-2 (6617/1 parcel),
- Market (6616/10 parcel),
- OIZ Administrative Building (6615/11 parcel).

The title deeds of the buildings and OIZ spatial plan are given in Annex-2 and Annex-13, respectively.

6.7 Infrastructure Services

Infrastructure services for Aydınlı Neighborhood where the project area is located are given in Table 23.

Table 23. Infrastructure Services

Settlement	Water Resource	Irrigation Resource	Sewerage System	Waste Management	Mass Transportation Vehicle
Aydınlı Neighborhood	İSKİ Water and Sewerage Administration	-	İSKİ Water and Sewerage Administration	Tuzla Municipality	Buss

6.8 Traffic and Transportation

The nearest transportation route to the project area is D100 Highway. Traffic load and distance to the project area to D100 Highway are given in Table 24.

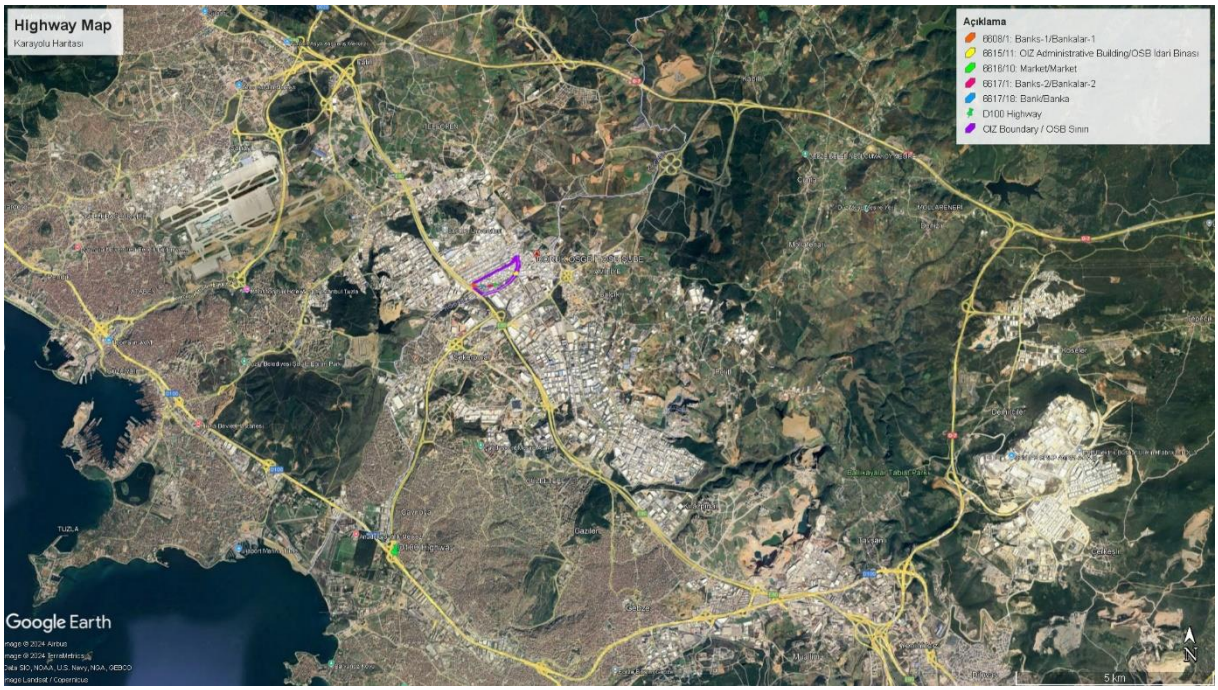

Figure 22. Distance of Project Area to D100 Highway

Vehicles that will work within the scope of construction phase of the project are given in Table 25.

According to the 2023 Traffic Volume Maps prepared by the Ministry of Transport and Infrastructure, General Directorate of Highways (see Figure 23), traffic loads of D100 Highway are presented in Table 24. The impact of a truck that will work during the construction activities of the project on the existing traffic load of the region is negligible.

Table 24. Information About Transportation Routes

Highway Name	Distance to OIZ Boundary (km)	Traffic Load
D100	6.5	Automobile: 98,791 Medium Commercial Vehicle: 12832 Bus: 504 Truck: 3,609 Truck+Trailer, Tow Truck+Semi Trailer: 4,770 Total: 120,506

Table 25. Vehicles to be Used During the Construction Phase

Vehicles	Number of Vehicles
Crane	1
Truck	1

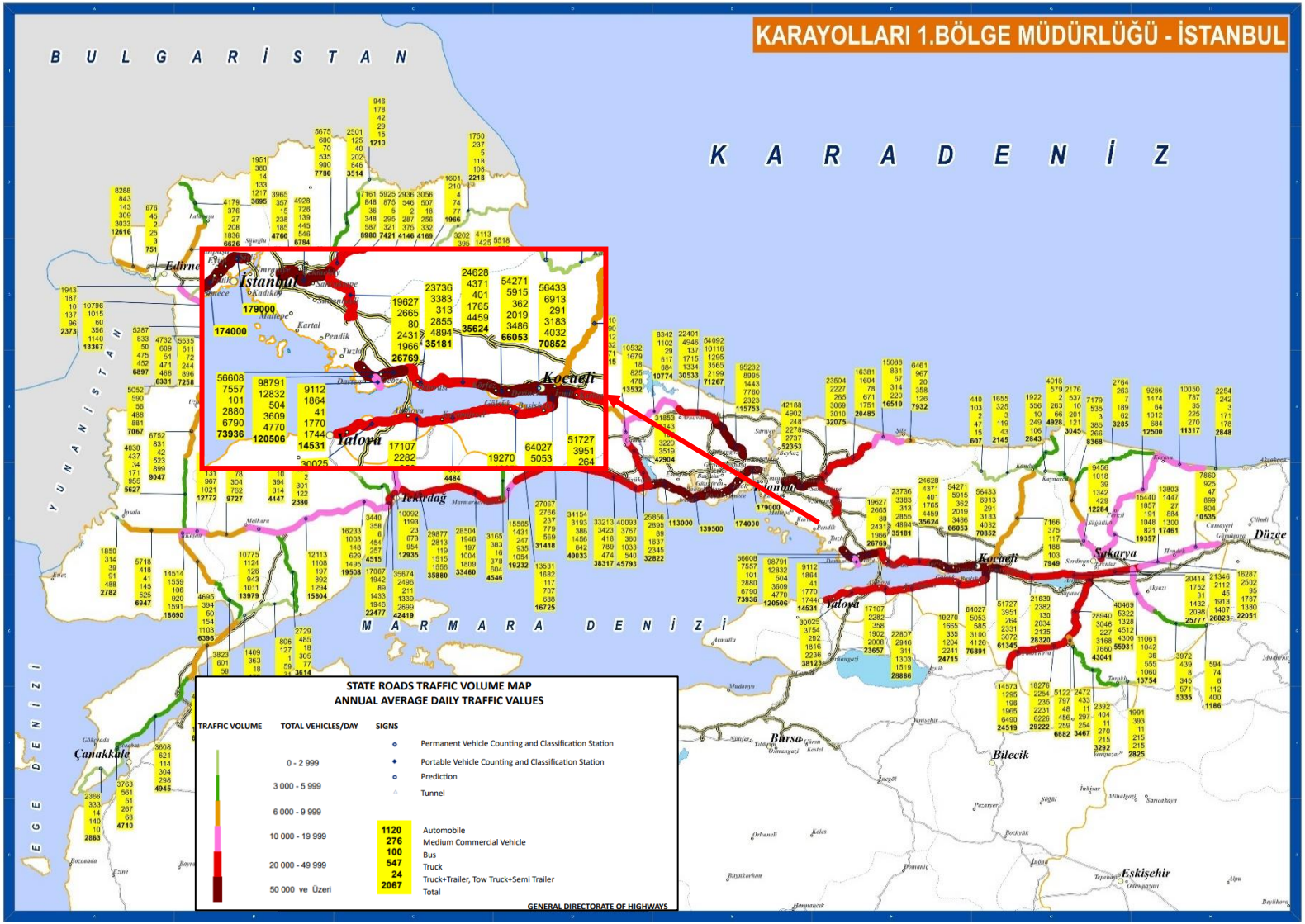

Figure 23. Highways Traffic Volume Map (2023)

7. ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS OF THE PROJECT

7.1 Environmental Risks and Impacts of the Project

In the EIA Regulation published in the Official Gazette dated 29.07.2022 and numbered 31907, the area of influence (AoI) is defined as "the area affected by a project planned to be realized before, during and after operation".

The environmental and social assessment is defined in WB ESS1 (Assessment and Management of Environmental and Social Risks and Impacts) Paragraph 23 as:

"The Borrower will carry out an environmental and social assessment of the project to assess the environmental and social risks and impacts of the project throughout the project life cycle. The assessment will be proportionate to the potential risks and impacts of the project, and will assess, in an integrated way, all relevant direct, indirect and cumulative environmental and social risks and impacts throughout the project life cycle, including those specifically identified in ESS2-10."

The environmental and social AoI of the project has been determined as 150 m-radius from rooftop SPP areas (see Figure 24-Figure 28). The 150-meter radius impact area has been determined considering environmental and social impacts of the project.

Akademi Gurme Restaurant located adjacent to the OIZ Administrative Building is within the AoI. There is also a Caribou Coffee Company under the Banks-2 building, this cafe is in the project AoI. Restaurant and cafe are not considered as sensitive receptor. These are considered as businesses in the AoIs.

There are only facilities and businesses in AoIs of project areas. There are no residential buildings in AoIs.There are no sensitive receptors such as houses, schools, mosques, health centers, etc. in AoIs of project areas. There are no educational institutions within the boundaries of Birlik OIZ. The nearest educational institution to the project area is "Şekerpınar Primary School" approximately 3,2 kilometers away by air distance. There is a Vocational Training Center Liaison Office in the OIZ Administrative Building, but it is not used. There are educational institutions in Tuzla district where the project area is located, however, these institutions are not within the project's impact area and are located at far distances. There is an "OSB Mosque" within the OIZ. The distance of this mosque to the closest project area (Market Building) is 260 meters. There is no park in AoIs of project areas.

In this section, the potential impacts of the project's pre-construction, construction and operation activities on air quality, water resources, noise level, waste management, soil quality and biodiversity were investigated.

In addition, estimated amount of air emissions, noise level increase, water use and wastewater to be generated because of the pre-construction, construction and operation activities have also been provided. The calculated values were compared with the project standards.

Assessments regarding the environmental and social risks and impacts that are foreseen to occur within the scope of the Project's pre-construction, construction and operation activities are presented under the following headings.

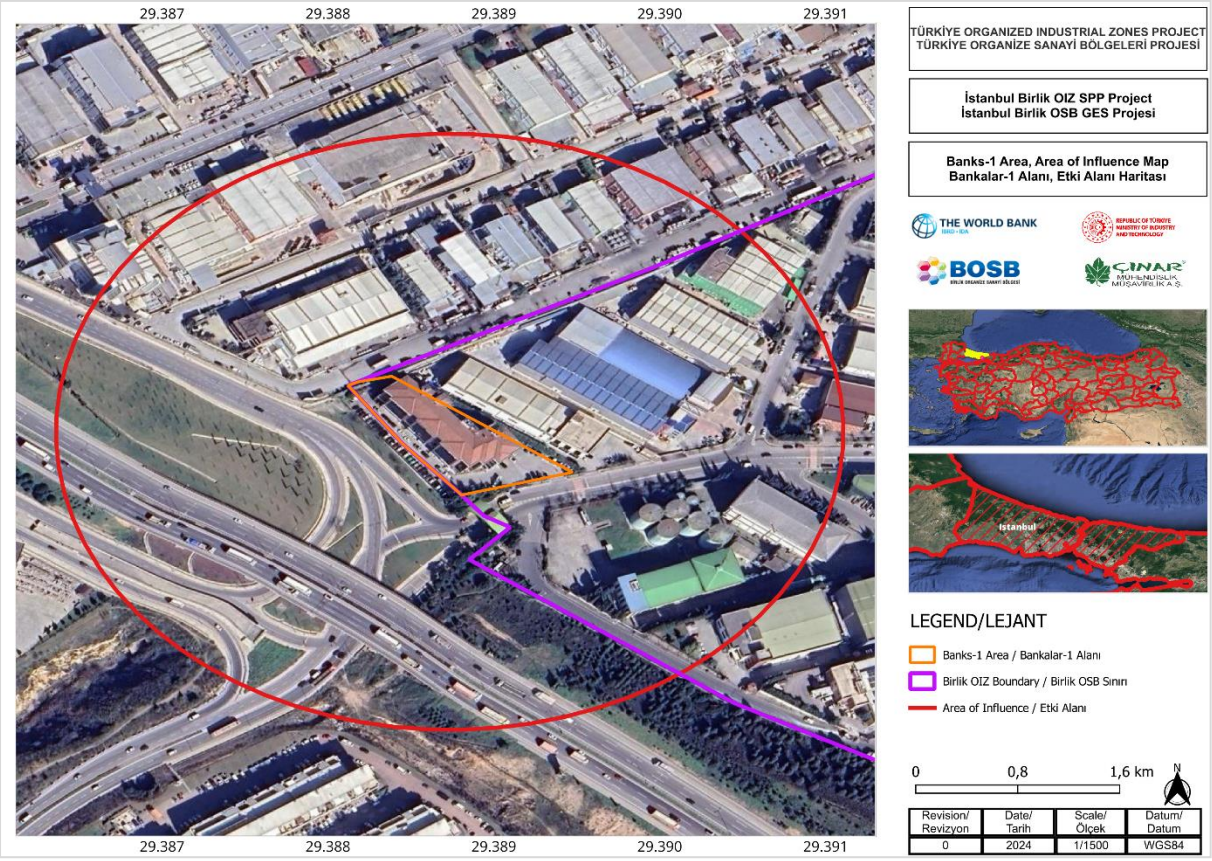

Figure 24. AoI for Banks-1 Area

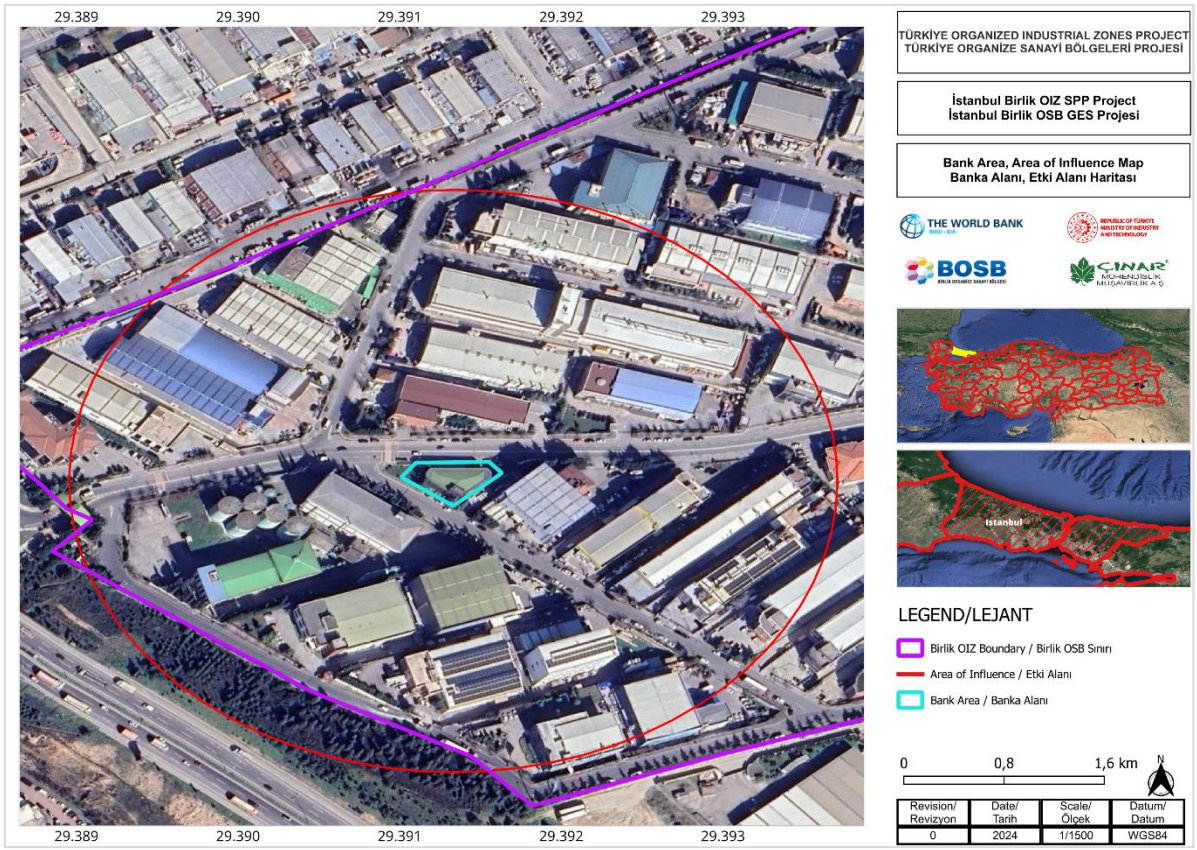

Figure 25. AoI for Bank Area

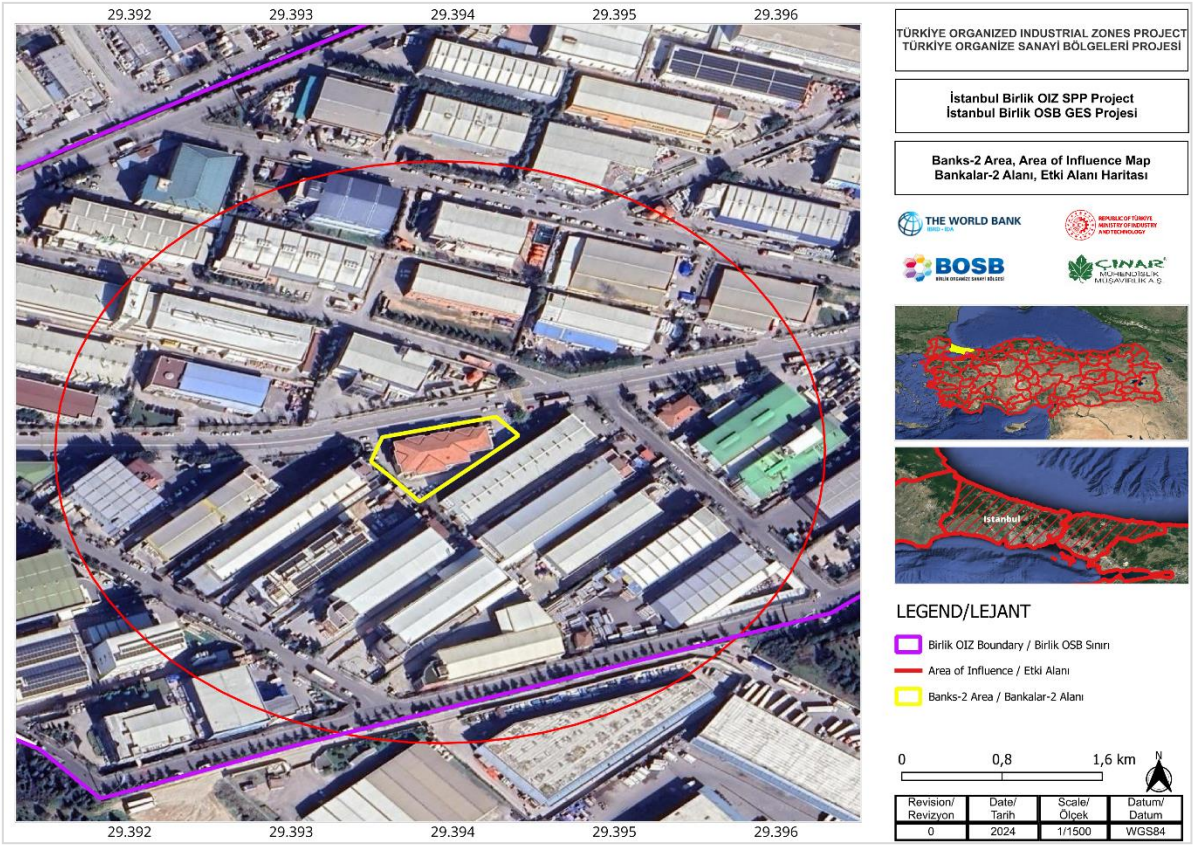

Figure 26. AoI for Banks-2 Area

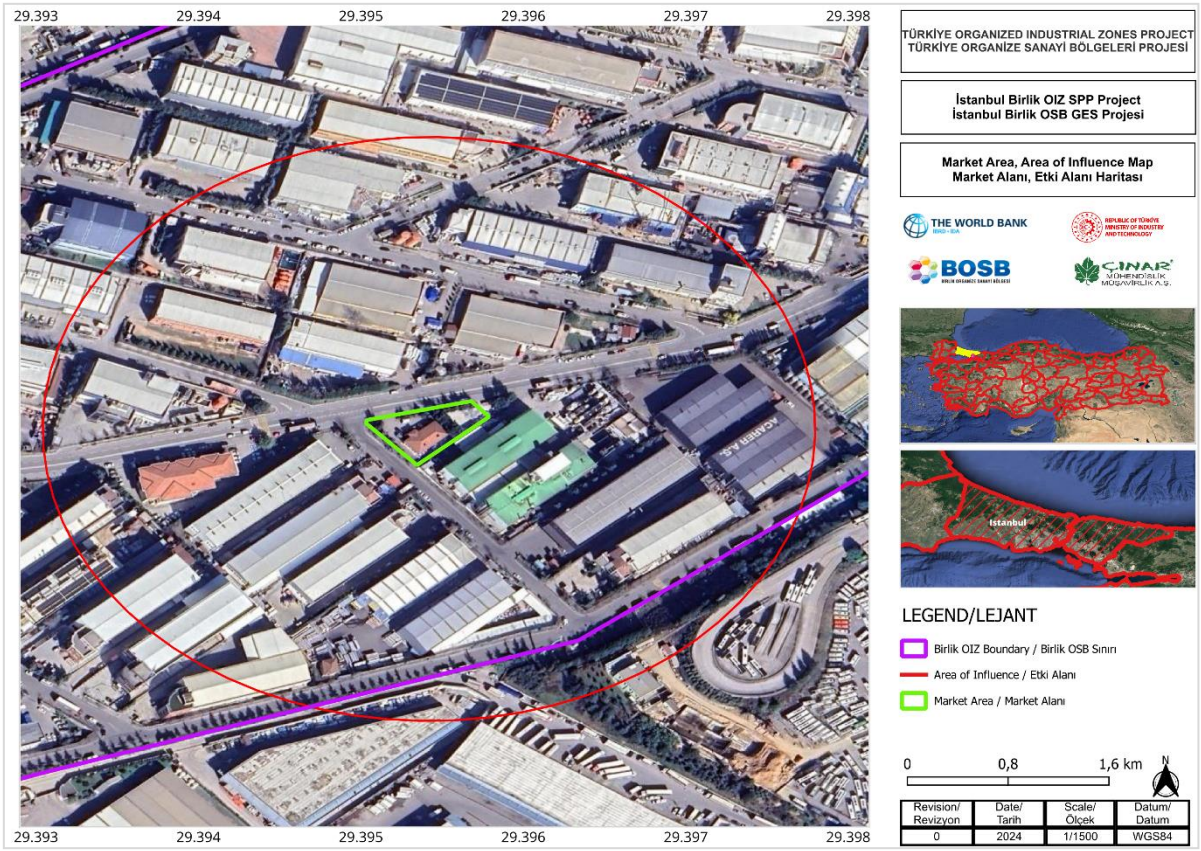

Figure 27. AoI for Market Area

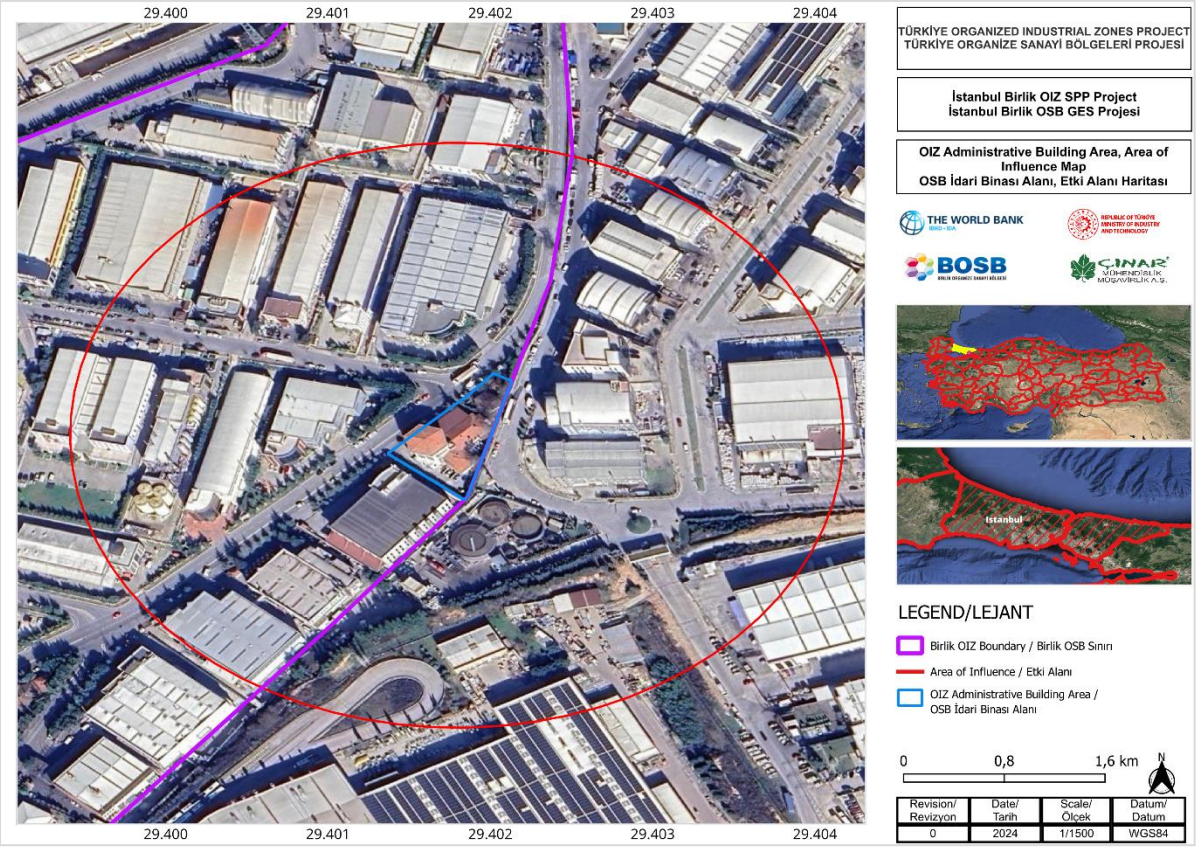

Figure 28. AoI for OIZ Administrative Building Area

7.1.1 Land Use

7.1.1.1 Construction Phase

Since the project areas are owned (see Annex-2) and used by Birlik OIZ, no land acquisition is planned. During the construction phase, all work will be confined to the areas designated for the rooftop SPPs, ensuring that there will be no significant impact on land use outside of these specified roofs. For rooftop SPPs, roof structures (static load capacity) should be evaluated and checked prior to installation of the panels to make sure that structural safety and suitability of the buildings are provided. Currently, the static works of the project was completed.

7.1.1.2 Operation Phase

During the operation phase of the project, the use of land will be limited strictly to the related building's roofs. Maintenance and repair activities will only be conducted in the event of a failure on the rooftop SPPs. As a result, there will be no new land use introduced during this phase. Consequently, no impact on land use is anticipated throughout the operation phase.

All phases of the project will meet ESS1 and ESS3 in terms of land use.

7.1.2 Geology

7.1.2.1 Construction Phase

The solar panels to be installed within the scope of the proposed sub-project will be located on the rooftops of five different buildings. Any risks/impacts on land and soil and relating to geology are not foreseen due to the sub-project activities.

The roofs where the sub-project will be performed should be controlled in terms of their static load capacity before the installation.

7.1.2.2 Operation Phase

During the operation phase of the project, SPP units will operate on the roofs of the related buildings. In this context, the project will have no impact on the geology of the region during the operation phase.

7.1.3 Hydrogeology

7.1.3.1 Construction Phase

The project area is not within the protection area of any surface water source that provides drinking and utility water. The stream beds in question have been rehabilitated against flood risk and have sufficiently wide sections and do not pose a flood risk in the Project area. There are no groundwater resources within the project's area of influence. Therefore, no significant adverse impact is expected on the existing groundwater resource status of the area due to the project activities.

With the implementation of appropriate measures, it is expected that there will be no significant impact on the region's hydrogeological structure (presence of surface water and groundwater) during the construction phase.

7.1.3.2 Operation Phase

During the operation phase of the project, SPP units will operate on the roofs of the related buildings. In this context, the project will have no impact on the hydrogeology of the region during the operation phase.

All phases of the project will meet ESS1 and ESS3 in terms of hydrogeology.

7.1.4 Climate and Vegetation

7.1.4.1 Construction Phase

The project areas are covered with filling material and/or concrete and there is no vegetation on the ground. No excavation work will be carried out during the construction phase of the project and solar panels will be located on the roofs of the related buildings. There are no trees in the project areas. Therefore, the project activities are not expected to have a significant adverse impact on climate and vegetation.

7.1.4.2 Operation Phase

There will be no work in the project areas except the maintenance/repair works. Therefore, no impact on vegetation is expected during the operation phase of the project.

The use of rooftop SPPs will promote decreased dependency on public utilities/electricity supply, increased use of renewable energy sources in various industrial sector and decrease the level of greenhouse gas emissions in the region, which will lead to have direct positive impacts against climate change and the associated effects.

All phases of the project will meet ESS1 and ESS3 in terms of climate and vegetation.

7.1.5 Soil Quality

7.1.5.1 Construction Phase

No excavation work will be carried out during the construction phase of the project. The panels will be placed on the roof of the relevant buildings with the help of a crane and then installed. In this context, there will be no direct contact with the soil. Therefore, the project activities are not expected to have significant impact on the soil structure of the region.

Technical operations such as maintenance, refueling and oil changes of the machinery and vehicles that will work during the construction phase of the project will be conducted at authorized services and that will reduce the risk of soil contamination at the project areas.

7.1.5.2 Operation Phase

During the operation phase of the project, the panels will not have any contact with the ground. Solar panels will be located on the roofs of buildings. Therefore, no impact on soil quality is expected during the operation phase.

All phases of the project will meet ESS1 and ESS3 in terms of soil quality.

7.1.6 Air Quality

7.1.6.1 Construction Phase

No excavation work will be carried out during the construction phase of the project. Therefore, no dust emission is expected. During the construction phase, only exhaust gas emissions will be generated from the construction machinery.

Dust and Exhaust Gas Emission from Vehicles

Dust and exhaust gas emissions will occur from the vehicles to be used within the scope of the construction phase of the project. The unit fuel consumption amount for all vehicles is accepted as 25 lt/h, and the specific weight of diesel is 0.845 kg/lt. It has been calculated that a total of 0.042 tons/h of diesel will be used in the vehicles to be used within the scope of the construction activities. Necessary calculations are given in Annex-4.

Calculations are made with the assumption that vehicles/work machines will work at the same time. However, vehicles and construction machines will be used at different times.

There will be no excavation within the scope of the project and no dust will be generated due to excavation. There is a “Dust” emission factor for exhaust gas emissions and it is not separated into PM_{10} and $PM_{2.5}$.

Therefore, the pollutant emissions calculated will be much less. The concentration values of the pollutants that will originate from the construction vehicles to be used are quite low. Hence, it is not expected that the emission values from the vehicles will have an adverse effect on the existing ambient air quality of the region.

The calculation results are given in Table 26. Since this calculation is based on the vehicles operating at full capacity, the calculated emission is expected to be lower in practice. Nevertheless, dust and exhaust gas emissions from construction machinery can be reduced by measures such as keeping vehicle use to a minimum, ensuring validity of the periodical exhaust emission inspections of the vehicles and training personnel. According to the calculations, air emissions from the construction phase of the project will meet the project standards.

Table 26. Air Quality Project Standards and Calculated Emission Values

Parameter	Unit	Calculated Emission Values	Project Standard
PM10	kg/hour	0.756	1
PM2.5[36]	kg/hour	0.529	
Carbon monoxide	kg/hour	0.4074	50
Hydrocarbons	kg/hour	1.218	3
Nitrous oxides	kg/hour	1.512	4

[36] *The EPA recognizes that fine particulate matter ($PM_{2.5}$) generally constitutes a large proportion of PM_{10}, often around 60-70% in urban environments where combustion processes dominate (U.S. EPA Air Quality Criteria for Particulate Matter (2004))

Parameter	Unit	Calculated Emission Values	Project Standard
Sulfoxides	kg/hour	0.273	6

7.1.6.2 Operation Phase

No excavation activities will be carried out during the operation phase of the project. There will be no use of vehicles / construction equipment for the operation phase. If there is a need for solar panels during the operation phase, the solar panel supplier company will transport the panels to the related project area using their own vehicles. Therefore, no air emissions are expected to occur during the operation phase of the project.

All phases of the project will meet ESS1 and ESS3 in terms of air quality.

7.1.7 Noise

7.1.7.1 Construction Phase

Within the scope of the project, it is planned to be used one (1) crane and one (1) truck (solar panel transportation) in construction activities.

The number and sound power levels of the vehicles and work machines to be used are given in the Table 27.

Table 27. Number and Sound Power Levels of Machinery Equipment to be used for Construction Phase

Machinery Equipment Name	Number	Sound Power Level (dB)
Crane	1	110
Truck	1	94

Noise level calculations results according to the distances are given in Annex-4 and noise level changes according to distances are given in Figure 29.

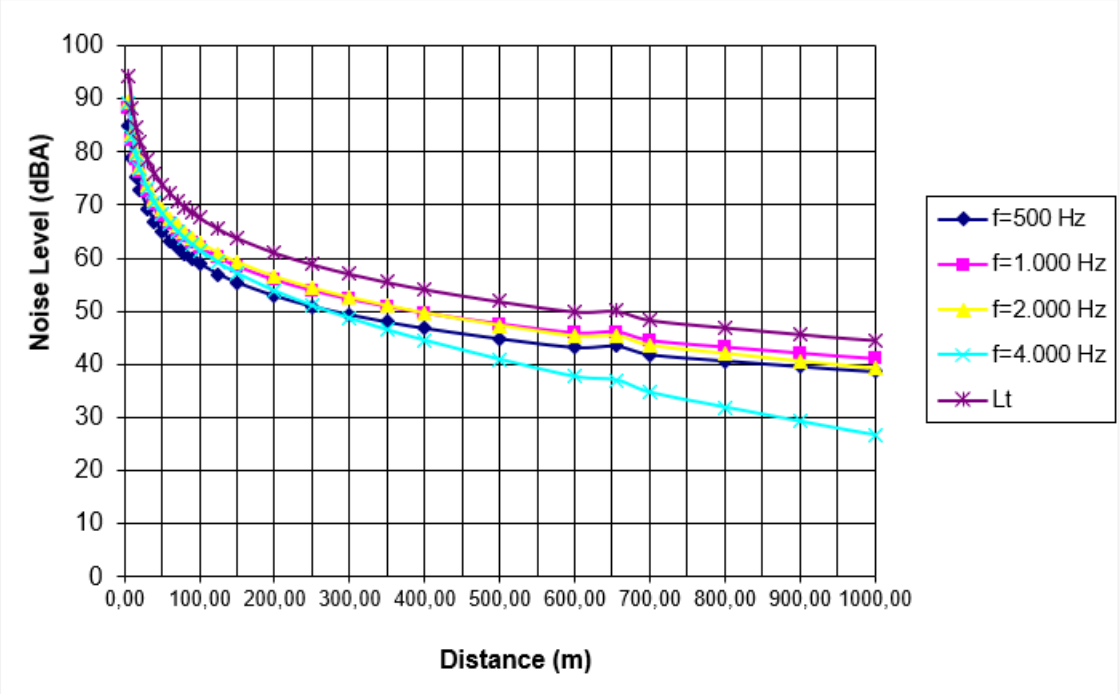

Figure 29. Change in Noise Levels According to Distances

As the results given in Annex-4, the project standard of 55 dB(A) limit value is met in closest dwellings (see Table 8). The mitigation measures given in Section 8 will be followed for These effects can be managed with standard precautions regarding construction activities (proper arrangement of working hours regarding noisy activities, providing necessary information to the surrounding residences, use of necessary PPE by personnel etc.). During construction phase, potential public complaints will be managed through the available Grievance Mechanism (see Section 11.3). Solar panels will be positioned on the roofs within one (1) day. The placement of solar panels on the roofs will be carried out with the help of a crane. The installation of the solar panels will be done manually in sections. During the fixing of the panels, minor noise may occur due to the use of hand tools. Since the crane lifting and solar panel fixing will be for a short term and limited, no significant impact in terms of environmental noise is expected if adequate precautions are taken.

However, in case of complaints from the settlements near the project area, noise measurement will be made in accordance with the national legislation in the places determined by considering the sensitivity of the receiving environment.

7.1.7.2 Operation Phase

There are no activities that may cause noise during the operation phase of the project, since the solar panels to be installed work silently. Therefore, no noise impact is expected during the operation phase of the project.

SPP Projects are exempt from noise within the scope of environmental permit.

All phases of the project will meet ESS1 and ESS3 in terms of noise.

7.1.8 Water Resources and Use

7.1.8.1 Construction Phase

There will be no use of water natural resources (surface water, groundwater etc.) for water use and no discharge to the water resources within the scope of the project, and no adverse effects on any natural water resources are expected due to the project activities.

The drinking water and utility water requirement for the construction phase will be for the personnel needs and cleaning activities during installation.

The utility water requirement of Birlik OIZ is supplied from İSKİ water network. The personnel who will work during the construction phase of the project will be provided from the project area buildings.

In case the personnel needs are met from the project area buildings within the OIZ, the water requirement will be met from İSKİ water network.

The drinking water needs of the personnel will be purchased from the market as carboy size bottled water.

The water demand for ten (10) personnel to be employed for the construction phase is calculated as follows by assuming that the daily water withdrawal per capita in İstanbul province for the year 2022 is 190 l/person-day[37] :

10 employees x 0.190 m^3/person-day = 1.9 m^3/day

There will be no accommodation within the scope of the Project, as the working time is 10 hours:

1.9 m^3/day * (10 hours/24 hours) = 0.79 m^3/day (for 10 hours)

[37] **Source:** www.tuik.gov.tr, Daily Water Use Per Capita in İstanbul Province, 2022

The water demand for cleaning activities during installation of solar panels will be approximately 20 m^3 (0.4 m^3/day)[38].

7.1.8.2 Operation Phase

No additional personnel will be employed during the operation phase of the project, water use by personnel is not expected.

With the commissioning of the planned project, water will be required for cleaning of the PV modules to increase efficiency, and the cleaning will be performed approximately every six (6) months. Clean water will be used for panel cleaning. There will be no use of chemicals/detergents together with cleaning water. Illustrative views from panel cleaning process are given in Figure 30.

In the operation phase, the water consumption for cleaning activities during maintenance and repair is expected to be 20 m^3 (0.05 m^3/day)[39].

The water to be used for washing the panels during the operation phase will be supplied from the OIZ network and brought in bottles. There will be no surface water or groundwater use during the operation phase of the Project. Since there are no natural water resources in and around the project areas, no measurements have been made. No significant impact on water resources is expected during the operation phase of the project.

Figure 30. Illustrative Views of Panel Cleaning[40]

7.1.9 Wastewater Management

7.1.9.1 Construction Phase

Assuming that all the water (%100) used by personnels will be converted into wastewater, 0.79 m^3/day (see Section 7.1.8.1) wastewater will occur in the construction phase. Cleaning of the panels will be carried out by spraying method with the help of a brush or fabric and no wastewater will be generated.

Birlik OIZ has its own infrastructure system. There is no WWTP within the OIZ. The wastewater entering the OIZ wastewater channel is directly transferred to the İSKİ sewerage system.

[38] 20 m^3 / 50 days (for installation) = 0.4 m^3/day.
[39] 20 m^3 / 365 days (1 year) = 0.05 m^3/day.
[40] **Sources:** https://www.forbes.com/home-improvement/solar/how-to-clean-solar-panels/ & https://www.bobvila.com/articles/how-to-clean-solar-panels/

Within the scope of the project, domestic wastewater generation will occur only during the construction phase. It has been stated by the Project Owner that no personnel will work during the operation phase.

The personnel who will work during the construction phase will meet their needs in the buildings (project areas) where they work. Therefore, the wastewater that will be generated during the construction phase of the project will be discharged to İSKİ sewerage system.

7.1.9.2 Operation Phase

Since no additional personnel will be employed during the operation phase of the project, no additional wastewater is generated. Cleaning of the panels will be carried out by spraying method with the help of a brush or fabric and no wastewater will be generated.

The water requirement during the construction and operation phases of the project, the quantity of wastewater generated, and the disposal methods are summarized in Table 28. Accordingly, a total of 1.19 m^3/day water will be required, and 0.79 m^3/day wastewater will be generated during construction phase, while negligible amount of water will be used during the operation phase.

Table 28. Water Usage Areas, Quantities and Wastewater Disposal Type

Period	Purpose of Use	Supply	Requirement (m^3/day)	Wastewater (m^3/day)	Disposal
Construction	Personnel domestic and drinking water	İSKİ water network	0.79	0.79	OIZ sewerage system
	Panel cleaning during installation	By Bottles/Drums from İSKİ water network	0.4	Evaporation	-
TOTAL			1.19	0.79	
Operation	Panel Cleaning	By Bottles/Drums from İSKİ water network	0.05	Evaporation	-
TOTAL			0.05	0	

7.1.10 Waste Management

7.1.10.1 Construction Phase

Within the scope of the project, during the construction of the SPPs, waste generation from materials, installation and personnel is expected. Waste generation during the construction phase will be low. Possible wastes are given in Table 29.

It is envisaged that 10 personnel will be employed during the construction phase. According to Turkish Statistical Institute (TurkStat) data, average daily municipal waste quantity is 1.13 kg/day per capita for İstanbul province in 2022.

Accordingly, daily domestic waste amount calculated for 10 personnel in land preparation and construction phases of the project is calculated as 11.3 kg/day.

During the construction phase, the packaging wastes to be generated are paper-cardboard, plastic, glass, etc. Assuming that the quantity of packaging waste generated will be approximately 20% of the total quantity of domestic solid waste, the amount of packaging waste for the construction phase is 2.26 kg/day.

Domestic wastes to be generated by personnel during the construction phase will be placed in the containers belonging to Tuzla Municipality within the OIZ.

The contractor will be responsible for the accumulation of other wastes to be generated during the construction phase and sending them to licensed companies. A clause will be added to the contract between the contractor and Birlik OIZ stating that the management of the wastes generated by the project is the responsibility of the contractor. Non-hazardous temporary waste storage areas and zero waste collection centers of OIZ will be used for temporary storage of the hazardous waste generated. The existing temporary hazardous waste storage area of the OIZ is not suitable for temporary storage of hazardous wastes that will be generated during the construction phase. In this context, a temporary hazardous waste storage area should be established by the Contractor.

The food needs of the personnel will be provided by purchasing from outside. In this context, no vegetable waste oil is expected to be generated within the site.

No medical waste generation is expected in the project area as the nearest hospital (Tuzla State Hospital) will be applied in case of health problems of the personnel to be employed.

In case of the generation of damaged solar panels during the construction phase of the project, damaged/broken solar panels will be removed from the project area by contractor. Since solar panels are not placed on the soil structure, there will be no soil contamination in case of breakage. Since solar panels may include hazardous materials such as cadmium, zinc, lead, Chlorofluorocarbons (CFCs), in the event of a release of these dangerous substances causing negative environmental effects, the concrete floor can be cleaned with an absorbent cloth/fabric, and this hazardous waste will be delivered to a disposal company. The recycling/disposal of the damaged solar panels from the project area is the responsibility of the solar panel manufacturer. According to the statement of Birlik OIZ authorities, if the damage to the solar panels is under guarantee, it is refunded, and if there is an external malfunction, the solar panel is replaced. To prevent any risk of accident/explosion/fire, the damaged/broken solar panels will be temporarily stored on the concrete floor away from the existing system, and the relevant company will be promptly informed. The damaged solar panels will be removed from the project area on the same day.

Wastes to be potentially generated during the construction phase of the project are given in Table 29.

Table 29. Construction Phase Waste Table

Waste Code	Explanation	Source	Disposal	Characteristic
20 03 01	Mixed municipal waste	Personnel activities	Tuzla Municipality's Solid Waste Collection System	Non-hazardous
15 01 01	Paper-cardboard	Product and material packages	Licensed recycling company	Non-hazardous
15 01 02	Plastic Packaging			
15 01 03	Wooden packaging			
15 01 07	Glass Packaging			
15 01 04	Metal Packaging			
18 01 03	Wastes whose collection and disposal are subject to special treatment to prevent infection	Infirmary	Licensed Medical Waste Disposal/Sterilization Plant	Hazardous
16 01 03	End-of-Life Tires	Vehicles/Work Machineries	Licensed recycling/disposal company	Non-hazardous
16 02 14	Discarded equipment other than that mentioned in 16 02 09 to 16 02 13	End-of-life solar panels	Solar panel manufacturer	Non-hazardous
16 06 05	Other batteries and accumulators	Vehicles/Work Machineries	Licensed recycling/disposal company	Non-hazardous
16 01 07*	Oil filters	Vehicles/Work Machineries	Licensed recycling/disposal company	Hazardous
20 01 35*	Recycled electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	Installation		
20 01 36	Discarded electrical and electronic equipment containing hazardous parts other than 20 01 21 and 20 01 23	Installation	Licensed recycling/disposal company	Non-hazardous
13 02 08*	Other engine, transmission and lubricating oils	Vehicles/Work Machineries	Licensed recycling/disposal company	Hazardous

Waste Code	Explanation	Source	Disposal	Characteristic
15 01 10*	Packaging materials containing residues of hazardous substances or contaminated with hazardous substances	Maintenance, repair or installation	Licensed recycling/disposal company	Hazardous
15 01 11*	Metallic packaging materials containing hazardous porous solid structure (e.g. asbestos), including empty pressure vessels			
15 02 02*	Absorbents contaminated with hazardous substances, filter materials (oil filters if not otherwise specified), cleaning clothes, protective clothing	Maintenance, repair, or installation	Licensed recycling/disposal company	Hazardous
15 02 03	Absorbents, filter media, cleaning cloths, protective clothing other than 15 02 02	Maintenance, repair, or installation	Licensed recycling/disposal company	Non-hazardous
20 01 26	Oils and fats other than 20 01 25	Refectory	Licensed recycling/disposal company	Hazardous
17 04 11	Cables other than 17 04 10	Cabling	Licensed recycling/disposal company	Non-hazardous
17 04 07	Mixed Metals	Installation	Licensed recycling/disposal company	Non-hazardous

7.1.10.2 Operation Phase

Waste generation from maintenance and repair activities is expected during the operation phase of the SPP. The maintenance/repair contractor will be responsible for the management of wastes arising from the maintenance and repair of the project units.

The type and amount of waste will be low due to maintenance and repair activities. The amount of waste will vary depending on maintenance and repair activities. Since no additional personnel will work during the operation phase, no additional domestic waste generation is expected.

In case of the generation of damaged solar panels during the operation phase of the project, damaged solar panels will be removed from the project area by the contractor. Since solar panels are not placed on the soil structure, there will be no soil contamination in case of breakage. Since solar panels may include hazardous materials such as cadmium, zinc, lead, CFCs, in the event of a release of these dangerous substances causing negative environmental effects, the concrete floor can be cleaned with an absorbent cloth/fabric, and this hazardous waste will be delivered to a disposal company. The recycling/disposal of the damaged solar panels from the project area is the responsibility of the solar panel manufacturer. According to the statement of Birlik OIZ authorities, if the damage to the solar panels is under guarantee, it is refunded, and if there is an external malfunction, the solar panel is replaced. To prevent any risk of accident/explosion/fire, the damaged solar panels will be temporarily stored on the concrete floor away from the existing system, and the relevant company will be promptly informed. The damaged solar panels will be removed from the project area on the same day.

Therefore, the significance of the impact will be low.

Wastes to be potentially generated during the operation phase of the project are given in Table 30.

Table 30. Operation Phase Waste Table

Waste Code	Explanation	Source	Disposal	Characteristic
20 01 36	Discarded electrical and electronic equipment containing hazardous parts other than 20 01 21 and 20 01 23	Maintenance and repair	Licensed recycling/disposal company	Non-hazardous
15 01 10*	Packaging materials containing residues of hazardous substances or contaminated with hazardous substances	Maintenance and repair	Licensed recycling/disposal company	Hazardous
15 01 11*	Metallic packaging materials containing hazardous porous solid structure (e.g. asbestos), including empty pressure vessels			
15 02 02*	Absorbents contaminated with hazardous substances, filter materials (oil filters if not otherwise specified), cleaning clothes, protective clothing	Maintenance and repair	Licensed recycling/disposal company	Hazardous
15 02 03	Absorbents, filter media, cleaning cloths, protective clothing other than 15 02 02	Maintenance and repair	Licensed recycling/disposal company	Non-hazardous
17 04 11	Cables other than 17 04 10	Cabling	Licensed recycling/disposal company	Non-hazardous
16 02 14	Discarded equipment other than that mentioned in 16 02 09 to 16 02 13	End-of-life solar panels	Solar panel manufacturer	Non-hazardous
20 01 35*	Discarded electrical and electronic equipment containing dangerous parts other than those mentioned in 20 01 21 and 20 01 23	End-of-life solar panels	Licensed recycling/disposal company	Hazardous

7.1.11 Natural Disaster Potential

7.1.11.1 Construction Phase

SPP units will be located on the roofs of the “Banks-1”, “Bank-2”, “Bank”, “Market” and “OIZ Administrative Building” areas which are owned and used by OIZ. Prior to the construction of these buildings, necessary permits were obtained, and ground survey studies were conducted. Therefore, no impact on the natural disaster potential of the region is expected.

All structures to be built within the scope of the project must comply with the principles of the "Regulation on Buildings to be Built in Disaster Areas" published in the Official Gazette dated 14.07.2007 and numbered 26582 of the Repealed Ministry of Public Works and Settlement and published in the Official Gazette numbered 30364 dated 18.03.2018 and published on 01.01.2019. The provisions of the "Turkish Building Earthquake Regulation" of the Disaster and Emergency Management Presidency, which came into force in 2019, will be strictly adhered to.

No negative impact on the natural disaster potential of the region is expected from the project in the construction phase.

7.1.11.2 Operation Phase

If national legislation (Regulation on Buildings to be Built in Disaster Areas) is complied with during the operation phase, no negative impact is expected from the project in this regard during the operation phase.

7.1.12 Biodiversity and Protected Areas

Due to the project area is situated within the Organized Industrial Zone and under high human activity, no expected impact on protected areas, habitats, or species has been identified. As a result, no risks are associated with the project.

7.1.13 Pesticide Use and Management

7.1.13.1 Construction Phase

No pesticides will be used during the construction phase of the project. Therefore, no adverse impact is expected due to the use of pesticides.

7.1.13.2 Operation Phase

No pesticides will be used during the operation phase of the Project. Therefore, no adverse impact is expected due to the use of pesticides.

If landscaping is carried out in project areas during operation and pesticides are used during this work, the following issues should be complied with the scope of WB ESS3.

- Where possible, the use of persistent organic pollutants (POPs) in pesticide formulation should be avoided or minimized.
- Safety rules for storage, handling and distribution of pesticides should be followed to minimize the potential for misuse, spillage and accidental human exposure.
- The use of pesticides containing chemicals listed in Annex III of the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade should be avoided.

7.2 Social Impacts of the Project

7.2.1 Population/Demography

7.2.1.1 Construction Phase

The timeline of the project is given in Table 3. The 8-month period covered the pre-construction and construction phases of the project (obtaining permits and construction of SPPs). The construction phase of the project is planned to last for three (3) months (90 days), with the installation of the solar panels will take between 7-10 days depending on the building. Ten (10) personnel will be employed during the construction phase.

No accommodation will be provided for project workers. Transportation to the project area will be arranged by the Contractor. The limited number of workers ensures no impact on the population and demography of close-by settlements. Therefore, there is no expected labor influx.

7.2.1.2 Operation Phase

There will be no employment during the operation phase of the project. Therefore, there is no expected impact on the population/demography. There will be service contracting for maintenance and panel cleaning and no permanent staff will be employed. There is an electrical engineer within OIZ for the management of SPP sites.

7.2.2 Cultural Heritage

The Project areas are located within the boundaries of OIZ. Therefore, it is considered that there are no cultural assets or archaeological artifacts in the project areas. Since no excavation will be carried out within the scope of the project, no cultural assets or archaeological artifacts are expected to be encountered during construction/operation activities. Site visits confirm no known cultural assets or archaeological artifacts in or around the project areas. In this context, a "Chance Find Procedure" has been prepared for the construction and operation phases of the project (see Annex-7). If any archaeological remains or objects are found, the construction activities will be stopped, and the Museum Directorate will be informed immediately pursuant to Article 4 of Law No. 2863.

7.2.3 Economy/Employment

7.2.3.1 Construction Phase

The project timeline, as outlined in Table 3, indicates a three-month (90 days) construction phase. The installation of the solar panels will take between 7-10 days depending on the building. The construction phase will involve the employment of 10 personnel.

Transportation to the site will be arranged by the Contractor. The Project Owner is responsible for providing minimum legal labor standards according to LMP of the TOIZP and as per ILO regulations. Full compliance with all Turkish Laws and International Labor Organization Conventions regarding child labor, forced labor, discrimination, freedom of association, collective bargaining, working hours and minimum wages. Work permits will be monitored, and recruitment will adhere to legal practices, avoiding unregistered, child, or forced labor.

To mitigate adverse impacts on employees/visitors in the “Banks-1”, “Banks-2”, “Bank”, “Market” and “OIZ Administrative Building”, contractors must develop own Labour Management Plan based on the LMP of the TOIZP, and provide written contracts to employees, with job description, working hours, wages, code of conduct training, ensuring workers understand and sign it during recruitment. The Project Owner oversees this process. The construction phase aims to offer temporary employment, prioritizing local materials and services to positively impact the local economy. Given the limited workforce and construction duration, the Project's impact on the local economy and employment is expected to be positive, local, and minor. Therefore, there is no expected labor influx.

7.2.3.2 Operation Phase

There will be no employment during the operation phase. There will be service contracting for maintenance and panel cleaning and no permanent staff will be employed. There is an electrical engineer within OIZ for the management of SPP sites.

7.2.4 Vulnerable/Disadvantaged Groups

7.2.4.1 Construction Phase

According to meetings, disabled people, female head of households, and foreign employee have been asessed (see Table 22); however, there are no disadvantaged people or groups that will be affected by the Project activities.

In the project meetings, stakeholders were concerned about noise.

7.2.4.2 Operation Phase

No impacts for vulnerable/disadvantaged groups are expected during the operation phase of the Project.

7.2.5 Land Acquisition

There is no land acquisition within the scope of the project.

7.2.6 Working Conditions and Labour Management

7.2.6.1 Construction Phase

Working conditions during construction phase will be managed by Project owner and contractor in line with the following items.

The project owner's responsibilities are outlined as follows:

- Ensure voluntary employment relationships to preserve the dignity of the workforce.
- Practice for equal opportunities and fair treatment in the workplace, eliminating discrimination and harassment based on factors such as language, race, sex, political opinion, philosophical belief, and religion in labor relations.
- Recognize the right to freedom of association without fear of reprisal and uphold the right of workers to engage in collective bargaining.
- Foster a harmonious employer-employee relationship through dialogue and negotiation to establish fair employment conditions.
- Ensure adherence to LMP, LM Plan, and ILO conventions to scrutinize working hours to prevent exploitation and establish minimum wage levels to ensure a decent standard of living.
- Ensure full compliance with ethical labor practices for a socially responsible work environment.
- Implement the right to collective bargaining in accordance with Law No. 6356 on Trade Unions and 4857 Labour Law on Collective Bargaining.
- Guarantee an efficient Project grievance mechanism to address concerns.
- Provide workers with detailed written contracts encompassing job descriptions, working hours, wages, rights and responsibilities, a code of conduct, and information about the workers' grievance mechanism.
- Minimize potential impacts on surrounding neighborhoods by offering amenities within the Project Area aligned with the employees' needs.
- Support this application with a Human Resources Policy compliant with the European Convention on Human Rights and the Turkish Constitution.

The responsibilities of Contractor also mentioned as follows:

- Contractor will develop its own LM Plan. This plan will encompass various provisions, including the assurance that workers will be provided with written contracts detailing job descriptions, working hours, wages, rights and duties descriptions, and a Code of Conduct, among other aspects.
- Informing MoIT PIU of any issues related to their engagement with stakeholders
- To keep local communities informed about any environmental monitoring activities such as noise, vibration, water quality monitoring, etc.
- To ensure transparency and awareness regarding the environmental impact of the project.
- To develop and implement a GM specifically for the workforce, before commencement of any works on site, including subcontractors.
- To address and resolve any concerns or grievances that may arise among the workforces.
- Strictly adhere to international standards by prohibiting child labor and forced labor.

7.2.6.2 Operation Phase

The responsibilities determined for the construction period, regardless of the number of employees, will also apply to the operation phase in accordance with LM Plan, LMP, ILO conventions, and national legislation. Details of the key mitigation measures for operation phase for potential E&S impacts related to labor conditions are given in Table 1.

7.2.6.3 Training

To mitigate potential E&S impacts related to labor conditions training programs will be implemented during construction and operation phase to cover requirements of ESS2. Items will be provided under training programs are occupational health and safety, labor conditions, GM, GBV and SEA/SH. All the staff should participate in these training sessions. Trainings will be conducted by the assigned experts of Project owner and contractor. Besides, Consultant (ÇINAR) will conduct ESMP training session prior to construction activities. Outputs of the provided trainings such as training records will be monitored by Project owner.

7.2.7 Community Health and Safety

7.2.7.1 Construction Phase

Public health and safety issues are associated with risk factors that may arise from the construction phase of the project. It is anticipated that employees / visitors of the nearby / adjacent facilities will be particularly affected by noise and exhaust gas emission generated during the construction phase. Exhaust gas emissions and noise impacts will be particularly intense during panel installation.

Traffic activities are expected to intensify during the supply of materials during the construction phase. Extra care should be taken especially for construction activities to be carried out in front of project implementation areas. All necessary Occupational Health and Safety (OHS) measures will be taken to ensure that both employees /visitors of the nearby / adjacent facilities and the project implementation building bare not adversely affected by the project. The Project Owner and the Contractor will comply with the mitigation measures specified in this ESMP.

In addition, the contractor will take necessary H&S measures during pre-construction and construction activities under the direction of the Project Owner, such as using appropriate warning signs. In the course of project activities, special and careful attention will be paid to

taking and implementing mitigation measures that will ensure the highest level of life safety for the people and workers in the region.

Users of the facilities in the vicinity of the project area may be exposed to physical hazards associated with project components during the construction phase. In addition, confined spaces or fall hazards may occur due to unattended infrastructure. To prevent physical hazards to people and workers associated with the project, the project area will be fenced with appropriate equipment and construction activities will be announced at least two (2) days in advance to employees /visitors of the nearby / adjacent facilities and the project implementation building , facilities / businesses

All the staff should be integrated training sessions which include grievance mechanism, gender-based violence, sexual exploitation and abuse, sexual harassment. Besides, Consultant (ÇINAR) will conduct ESMP training session prior to construction activities.

7.2.7.2 Operation Phase

No personnel will be employed during the operation phase of the project. There will be service contracting for maintenance and panel cleaning and no permanent staff will be employed. There is an electrical engineer within OIZ for the management of SPP sites. A maintenance and repair contractor will enter the project area only for maintenance and repair activities. In case of failure, maintenance and repairs will be carried out by taking the necessary OHS measures on the relevant section.

As SPP units will be on the roof of buildings during the operation phase of the project, there will be no interaction with the employees /visitors of the nearby / adjacent facilities and the project implementation building .

The necessary signs and warnings will be placed on the rooftops of the buildings in case that local community (employees/visitors in the “Banks-1”, “Banks-2”, “Bank”, “Market” and “OIZ Administrative Building”) have access to the rooftop SPP areas. The access to the rooftops of the SPPs will be restricted.

7.2.8 Traffic and Transportation

7.2.8.1 Construction Phase

It is anticipated that no significant additional load will be of concern, considering that one truck, one crane and one truck will enter the project area during the construction works to be carried out within the scope of the project. Existing traffic load assessments are detailed in Section 6.9. Traffic load map and distance to closest highway are shown in Figure 22 and Figure 23.

The vehicles that will operate during the construction phase of the project are given in Table 24. Among these vehicles, it is foreseen that only truck can use the transportation roads. Since other vehicles will operate in Project area, they will not leave the Birlik OIZ unless necessary.

The times when the traffic density is low should be preferred for crane and truck, and the necessary warning signs should be placed for the special link road. The personnel operating vehicles and heavy equipment will be dedicatedly assigned and that they will be provided with traffic and road safety training. The maintenance of the construction machinery and equipment will be carried out regularly and regulatory speed limitations will be followed for construction vehicles, and this should be included in the project areas, transport and traffic management plan to be prepared by the Contractor.

Prior to construction activities, the Contractor will install all signs, barriers and control devices needed to ensure the safe use of the road by traffic and pedestrians, as required by the transport and traffic management plan to be prepared.

7.2.8.2 Operation Phase

There will be no vehicle/work machine use during the operation phase of the project. Only vehicles belonging to the maintenance service will visit the sites at regular intervals. Necessary OHS measures will be taken during maintenance operations (see Section 8). In this context, no impact on traffic is expected during the operation phase.

7.2.9 Occupational Health and Safety

The planning to be made in the project before the installation of solar power plants and the occupational health and safety measures taken accordingly are important to prevent accidents that may occur during the installation phase of solar power plants. The dangers identified before the installation phase, the risk contained in the concept of danger and factors that these risks are related to are completely prevented or the incidents that cannot be prevented are in direct proportion to the measures to be taken. Occupational health and safety measures have adopted a proactive approach rather than a reactive approach, depending on the experiences and highlighted this approach. Compliance with the planned measures will be continuously monitored during the installation, i.e., construction phase, and during the operation phase. In this context, work will be carried out in accordance with the international standards (see Section 3) and national OHS legislation (see Annex-6).

7.2.9.1 Pre-Construction Phase

Before commencing the construction phase, a Health and Safety Plan will be prepared by Contractor[41]. The Health and Safety Plan should take into account national and international practices and encompass all necessary instructions. The Health and Safety Plan is a document prepared or ensured to be prepared by the responsible employer, project supervisor or project coordinator for the entire construction site to coordinate health and safety matters among different employers, subcontractors, self-employed individuals, and various work teams operating in the same construction area. It defines the assessment of potential risks and determines when and by whom health and safety measures, organizational structure, work methods, and related tasks should be implemented throughout the construction process.

The contractor is responsible for identifying and controlling hazards in every area, from the preparation phase of the work to the delivery phase, in all areas where the workers are involved. Additionally, mitigation measures for the pre-construction are given in Table 31.

7.2.9.2 Construction Phase

There will be no excavation within the scope of the project and solar panels will be transported to the roof of the buildings with the help of a crane. The transportation process will take approximately one (1) day for each of the project areas.

To ensure the monitoring and sustainability of health and safety issues during construction, it is necessary to establish an OHS unit. This team will consist of an occupational physician conducting periodic health examinations for the employees working during the construction phase, one (1) assistant health personnel to support them, and a full-time OHS Expert, Class A.

A Risk Assessment will be conducted to identify existing or potential hazards within the workplace, both internal and external, analyze and rank risks arising from these hazards by considering factors leading to their occurrence, and determine control measures.

[41] **Source:** 05.10.2103 dated 28786 numbered Regulation on Occupational Health and Safety in Construction Works" Article-8

Risk assessment is conducted by a team formed by the contractor. Risk assessment team consists of the following.

- Employer or employer's representative.
- Occupational safety specialists and workplace physicians providing health and safety services at the workplace.
- Employee representatives at the workplace.
- Employees designated to represent all units at the workplace and who possess knowledge about ongoing activities, existing or potential hazards, and risks within the workplace.

The completion of a risk assessment does not exempt the employer from the obligation to ensure occupational health and safety in the workplace. Furthermore, the employer provides the individuals tasked with risk assessment with any necessary information and documents related to risk assessment.

The emergency plan should be prepared by the contractor following stages starting from the design or establishment phase for all workplaces . These stages include identifying emergencies, taking preventive, and limiting measures against their adverse effects, determining designated individuals, establishing emergency intervention and evacuation methods, documentation, conducting drills, and renewing the emergency plan.

Additionally, a project-specific emergency action plan will be developed, and drills will be scheduled. Possible emergencies in the workplace are determined based on the results of risk assessments, taking into account the following and similar aspects:

- Probability of fire and explosion.
- Probability of dissemination, poisoning, and outbreak of diseases caused by hazardous chemicals, biological, radioactive, and nuclear materials.
- Probability of natural disasters occurring.
- Probability of sabotage.

The Health and Safety Plan, Risk Analysis Report, and Emergency Action Plan should be prepared in accordance with the relevant regulations and include communicable diseases precautions.

During the construction phase, the contractor will have an OHS expert on-site. Throughout the construction period, hazards that may arise will be identified, and new risks will be analyzed, leading to the regular updating of the Risk Analysis Report. All employees involved in the construction will be provided with PPE and will receive appropriate training. Since the work primarily involves assembly, qualified labor will be employed.

Employees working in the construction phase will be engaged in tasks involving working at heights, assembly. Within this scope, employees must utilize the following protective equipment: head protection (helmets compliant with TS EN 397+A1 standards), foot protection (shoes compliant with TS EN ISO 20345 standards), protective gloves (compliant with TS EN 388 and TS EN 420 standards), eye protection (compliant with TS 5560 EN 166 standards), fall protection equipment (must comply with all EN 361 parachute-type harness, EN 354 lanyard, EN 355 shock absorber, EN 362 connector standards), and workwear (compliant with TS EN ISO 13688 and TS EN ISO 20471 standards).

Work will not be permitted during rainy or windy weather conditions. Additionally, during assembly, there may be a risk of heat stroke depending on the season.

All employees involved in the construction phase will receive Human Resources training upon entry, basic OHS training, emergency response training, and basic first aid training. The selected employees for the first aid certificate will receive a separate “first aid training”. Pre- and post-training assessments will be conducted, and in cases where the training is deemed insufficient, it will be repeated. Specific training will be provided to employees working at

heights. As per TS 13885 standards, individuals attending training for working at heights must be over 18 years old and possess a health report confirming suitability for the training. Prior to commencing work at heights, a work permit form will be issued, and work will only proceed once appropriate conditions are ensured.

Additionally, mitigation measures for the construction phase are given in Table 32.

7.2.9.2.1 Permit to Work

A work permit system must be implemented to ensure that certain high-risk tasks are carried out safely. The following tasks must require a work permit: confined space work, working at heights, hot works (e.g., welding, cutting), electrical works, handling of hazardous chemicals, excavation activities, and heavy equipment operation.

During the installation of rooftop SPPs, a work permit system must be applied to ensure that high-risk tasks are performed safely. The activities requiring work permits must include:

- Working at heights
- Electrical works
- Hot works (e.g., welding, cutting, if required)
- Heavy equipment operation

These tasks must be assessed in advance to minimize occupational health and safety risks, and the required permit forms must be completed and approved by authorized personnel. The work permit process must be monitored and audited at each stage of the activity to ensure that safety measures are implemented and maintained.

7.2.9.2.2 Working at height

Special precautions will be taken for work at height:

- The areas where work will be carried out should be of sufficient strength and durability, taking into account factors such as the working personnel, the maximum weight they may carry, and the distribution of this weight. It is essential to ensure that the supporting systems and other components of these work areas are structurally sound.
- Before commencing work at heights, it is crucial to check for any hazards or risks posed by energy transmission lines or other potential danger sources in the area. Work should only begin once these hazards have been eliminated or mitigated.
- Depending on the nature of the work being performed at heights, only personnel who are both qualified and experienced in working at heights and are in good health should be assigned to such tasks.
- Safe access to work areas should be provided for employees, along with appropriate ascent and descent equipment and tools.
- The safety of workers in work areas should primarily be ensured through collective protection measures such as safety railings, fall prevention platforms, barriers, covers, work scaffolds, safety nets, or airbags.
- In cases where collective protection measures cannot be implemented, and the risk of falling cannot be entirely eliminated, lifelines should be installed, and full-body harness systems (parachute-type safety harness) or similar safety systems should be used.
- Workers in these areas should be informed about the hazards and risks associated with working at heights and should receive the necessary training.
- Work at heights should be carried out under the supervision and control of a competent person appointed by the employer.
- Measures should be taken to prevent the falling of hand tools and other materials used in work at heights.
- Waste materials or surplus items generated during work at heights should not be dropped directly to the ground from any height. Instead, they should be lowered down

in a balanced and safe manner and properly stored in a suitable location. Safe methods for waste material removal, such as chute systems, should be preferred.

- Personnel without parachute-type safety harnesses or working in areas without a lifeline will not have their work permits approved, and they will not be allowed to work.

7.2.9.2.3 Working with chemicals

Chemical hazards denote the potential for sickness or injury arising from either a single acute exposure or repeated chronic exposure to substances that are toxic, corrosive, sensitizing, or oxidative. There is also a risk of uncontrolled reactions, such as fire and explosion, if incompatible chemicals are unintentionally mixed. The most effective prevention of chemical hazards involves a hierarchical approach encompassing the following strategies:

- Substituting the hazardous substance with a less harmful alternative.
- Implementing engineering and administrative controls to prevent or minimize the release of hazardous substances into the work environment, thereby maintaining exposure levels below internationally established limits.
- Minimizing the number of employees exposed or likely to be exposed.

During the construction phase, the use of chemical substances is not of a concerning magnitude. However, in cases where working with chemical substances is necessary:

The Health and Safety (H&S) Unit will conduct assessments related to the chemicals used, and hazard cards will be created. These hazard cards, along with Safety Data Sheet (SDS) and, will be posted at accessible points in areas where chemicals are stored and used. Personnel working with chemicals will be provided with suitable equipment and PPE in accordance with the working conditions and the chemicals, and the procurement and stock process will be overseen by the respective departments.

7.2.9.2.4 Fire and Explosion

To prevent the risks of ignition, explosion, and fire, avoidance, reduction, engineering controls, and other internationally accepted control methods will be implemented.

In solar energy construction projects, internationally recognized control methods and engineering measures for fire detection, containment, and extinguishing are paramount. Within these initiatives, various safety precautions must be implemented to mitigate the risk of fire and ensure effective response in the event of a fire outbreak. Specialized detection systems such as thermal and smoke detectors can be employed for fire detection in solar energy systems. Additionally, fire suppression technologies like automatic sprinkler systems or CO_2-based extinguishing methods may be favored. Engineering measures encompass system isolation, material selection, and assembly standards aimed at minimizing fire hazards. All these measures play a crucial role in ensuring the safety of personnel and facilities involved in solar energy construction.

Employees will be trained on what to do in emergency situations, team responsibilities and coordination, and the management and execution of operations within the scope of the emergency response plan.

7.2.9.2.5 Noise

During the construction phase, the source of noise is the work equipment. The contractor should consider the noise emission characteristics of equipment when selecting equipment for the project and select the least noisy machine available to perform the specific work. Employees should be provided with ear protection (PPE) to prevent them from being harmed by the noise.

Every employee who will work in areas with a noise level of 80 dB(A) or higher should receive training before starting work. This training should cover the potential effects of noise on hearing, the purpose of ear protectors, their advantages and disadvantages, proper usage, determining the appropriate type of protection, maintenance, and cleaning. Hearing protectors

(PPE) should be distributed to employees. These training sessions should be renewed annually. Additionally, regular annual examinations and audiometric tests should be conducted for employees before and after employment to monitor potential hearing damage.

Exposure action values and exposure limit values to be complied with throughout the construction phase are provided below according to the relevant legislation[42].

- Minimum exposure action values: 80 dB(A). When the ambient noise level reaches 80 dB(A), hearing protectors (PPE) should be readily available.
- Maximum exposure action values: 85 dB(A). The effect of ear protectors is not considered in exposure action values. When the ambient noise level reaches 85 dB(A), hearing protectors (PPE) must be used.
- Exposure limit values: 87 dB(A). When applying exposure limit values, the protective effect of the personal hearing protection devices used by employees is also taken into account when determining the employee's exposure.

7.2.9.2.6 Vibration

During the construction phase, the source of vibration is once again the work equipment. To prevent employees from being harmed by vibration, regular maintenance of the work equipment will be carried out. Additionally, working hours for employees will be organized.

Exposure action values and exposure limit values to be complied with throughout the construction phase are provided below according to the relevant legislation[43].

For hand-arm vibration:

- Daily exposure limit value for an eight-hour working period: 5 m/s².
- Daily exposure action value for an eight-hour working period: 2.5 m/s².

For whole-body vibration:

- Daily exposure limit value for an eight-hour working period: 1.15 m/s².
- Daily exposure action value for an eight-hour working period: 0.5 m/s².

To prevent or reduce exposure;

- Risks originating from exposure to mechanical vibration are eliminated or minimized at the source, considering the feasibility of combating risks with technical developments.
- Compliance with the principles of risk prevention specified Law No. 6331 is observed for preventing or reducing exposure.
- In case it is determined that the exposure action values mentioned the employer creates and implements an action plan specifically aimed at minimizing exposure to mechanical vibration and the risks it may cause, considering the following aspects.
  - Choosing alternative working methods that reduce exposure to mechanical vibration.
  - Selecting ergonomically designed appropriate work equipment that generates the lowest possible level of vibration considering the performed task.
  - Providing auxiliary equipment such as seating that effectively reduces whole-body vibration exposure, handholds that reduce transmitted vibration to the hand-arm system, and similar equipment to reduce exposure to vibration.
  - Implementing appropriate maintenance programs for the workplace, workplace systems, and work equipment.
  - Designing and arranging the workplace and working environment appropriately.
  - Providing necessary information and training to employees on using work equipment correctly and safely to reduce exposure to mechanical vibration.

[42] **Source:** 28.07.2013 dated 28721 numbered Regulation on Protection of Employees from Risks Related to Noise
[43] **Source:** 22.08.2013 dated 28743 numbered Regulation on Protection of Employees from Risks Related to Vibration

- Limiting the duration and level of exposure.
- Regulating working hours with adequate rest periods.

7.2.9.2.7 Rotating and Moving Equipment

Injury or death can occur from unexpected starting of equipment or unapparent movements during operations, leading to entanglement, trapping, or impact on machine parts. Designing machines to eliminate trap hazards and preventing extremities from harm under normal operating conditions. Examples of proper design considerations include two-hand operated machines to prevent amputations, or the availability of emergency stops dedicated to the machine and strategically positioned.

If a machine or equipment has an exposed rotating part or an open pinch point that could jeopardize the safety of any worker, the machine or equipment should be equipped with a guard or another device that prevents access to the rotating part or pinch point. Guards should be designed and installed in accordance with appropriate machine safety standards.

The rotating components of machinery and lifting equipment used during material handling, as well as the rotating parts of hand tools that may be used during the assembly phase, can pose potential hazards. It is important to adhere to work instructions and prioritize the use of machine guards and PPE during these operations.

7.2.9.2.8 Electrical

Exposed or faulty electrical devices, such as circuit breakers, panels, cables, wires, and hand tools, can pose a serious risk to workers. Overhead wires can be struck by metal devices like poles, ladders, or vehicles with metal booms. Vehicles or grounded metal objects in contact with overhead wires can create an arc between the wires and the object without actual contact. All energized electrical devices and lines must be marked with warning signs. Check all electrical cords, cables, and hand power tools for frayed or exposed wires, and follow the manufacturer's recommendations for the maximum permitted operating voltage of portable hand tools. Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with ground fault interrupter protected circuits Power cords and extension cords should be shielded or suspended above traffic areas to protect against damage from traffic. Rubber tired construction or other vehicles that come into direct contact with, or create arcing between, high-voltage wires may need to be taken out of service for periods of 48 hours and have their tires replaced to prevent catastrophic tire and wheel assembly failure, potentially causing serious injury or death.

7.2.9.2.9 Welding / Hot Work

The welding process can generate extremely bright and intense light, posing a serious risk to a worker's eye health and, in extreme cases, leading to blindness. Additionally, prolonged exposure to the welding process can produce harmful fumes, potentially causing severe chronic illnesses. During the construction phase, if welding is required during assembly, there are important considerations to follow.

All employees involved in or assisting with welding must adhere to the work instructions. Proper eye protection, such as welding goggles and/or a full-face eye shield, must be provided for all personnel participating in or assisting with welding operations. Devices to extract and remove harmful fumes at the source may also be necessary. Paying attention to the use of PPE is crucial to reduce exposure to harmful fumes.

Working Environment Temperature

Exposure to hot or cold working conditions in indoor or outdoor environments can result in temperature stress-related injuries or death. The use of PPE for protection against other occupational hazards may accentuate and exacerbate heat-related illnesses. Extreme temperatures in permanent work environments should be avoided, and engineering controls

and ventilation practices should be implemented for this purpose. In cases where this is not feasible, as in the assembly of the project, the following precautions should be taken:

- Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly.
- Adjustment of work and rest periods based on temperature stress management procedures provided, considering both temperature and workload.
- Providing temporary shelters to protect against the elements during working activities or for use as a rest area.
- Use of protective clothing.
- Ensuring easy access to adequate hydration, such as drinking water or electrolyte drinks.

7.2.9.2.10 Ergonomics, Repetitive Motion, Manual Handling

Injuries caused by ergonomic factors, such as repetitive motion, overexertion, and manual handling, develop with prolonged and repeated exposures, typically requiring weeks to months for recovery. These OHS issues should be minimized or eliminated to maintain a productive workplace. Controls may include:

- Designing facilities and workstations with consideration for operational and maintenance workers ranging from the 5th to the 95th percentile.
- Using mechanical aids to eliminate or reduce the exertion required for lifting materials, holding tools and work objects, and implementing multi-person lifts if weights exceed set thresholds.
- Selecting and designing tools that decrease force requirements and holding times while improving postures.
- Providing user-adjustable workstations.
- Incorporating rest and stretch breaks into work processes and implementing job rotation.
- Implementing quality control and maintenance programs that reduce unnecessary forces and exertions.
- Considering additional special conditions, such as those applicable to left-handed individuals

7.2.9.2.11 Over-exertion

Over-exertion, ergonomic injuries, and illnesses such as repetitive motion, excessive effort, and manual handling are among the most common causes of injuries in constructions. To prevent and control these, construction workers should be trained in lifting and material handling techniques. Weight limits requiring mechanical assistance, or two-person lifts should be determined and communicated to the workers. Additionally, planning the layout of the work area to minimize the need for manual handling of heavy loads is essential.

7.2.9.2.12 Slips and Falls

Slips and falls on the same level associated with poorly organized work areas, especially due to factors like excessive waste material, loose construction materials, liquid spills, and uncontrolled electrical cables and ropes on the ground, are among the common workplace accidents in construction. Methods to prevent slips and falls on the same level include:

- Implementing good organization practices, such as arranging waste materials or demolition debris in designated areas away from pedestrian paths
- Regularly cleaning up excessive waste material and liquid spills
- Positioning electrical cables and ropes in common areas and marked corridors
- Using slip-resistant footwear

7.2.9.3 Operation Phase

During the operation phase of the project, there will be only maintenance and repair activities. There is a risk of electric shock during transformer maintenance and repair. For this reason, maintenance and repair operations will be carried out by experts. Warning signs regarding electrical hazards will be posted. Additionally, mitigation measures for the operation phase are given in Table 33.

7.2.9.3.1 Permit to Work

A work permit system must be implemented to ensure that certain high-risk tasks are carried out safely. The following tasks must require a work permit: confined space work, working at heights, hot works (e.g., welding, cutting), electrical works, handling of hazardous chemicals, excavation activities, and heavy equipment operation. During the operation phase of rooftop SPPs, a work permit system must be applied to ensure that high-risk tasks are performed safely. The activities requiring work permits must include:

- Working at heights
- Electrical works
- Hot works (e.g., welding, cutting during maintenance and repair, if required)
- Heavy equipment operation (during panel replacement)

These tasks must be assessed in advance to minimize occupational health and safety risks, and the required permit forms must be completed and approved by authorized personnel. The work permit process must be monitored and audited at each stage of the activity to ensure that safety measures are implemented and maintained.

7.2.9.3.2 Electrical

Exposed or faulty electrical devices, such as circuit breakers, panels, cables, cords, and hand tools, can pose a serious risk to workers.

All energized electrical devices and lines need to be marked with warning signs.

During maintenance or service, devices should be locked out (discharged and left open with a controlled locking device) and tagged out (warning sign placed on the lock).

All electrical cords, cables, and hand power tools should be checked for frayed or exposed cords, and portable hand tools should follow the manufacturer's recommendations for the maximum permitted operating voltage.

Electrical equipment used in wet or potentially wet environments should be double insulated/grounded, and equipment with ground fault interrupter protected circuits should be used.

Service rooms housing high-voltage equipment ('electrical hazard') and areas with controlled or prohibited entry should be appropriately labeled, and warning signs should indicate areas where entry is controlled or prohibited.

LockOut/TagOut, which is the locking and tagging method applied to prevent any unexpected operation of a machine or device or the discharge of hazardous substances from a line that may cause harm to employees, should be implemented. This aims to minimize workplace accidents due to electric shock. Maintenance repair teams will receive training and guidance from an OHS expert to identify hazards and risks related to their work. Personnel performing maintenance and repairs are required to possess a High Voltage Electrical Facilities (EKAT))

certificate[44]. During the operation phase of the project, there will be no permanent employment as there will be work only during maintenance and repair.

For the maintenance team, the PPE should include an electrician's helmet (EN 397+A1 and EN 50365 Class 0), electrician's footwear (EN 20345), electrician's gloves (EN 1149-1/2), and protective clothing against electric arcs. Additionally, the use of insulating mats and insulated hand tools is necessary.

7.2.9.3.3 Working at height

Fall prevention and protection measures should be implemented whenever a worker is exposed to the hazard of falling more than two meters, through an opening in a work surface. Fall prevention/protection measures may also be required for specific situations when there are risks of falling from lower heights. According to national regulations, all areas with level differences are considered hazardous, posing a risk of falling. Special precautions will be taken for working at height during cleaning and repair/maintenance of solar panels.

- It is necessary to install guardrails with mid-rails and toe boards at the edge of any fall hazard area.
- The use of fall prevention devices, including safety belts and lanyard travel limiting devices to prevent access to the fall hazard area, or fall protection devices such as full-body harnesses used in conjunction with shock-absorbing lanyards or self-retracting inertial fall arrest devices attached to a fixed anchor point or horizontal lifelines, should be considered.
- Appropriate training should be provided on the use, functionality, and integrity of the necessary PPE.
- Rescue and/or recovery plans and equipment should be included in responding to workers after an arrested fall.
- The areas where work will be carried out should be of sufficient strength and durability, taking into account factors such as the working personnel, the maximum weight they may carry, and the distribution of this weight. It is essential to ensure that the supporting systems and other components of these work areas are structurally sound.
- Before commencing work at heights, it is crucial to check for any hazards or risks posed by energy transmission lines or other potential danger sources in the area. Work should only begin once these hazards have been eliminated or mitigated.
- Depending on the nature of the work being performed at heights, only personnel who are both qualified and experienced in working at heights and are in good health should be assigned to such tasks.
- Safe access to work areas should be provided for employees, along with appropriate ascent and descent equipment and tools.
- The safety of workers in work areas should primarily be ensured through collective protection measures such as safety railings, fall prevention platforms, barriers, covers, work scaffolds, safety nets, or airbags.
- In cases where collective protection measures cannot be implemented, and the risk of falling cannot be entirely eliminated, lifelines should be installed, and full-body harness systems (parachute-type safety harness) or similar safety systems should be used.
- Workers in these areas should be informed about the hazards and risks associated with working at heights and should receive the necessary training.
- Work at heights should be carried out under the supervision and control of a competent person appointed by the employer.

[44] **Source:** Electric Power Current Facilities Regulation, which was published in the Official Gazette dated 30.11.2000 and numbered 24246.

- Measures should be taken to prevent the falling of hand tools and other materials used in work at heights.
- Waste materials or surplus items generated during work at heights should not be dropped directly to the ground from any height. Instead, they should be lowered down in a balanced and safe manner and properly stored in a suitable location. Safe methods for waste material removal, such as chute systems, should be preferred.
- Personnel without parachute-type safety harnesses or working in areas without a lifeline will not have their work permits approved, and they will not be allowed to work.

7.2.9.3.4 Working with chemicals

During the operation phase of Project, the use of chemical substances is not of a concerning magnitude. However, in cases where working with chemical substances is necessary, the H&S Unit will conduct assessments related to the chemicals used, and hazard cards will be created. These hazard cards, along with Safety Data Sheets (SDS) will be posted at accessible points in areas where chemicals are stored and used. Personnel working with chemicals will be provided with suitable equipment and PPE in accordance with the working conditions and the chemicals, and the procurement and stock process will be overseen by the respective departments.

7.2.9.3.5 Fire and Explosion

Electrical equipment is the main source of a potential fire hazard. In the event of fire catching a solar module, it is theoretically possible for hazardous fumes to be released, and inhalation of these fumes could pose a risk to human health.

Leaching of materials from broken or fire damaged PV modules. The potential for chemical releases appears to be small since the chemicals are present in the sealed PV modules when completed installations of photovoltaic systems for power generation. Releases are likely to occur only due to fires or other unusual accidents. Cadmium could be a potential concern in this setting with thin-film technologies, as would arsenic and zinc to a lesser extent. Other chemicals that have inhalation toxicity factors are present only during the manufacturing process. Solar PV modules may contain heavy metals like lead, mercury, cadmium, chromium, polybrominated biphenyls (PBBs), or brominated diphenyl ethers (PBDEs) etc.

7.2.9.3.6 Noise

During the operational phase, no significant noise that could harm the workers is expected.

7.2.9.3.7 Vibration

During the operational phase, no significant vibration that could harm the workers is expected.

Working Environment Temperature

Exposure to hot or cold working conditions in indoor or outdoor environments can result in temperature stress-related injuries or death. The use of PPE for protection against other occupational hazards may accentuate and exacerbate heat-related illnesses. Extreme temperatures in permanent work environments should be avoided, and engineering controls and ventilation practices should be implemented for this purpose. In cases where this is not feasible, as in the maintenance of the project, the following precautions should be taken:

- Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly.
- Adjustment of work and rest periods based on temperature stress management procedures provided, considering both temperature and workload.
- Providing temporary shelters to protect against the elements during working activities or for use as a rest area.

- Use of protective clothing.
- Ensuring easy access to adequate hydration, such as drinking water or electrolyte drinks.

7.2.9.3.8 Ergonomics, Repetitive Motion, Manual Handling

Injuries caused by ergonomic factors, such as repetitive motion, overexertion, and manual handling, develop with prolonged and repeated exposures, typically requiring weeks to months for recovery. These OHS issues should be minimized or eliminated to maintain a productive workplace. Controls may include:

- Designing facilities and workstations with consideration for operational and maintenance workers ranging from the 5th to the 95th percentile.
- Using mechanical aids to eliminate or reduce the exertion required for lifting materials, holding tools and work objects, and implementing multi-person lifts if weights exceed set thresholds.
- Selecting and designing tools that decrease force requirements and holding times while improving postures.
- Providing user-adjustable workstations.
- Incorporating rest and stretch breaks into work processes and implementing job rotation.
- Implementing quality control and maintenance programs that reduce unnecessary forces and exertions.
- Considering additional special conditions, such as those applicable to left-handed individuals

7.2.9.3.9 Over-exertion

Over-exertion, ergonomic injuries, and illnesses such as repetitive motion, excessive effort, and manual handling are among the common causes of injuries in maintenance. To prevent and control these, workers should be trained in lifting and material handling techniques. Weight limits requiring mechanical assistance, or two-person lifts should be determined and communicated to the workers. Additionally, planning the layout of the work area to minimize the need for manual handling of heavy loads is essential.

7.2.9.3.10 Slips and Falls

Slips and falls on the same level associated with poorly organized work areas, especially due to factors like excessive waste material, liquid spills, and uncontrolled electrical cables and ropes on the ground, are among the common workplace accidents in maintenance. Methods to prevent slips and falls on the same level include:

- Implementing good organization practices, such as arranging waste materials or demolition debris in designated areas away from pedestrian paths
- Regularly cleaning up excessive waste material and liquid spills
- Positioning electrical cables and ropes in common areas and marked corridors
- Using slip-resistant footwear

8. ENVIRONMENTAL AND SOCIAL ASPECTS, AND BEST PRACTICE MITIGATION MEASURES

The E&S baseline and E&S risks and impacts are presented in Section 6 & Section 7 and considered for the assessment of the best practice mitigation measures defined for the project. Most stringent among national legislation and WB standards and most up-to-date legislation will be complied within the scope of the project.

The mitigation plans prepared for the pre-construction, construction and operation phases are presented in Section 8.1 and Section 8.3.

This section presents cost effective and feasible measures to reduce adverse environmental and social impacts to acceptable levels. The mitigation measures in addition to the standard mitigation measures listed above are presented in Table 31, Table 32 and Table 33.

During the implementation of the mitigation plan, project standards as described in Chapter 3 will be complied with.

8.1 Mitigation Plan for the Pre-Construction Phase

Table 31. Mitigations for the Pre-construction Phase

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
PR-GN-01	Disclosure	Insufficient information	Medium	• The information on the start and finish dates of construction and working periods and the permits obtained from the provincial/district municipality and other relevant institutions/organizations (if necessary) will be shown by the contractor in a signboard that is easily visible to all personnel at the construction site. • Before the start of construction works, the local people and all relevant internal and external stakeholders will be informed of the works to be performed and the measures to be taken through stakeholder consultation meeting by project owner.	Low	Included in construction costs	Implementation: Project Owner
PR-GN-02	Permits and Pre-design	Lack of legal permits and project management	Low	• EIA Exemption Letter has been received for the project. Apart from this, the project should not be started before the necessary static calculations, ground survey studies, etc. related to the project design are completed. Project design is responsibility of Design Consultant.	Low	To be included in design costs	Implementation: Design Consultant Monitoring: Project Owner
PR-OHS-01	Occupational Health and Safety	Accidents and injuries resulting from incorrect conditions or behaviors	High	• Prior to the construction activities of the projects, consultations, assessments and plans regarding occupational health and safety (OHS Plan, Risk Assessment and Emergency Response Plan) and labor management and working conditions will be made by the contractor and shared with OIZ to prevent or, if unavoidable, reduce to an acceptable level every potential risk factor that may arise during installation. • OHS Plan, risk assessment and emergency response plan will be prepared by contractor. • OIZ Project Management Unit will guide the work to be carried out by the Contractor regarding OHS issues.	Low	Included in construction costs	Implementation: Contractor Monitoring: Project Owner
PR-OHS-02	Community Health and Safety	Access from outside and accidents that may occur due to lack of security of the project area	High	• The perimeter of the construction areas (i.e. SPP areas) will be enclosed with a fence/curtain, etc. • Warning signs will be hung. • All the staff should undergo training sessions which include OHS, grievance mechanism, gender-based violence, sexual exploitation and abuse, sexual harassment. Also ESMP training from consultant (ÇINAR) will be conducted. Traffic planning will be conducted.	Low	Included in construction costs	Implementation: Contractor Monitoring: Project Owner
PR-SE-01	Stakeholder Engagement	Insufficient stakeholder engagement activities and public consultation	Medium	• The draft E&S instruments will be disclosed both on the OIZ's and MoIT's official webpages. • A public/stakeholder consultation meeting will be held following the disclosure of the E&S instruments before the initiation of the tendering process and construction works to disseminate information on the details of the Project and project owner, potential E&S risks and impacts of the proposed subproject and relevant mitigation to be taken to manage these risks and impacts, monitoring activities, stakeholder engagement activities, GM. • An effective GM will be implemented.	Low	Included in construction costs	Implementation: Project Owner

8.2 Mitigation Plan for the Construction Phase

Table 32. Mitigations for the Construction Phase

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
CP-WWM-01	Wastewater Management	Soil and water pollution caused by wastewater generation due to improper practices during the construction phase	Medium	• Operations such as construction machinery and vehicle washing will not be carried out in the project area. • The personnel who will work during the construction phase will meet their needs in the buildings (project areas) where they work. Therefore, the wastewater that will be generated during the construction phase of the project will be discharged to İSKİ sewerage system. • Activities should not affect the availability of water for drinking and hygienic purposes.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-AQM-01	Air Quality Management	Air pollution due to dust and exhaust gas emissions	Medium	• Minimize dust from exposed work sites by applying water on the ground regularly during dry season. • Air emission levels will comply with project standards. • Workers will be trained on the management of air emissions. • Grievance mechanism will be maintained. • Dust measurements (if needed) will be carried out by an authorized laboratory in case of any complaints from the nearest stakeholders regarding dust generation. If the measured levels indicate possible pollution from the project, additional mitigation measures will be developed for the areas where most of the dust is generated, such as windbreaks and barriers, protective covers or curtains. • It will be ensured that the periodic inspections and maintenances of the construction machinery and equipment are valid, and they are used in line with the manufacturers' statements. • Construction work will not start at the same time to reduce dust generation. • Avoid burn site clearance debris (trees, undergrowth) or construction waste materials. • Keep stockpile of project materials covered to avoid suspension or dispersal of fine soil particles during windy days or disturbance from stray animals. • Reduce the operation hours of generators /machines /equipment /vehicles. • Control vehicle speed when driving through community areas is unavoidable so that dust dispersion from vehicle transport is minimized.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-NOI-01	Noise	Noise due to vehicles installation works	High	• Works will only be carried out during the day and not at night. • Noise measurements (if needed) will be carried out by an authorized laboratory in case of noise complaints from the nearest stakeholders. • Working hours will be reduced if necessary. • Installation works near sensitive areas will be carried out during local community working hours (weekday/daytime) • Workers will be trained on noise management. • Grievance mechanism will be kept active. • Project standards on noise level will be complied with. • Machinery and equipment will not be operated simultaneously. • It will be ensured that the periodic inspections and maintenances of the construction machinery and equipment are valid, and they are used in line with the manufacturers' statements. • Plan activities in consultation with communities so that noisiest activities are undertaken during periods that will result in least disturbance. • Use when needed and feasible noise-control methods such as fences, barriers or deflectors (such as planting of fast-growing trees). • Minimize project transportation through community areas. Maintain a buffer zone (such as open spaces, row of trees or vegetated areas) between the project site and residential areas to lessen the impact of noise to the living quarters.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-WM-01	Waste Management	Domestic wastes from workers in the project area	Medium	• Waste management will be carried out in accordance with the "waste hierarchy". • Personnel will be made aware of waste management through trainings. • Domestic wastes will be collected by using waste boxes located in the project buildings. • The Contractor will be responsible for waste management in the project area. The Project Owner will include this issue to the Contractor's contract. Wastes will be sent by the licensed vehicles to licensed disposal/recycling companies contracted by the Contractor. Project Owner will follow up waste management implementations.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-WM-02	Waste Management	Hazardous and non-hazardous wastes from construction activities	Medium	• Construction wastes will be segregated as recyclable, hazardous and non-hazardous. • Waste records will be kept regularly. • Non-hazardous temporary waste storage areas and zero waste collection centers of OIZ will be used for temporary storage of the waste generated. • A temporary hazardous waste storage area should be established by the contractor.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
				• Boxes/containers will be positioned on site for hazardous and non-hazardous wastes, and wastes will be sent by the Contractor. Stored wastes will be sent to licensed disposal/recycling companies contracted by the Contractor. Project Owner will follow up waste management implementations. • Hazardous and non-hazardous wastes will be stored separately from each other in line with the project standards (WB ESSs). • Temporarily stored waste will be labeled with the phrase “hazardous waste” as well as the waste code, the amount of waste stored and the date of storage. • Hazardous waste will be delivered to licensed disposal / recycling facilities by using licensed transportation vehicles. Waste transportation will be carried out with the help of online mobile waste tracking system (MoTAT). Regarding the disposal of hazardous waste, the provisions of the 'Waste Management Regulation' will be complied with. • If different categories of oils are produced from the works at the construction site, these oils will be stored separately. • Containers where waste oils are stored will be kept closed and protected from rainwater. • The maintenance of the construction machinery to be used during the construction phase will be carried out at authorized services. However, if waste accumulators or end-of-life tires are generated in the project area, they will be sent to the OIZ’s temporary waste storage area and delivered to licensed companies. • Wastes will be sent by the licensed vehicles to licensed disposal/recycling companies contracted by the Contractor. Project Owner will follow up waste management implementation. • Collect and properly dispose of small amount of maintenance materials such as oily rags, oil filters, used oil, etc. Never dispose spent oils on the ground and in water courses as it can contaminate soil and groundwater (including drinking water aquifer). • Need to raise community awareness on proper disposal of solar panels, specifically avoiding disposal of panels near water bodies. • End of life solar panels will be considered as “Discarded electrical and electronic equipment containing hazardous parts other than 20 01 21 and 20 01 23” according to relevant national legislation and will be disposed of accordingly. End of life solar panels will be stored separately and send to licensed recycling facilities.			
CP-WM-03	Waste Management	Pollution potential due to inappropriate waste storage area	Medium	• A temporary hazardous waste storage area should be established by the contractor. • The door to the waste storage area will be kept locked. The access to this area will be restricted. • Containers in the waste storage area should be labeled according to waste types. • Blind shaft should be placed in case of possible leakages in the waste storage area. • Adequate number of fire extinguishers should be positioned in the waste storage area. • A signboard should be provided and hanged in a visible place in waste storage area. • Hazardous and non-hazardous wastes will be stored separately from each other. • Waste generated during construction will be removed from the project area at the end of the day. No domestic waste from workers should be stored on site. • Contracts made with waste transportation companies will be kept up to date. • Waste records will be kept regularly. • Spill kits and appropriate fire extinguishers will be kept in the waste area to prevent spills and fire emergencies. • A waste area responsible will be determined. The waste area responsible will be Contractor’s workers. The sign containing the name, surname and contact information of the waste area manager responsible will be placed at a visible point in the area.	Low	Included in construction costs	<u>Implementation:</u> Contractor <u>Supervision/Monitoring:</u> Project Owner
CP-PST-01	Pesticide Use and Management	Pesticide Use and Management	Low	No pesticides will be used during the construction phase of the project. Therefore, no adverse impact is expected due to the use of pesticides. • If landscaping is carried out in Project areas during construction and pesticides are used during this work, the following issues should be complied with the scope of WB ESS3. • Where possible, the use of POPs in pesticide formulation should be avoided or minimized. • Safety rules for storage, handling and distribution of pesticides should be followed to minimize the potential for misuse, spillage and accidental human exposure. • The use of pesticides containing chemicals listed in Annex III of the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade should be avoided. • If asbestos or asbestos containing materials (ACM) are found at a construction site, they should be clearly marked as hazardous waste . • The asbestos should be appropriately contained and sealed to minimize exposure. • Prior to removal, if removal is necessary, ACM should be treated with a wetting agent to minimize asbestos dust. • If ACM is to be stored temporarily, it should be securely placed inside closed containers and clearly labeled. • Removed ACM must not be reused.	Low	Included in construction costs	<u>Implementation:</u> Contractor <u>Supervision/Monitoring:</u> Project Owner

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
CP-SP-01	Soil Pollution	Soil pollution caused by substances such as oil, filters, etc. from maintenance and repair of construction machinery and vehicles	Medium	• Work machine and vehicle maintenance and repair operations will not be carried out in the project area. • Maintenance and repair operations will be carried out at the authorized services. • Waste and wastewater management activities will be followed as described in this ESMP.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-SP-02	Soil Pollution	Soil pollution due to leakages such as diesel oil and oil due to malfunctions of vehicles used in project construction (accidental spillages/leakages)	Medium	• Periodic maintenance and repairs of vehicles will be carried out regularly. • Response kits / spill kits to be used in emergency situations will be kept on site. • Employees will be trained regarding spills and leaks. • Records will be kept regarding emergencies / incidents. • Soil or materials affected by the spill will be taken to a temporary hazardous waste storage area as hazardous waste.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-SP-03	Soil Pollution	Soil pollution due to leakages from broken/end of life solar panels	Low	• Since solar panels are not placed on the ground, there will be no soil contamination in case of breakage. In the event of a potential leakage, the concrete floor can be cleaned with an absorbent cloth, and the resulting waste will be delivered to a disposal company as contaminated waste. • The delivery and recycling of the end-of-life solar panel from the project areas are the responsibility of the relevant recycling company or the solar panel manufacturer, depending on the agreement. • To prevent any risk of accident/explosion/fire, the end-of-life solar panels will be temporarily stored on the concrete floor away from the existing system, and the relevant company will be promptly informed. The end-of-life solar panels will be removed from the project areas on the same day.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-CHS-01	Community Health and Safety	Accidents that may occur due to lack of security of the project area	Medium	• The boundary of the project area will be determined, and the project area will be surrounded by fences or warning equipment such as OHS curtains. • Warning signs will be hung. • The public, and nearby institutions and organizations, and health centers and schools will be informed at least two (2) days before construction works that may cause disturbance temporarily. • The grievance mechanism officer will be introduced to the local people and updated information about the grievance mechanism will continue to be provided.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-CHS-02	Community Health and Safety	Adverse impacts that may occur in OIZ traffic due to the project	Low	• Vehicles carrying project materials will not park outside the project area. • Speed limits will be obeyed. • People who use construction equipment must have a professional qualification certificate. • Warning signs regarding the speed limit will be hung around the project area. • The working hours will be adjusted according to the peak hours of transportation. • The public, and nearby institutions and organizations, and hospitals and schools will be informed at least two days before construction works that may cause disturbance temporarily. • Contractor will take necessary health and safety measures, such as using appropriate warning signs and signboards and performing irrigation in dry seasons, under the management of the Project Owner during site preparation and construction activities. • An Emergency Response Plan (ERP) will be prepared and implemented in order to be able to take and manage measures to protect public health and safety. Project employees, local people and response teams will be informed about this plan. • The project area will be fenced to avoid physical hazards to the communities associated with the project, and construction activities will be announced to the affected local people, businesses and governmental bodies at least two (2) days in advance. • Traffic management and planning will be done.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-TPS-01	Traffic and Pedestrian Safety	Direct and indirect threats posed by construction activities against traffic and pedestrians	Low	• Traffic and warning signs will be placed around and near the project area. • The project area will be made visible. • Local people will be informed about potential hazards and risks through brochures and posters left in common areas frequently used by local people such as headman's offices, hospital, health center, mosque, coffee house and marketplace. • The activities affecting the local traffic will be planned considering the rush hours of the traffic as much as possible. • All drivers involved in the project will be informed about road safety, speed limits, and traffic rules to be followed during the project, and requirements to be observed. • To prevent unauthorized access to the construction site, the construction site will be surrounded by fence/curtain/protection tape, and uncontrolled entrances will be prevented.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
CP-LC-01	Labor Conditions	Environmental and occupational accidents due to lack of competent and sufficient labor force. Improper Working Employment of Child labor, forced labor and unregistered employment	Medium	• At the beginning of the project, necessary training on environmental, social and OHS issues will be given to the project personnel and recorded. • Priority will be given to the local labor where possible and practical. • Workers will be provided access to the specific Workers' Grievance Mechanism (WGM) and be aware about this Mechanism. • The work permits of the employees will be controlled within the scope of the Project, prohibiting child labor, forced labor, and child labor under the age of 18. • Discrimination, GBV, SEA/SH, etc. in the workplace will be eliminated through trainings and violations hereof will be properly addressed • LMP of the TOIZP, WB ESS2 and the national legislation will be complied with in the working conditions. • Contractor will develop its own LM Plan in line with LMP. This plan encompasses various provisions, including the assurance that workers will be provided with written contracts detailing job descriptions, working hours, wages, rights and duties descriptions, and a Code of Conduct, among other aspects and access to a worleers' GM • Workers will be provided hygienic and adequate facilities. • Workers will be provided access to primary healthcare on site, enabling the provision of prescriptions. • Discrimination based on language, race, gender, political thought, philosophical belief and religion will be avoided in business relations.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-EE-01	Employment / Economy	Improper Working Conditions Child labor, forced labor and unregistered employment	Low	• Care will be taken to contributing to the local economy through the use of local materials and to procuring various goods and services from local resources. • Priority will be given to the local labor where possible and practical. • Efforts will be exercised to allocate employment opportunities to the local parties and the settlements within the AoIs. • The work permits of the employees will be controlled within the scope of the project, prohibiting child labor, forced labor, and child labor under the age of 18, and properly enforced. • Discrimination in the workplace will be eliminated. • Necessary measures will be taken by contractor to make sure that workers coming from outside the city undergo a training program on dialogue and communication with local communities, and that there are no social or cultural issues between host communities and external workers. It is the Project Owner's responsibility to ensure that the contractor complies with the determined criteria. • The adequate number of appropriate firefighting equipment will be always kept available at construction sites.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-CH-01	Cultural Heritage	Loss of cultural heritage	Low	• In case a cultural asset is encountered during construction phase, the work will be stopped, and the Chance Find Procedure (provided in Annex-7) will be followed, and the nearest museum directorate will be notified. • No disturbance of cultural or historic sites.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-BD-01	Biodiversity and Protected Areas	Protection	Low	• All natural habitats, wetlands and sites considered as protected areas in the immediate vicinity of the operations will not be damaged or misused. • No cutting of trees or destruction of vegetation other than on construction site. • No hunting, fishing, capture of wildlife or collection of plants.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CO-OHS-01	Occupational Health and Safety	Work stoppage due to work accident (lack of appropriate OHS measures/unsafe work environment)	High	• The workers (both regular and contractual) on the project will be provided with training on the Health and Safety policy in place, and their role in the same and refresher courses will be provided throughout the life of the project and training records will be kept. • Work permits are implemented throughout the construction works using procedures and forms. • Employees are obligated to ensure their own health and safety, as well as that of other employees affected by their actions or work, in accordance with the occupational health and safety training they receive and the employer's instructions in this regard. • Employees are obliged to use machinery, equipment, vehicles, tools, hazardous substances, transportation devices, and other production tools in compliance with the rules, use their safety features correctly, and refrain from removing or altering them arbitrarily. • Employees are required to immediately notify the employer or employee representative when they encounter a serious and immediate health or safety hazard with machinery, equipment, vehicles, tools, facilities, or buildings at the workplace, or when they observe any deficiencies in protective measures. They are obligated to collaborate with the employer and employee representative to ensure occupational health and safety measures are upheld. • Employees are obliged to use and maintain the provided personal protective equipment correctly. • Incident/accident notification will be done. • OHS records such as incident/accident, neat misses etc. will be kept.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
				• Tidy wiring for easy maintenance and reduces the risk of accidents. • Workers' access to GM for complaining about working conditions, safety etc. will be ensured. • MoIT shall obligate the OIZ concerned to report to the MoIT the details of any significant environmental or social incidents (e.g., fatalities, lost time incidents, environmental spills, etc.) within 48 hours after the occurrence of the incident or accident, and MoIT shall immediately notify the Bank upon receipt of such notification MoIT shall obligate the OIZ concerned to submit to MoIT an incident report, including root cause analysis, precautions and compensation measures taken within 30 business days of the incident.			
			High	• The contractor will ensure that no person is engaged in driving or operating construction machinery unless he/she is sufficiently competent and reliable, possess the knowledge of risks involved in the operation and is medically examined periodically. • The employee who will operate work equipment will possess a G-class driver's license, a psychotechnical report, a defensive driving certificate, and a professional competency training document (SRC (Driver) certificate).	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			Medium	• Contractor will prepare a site Emergency Preparedness and Response Procedure, which should be followed for the subjected project. • Contractor will prepare and implement OHS Plan (including OHS Risk Assessment).	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• Employment of individuals under the age of 18 should be prohibited during project construction.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• Adequate training will be provided to staff about raising awareness about use of PPE and emergency response measures.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			Medium	• Job responsibility and shifting chart will be prepared so that no person shall be over exhausted, which will ultimately lead to the accident or injuries.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• Safety sign will also be marked at appropriate places.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• It shall also be ensured that good housekeeping at the construction site is maintained to avoid slips and falls.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• Dropping/lowering of construction material or tool will be restricted and undertaken only under strict supervision if required. PPEs such as safety glasses with side shields, face shields, hard hats and safety shoes shall be mandatory at a construction site.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• Use of personal fall arrest system, such as full body harnesses and other PPE as well as fall rescue procedures to deal with workers whose fall has been successfully arrested shall also be carried out.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• During the construction phase, the source of vibration is, the work equipment. All body vibration values of the equipment in use should be measured. If the measured value exceeds the exposure action value of 0.5m/s², preventive measures should be taken. To prevent employees from being harmed by vibration, regular maintenance of the work equipment will be conducted. Additionally, the working hours of employees will be adjusted.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
			High	• The contractor will ensure that the exhausts of the work machinery are equipped with silencers (where possible) • Construction vehicles and machinery will be well maintained and not kept idling when not in use. • Earplugs shall be provided for workers placed in high noise areas.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• Risks related to the contagious diseases or any other similar will be determined for all departments through risk assessment studies.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-SE-01	Stakeholder Engagement	Insufficient stakeholder engagement activities and public consultation	Medium	Public awareness and sufficient public engagement should provide the following informative actions: • Providing information about current progress of the project to stakeholders • Disclosure and consultation regarding the project and its potential E&S risks and impacts • Implementation of project-specific GM • Use of various communication tools and consultation methods to keep open the communication channels • Providing information about MoIT and WB's grievance redress services (GRS) • Grievance mechanisms and tools other than project-specific GM implementations • Sharing in-company employment and internship opportunities.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-GM-01	Grievance Mechanism	Insufficient and/or ineffective grievance mechanism for the internal and external stakeholders	Medium	• Disclosure of project specific GM to stakeholders and keeping the GM active • Information about current progress of the project • Impact of changes in the Project on employees • Information on occupational health and safety • Providing information about MoIT and WB's grievance redress services • Grievance mechanisms and tools other than project-specific GM implementations. • Establishing employee codes of conduct and raising awareness among employees on this issue.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner

8.3 Mitigation Plan for the Operation Phase

Table 33. Mitigations for the Operation Phase

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
OP-WM-01	Waste Management	Waste generation due to maintenance and repair of SPP units	Medium	• Wastes will be segregated as recyclable, hazardous and non-hazardous. • Waste records will be kept regularly. • Non-hazardous temporary waste storage areas and zero waste collection centers of OIZ will be used for temporary storage of the waste generated. • A temporary hazardous waste storage area should be established by the OIZ. • Boxes/containers will be positioned on site for hazardous and non-hazardous wastes, and wastes will be sent by the OIZ. Stored wastes will be sent to licensed disposal/recycling companies contracted by the OIZ. Project Owner will follow up waste management implementations. • Hazardous and non-hazardous wastes will be stored separately from each other in line with the national and international standards (WB ESSs). • Temporarily stored waste will be labeled with the phrase “hazardous waste” as well as the waste code, the amount of waste stored and the date of storage. • Hazardous waste will be delivered to licensed disposal / recycling facilities by using licensed transportation vehicles. Waste transportation will be carried out with the help of online MoTAT. Regarding the disposal of hazardous waste, the provisions of the 'Waste Management Regulation' will be complied with. • If different categories of oils are produced from the works at the construction site, these oils will be stored separately. • Containers where waste oils are stored will be kept closed and protected from rainwater. • The maintenance of the construction machinery to be used during the construction phase will be carried out at authorized services. However, if waste accumulators or end-of-life tires are generated in the project area, they will be sent to the OIZ’s temporary waste storage area and delivered to licensed companies. • Wastes will be sent by the licensed vehicles to licensed disposal/recycling companies by the Contractor. • Collect and properly dispose of small amount of maintenance materials such as oily rags, oil filters, used oil, etc. Never dispose spent oils on the ground and in water courses as it can contaminate soil and groundwater (including drinking water aquifer). • Need to raise community awareness on proper disposal of solar panels, specifically avoiding disposal of panels near water bodies. • End of life solar panels will be considered as “Discarded electrical and electronic equipment containing hazardous parts other than 20 01 21 and 20 01 23” according to relevant national legislation and will be disposed of accordingly. End of life solar panels will be stored separately and send to licensed recycling facilities.	Low	No additional cost	Implementation: Project Owner
OP-SP-03	Soil Pollution	Soil pollution due to leakages from broken/end of life solar panels	Low	• Since solar panels are not placed on the ground, there will be no soil contamination in case of breakage. In the event of a potential leakage, the concrete floor can be cleaned with an absorbent cloth, and the resulting waste will be delivered to a disposal company as contaminated waste. • The delivery and recycling of the end-of-life solar panel from the Project area are the responsibility of the relevant recycling company or the solar panel manufacturer, depending on the agreement. • To prevent any risk of accident/explosion/fire, the end-of-life solar panels will be temporarily stored on the concrete floor away from the existing system, and the relevant company will be promptly informed. The end-of-life solar panels will be removed from the Project area on the same day.	Low	Included in construction costs	Implementation: Project Owner
OP-PST-01	Pesticide Use and Management	In case landscaping is needed	Low	No pesticides will be used during the operation phases of the project. Therefore, no adverse impact is expected due to the use of pesticides. However, if landscaping is carried out in Project area during operation and pesticides are used during this work, the following issues should be complied with the scope of WB ESS3. • Where possible, the use of POPs in pesticide formulation should be avoided or minimized. • Safety rules for storage, handling and distribution of pesticides should be followed to minimize the potential for misuse, spillage and accidental human exposure. • The use of pesticides containing chemicals listed in Annex III of the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade should be avoided.	Low	No additional cost	Implementation: Project Owner
OP-CHS-01	Community Health and Safety	Unauthorized access to the solar panels	Low	• Periodic safety checks will be carried out by the Project Owner. • Grounding must be done. • Safety and warning signs must be placed. • To continue GM implementation	Low	No additional cost	Implementation: Project Owner

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
				• Need to raise community awareness on electrical hazards and health and safety concerns, as well as proper maintenance of solar panels.			
OP-LC-01	Labor and Working Conditions	Environmental and occupational accidents due to lack of competent and sufficient labor force. Improper Working Conditions Child labor, forced labor and unregistered employment	Medium	• Priority will be given to the local labor where possible and practical. • Workers will be provided access to the specific WGM and be aware about this Mechanism. • The work permits of the employees will be controlled within the scope of the Project, prohibiting child labor, forced labor, and child labor under the age of 18, and enforcement will take place. • Discrimination, GBV, SEA/SH, etc. in the workplace will be eliminated through trainings, and violations will be addressed. • LMP of the TOIZP, WB ESS2 and the national legislation will be complied with in the working conditions. • Contractor will develop its own LM Plan. This plan encompasses various provisions, including the assurance that workers will be provided with written contracts detailing job descriptions, working hours, wages, rights and duties descriptions, and a Code of Conduct, among other aspects. • Workers will be provided hygienic and adequate facilities. • Workers will have access to primary healthcare on site, enabling the provision of prescriptions. • Discrimination based on language, race, gender, political thought, philosophical belief and religion will be avoided in business relations.	Low	No additional cost	Implementation: Maintenance Contractor Monitoring: Project Owner
OP-OHS-01	Emergency Preparedness and Response	Fire caused by electric arc	Low	• Periodic maintenance plan of the solar panels and cables will be prepared and implemented. • Appropriate firefighting equipment will be available in the project area. • Emergency Preparedness and Response Plan will be prepared and implemented. • Emergency teams will be formed and informed. • Employees will be trained on emergency situations and fire extinguishing drills will be carried out.	Low	No additional cost	Implementation: Project Owner
OP-OHS-02	Occupational Health and Safety- Work stoppage	Access from outside and accidents that may occur due to lack of security of the project area	High	• Warning signs will be hung. • The access to the rooftops where the SPPs are installed will be restricted during the operation phase. • Relevant OHS risks (to be determined by risk assessment) will be included in the OHS Plan of OIZ	Low	No additional cost	Implementation: Project Owner
OP-OHS-03	Occupational Health and Safety Hazard	Working at height and working with electricity (during maintenance and repair)	High	• Use of personal fall arrest system, such as full body harnesses and other PPE as well as fall rescue procedures to deal with workers whose fall has been successfully arrested shall also be carried out during the maintenance and repair works. • Only adequately trained/ certified personnel will be allowed to work at height and/or electricity.	Low	No additional cost	Implementation: Maintenance Contractor Monitoring: Project Owner
		Tripping, slipping, and falling on uneven ground (during maintenance and repair)	Medium	• Maintenance of good housekeeping will be ensured to prevent slips and falls.	Low	No additional cost	Implementation: Maintenance Contractor Monitoring: Project Owner
		Working with chemicals	High	• Personnel working with chemicals must use equipment and PPE suitable for the working conditions and the chemicals. • Personnel will work in accordance with the hazard cards prepared by the H&S Unit.	Low	No additional cost	Implementation: Maintenance Contractor Monitoring: Project Owner
OP-SE-01	Stakeholder Engagement	Insufficient stakeholder engagement activities and public consultation	Low	• Continuation of the Project specific GM • Appointment of Community Liaison Officers (CLOs) • Continue to use various communication tools and consultation methods to keep open the communication channels • Considering language-based handicaps for any kind communication techniques • Providing a living document form used in disclosure process	Negligible	Included in the Project Owner's budget	Implementation: Project Owner
OP-SE-01	Grievance Mechanism	Insufficient and/or ineffective grievance mechanism for the internal and external stakeholders	Low	• Continuation of the Project specific GM • Appointment of CLOs • Assignment of grievances to relevant departments • Monitoring of contractor's to be hired for maintenance and repair activities engaged in GM	Negligible	Included in the Project Owner's budget	Implementation: Project Owner

9. ENVIRONMENTAL AND SOCIAL MONITORING PLAN

The monitoring, review and audit program detailed in between Table 34 and Table 36 will be implemented during pre-construction, construction and operation to monitor the implementation of the environmental and social commitments of the ESMP requirements. The Project Owner and Construction Supervision Consultant will be responsible for ensuring that the Contractor and its contractor comply with applicable national and international regulations requirements.

9.1 Monitoring Plan for the Pre-Construction Phase

Table 34. Monitoring Plan for the Pre-Construction Phase

No.	**Issue**	**Parameters to be monitored** *(What parameter is to be monitored?)*	**Target/Threshold Value**	**Monitoring location** *(Where the parameter is to be monitored?)*	**Monitoring Method** *(How is the parameter to be monitored/ type of monitoring equipment?)*	**Timing/Frequency of Monitoring** *(When is the parameter to be monitored- frequency of measurement or continuous?)*	**Cost of Monitoring** *(What is the cost of equipment or contractor charges to perform monitoring?)*	**Responsible Party/Parties**
MON-PR-GN-01	Disclosure	• All Permits/approvals/certifications/official letters	• All Permits/approvals/certification/official letters are available and valid	• Project Owner's Administrative Building and Contractor's office	• Review and control of permits / approvals / certifications / official letters.	• Before construction starts	• Included in construction costs and supervision costs	Implementation: Contractor Supervision/Monitoring: Project Owner
MON-PR-TR-01	Permits and Pre-design	• Trainings on grievance mechanism, gender-based violence, sexual exploitation and abuse, sexual harassment • Trainings on ESMP	• All the staff should participate in training sessions which include OHS, Code of Conduct (CoC), grievance mechanism (GM), GBV, SEA/SH prior to construction activities. • %100 Completion of ESMP training by the Environmental and Social Consultant.	• Project Owner's Administrative Building	• Review of training documents and records	• Before construction starts	• Supervision cost	Implementation: Contractor Project Owner Supervision/Monitoring: Project Owner ESMP Training: Environmental and Social Consultant
MON-PR-OHS-01	Occupational Health and Safety	• Documents to be prepared before the commencement of construction works (OHS Plan, OHS Risk Assessment, LM Plan, etc.) • Initial E&S and OHS trainings	• %100 of documents prepared and approved (The plans have sufficient content and include COVID-19 and other contagious diseases or other outbreak precautions) • All workers trained	• Project Owner's Administrative Building • Contractor's office	• Document review • Review of training documents and records	• Before construction starts	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
MON-PR-CHS-01	Community Health and Safety	• Fencing • Warnings/signs	• Project area enclosed • Warnings/signs placed at appropriate locations within the project area	• Project Areas	• On-site inspection	• Before construction starts	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
MON-PR-SE-01	Stakeholder Engagement	• Establishment of GM • Smooth Management of Disclosure Process	• Grievances resolved in time and in mutually satisfactory manner	• Project Areas	• On-site inspection • Public consultation meetings	• Before construction starts	• Public consultation meeting cost • Supervision cost	Implementation: Contractor Supervision/Monitoring: Project Owner

9.2 Monitoring Plan for the Construction Phase

Table 35. Monitoring Plan for the Construction Phase

No.	Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties
MON-CP-AQM-01	Air Quality (dust and air emissions)	• Air quality grievance records • Dust and exhaust gas emissions • Air quality management implementations • Air quality measurements (PM10 and PM2.5 measurements in case of grievance)	• Zero non-compliance on air quality management • Zero complaint/grievance on air quality	• Project area • Sensitive receptor(s) (in case of grievance)	• On-site inspections • PM_{10} and $PM_{2.5}$ measurements to be performed by an authorized environmental laboratory at the sensitive receptor(s) in case of grievance	• In case of grievance (for measurements)Monthly starting from the initialization of construction phase •	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
MON-CP-NOI-01	Noise	• Noise grievance records • Noise management implementations (such as announcement of working schedule, periodic inspection and maintenance records of the construction machinery and equipment, etc.) • Noise measurements (in case of grievance)	• Zero non-compliances on noise management • Zero noise grievances	• Project area • Sensitive receptor(s) (in case of grievance)	• On-site inspections • Document review/checks (such as announcement records, machinery/ equipment inspection and maintenance records, etc.) • Noise measurements to be performed by an authorized environmental laboratory at the sensitive receptor(s) in case of grievance	• In case of grievance (for measurements) • Monthly starting from the initialization of construction phase •	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
MON-CP-WM-01	Waste Management	• Waste records (amount of waste generated, waste types, disposal situations, etc.) • On-site waste management practices such as proper collection and temporary storage of wastes, etc.	• Minimization of total waste generated (less than calculated in impact section) • Minimize the ratio of hazardous waste generated to total waste (by contamination and by generation) • Increase ratio of recovered/reused/recycled to landfilled	• Project area (including waste storage area(s))	• Review and control of waste records • On-site inspection regarding waste management practices such as proper collection and temporary storage of wastes, etc.	• Weekly	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
MON-CP-WM-03	Domestic Waste Management	• Domestic waste amount • Recovery /reuse /recycle ratio	• Minimization of domestic waste generated • Increase in the ratio of recovered/reused/recycled to landfilled (less than calculated in impact section)	• Project area	• Review and control of domestic waste records • On-site inspection	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
MON-CP-WM-04	Hazardous Waste Management	• Hazardous waste amount • Recovery /reuse /recycle ratio • Hazardous waste management practices including relevant documentation (such as Hazardous Waste Liability Insurance, availability and condition of temporary waste storage area, spill kits, fire precautions, etc.)	• Minimization of hazardous waste generated • Proper handling of hazardous wastes	• Project area (including waste storage area(s))	• Review and control of hazardous waste records and documents • On-site inspection	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
MON-CP-WM-05	Nonhazardous Waste Management	• Nonhazardous waste amount • Recovery /reuse /recycle ratio	• Minimization of Nonhazardous waste generated • Increase in the ratio of recovered/reused/recycled to landfilled	• Project area	• Review and control of nonhazardous waste records • On-site inspection	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
MON-CP-CH-01	Cultural Heritage	• Chance find and implementation of chance find procedure	• No cultural heritage asset is damaged	• Project area	• On-site inspection • Review and control of chance find records	• In case of chance find	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner

No.	Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties
MON-CP-BD-01	Biodiversity and Protected Areas	• Alteration in the habitat	• Zero damage to natural habitats, wetlands and sites considered as protected or sensitive areas • Zero hunting, capture of wildlife, collection of plants	• Project area	• On-site inspection	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
MON-CP-TPS-01	Traffic and Pedestrian Safety	• Traffic related grievance records • Traffic warning signs • Brochures/posters delivered • Timing plan according to rush hours • Training records of the workers on the issue	• Zero number of drivers found to be exceeding speed limits or driving unsafely • Zero road traffic accidents • Zero accidental injuries and deaths • Zero traffic-related grievances	• Project area	• On-site inspection • Documentation checks	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
MON-CP-CHS-01	Community Health & Safety	• Number of Grievances • Number of Incidents • Number of Accidents	• Effective and satisfactory resolution of all received complaints • Zero incidents • Receiving and recording complaints • Reducing the number of open complaints	• Project area • Residential areas around project area	• Records of comments/ suggestions/complaints • Site Audits • Training records • Incident/Accident Records (if any) • Number of communicable and non-communicable diseases and injuries • Number of community health safety & security complaints from local communities as recorded in the grievance management system • Number of reported community health & safety incidents	• Monthly	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
MON-CP-LC-01	Labor Conditions	• Workers' Grievances • Training records • Recruitment documentations • Number of employees	• All grievances addressed and closed-out within the target timeframe. • All employees will be trained on OHS, GM, GBV, SEA/SH trainings. ESMP training and other E&S issues by the consultant (ÇINAR) will be provided. • All recruitment documentation complied with national and international requirements.	• Project area	• Internal and external audits • Grievance records (number and nature of grievances) • Accident/incident records • Training records • Sample contracts • Human Resource Policy • Number of the local employees • Legal work permit	• Monthly	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
MON-CP-OHS-01	Occupational Health and Safety	• Use of PPE	• Specific PPE matrices will be created for work areas throughout the facility. • Personnel will be provided with equipment that is suitable for the working conditions and meets the specifications and standards outlined in the PPE matrices.	• Project area	• On-site inspection • Review and control of PPE records	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
		• Training	• Mandatory basic OHS training, emergency intervention training, and training on social rights will be provided to all employees and subcontracted personnel. • Orientation training will be mandatory for all personnel, subcontractor personnel, and anyone entering the facility. Competency tests will be conducted before and after the training.	• Project area	• On-site inspection • Review and control of training documents and records	• Continuous	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner

No.	Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties
			• All employees will receive accident investigation and root cause training following workplace accidents. • All training will be provided in Turkish and/or in a language suitable for the facility's employees.					
		• Machinery and Equipment	• A list of all work machines throughout the facility will be compiled, and their operators will be designated. Work machines will only be operated by their designated operators. Areas without personnel access will be determined to ensure that work machines do not have unauthorized individuals in their vicinity. Periodic inspections of work machines, as required by national regulations, will be monitored, and conducted by the H&S Unit. • (Regulation on Health and Safety Conditions in the Use of Work Equipment, numbered 28628 and dated 25.04.2013)	• Project area	• On-site inspection • Review and control of machinery and equipment documents and records	• Monthly	• Included in construction costs	<u>Implementation:</u> Contractor <u>Supervision/Monitoring:</u> Project Owner
		• Occupational accidents and near-miss incident records	• Records of occupational accidents and near-miss incidents will be kept systematically, and after each incident, a root cause analysis will be conducted to take measures to prevent the recurrence of the incident. • Records in Workers' GM related to OHS	• Project area	• On-site inspection • Review and control of accident and near-miss incident records • Review and control of WGM records related to OHS	• Continuous	• Included in construction costs	<u>Implementation:</u> Contractor <u>Supervision/Monitoring:</u> Project Owner
		• Safety Signs and Warning Signs	• Warning signs will be designed for the entire facility in accordance with national regulations and work areas, and all facility warning signs will be updated.	• Project area	• On-site inspection	• Continuous	• Included in construction costs	<u>Implementation:</u> Contractor <u>Supervision/Monitoring:</u> Project Owner
		• Work Permits	• Work permits will be obtained before commencing work involving working at heights, working electricity and hot work.	• Project area	• On-site inspection • Review and control of work permits	• Continuous	• Included in construction costs	<u>Implementation:</u> Contractor <u>Supervision/Monitoring:</u> Project Owner
		• First Aid	• A sufficient number of personnel who have received Basic First Aid Training, appropriate for the hazard class, will be provided and distributed evenly in the operational areas.(As per the First Aid Regulation (Official Gazette Date: 29 July 2015; Number: 29429) ARTICLE 19 – (1) Within the scope of occupational health and safety; a) In slightly hazardous workplaces, there must be 1 first aider for every 20 employees, b) In hazardous workplaces, there must be 1 first aider for every 15 employees, c) In highly hazardous workplaces, there must be 1 first aider for every 10 employees). • First aid materials and kits will be provided throughout the project.	• Project area	• On-site inspection • Review and control of basic first aid training records/certificates	• Continuous	• Included in construction costs	<u>Implementation:</u> Contractor <u>Supervision/Monitoring:</u> Project Owner

No.	Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties
			• First aid materials will be regularly inspected, and any deficiencies will be addressed by the health unit on a monthly basis.					
		• Electrical works	• Only qualified and trained personnel will work with electricity.	• Project area	• On-site inspection • Review and control of training records/related certificates	• Continuous	• Included in construction costs	<u>Implementation:</u> Contractor <u>Supervision/Monitoring:</u> Project Owner
MON-CP-SE-01	• Stakeholder Engagement	• SEP implementation / public consultations records • Stakeholder engagement records	• At least one public consultation meeting will be held.	• Project area and Project management office	• Minutes of public consultation meeting • Stakeholder engagement records	• Continuous	• Included in construction costs	<u>Implementation:</u> Contractor <u>Supervision/Monitoring:</u> Project Owner
MON-CP-GM-01	• Grievance Mechanism	• Grievances recorded (Grievance database)	• Number and nature of the grievances will be recorded, addressed, analyzed and closed with the satisfaction of the holder • All grievances will be closed-out within the target timeframe.	• Project area and Project management office	• Grievance records (numbers of open and closed grievances, statistics regarding the nature of the grievances)	• Continuous	• Included in construction costs	<u>Implementation:</u> Contractor <u>Supervision/Monitoring:</u> Project Owner

9.3 Monitoring Plan for the Operation Phase

Table 36. Monitoring Plan for the Operation Phase

No.	**Issue**	**Parameters to be monitored** *(What parameter is to be monitored?)*	**Target/Threshold Value**	**Monitoring location** *(Where the parameter is to be monitored?)*	**Monitoring Method** *(How is the parameter to be monitored/ type of monitoring equipment?)*	**Timing/Frequency of Monitoring** *(When is the parameter to be monitored- frequency of measurement or continuous?)*	**Cost of Monitoring** *(What is the cost of equipment or contractor charges to perform monitoring?)*	**Responsible Party/Parties**
MON-OP-WM-01	Waste Management	• Waste records (amounts, types, disposal/recycling information) • On-site waste management practices such as proper collection and temporary storage of wastes during maintenance activities (including end of life solar panels), etc.	• Minimization of total waste generated • Minimize the hazardous waste generated	• Project area	• Review and control of waste records • On-site inspection regarding waste management practices such as proper collection and temporary storage of wastes (including end of life solar panels), etc.	• During maintenance and repair activities	• No additional cost	Supervision/Monitoring: Project Owner
MON-CP-WWM	Water Management	• Amount of water used for solar panel cleaning (every six months)	• Minimization of water use for panel cleaning	• Project area	• Review and control of water use records • On-site inspection while solar panels are cleaning	• Every six (6) months for panel cleaning	• No additional cost	Supervision/Monitoring: Project Owner
MON-OP-CHS-01	Community Health & Safety	• Grievances • Incidents • Accidents • Warning signs presence	• No significant increase in injury rates • Decreasing number/ continuous improvement in number of complaints • Zero incidents per year • Zero grievances per year	• Project area • Residential areas around project area	• Records of comments/ suggestions/complaints • Site Audits • Training records	• Monthly	• No additional cost	Supervision/Monitoring: Project Owner
MON-OP-OHS-01	Occupational Health and Safety	• Electrical works	• Only qualified and trained personnel will work with electricity.	• Operation area	• On-site inspection • Review and control of training records/related certificates	• Continuous	• No additional costs	Supervision/Monitoring: Project Owner
		• First Aid	• A sufficient number of personnel who have received Basic First Aid Training, appropriate for the hazard class, will be provided and distributed evenly in the operational areas. • First aid materials and kits will be provided throughout the project. • First aid materials will be regularly inspected, and any deficiencies will be addressed by the health unit on a monthly basis.	• Operation area	• On-site inspection • Review and control of basic first aid training records/certificates	• Continuous	• No additional costs	Supervision/Monitoring: Project Owner
		• Use of PPE	• Specific PPE matrices will be created for work areas throughout the facility. • Personnel will be provided with equipment that is suitable for the working conditions and meets the specifications and	• Operation area	• On-site inspection • Review and control of PPE records	• Continuous	• No additional costs	Supervision/Monitoring: Project Owner

No.	Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties
			standards outlined in the PPE matrices.					
		• Training	• Mandatory basic OHS training, emergency intervention training, and training on social rights will be provided to all employees and subcontracted personnel. • Orientation training will be mandatory for all personnel, subcontractor personnel, and anyone entering the facility. Competency tests will be conducted before and after the training. • All employees will receive accident investigation and root cause training following workplace accidents. • Minimum one annual refresher training for GM, SEA/SH and GBV should be added, and all staff should participate in integrated training sessions. • All training will be provided in Turkish and/or in a language suitable for the facility's employees.	• Operation area	• On-site inspection • Review and control of training documents and records	• Continuous	• No additional costs	<u>Supervision/Monitoring:</u> Project Owner
		• Occupational accidents and near-miss incident records	• Records of occupational accidents and near-miss incidents will be kept systematically, and after each incident, a root cause analysis will be conducted to take measures to prevent the recurrence of the incident.	• Operation area	• On-site inspection • Review and control of accident and near-miss incident records	• Continuous	• No additional costs	<u>Supervision/Monitoring:</u> Project Owner
		• Safety Signs and Warning Signs	• Warning signs will be designed for the entire facility in accordance with national regulations and work areas, and all facility warning signs will be updated.	• Operation area	• On-site inspection	• Continuous	• No additional costs	<u>Supervision/Monitoring:</u> Project Owner
		• Work Permit	• Work permits will be obtained before commencing work involving working at heights.	• Operation area	• On-site inspection • Review and control of work permits	• Continuous	• No additional costs	<u>Supervision/Monitoring:</u> Project Owner

No.	Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties
		• Emergency Preparedness and Response (risk of fire caused by electric arc) • Existence of a Periodic maintenance plan • Firefighting equipment availability • Emergency Preparedness and Response Plan • Emergency team presence • Drill records	• Periodical maintenance and repairs of solar panels and cables will be performed • Emergency Preparedness and Response Plan will be available • Emergency teams will be formed and trained. • Firefighting equipment will be available in the carport SPP area.	• Administrative building • Operation area	• On-site inspection • Document control • Review and control of training and drill records • Review and control of periodical maintenance plan	• Continuous	• Included in Project Owner's budget	Supervision/Monitoring: Project Owner
MON-OP-SE-01	Stakeholder Engagement	• Stakeholder Engagement implementation / public/stakeholder consultation records	• All provisions given in the Stakeholder Engagement will be implemented and recorded.	• Project area and project management office	• Minutes of public/stakeholder consultation meeting • Stakeholder engagement records	• Continuous	• Included in Project Owner's budget	Supervision/Monitoring: Project Owner
MON-OP-GM-01	Grievance Mechanism	• Grievances recorded (Grievance database)	• Number and nature of the grievances will be recorded, addressed, analyzed and closed with the satisfaction of the holder • All grievances will be closed-out within the target timeframe.	• Project area and project management office	• Grievance records (numbers of open and closed grievances, statistics regarding the nature of the grievances)	• Continuous	• Included in Project Owner's budget	Supervision/Monitoring: Project Owner

10.INSTITUTIONAL ARRANGEMENT AND TRAINING

10.1 Roles and Responsibilities

The Industrial Zones Directorate in MoIT will be the responsible Project Implementation Unit, which will coordinate overall project activities on a daily basis and involve other MoIT units and departments as needed. The PIU shall include environmental and social specialists (one environmental, one social, one occupational health and safety and one stakeholder engagement specialists) with sufficient qualifications and experience to manage implementation of the ESMP and respective requirements.

Birlik OIZ will have a project management unit that will include experts at least one environmental expert, one social expert and one OHS expert. Within the OIZ management, there are officials dealing with the issues specified under the Project. A PMU has not been officially established, but a team of existing OIZ officials with relevant expertise will be brought together to fulfill the tasks included in this ESMP. In case the financial and institutional capacity of the OIZ is not sufficient to employ experts/consultant company, MoIT will hire external consultancy or independent experts on behalf of OIZ management.

The organizational chart of Project Management Unit (PMU) of Birlik OIZ is presented in Figure 31 and the detailed responsibilities of the experts in PMU are provided in Table 37. On the other hand, the roles and responsibilities of all project parties are provided in Table 38.

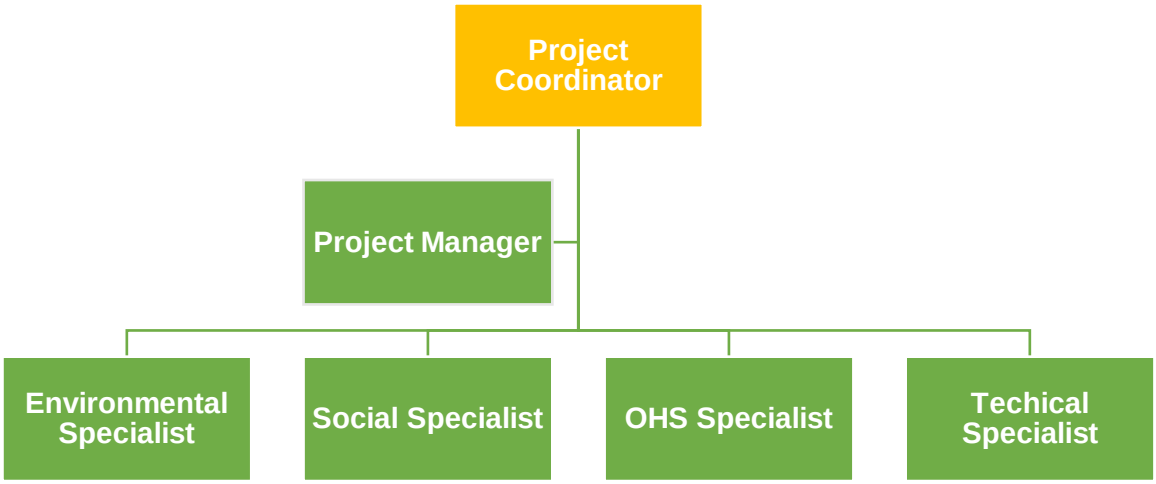

Figure 31. Organizational Chart of Project Management Unit (PMU)

Table 37. General Organization Structure of PMU for Implementation of ESMP

Roles	Responsibilities
Project Coordinator	• Overall responsibility for the ESMP implementation
Project Manager	• Ensure that ESMP provisions are implemented to mitigate environmental (including OHS) and social impacts, and contractor's Labour Management Plan is in accordance with the LMP • Ensure that all workers, participate in training sessions on ESMP. Maintain a record of training and conduct of awareness sessions for staff to ensure compliance with environmental and safety commitments stated in ESMP, • Prepare monthly environmental and social monitoring reports for submission to MoIT PIU

Roles	Responsibilities
Environmental Specialist	• Ensure that the environmental management systems of the project comply with the ESMP, • Monitor the environmental impacts and risks of the construction activities on site, • Contribute to the environmental and social monitoring reports.
Social Specialist	• Establish an easily accessible public and workers public grievance mechanism, • Manage and ensure effective operationalization of the GM, • Record grievances, • Disclosure to complainant, • Monitor the social impacts and risks of the construction activities on site, • Ensure that ESMP provisions are implemented to mitigate impacts, • Undertake monitoring of the implementation of the ESMP, • Contribute to the environmental and social monitoring reports.
OHS Specialist	• Ensure that implementation and supervision of Occupational Health and Safety Management Plan, • Preparedness and response to emergency situation according to Emergency Response Plan, • Notify MoIT PIU immediately if any contingencies such as labor issues, accidents and incidents. The incident report including root cause analysis, precautions and compensation measures taken, will be shared with MoIT PIU in 30 business days, • Ensure monitoring of the LMP implementation, • Contribute to the environmental and social monitoring reports.
Technical Specialist	• Responsible for the project design, • Coordinating the actions and evaluations in case of a change due to engineering/design changes.

Table 38. Responsibilities of Project Parties

Responsible Entity	Responsibilities
MoIT PIU	• Providing guidance to OIZ and the consultant that is responsible for preparation of this ESMP considering WB's requirements (standards, guidelines and procedures), • Reviewing the documents related to the environmental and social assessment of the project, provide comments/revisions to the consultant in order to develop (performing overall quality assurance) the E&S documents, • Guiding OIZ and the consultant on stakeholder consultation and announcement requirements within the scope of this ESMP, • Following of monitoring activities such as the implementation of this ESMP, other environmental and social mitigation measures, grievance process and Main Project's Labor Management Procedures (LMP), • Auditing the OIZ's ESMP practices and giving feedback on its performance, and further actions to be taken within the overall project audit, • Being open and responsive to concerns raised by affected groups and local environmental authorities regarding environmental aspects of sub-project implementation. Meet with these groups during site visits, as necessary, • In case of necessity, providing coordination and communication regarding the field visits • To provide CoC, OHS, GM, GBV, SEA/SH training to the contractor, and OIZ PMU specialists before the construction activities
OIZ Project Management Unit (PMU)	• Assigning/hiring one environmental, one social expert and one OHS specialist with sufficient qualifications and skills • Identification and management of risks and impacts related to environmental, social and OHS issues during construction activities on site • Implementation of this ESMP and related management plans and achieving of all commitments under these plans. Checking both the technical and administrative progress of contract packages and

Responsible Entity	Responsibilities
	• Providing support to implementation of the mitigation measures and commitments given in the ESMP on site • The E&S Team will also be responsible for taking actions required to eliminate/minimize environmental and social impacts and risks in line with this ESMP and for putting monitoring plans into practice, • Sharing the ESMP with the Contractor, • Guiding the Contractor in preparing and approving the sub-management plans, and Contractor's Labour Management Plan • Coordinating the actions and evaluations in case of a change due to engineering/design changes, route/location changes, legislative changes related to environmental and social issues, authorization provision changes, new environmental/social data, construction/operation strategy changes. • Updating the ESMP when necessary and sharing additional commitments with the Contractor, • Informing MoIT PIU via monthly ES Monitoring Reports which will be prepared in line with ESMF and submitted by the contractor, • Monitoring and evaluating the performance of the contractor activities in line with ESMP requirements, • Ensuring compliance with project standards, taking urgent action in case of non-compliance within the knowledge and approval of MoIT PIU, • Any non-conformities found during the inspections will be managed by a process adapted to the severity of the case, • To provide training to the project personnel of the Contractor and their own personnel on ESMP implementations, CoC, OHS, GM, GBV, SEA/SH trainings and commitments, which covers project related environmental and social impacts and risks, and corresponding measures applied to avoid, reduce, and mitigate the risks and potential adverse impacts, roles and responsibilities assigned to the relevant party, monitoring plan and reporting process prior to the construction activities are commenced • Preparing the bidding documents during the implementation, conducting bidding processes. The requirements of the WB and the Construction Contract including this ESMP and LMP will be chased and cooperating with the MoIT PIU for the supervision of construction activities • Supervision of construction and/or rehabilitation works and installation of equipment, • Suspending work in any situation that threatens environment and community and occupational health and safety and informing MoIT PIU, • Analysing and following-up the environmental (including OHS) and social accidents/incidents. Specifically, for any significant environmental or social incidents (e.g. fatalities, lost time incidents, environmental spills etc.), the OIZs will inform MoIT PIU in 48 hours after the occurrence of the incident or accident, • Notifying MoIT PIU immediately about any contingencies such as environmental, social and labour issues or accidents, incidents or loss of time that has or is likely to have a significant adverse impact on the environment, affected communities, the public or workers. The incident report including root cause analysis, precautions and compensation measures taken, will be submitted to MoIT PIU in 30 business days, • Follow up the penalties arising from the contract, checking the suitability of the work done by the Contractor, giving warnings and directions and notifying the MoIT PIU in a timely manner if necessary
E&S Consultant	• Preparation and finalizing this ESMP as per the concerns/opinions of the stakeholders of the Project for the approval of MoIT PIU and WB, • Supporting the PIU to organize and carry out the stakeholder consultation meeting for the draft version of this ESMP, • Organizing and delivering a training to the respective OIZ on ESMP implementations, GM, GBV, SEA/SH trainings and commitments, which covers project related environmental and social impacts and risks, and corresponding measures applied to avoid, reduce, and

Responsible Entity	Responsibilities
	mitigate the risks and potential adverse impacts, roles and responsibilities assigned to the relevant party, monitoring plan and reporting process prior to the construction activities are commenced.
Contractor	• Fulfilment of all requirements of ESMP and the relevant management plans, • Implementation of additional commitments to be included in the Construction Contract, • Preparation of its site-specific sub-management plans (mentioned above in the relevant sections and the mitigation measures Tables) in line with this ESMP, including OHS plans before construction, as part of their method statement and submit to the OIZ and MoIT PIU for review and approval, • Ensuring compliance with project standards, obtaining all relevant permits and licenses, • Implementation of the mitigation measures provided in this ESMP and monitoring of construction activities (including subcontractor activities) in compliance with the national legislation and WB standards, • Development of monitoring plans/procedures in accordance with the ESMP structure, implementation after the approval of OIZ and MoIT PIU, • Employment of qualified Environmental, Social and OHS Experts (at least one Environmental and Social Expert and one full-time OHS Expert) within the scope of the project, • Training its own and subcontractor's staff on environmental, social and OHS issues, • Carrying out the environmental and social audits to monitor the ESMP practices on site and report on this to the KOIZ PMU, • Submission of Environmental and Social Progress Reports (ESPRs) on environmental and social issues, mitigation, results and findings throughout the construction period to the Consultant and OIZ PMU, • Notifying immediately of the contingencies such as environmental, social and labour issues or accidents, incidents or loss of time to Consultant and OIZ and keeping an event log on site throughout the life of the Project. The incident report including root cause analysis and the corrective actions to be taken will be submitted to Consultant and OIZ within 30 days, • Developing and implementing Labour Management Plan (based on Project's LMP and in compliance with the Labor Legislation (4857 Labor Law), Occupational Health and Safety Plan and Procedures (6331 Occupational Health and Safety Law) and 5510 Social Insurance Law) including working conditions, fair treatment, non-discrimination, equal opportunity, vulnerable/disadvantaged workers, GBV, SEA/SH, prevention of child labour and forced labour issues under the project's Labor and Employment Policy for construction phase.To provide CoC, GM, GBV, SEA/SH, OHS training to the project personnel before construction activities and repeat annually. Training records will be kept • Establishment and implementation of project specific grievance mechanism and the Worker's GM for the Project construction activities in coordination with OIZ PMU

10.2 Reporting

Documentation is an important element linked to the implementation of the ESMP. Responsibilities will be assigned to relevant personnel for ensuring that the ESMP documentation system is maintained, document controlled and distributed to the identified personnel.

Reporting process that should be put into action during the implementation phase of the project is an important tool to record and chase project activities in compliance with the project standards. Therefore, the requirements of such processes are presented in Table 39.

Table 39. Responsibilities for Reporting Process

Responsible Party	Roles & Responsibility
MoIT Project Implementation Unit (PIU)	• Quarterly inform the WB with Environmental and Social Reports (ESRs) to include summary of Environmental and Social Monitoring Reports (ESMRs) on the progress and updates. Quarterly ESRs will highlight any issues arising from non-compliance with ES requirements and how it has been/is being addressed from the ESF requirements point of view. • Submitting the quarterly Grievance Mechanism Report (GMR) to WB • Site visits will be carried out quarterly and environmental and social issues will be examined on site. Findings after site visit will be included in the quarterly ESRs. • Before the construction starts GM, OHS, CoC, GBV, SEA/SH training will be given to OIZ PMU, and Contractor's Environmental and Social Specialists, OHS Specialists and training records will be kept.
OIZ Project Management Unit (PMU)	• Review and submit monthly ESMRs to MoIT PIU • Follow up construction activities • This ESMP implementation, CoC, OHS, GM, GBV, SEA/SH training will be given to project employees of Contractor and their own employees and training records will be kept.
Contractor	• Prepare and submit monthly ESPRs covering the progress of the construction activities and environmental, social and OHS issues to the OIZ PMU • CoC, OHS, GM, GBV, SEA/SH training will be given to their own employees and training records will be kept

10.3 Training

All employees will be provided with training on environment, social, community and occupational health and safety, labor and security issues by suitably qualified personnel. The following subjects will be covered in these training programs for all employees:

- National and international legislations and its applicability to the Project,
- Occupational health and safety,
- Accident investigation and root cause,
- Roles and responsibilities,
- Environmentally sensitive areas,
- Potential effects of activities,
- The steps and timing required to protect the environment,
- Activities to be avoided,
- Requirements of equipment use in the event of incident and procedures to follow,
- Mitigation measures to implement in the Project,
- Implementation of Environmental and Social Management Plan
- Code of Conduct and GM, GBV, SEA/SH trainings

Details of the trainings within the scope of requirements of this ESMP are also presented in Table 40. This training program is a minimum and should be extended in line with the project requirements.

Table 40. Training Program

Training Topics	Responsible Party (Trainer Party)	Target Group	Timing	Duration	Cost
Induction Training[45]	Contractor OIZ PMU	Newly recruited Personnel Personnel of newly contracted subcontractor-service provider.	Whenever needed	Minimum 1 (one) day	No additional cost
OHS and Accident Investigation and Community Health and Safety	MoIT PIU Contractor OIZ PMU	Newly recruited Personnel Personnel of newly contracted subcontractor-service provider.	Whenever needed	Minimum 16 (sixteen) hours (national legislation requirement)	No additional cost
Root Cause Training	Contractor	All personnel	Whenever needed in case of accidents and near misses	Minimum 1 (one) day	No additional cost
Environmental Management System Awareness Training	OIZ PMU	All personnel	Once in a month	Minimum 1 (one) day	No additional cost
ESMP Training	Environmental and Social Consultant	All personnel	Once before implementation	Minimum 1 (one) day	No additional cost
Training on GBV and SEA/SH	MoIT PIU	OIZ PMU Contractor	Once before implementation	Minimum 1 (one) day	No additional cost
Training on GBV and SEA/SH	OIZ PMU Contractor	All personnel	Once before implementation and later whenever needed	Minimum 1 (one) day	No additional cost
Training on GM	MoIT PIU	OIZ PMU Contractor	Once before implementation	Minimum 1 (one) day	No additional cost
Training on GM	OIZ PMU Contractor	All personnel	Once before implementation and later whenever needed	Minimum 1 (one) day	No additional cost
Training on Chance Find Procedure	Contractor OIZ PMU	All personnel	Once before implementation	Minimum 1 (one) day	No additional cost

[45] OIZ PMU will provide this training to the contractor and the contractor will provide this training to its new staff.

11.STAKEHOLDER MANAGEMENT UNDER ESMP

TOIZsP's SEP[46] will be adapted for the Project. This chapter contains a brief description of stakeholder engagement. The Project's SEP has data and explanations on this subject. As mentioned above, the TOIZsP Stakeholder Engagement Plan (SEP), will be used for this sub-project and all project parties (including contractor, Organized Industrial Zone (OIZ) and Ministry of Industry and Technology (MoIT) PIU) will be responsible for ensuring compliance with the TOIZsP SEP.

A stakeholder is defined as any individual, organization or group who is potentially affected by the Project or who has an interest in the Project and its impacts. The objective of stakeholder identification is to establish which stakeholders may be directly or indirectly affected – either positively or negatively - ("affected parties") or have an interest in the Project ("other interested parties").

The term "project affected parties" includes those likely to be affected by the project because of actual impacts or potential risks to their physical environment, health, security, cultural practices, well-being, or livelihoods. These stakeholders may include individuals or groups, including local communities.

The term "other interested parties" refers to individuals, groups, or organizations with an interest in the project, which may be because of the project location, its characteristics, its impacts, or matters related to public interest. For example, these parties may include regulators, government officials, the private sector, the scientific community, academics, unions, women's organizations, other civil society organizations, and cultural groups.

The environmental and social impact area of the project is determined as a circle with a radius of 150 meters from the project areas. The 150-meter radius impact area has been determined considering environmental and social impacts, especially sensitive receptors in the vicinity of the project area. However, the impact area does not include sensitive receptors.

Within the scope of the project, interviews were held with institutions and companies located in Banks-1 building, Banks-2 building, Bank building, Market building and OIZ Administrative Building in OIZ (see Table 11). In addition, Akademi Gurme Restaurant located adjacent to the OIZ Administrative Building is within the AoI. OSB Mosque and Doruk OSGB are not in the AoI's but are considered as stakeholders and also interviewed. In addition, since Birlik OIZ is located within the borders of Aydınlı neighborhood, the headman of Aydınlı neighborhood was also interviewed. The outputs of the realized interviews are given in detail as Minutes of Meeting under Annex-18.

Türkiye Halk Bankası A.Ş. and T.C. Ziraat Bankası A.Ş., which are in the buildings, are under renovation and therefore could not be contacted. In addition, a representative of Ziraat Katılım Bankası A.Ş. refused to be interviewed. Detailed information is presented in Table 41.

[46] Stakeholder Engagement Plan of "TURKEY ORGANIZED INDUSTRIAL ZONES PROJECTS": https://yesilosb.sanayi.gov.tr/assets2/pdf/projectdocuments/2.1-StakeholderEngagementPlan.pdf

Table 41. Buildings and Stakeholders Details

Buildings	Stakeholders	Number of Employees	Number of Visitors	Identification of Stakeholder	Relation	Relevance of Stakeholders to the Project
Banks-1 (6608/01)	Kuveyt Türk Katılım Bankası A.Ş. – Tuzla Branch (Kuveyt Türk)	9	50	PAP	Direct	It is located in the Banks-1 building. Employees and customers of the company can be affected Project related activities due to the noise.
	Türkiye Vakıflar Bankası T.A.O. – Tuzla Branch (Vakıfbank)	12	100	PAP	Direct	It is located in the Banks-1 building. Employees and customers of the company can be affected Project related activities due to the noise.
	Türkiye Vakıflar Bankası T.A.O. – Regional Directorate (Vakıfbank – Regional Directorate)	10	2	PAP	Direct	It is located in the Banks-1 building. Employees and customers of the company can be affected Project related activities due to the noise.
	Schneider Electric	10	0	PAP	Direct	It is located in the Banks-1 building. Employees and visitors of the company can be affected Project related activities due to the noise.
	Bartek Elektrik Sistemleri San. Ve Tic. A.Ş. (Bartek Elektrik)	30	0	PAP	Direct	It is located in the Banks-1 building. Employees and visitors of the company can be affected Project related activities due to the noise.
	PTT A.Ş. – Tuzla Branch (PTT)	1	150	PAP	Direct	It is located in the Banks-1 building. Employees and visitors of the company can be affected Project related activities due to the noise.
	Biyoteknoloji Sanayicileri Derneği (BİYOSAD)	5	20	PAP	Direct	It is located in the Banks-1 building. Employees and visitors of the company can

Buildings	Stakeholders	Number of Employees	Number of Visitors	Identification of Stakeholder	Relation	Relevance of Stakeholders to the Project
						be affected Project related activities due to the noise.
	DEK Girişim Gayrimenkul Danışmanlığı San. Tic. Ltd. Şti. (DEK Girişim)	5	7	PAP	Direct	It is located in the Banks-1 building. Employees and visitors of the company can be affected Project related activities due to the noise.
	Polymar Pigment Kimya Sanayi ve Ticaret Ltd. Şti. (Polymar)	10	6	PAP	Direct	It is located in the Banks-1 building. Employees and visitors of the company can be affected Project related activities due to the noise.
	Siyah Plan Proje Müh. İnşaat Yatırım ve Dan. Hiz. (Siyah Plan Proje Müh.)	20	10	PAP	Direct	It is located in the Banks-1 building. Employees and visitors of the company can be affected Project related activities due to the noise.
	Türkiye Halk Bankası A.Ş. – Tuzla Branch (Halkbank)	No information	No information	PAP	Direct	It is located in the Banks-1 building. Employees and customers of the company can be affected Project related activities due to the noise.
Banks-2 (6617/01)	Caribou Coffee Company – Tuzla (Caribou Coffee)	3	250	PAP	Direct	It is located in the Banks-2 building. Employees and customers of the company can be affected Project related activities due to the noise.
	Alfa Kimya A.Ş. (Alfa Kimya)	10	3	PAP	Direct	It is located in the Banks-2 building. Employees and visitors of the company can be affected Project related activities due to the noise.
	Türkiye İş Bankası A.Ş. – Tuzla Branch (İş Bankası)	9	100	PAP	Direct	It is located in the Banks-2 building. Employees and customers of the company

Buildings	Stakeholders	Number of Employees	Number of Visitors	Identification of Stakeholder	Relation	Relevance of Stakeholders to the Project
						can be affected Project related activities due to the noise.
	Akbank T.A.Ş. – Tuzla Branch (Akbank)	13	150	PAP	Direct	It is located in the Banks-2 building. Employees and customers of the company can be affected Project related activities due to the noise.
Bank (6617/18)	T.C. Ziraat Bankası A.Ş. – Tuzla Branch (Ziraat Bankası)	No information	No information	PAP	Direct	It is located in the Bank building. Employees and customers of the company can be affected Project related activities due to the noise.
	Ziraat Katılım Bankası A.Ş. – Tuzla Branch (Ziraat Katılım)	No information	No information	PAP	Direct	It is located in the Bank building. Employees and customers of the company can be affected Project related activities due to the noise.
Market (6616/10)	Migros Ticaret A.Ş. – Tuzla (Migros)	4	800	PAP	Direct	It is located in the Market building. Employees and customers of the company can be affected Project related activities due to the noise.
OIZ Administrative Building (6615/11)	OIZ Administrative Building	20	10	PAP	Direct	Employees and visitors of the company can be affected Project related activities due to the noise.
Project Workers		10	-	PAP	Direct	Workers who will work during the construction phase of the project are also among the stakeholders.
Akademi Gurme Restaurant		65	250	OIP	-	Since it is located next to the OIZ Administrative

Buildings	Stakeholders	Number of Employees	Number of Visitors	Identification of Stakeholder	Relation	Relevance of Stakeholders to the Project
						Building, employees and customers can be expected to be affected by Project related activities such as noise.
Local residents of Aydınlı Neighborhood		-	-	OIP	-	The neighborhood can expect to benefit from employment opportunities within Birlik OIZ. The approximate distance of the project areas to Aydınlı Neighborhood is 4.4 km. Population of Aydınlı Neighborhood is 70,400.
Mukhtarship of Aydınlı Neighborhood		-	-	OIP	-	

Project affected parties and other interested parties affected by the project will differ depending on the project phase. The visible environmental impacts during the construction and installation phases of the Project will affect employees as well as customers/visitors. In addition, employees and customers of the Akademi Gurme Restaurant located next to the OIZ Administrative Building are also within the impact area. During the construction period, difficulties that will be faced include noise from construction activities.

Construction works are planned to take 7 to 10 days. In this period, necessary precautions will be taken to ensure that the employees in the relevant building are not affected by the construction process. In this regard, construction works can be scheduled out of working hours or on weekends. Parking lots in the buildings can be used with necessary precautions.

Ten workers expected to be involved in the project will also be considered as stakeholders among those affected by the project. These workers are expected to use the OIZ Administrative Building for their daily dining routines and hygiene needs. Although there is sufficient space for these services in the aforementioned building, congestion in these areas is expected during project activities. In case of such a situation, it has been reported that the OSB Mosque can be used for hygiene needs.

11.1 Previous Stakeholder Engagement Activities

A site visit was conducted on 11th of July, 2024. During the site visit, face-to-face interviews were conducted with businesses and companies located in the buildings where the Project will be located, the building next to the OIZ administrative building and the residential area near the OIZ. In addition, although not in the AoI's, OSB Mosque and Doruk OSGB were considered as stakeholders and also interviewed. Please see Annex-18 for details of the interviews. Photographs from the stakeholder interviews are presented in Annex-5.

11.2 Disclosure and Consultation of the ESMP

As part of the requirements of the WB ESF and ESSs, the draft ESMP must be publicly disclosed by the Project Implementation Unit (PIU) and Project Owner. This disclosed document will be published on the official Project website, accompanied by an announcement inviting stakeholders to the Stakeholder Engagement Meeting.

The invitation and the draft ESMP must remain accessible for 10 days prior to the announced meeting date. Following the completion of the meeting, all feedback and outputs will be incorporated into the draft ESMP. The revised draft ESMP, once approved, will be republished on the official Project website as the final ESMP.

Additionally, the final ESMP will be made available as a hard copy at the Project office to share with stakeholders who visit the location.

The official website of abovementioned process is given below:

- https://www.birlikosb.org.tr/
- https://yesilosb.sanayi.gov.tr/

The stakeholder consultation meeting documents (photos, disclosure announcements, etc.) will be added in the final version of this ESMP after the meeting is performed.

A range of tools will be utilized for stakeholder engagement under this Project. Different engagement methods are proposed and cover different stakeholder needs for before construction, during construction and operation phases as stated below:

- Formal/ informal face-to-face meetings,
- Digital communication tools (including web pages, correspondence by phone/email, whatsapp, short message service),
- Written materials,

- Grievance mechanism,
- Media promotions.

A Stakeholder Consultation Meeting (SCM) will be conducted after the approval of this Draft ESMP. During the meeting, details about the project, its potential environmental and social impacts/risks, mitigation measures to be taken, and implementation/monitoring/reporting responsibilities of different parties will be shared with the stakeholders; and then their opinions and suggestions will be received during the question-answer (Q&A) session. Minutes of the Stakeholder Consultation will be prepared and published on the İstanbul Birlik OIZ website (https://www.birlikosb.org.tr/) and MoIT PIU website (yesilosb.sanayi.gov.tr).

11.3 Grievance Mechanism

The grievance mechanism is monitored within a transparent and open framework to address, assess and resolve Project-related grievances.

The main aim of the grievance mechanism is to assist in resolving complaints and grievances in a timely, effective, and efficient manner that satisfies all parties involved. The GM (and also WGM) will be effective during the lifespan of the project. It is intended to serve as a mechanism to:

- Allow identification and impartial, timely and effective resolution of issues affecting the project,
- Strengthen accountability of the beneficiaries, including project-affected stakeholders,
- Provide channels for the stakeholders to provide feedback and raise concerns.
- Offer a consultation process that is clear, transparent, culturally sensitive, and easily accessible.
- Provide the option for anonymous complaints and feedback, particularly in cases related to GBV, SEA and SH.
- Recognize that grievances concerning community health, safety, and environmental risks may be urgent, especially in cases of accidents, communicable diseases, and pollution. Immediate actions must be taken to address and prevent further harm.

In addition to public GM, the ESS 2 requires the establishment of a WGM for the project workers. Constitution of WGM will be the responsibility of the Contractor in accordance with its LM Plan which will be prepared in line with Project's LMP. The project workers will use the WGM to convey their concerns or suggestions regarding their working conditions and workplace.

The sample forms can be used to for GM are given in Annex-15, Annex-16, and Annex-17.

11.3.1 Procedural Steps of GM

Table 42. Grievance Mechanism Implementation

Step	Description of Process	Time Frame	Responsibility
GM implementation structure	There exist three Grievance Mechanism at the National Level: •Presidency's Communication Center and •Foreigners Communication Center •MoIT level GM •Additionally there is also a Project Level GM Main responsibilities of Project level implementation will be conducted by Project owner. Tools for application will be OIZ phone number, e-mail addresses, complaint boxes, etc. Outputs will be recorded and followed by assigned staffs of Contractor / Project Owner. Redress activities will be also followed by MoIT PIU. In cases of SEA/SH and GBV issues, applications will be filed and kept confidential. For statistical purposes, cases will be anonymized and bundled to avoid identification of persons involved. Handling SEA/SH and GBV grievances that are sensitive will be treated in full confidentiality. SEA/ SH and GBV survivors to the Ministry of Family and Social Services call center (ALO 183) for SEA/SH, and to the Ministry of Labor and Social Security call center (ALO 170)	-	Presidency's Communication Center, and Foreigners Communication Center and related authorities MoIT PIU OIZ PMU
Grievance uptake	In order to foster open communication and ensure a steadfast commitment to addressing stakeholders' concerns promptly and effectively, Birlik OIZ will be implemented the following steps: 1) Birlik OIZ will actively encourage stakeholders to provide a detailed description of their grievances via e-mail, and the dedicated grievance inbox may be utilized for this purpose. 2) Traditional correspondence will remain a viable option, allowing stakeholders to choose to direct a letter detailing their grievances to the grievance focal points at their local administration. 3) A standardized grievance form (see Annex-15) will be made available for use, and stakeholders will be able to submit	-	Birlik OIZ PMU

Step	Description of Process	Time Frame	Responsibility
	it through any of the aforementioned channels, ensuring consistency in information collection. 4) For those who prefer face-to-face interaction, Birlik OIZ will ease the registration of feedbacks in the grievance logbook provided Project area which is followed by assigned staff of Contractor. Alternatively, stakeholders will have the choice to drop a written grievance into the complaint boxes located at the administrative building of Birlik OIZ management. 5) All grievances to be registered in central database to facilitate tracking and analysis		
Sorting, processing	Any grievance, complaint, feedback, question, suggestion, concern etc. received is sent to the relevant department will be appointed by Project PMU, logged in the project specific GM database, and categorized according to the following inputs: - Project related activities - Project labour force - Issues related to resource use, sustainability, and pollution - Community health and safety issues -- Chance finds - Risk on biodiversity if any - Chance finds if any - Stakeholder engagement	Upon receipt of complaint	MoIT PIU GM Focal Point OIZ PMU
Acknowledgment and follow-up	The acknowledgment and recording of the complaint are conveyed to the complainant by the unit responsible for receiving and/or addressing the complaint. The responsible party in this case will be Project PMU, appointed by Birlik OIZ management, and/or GM committee. Feedback is provided to the complainant during the progress of the resolution process, showing the unit where the complaint is being handled and the stage it has reached. The complainant's proposed solution will also be taken into consideration during this process. Throughout this entire process, ensuring correct, effective, and timely communication with stakeholders is crucial for the successful implementation of the resolution process.	Within 2 days of receipt	Birlik OIZ PMU Social Specialist
Verification, investigation, action	The investigation of the complaint is led by Birlik OIZ PMU. A proposed resolution is formulated by Birlik OIZ and communicated to	Within 10 working days	Project Manager OIZ PMU Workers' representative

Step	Description of Process	Time Frame	Responsibility
	the complainant representative by appointed unit. The Grievance Committee will be activated if a resolution cannot be reached at the initial level. The Committee will be established, comprising local representatives and relevant institutional representatives. Independent experts will be selected from local universities, institutes, or non-governmental Organizations (NGOs). Throughout this process, Birlik OIZ PMU and / or GM committee takes the lead in thoroughly evaluating the complaint and finding a fair resolution. In communication with the complainant, the proposed solution is presented in a clear manner, aiming to resolve the complaint fairly and effectively		
Provision of feedback	When the resolution stage is reached in the complaint process, the relevant action is presented to the complainant for approval. If the complainant is satisfied with the resolution at this stage, the complaint is closed, and the resolution process is started. If the complainant is not satisfied with the proposed solution, support is provided to the complainant to have a project-internal appeal process. This support may involve seeking recourse to another government agency, engaging in legal proceedings, or involving law enforcement, especially in cases involving sensitive groups such as people with disabilities, minors, individuals in low-income groups, women, or victims of harassment and/or violence.	Will be decided by MoIT PIU specialists	OIZ PMU
Monitoring and evaluation	All records received, recorded, and tracked by Birlik OIZ PMU will be in the project specific GM database. Records in the database will be filterable by status—open, closed, and ongoing. Moreover, there needs to be an outcome associated with the various record types. For each registered grievance, the approach and result of the GM process should be recorded. Grievances are also registered according to the nature of grievance The analysis should encompass the resolution approaches employed in handled incidents as well. This way, a report will be generated for Birlik OIZ PMU to refer to in terms of	Will be decided by MoIT PIU specialists	OIZ PMU

Step	Description of Process	Time Frame	Responsibility
	risk, preventive measures, and assessment within the operational process. This report will be submitted to MoIT PIU and WB at specified intervals and will be consistently maintained in a transparent manner for ongoing monitoring. All documents, photos, analysis results, damage assessments, incident reports, and related materials about recorded incidents should also be stored in the system.		

11.3.1.1 Existing Grievance Mechanism of the Birlik OIZ

There is no complaint and suggestion box in Birlik OIZ. The external complaint collection channel is via the complaint form available on website[47].

The existing grievance mechanism will be improved and implemented as outlined in this ESMP and the TOIZP SEP.

Current contact information of Birlik OIZ are given in below:

- Official website: https://www.birlikosb.org.tr/#
- Communication section of the webpage: https://www.birlikosb.org.tr/iletisim/
- Address: Birlik OSB Mahallesi 1 No'lu Cadde No: 26 34953 Tuzla İstanbul
- Telephone: 02165930820
- E-mail: info@birlikosb.org.tr
- Complaint form: https://www.birlikosb.org.tr/oneri-ve-sikayetler-formu/

11.3.1.2 Workers' Grievance Mechanism

In addition to public GM, the ESS 2 requires the establishment of a WGM for the project workers. Constitution of WGM will be the responsibility of the Contractor in accordance with its LM Plan which will be prepared in line with Project's LMP. The project workers will use the WGM to convey their concerns or suggestions regarding their working conditions and workplace. The Worker Grievance Mechanism is defined as the mechanism that receives complaints from Project employees (including both direct and indirect employees). Procedural steps of WGM are same as public GM as explained above.

11.3.1.3 Grievances Related GBV/SH/SEA

To properly address SEA/SH risks, the GM will be in place prior to contractors mobilizing. For GBV—and particularly SEA/SH—complaints, there are risks of stigmatization, rejection and reprisals against complainant. This creates and reinforces a culture of silence so complainant may be reticent to approach the project directly. To enable survivors of GBV, SH/SEA to safely access the GM, multiple channels will be made available through which complaints can be registered in a safe and confidential manner. The GM operators and CLO will to be trained in how to collect SEA/SH cases confidentially and empathetically (with no judgement).

Projects will have multiple complaint channels. No identifiable information on the survivor will be stored in the GM. The GM will not ask for, or record, information on more than the following related to the SEA/SH allegation:

[47] https://www.birlikosb.org.tr/oneri-ve-sikayetler-formu/

- The nature of the complaint (what the complainant says in her/his own words without direct questioning);
- If, to the best of the survivor's knowledge, the perpetrator was associated with the project;
- If possible, the age and sex of the survivor; and
- If possible, information on whether the survivor was referred to services.

The information in the GM will be confidential especially when related to the identity of the complainant.

Grievances can be submitted via the channels presented under the above section on GM.

Anonymous Grievances can be submitted via the following channels:

- Telephone
- Letter to Grievance focal points at local facilities
- Suggestion box

REFERENCES

- The World Bank, Environmental and Social Framework,2017
- Bank Directive, Environmental and Social Directive for Investment Project Financing, November 2021
- İstanbul Birlik OIZ Solar Power Plant Project Identification Document (PID), MRC Türkiye & ACE Consulting and Engineering
- İstanbul Birlik OIZ Solar Power Plant Project Environmental and Social Screening Reports and Screening Forms MRC Türkiye & ACE Consulting and Engineering
- İstanbul Province Environmental Status Report (2022), MoEUCC
- İstanbul Birlik OIZ SPP Project Environmental and Social Screening Form
- 2023 Traffic Volume Maps, Ministry of Transport and Infrastructure, General Directorate of Highways
- Corine 2020 Version Data
- https://www.birlikosb.org.tr/enerji-politikamiz
- https://www.who.int/publications/i/item/9789241549950
- https://www.iski.gov.tr/web/assets/SayfalarDocs/Mevzuat%20ve%20Y%C3%B6netmelikler/%C4%B0SK%C4%B0%20ATIKSULARIN%20KANAL%C4%B0ZASYONA%20DE%C5%9EARJ%20Y%C3%96NETMEL%C4%B0%C4%9E%C4%B0.pdf
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- https://weatherspark.com/y/95434/Average-Weather-in-%C4%B0stanbul-Turkey-Year-Round
- https://www.mgm.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx?k=A&m=ISTANBUL
- MoEUCC National Air Quality Monitoring Network, https://www.havaizleme.gov.tr/
- https://iski.istanbul/kurumsal/iski-tesisleri/icme-suyu-aritma-tesisleri/oemerli-icme-suyu-aritma-tesisleri
- https://iski.istanbul/abone-hizmetleri/laboratuvar-hizmetleri/su-kalite-raporlari/2024-yili-su-kalite-raporlari
- https://iski.istanbul/kurumsal/iski-tesisleri/atik-su-aritma-tesisleri/tuzla-ileri-biyolojik-atik-su-aritma-tesisi/
- İSKİ Regulation on Discharge of Wastewater to Sewerage, Table 1, Sewerage Systems Wastewater Infrastructure Facilities Resulting in Full Treatment
- İstanbul Provincial Disaster Risk Reduction Plan, İRAP, AFAD, 2021
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LIST OF ANNEXES

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(Annexes are presented as separate documents.)