TÜRKİYE ORGANIZED INDUSTRIAL ZONES PROJECT

Asım Kibar Organized Industrial Zone

Solar Sludge Drying Facility and Rooftop Solar Power Plant (0.12 MW) Project

Environmental and Social Management Plan (ESMP)

APRIL 2025

Table I Key Experts and Roles

Name-Surname	Company/ Organization	Department	Title
Başak Mutlu	MoIT	PIU E&S Team	Comm. & Stakeholder Engagement Specialist
Başak Özer	MoIT	PIU E&S Team	Environmental Specialist
Burcu Kırdar	MoIT	PIU E&S Team	Environmental Specialist
Emre Yıldız	MoIT	PIU E&S Team	Social Specialist
Kadir Tomas	MoIT	PIU E&S Team	OHS Specialist
Sadiye Dişbudak	Asım Kibar OIZ	Regional Directorate of Asım Kibar OIZ	OIZ Regional Manager
Seda Çapa Eroğlu	Asım Kibar OIZ	Environment and OHS Department	Environment and OHS Manager
H. Baran Demirli	Asım Kibar OIZ	Mechanical Works and Treatment Plant	Mechanical Operation and Treatment Plant Manager
Serkan Duran	Asım Kibar OIZ	Directorate of Zoning and Construction Works	Director of Zoning and Construction Works
Evrim Alatas	Infratech	ESG Team	Project Manager
Murat Avcı	Infratech	ESG Team	Environmental Engineer
Ezgi Sena Satılmış	Infratech	ESG Team	Social & Resettlement Expert
İsmail Fulser	Infratech	ESG Team	Environmental Specialist

REVISION HISTORY

Ver	Date of Issue	Issue Reason	Project Owner	Sumbitted	Consultant
0	22nd July, 2024	Preliminary Review	Asım Kibar OIZ	Asım Kibar OIZ	Infratech Yazılım, Mühendislik ve İnovasyon A.Ş.
1	2nd August, 2024	First submission to OIZ	Asım Kibar OIZ	Ministry of Industry and Technology	Infratech Yazılım, Mühendislik ve İnovasyon A.Ş.
2	15th September, 2024	Second submission to MoIT	Asım Kibar OIZ	Ministry of Industry and Technology	Infratech Yazılım, Mühendislik ve İnovasyon A.Ş.
3	11th October, 2024	Third submission to MoIT	Asım Kibar OIZ	Ministry of Industry and Technology	Infratech Yazılım, Mühendislik ve İnovasyon A.Ş.
4	13th December, 2024	Fourth submission to MoIT	Asım Kibar OIZ	Ministry of Industry and Technology	Infratech Yazılım, Mühendislik ve İnovasyon A.Ş.
5	7th February 2025	Including SCM documents	Asım Kibar OIZ	Ministry of Industry and Technology	Infratech Yazılım, Mühendislik ve İnovasyon A.Ş.
6	29th April 2025	Final Submission	Asım Kibar OIZ	Ministry of Industry and Technology	Infratech Yazılım, Mühendislik ve İnovasyon A.Ş.

TABLE OF CONTENTS

LIST OF TABLES

LİST OF FIGURES

LIST OF ABBREVIATIONS

AC	Alternating Current
AFAD	Disaster and Emergency Management Presidency
AISI	American Iron and Steel Institute
AKOIZ	Asım Kibar Organized Industrial Zone
AoI	Area of Influence
AZE	Alliance for Zero Extinction
BOD	Biological Oxygen Demand
BOS	Balance of System
CCTV	Closed-circuit television
CH4	Methane
cm	centimetre
CO_2	Carbon dioxide
COD	Chemical Oxygen Demand
CR	Critically Endangered
dB	Decibel
dBA	Decibels adjusted
DC	Direct current
DEM	Digital Elevation Model
DNP	Defects Notification Period
E&S	Environmental and Social
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMF	Electromagnetic Fields
EN	Endangered
EPA	Environmental Protection Agency
ESCOPs	Environmental Codes of Practice
ESF	Environmental and Social Framework
ESHS	Environmental, Social Health, and Safety
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMR	Environmental and Social Monitoring Report
ESMS	Environmental and Social Management System
ESRs	Environmental and Social Reports
ESS	Environmental and Social Standards
EU	European Union
EUNIS	European University Information Systems
EVA	Etihylene vinyl acetate
FI	Financial Intermediary

GBV	Gender Based Violence
GHG	Green House Gas
GIS	Geographic Information Systems
GM	Grievance Mechanism
GMR	Grievance Mechanism Report
HJT	Hetero-junction
IAPCR	Industrial Air Pollution Control Regulation
IBA	Important Bird Area
IBC	Interdigitated back contact
IBRD	International Bank for Reconstruction and Development
IEC	International Electrotechnical Commission
ILO	International Labor Organization
INFRATECH	Infratech Yazılım, Mühendislik ve İnovasyon A.Ş.
İSU	Kocaeli Water and Sewerage Administration General Directorate
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Area
KEOS	City Automation System
KGM	General Directorate of Highways
kW	Kilowatt
KWh	Kilowatt-hour
kWp	Kilowatt peak
LMP	Labor Management Procedures
LPG	Liquefied Petrolium Gas
m	metre
MAK	Central Hunting Commission Decisions
MC4	Multi-Contact Connector
mm	Millimeter
MoEUCC	Ministry of Environment, Urbanization and Climate Change
MoIT	Ministry of Industry and Technology
MPPT	Maximum Power Point Tracking
MSDS	Material Safety Data Sheet
MW	Megawatt
N/A	Not Applicable
NAF	North Anatolian Fault
NAFZ	North Anatolian Fault Zone
NO2	Nitrogen oxides
NOx	Nitrogen oxides
NT	Near Threatened
OHS	Occupational Health and Safety

OIZ	Organized Industrial Zone
OSE	Occupational Safety Expert(s)
PAP	Project Affected Parties
PERC	Passivated emitter rear contact
PERT	Passivated Emitter Rear Totally Diffused
PGA	Peak Ground Acceleration
PGV	Peak Ground Velocity
PID	Project Identification Document
PIF	Project Introduction File
PIU	Project Implementation Unit
PM	Particulate Matter
PM_{10}	Particles with aerodynamic diameter smaller than 10µm
$PM_{2.5}$	Particles with aerodynamic diameter smaller than 2.5µm
PMP	Pest Management Plan
PMU	Project Management Unit
PoEUCC	Provincial Directorate of Environment, Urbanisation and Climate Change
PPE	Personal Protective Equipment
PS	Performance Standards
PV	Photovoltaic
PVC	Polyvinyl Chloride
R&D	Research and Development
RAMAQ	Regulation on the Assessment and Management of Air Quality
RENC	Regulation on Environmental Noise Control
rpm	Revolutions Per Minute
SCADA	Supervisory Control and Data Acquisition
SCM	Stakeholder Consultation Meeting
SEA/SH	Sexual Exploitation Abuse / Sexual Harassment
SEDAŞ	Sakarya Elektrik Dağıtım A.Ş./ Sakarya Electricity Distribution Co.
SEP	Stakeholder Engagement Plan
SO2	Sulphur dioxide
SPP	Solar Power Plant
SPS	Standby Power Supply
SSI	Social Security Institution
St-52	Non alloy quality steel
TAP	Portable Battery Manufacturers and Importers Association
TDF	Fish Bioassay
TDS	Total Dissolved Solids
TKN	Total Kjeldahl Nitrogen
TN	Total Nitrogen

TOIZ	Türkiye Organized Industrial Zone
TOIZsP	Türkiye Organized Industrial Zones Project
ToR	Terms of Reference
TP	Total Phosphorus
TS	Turkish Standards
TS EN	Turkish Standards Institute
TSS	Total Suspended Solids
TurkStat	Turkish Statistical Institute
UNESCO	United Nations Educational, Scientific and Cultural Organization
UV	Ultraviolet
V	Volt
VOCs	Volatile Organic Compounds
VU	Vulnerable
W/m^{2}K	Watts per square meter per kelvin
WB	World Bank
WBG	World Bank Group
WGM	Workers' Grievance Mechanism
WHO	World Health Organization
WW	Wastewater
WWTP	Wastewater Treatment Plant

EXECUTIVE SUMMARY

Türkiye Organized Industrial Zones Project (TOIZsP) will be financed by the World Bank/ International Bank for Reconstruction through a loan for which Ministry of Industry and Technology (MoIT) has been designated as responsible for project implementation by the Ministry of Treasury and Finance. The project aims to increase the efficiency, environmental sustainability, and competitiveness of Organized Industrial Zones (OIZs) in Türkiye. With a total budget of EUR 250.3 million, the Project will be implemented by the Ministry of Industry and Technology (MoIT) through the General Directorate of Industrial Zones.

The main responsible organization for the implementation of this Environmental and Social Management Plan (ESMP) is Asım Kibar OIZ (AKOIZ). A Project Management Unit (PMU) will be established to carry out operational and administrative tasks. The PMU staff will be the Asım Kibar OIZ's own staff who has previous WB Project experience. Besides, on different phases of the Project (pre-construction, construction and operation), different parties (Consultant, Contractors, Construction Supervision Consultant, MoIT/ Project Implementation Unit (PIU)) will take responsibility for various works in the scope of the ESMP. All mentioned works will be coordinated by the Asım Kibar OIZ. The roles and responsibilities of these parties are detailed in Section 8.

Presently, the Asım Kibar OIZ is producing 15 tons of sludge each day in total. Of the 15-ton sludge, 13-ton sludge was generated by the industrial wastewater treatment plants of two firms operating within the OIZ boundaries and two more tons were generated by the OIZ's wastewater treatment plant operations. The treatment sludge has been collected in sludge collection tanks having impermeable surfaces and disposed of to the licensed facilities regularly. This sludge has been disposed of with the waste code "19 08 13: Sludges containing hazardous substances resulting from industrial wastewater treatment by other methods".

Upon the commissioning of the sub-project, the sludge will be dried within the solar sludge drying facility. For this purpose, Asım Kibar OIZ plans to establish a 15 tonnes/day solar sludge drying plant and a rooftop solar power plant with a total power of 0.12 MW in order to meet its own heat and electrical energy needs from renewable sources. This will both lower its emissions and increase its supply security.

The sub-project consists of establishing a solar sludge drying facility with an approximate capacity of 15-ton sludge/day near the existing wastewater treatment plant of the OIZ. The solar sludge drying facility will be on the land allocated for the treatment plant area with parcel no 164/34. The solar sludge drying facility will aim to decrease the sludge's water content to an 85% solid content rate. The total area of the solar sludge drying facility is 5,000 m^2, where 3,360 m^2 of it will be used for drying halls. There will be two drying halls, each 12 m in width and 140 m in length. Sludge will be dried with heat of solar energy in these drying halls. The electricity to be used for electrically powered equipment of the solar sludge drying facility will be supplied by the electricity grid system of the OIZ. The construction period is expected to last 340 days.

In addition to the drying facility, a rooftop solar power plant with 0.12 MW power is planned to be installed on the existing wastewater recovery facility of the OIZ, similarly on the land allocated for the treatment plant area with parcel no 164/34. The electricity generated by the rooftop solar power plant will be supplied to the electricity grid system of the OIZ and will indirectly feed energy to the electrically powered equipment of the solar sludge drying facility**.** In cases where solar radiation is insufficient, the drying facility will continue operating using energy supplied directly from the OIZ's grid system, ensuring uninterrupted operation regardless of seasonal or daily variations in solar radiation. The total area of the solar panels to be installed on the roof of the existing wastewater recovery facility is 1,217 m^2.

The treatment sludge will be delivered to the solar sludge drying facility with licensed hazardous material carrier trucks. The transportation route is from two treatment sludge resources: (i) from the treatment sludge collection tanks of two firms operating within the OIZ boundaries with an approximate distance of 500 m to 1 km, and (ii) from the OIZ's sludge collection tanks beside the OIZ's wastewater treatment plant on the same parcel with the proposed solar sludge drying facility with an approximate distance of 50 m. With the sub-project, the sludge will be dried within the solar sludge drying facility. After the drying process, the sludge amount will decrease from 15 ton/day to an estimated 5.25 ton/day. The dried

sludge having the same waste code is to be delivered to a cement factory to be used as fuel within the scope of waste reuse.

It is estimated that the pre-construction phase of the project will be 1 month and the construction phase will be 340 days. The economic life of the investment is envisaged as 25 years, taking into account the operating period of the solar power plant. Local people will be given priority in personnel employment during the pre-construction and construction phases of the Project. It is anticipated that 4 people will be employed for the pre-construction phase, 25 people for the construction phase and 1 people for the operation phase.

The Project will comply with the good international practice, including WB Environmental and Social Standards (ESSs), the Environmental and Social Management Framework (ESMF) of the TOIZ project, guidelines, standards and best practices documents alongside the national legislation. In addition, the Project and the social and environmental elements in the Area of Influence (AoI) of the Project include elements or activities that fall within the scope of ESS1, ESS2, ESS3, ESS4, ESS6 and ESS10. The main objectives of these standards within the scope of the Project are presented below.

- ESS1: Assessment and Management of Environmental and Social Risks and Impacts,
- ESS2: Labour 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.

The Project's anticipated environmental and social impacts/risks will be in terms of air quality, soils, water resources, noise, biological environment, landscape, resources and waste, socioeconomic environment and occupational health and safety, cultural heritage and community health, safety and security. Summary of the mitigation measures are provided in Table 1.

Table 1 Summary of the Significant Impacts and Mitigation Measures

Potential Environmental and Social (E&S) Impacts/Risks	Mitigation Measures
Air Emissions and Odor	Dust and exhaust emissions management Air quality and odor monitoring Speed limitations will be applied
Soils Pollution and Contaminated Land	Topsoil preservation and restoration Prevention of soil contamination Erosion control measures
Impacts on Water Resources	Proper storage of chemicals Prevention of surface runoff Effluent discharge consistent with the Project Standards
Noise emissions	Regular maintenance of the construction machinery, equipment and vehicles Noise monitoring Coordinate the working schedule with sensitive receptors Establishment of a robust grievance mechanism
Impacts on Biological Environment	Re-vegetation, where possible Measures to further avoid and minimize the construction footprint
Landscape and Visual Impacts	Prevent glare and reflection of solar panels
Use of Resources and Wastes Generation	Wastes management in accordance with the waste management hierarchy Selection of most appropriate raw materials by evaluating clean production options
Employment and Procurement Opportunities	Providing transparent, non-discriminatory, equal recruitment opportunities with respect to ethnicity, religion, language, gender and sexuality
Infrastructure and Services	Prompt compensation of any damage to infrastructure

Potential Environmental and Social (E&S) Impacts/Risks	Mitigation Measures
Labor Force	A grievance mechanism Preparation of information materials Managing and monitoring the performance of contractors in relation to the prohibition of use of child labor, unregistered employment and forced labor Proper adaptation of human rights policy and labor rights Provision of written contracts to all workers with job description, working hours, wages etc
Impacts on Community Health, Safety and Security	Usage of appropriate traffic signage
Archaeological and Cultural Heritage Impacts	Informing related Civilian Authority or Museum Directorate

As a part of the mitigation measures, this site-specific Environmental and Social Management Plan (ESMP) has been developed. The ESMP includes management plans and procedures required for both phases of the Project, which are given in Table 2. along with guidelines for preparation of the management plans to be prepared by the contractor. The ESMP will be included in the bidding documents. In addition, the TOIZsP Stakeholder Engagement Plan (SEP) will be used for this sub-project and all project parties will be responsible for ensuring compliance with the TOIZsP SEP.

Table 2 Required Management Plans and Procedures for the Project

Management Plans/Procedure	Stage to be Prepared	Responsible Party	Monitoring & Reporting Party	Approving Party
Pre-construction and Construction Phase				
Soil Management Plan	Prior to pre-construction	Contractor	Construction Supervision Consultan	MoIT PIU
Air Quality and Emissions Management Plan	Prior to pre-construction	Contractor	Construction Supervision Consultant	MoIT PIU
Water Resources Management Plan	Prior to pre-construction	Contractor	Construction Supervision Consultant	MoIT PIU
Noise and Vibration Management Plan	Prior to pre-construction	Contractor	Construction Supervision Consultant	MoIT PIU
Waste Management Plan	Prior to pre-construction	Contractor	Construction Supervision Consultant	MoIT PIU
Oil and Chemical Spill Contingency Management Plan	Prior to pre-construction	Contractor	Construction Supervision Consultant	MoIT PIU
Community Health, Safety, and Security Management Plan	Prior to pre-construction	Contractor	Construction Supervision Consultant	MoIT PIU
Traffic Management Plan	Prior to pre-construction	Contractor	Construction Supervision Consultant	MoIT PIU
Occupational Health and Safety Management Plan	Prior to pre-construction	Contractor	Construction Supervision Consultant	MoIT PIU
Labour Management Plan	Prior to pre-construction	Contractor	Construction Supervision Consultant	MoIT PIU
Contractor Management Plan	Prior to pre-construction	Asım Kibar OIZ		MoIT PIU
Operation Phase				
Odor Management Plan	Prior to operation	Asım Kibar OIZ		MoIT PIU
Water Resources and Effluent Management Plan	Prior to operation	Asım Kibar OIZ		MoIT PIU
Waste Management Plan	Prior to operation	Asım Kibar OIZ		MoIT PIU
Sludge Management Plan	Prior to operation	Asım Kibar OIZ		MoIT PIU
Occupational Health and Safety Management Plan	Prior to operation	Asım Kibar OIZ		MoIT PIU

In order to clearly determine the management plan execution responsibilities of the Constructor and the Construction Supervision Consultant, which are given as responsible parties in the table above, the definitions of the responsibility areas of both are summarized below:

- Contractor's responsibilities:
  - Implementing the management plans to ensure that all activities on the Project site adhere to the requirements outlined by this ESMP, and Construction Supervision Consultant.
  - Allocating any required resources, manpower, and equipment necessary for the successful implementation of the management plans.
  - Managing subcontractors and suppliers to ensure their compliance with the management plans.
  - Documenting activities, inspections, and any deviations from the plans for reporting purposes.

- Construction Supervision Consultant:
  - Reviewing and providing guidance/advice to the Contractor and the Project Owner regarding the implementation of management plans.
  - Conducting audits/inspections/visits and reporting any deviations or issues and recommending corrective actions.
  - Monitoring progress and performance against the plans and providing feedback to the client.

Main impacts presented in Chapter 7 for the pre-construction, construction and operation phases of the project and the mitigation measures taken to manage these impacts are presented in Chapter 8.

In Chapter 9, the various parameters to be monitored in relation to the implementation of the ESMP and the monitoring activities for pre-construction, construction and operation phases are defined.

1 INTRODUCTION

1.1 Project Background and Rationale

The World Bank/International Bank for Reconstruction and Development (IBRD) is funding the Türkiye Organized Industrial Zones Project (TOIZsP) via a loan. The Ministry of Industry and Technology (MoIT), appointed by the Ministry of Treasury and Finance, will oversee the project's execution. This initiative aims to enhance the efficiency, environmental sustainability, and competitiveness of Türkiye's Organized Industrial Zones (OIZs). To measure progress, the project has identified specific indicators:

- Measuring energy savings resulting from OIZ spending on essential and eco-friendly infrastructure.
- Assessing water conservation achieved through OIZ investments in eco-friendly infrastructure.
- Tracking the decrease in CO_2 emissions resulting from the funded investments.
- Evaluating the proportion of OIZs successfully attracting new investments.

The primary project, with a total budget of EUR 250.3 million, will be managed and implemented by the Ministry of Industry and Technology (MoIT) through the General Directorate of Industrial Zones.

The Ministry of Industry and Technology (MoIT) has a significant track record in enhancing Organized Industrial Zones (OIZs). These zones in Türkiye are strategically located to comply with specific regulations (Organized Industrial Zones Law No. 4562) and receive backing from the MoIT. The primary aim of the Türkiye Organized Industrial Zones Project is to enhance the effectiveness, eco-friendliness, and competitiveness of chosen OIZs in Türkiye

Sub-projects within the framework of the TOIZsP are subject to an initial screening process based on three primary criteria: the project's nature, size, and location, particularly considering sensitive areas. This screening aims to identify at an early-stage sub-projects that may have noteworthy environmental or social impacts, necessitating a comprehensive Environmental and Social Impact Assessment, in accordance with the World Bank's Environmental and Social Framework (ESF) and TOIZsP's Environmental and Social Management Framework (ESMF).

Environmental and social screening processes have been completed for the subject projects of these OIZs in line with the World Bank's requirements. The screening processes utilized Environmental and Social Screening Forms, along with accompanying annexes, to address pertinent questions aimed at identifying potential environmental and social consequences arising from the execution of the sub-project. Overall environmental and social risks of the projects of these OIZs have been rated as "Moderate".

The Project is financed by the World Bank (WB). The Ministry of Industry and Technology (MoIT) is responsible for execution and Asım Kibar Organized Indusrrial Zone (OIZ) is the subproject owner and responsible for the implementation of the Project at the local level.

15 ton/day Solar Sludge Drying Facility and 0.12 kWp Rooftop Solar Power Plant Project (''the Project'') by Asım Kibar OIZ has been accepted as one of the sub-projects in the Türkiye Organised Industrial Zones (TOIZ) under the Ministry of Industry and Technology due to both supporting waste management capacity and increasing the use of renewable energy. Within the scope of the project, a lower amount of sludge will be disposed of by using renewable energy. The organized industrial zone will be able to use its wastewater treatment capacity more effectively because less sludge will be disposed of. Location of the Asım Kibar OIZ Solar Sludge Drying Plant and Rooftop Solar Power Plant Project in Kocaeli is shown in Annex-2 Figure 23.

1.2 Purpose and Scope of Environmental and Socail Management Plan (ESMP)

The project is assessed as of Moderate Risk according to WB's E&S Policy, which states that for moderate risk projects, the potential risks and impacts and issues are likely to have the following characteristics: (i) predictable and expected to be temporary and/or reversible, (ii) low in magnitude, (iii) site-specific, without likelihood of impacts beyond the actual footprint of the project and (iv) low probability of serious adverse effects to human health and/or the environment (e.g., do not involve use or disposal of toxic materials, routine safety precautions are expected to be sufficient to prevent accidents, etc.). The reasons for the risk characterization of the Project is given below:

- The activities include land preparation and construction for a sludge drying facility and installation works for a rooftop solar power plant, which could pose common environmental risks/impacts associated with waste generation, noise nuisance, dust, and exhaust emissions. Those are considered predictable, site-specific, and temporary and can be easily mitigated with adequate mitigation and management measures to be implemented following the provisions given in the national regulation, WB ESSs, and WB Group's Environmental, Health and Safety (EHS) Guidelines.
- The adjacent agricultural land, creek, and groundwater are considered sensitive environmental receptors, and wastes and emissions could pose a risk to the subject receptors. The risks are predictable, mostly temporary, and could be managed once adequate measures are applied to avoid the risks on the subject receptors.
- All activities will be carried out within the OIZ boundaries. The land allocated as a treatment plant area will be used
- The impact on vegetation, soil, and ecosystem is site-specific, and the associated risk is low in magnitude.
- Land acquisition or resettlement is not needed,
- There are occupational health and safety risks during the operation stage that can be mitigated through additional measures and precautions,
- Excessive labour influx will not be generated,
- The livelihoods of households within the AoI, specifically vulnerable groups and formal-informal users on land, will not be damaged, and
- Impacts will be very low in scale and will not be differentiated on women and men, different ethnic groups, or social classes. National legislation and WB ESSs will be applied to fair employment, equal access, and employment opportunities for women.

One of the tasks under the scope of the Project is the preparation of an ESMP in accordance with both national regulations and WB ESSs, the ESMF of the TOIZsP, World Bank Group (WBG) General EHS Guidelines and Industrial Sector Guidelines and the national legislation in force in Türkiye. Accordingly, this ESMP has been prepared by Infratech Yazılım, Mühendislik ve İnovasyon A.Ş. (Infratech) to assess and identify the potential environmental and social impacts and risks arising from the development of the Project and recommend mitigation measures for significant adverse environmental and social impacts/risks and describes the monitoring and institutional requirements necessary to implement this Plan.

The primary purpose of this ESMP is to ensure that the environmental and social requirements and social commitments associated with the Project are duly implemented during the pre-construction, construction and operation phases of the Project and are effectively managed. The specific objectives of this ESMP are as follows:

- To conduct all project activities in accordance with the applicable national legislation and in compliance with the ESMF, WB's ESSs;
- To identify anticipated adverse environmental and social risks and impacts;
- To adopt the mitigation hierarchy and identify mitigation measures, which anticipate and avoid, minimize, and, where residual impacts remain, compensate or offset risks and impacts;
- To prevent or compensate any loss of the affected person;

- To prevent environmental degradation resulting from either individual sub-projects or their cumulative effects;
- To enhance positive environmental and social outcomes;
- To ensure maximizing efficiency and minimizing costs in complying with environmental and social legislation and standards;
- To provide an Action Plan to ensure that the project impact mitigation measures are properly implemented and monitored; and
- To ensure that all stakeholders' concerns are addressed.

A Stakeholder Engagement Plan (SEP) has not been prepared for the Project by Infratech at Sub-Project level. The SEP was prepared by the MoIT in January 2021, aiming to fulfil the World Bank's ESS 10 Stakeholder Engagement and Information Disclosure requirements. Stakeholder engagement activities will be based on the plan prepared by the MoIT and stakeholders at sub-project level have been identified and their relevance to the project is stated in Section 11 of this ESMP. The TOIZsP Stakeholder Engagement Plan (available at https://yesilosb.sanayi.gov.tr/projedokumanlari) will be implemented throughout the lifecycle of this sub-project and all project parties (including the contractor, Organized Industrial Zone (OIZ) and Ministry of Industry and Technology (MoIT) PIU) will be responsible for ensuring compliance with the TOIZsP SEP.

This plan was structured around the below main headings. The information provided in the report plan was detailed under these headings to the extent that the best available data allowed. Accordingly, the chapters included in the ESMP can be briefly explained as the following:

- Chapter 1 Introduction; introduction to the project and ESMP, providing project details.
- Chapter 2 Project Description; is a description of the project including its location, components, technical specifications, associated construction and operation activities, and a proposed schedule for implementation.
- Chapter 3 Legal Framework; explains national and international legal requirements, analyzes gaps between national legislation and WB ESF and identifies environmental and other relevant to the project.
- Chapter 4 Methodology; describes ESMP preparation methodology
- Chapter 5 Environmental Baseline of the Project; describes the baseline conditions in and around the proposed Project Area, including physical, biological conditions.
- Chapter 6 Social Baseline of the Project; describes the baseline conditions in and around the proposed Project Area, including socio-economic conditions.
- Chapter 7 Environmental and Social Risks and Impacts of the Project; assesses the potential negative risks and impacts of the project.
- Chapter 8 Environmental and Social Aspects and Best Practice Mitigation Measures; describes the necessary management strategies and responsibilities for implementation of the identified mitigation measures.
- Chapter 9 Environmental and Social Monitoring Plan; decribes monitoring activities.
- Chapter 10 Institutional Arrangements and Training; gives the information about environmental and social management structure and environmental and social monitoring reports.
- Chapter 11 Stakeholder Management Under ESMP; explains the needs, expectations and concerns of these stakeholders to ensure that the project's impacts and risks on the stakeholder or organization are positive, in other words, the summary of the SEP.
- Chapter 12 Deviation from the E&S Screening Studies; describes the deviations between the findings obtained during the ESMP studies and the findings obtained during the Screening studies.

2 PROJECT DESCRIPTION

2.1 Objectives of the Project

The Asım Kibar OIZ has been operating its industrial wastewater treatment plant since 2015 and disposing of its sludge with a high-water content following national regulations. All firms within the OIZ boundaries discharge their wastewater either treated or not to the Asım Kibar OIZ's sewage system ending with the OIZ's wastewater treatment plant. The treated wastewater in the wastewater treatment plant is conveyed to the wastewater recovery facility for advanced treatment. The recovered wastewater is used by the firms within the OIZ as process water and the treated effluent is discharged to Yirim Creek at the 50 m south of the existing wastewater treatment facilities.

Presently, the Asım Kibar OIZ is producing 15 tons of sludge each day in total. Of the 15-ton sludge, 13-ton sludge was generated by the industrial wastewater treatment plants of two firms operating within the OIZ boundaries and 2 more tons were generated by the AKOIZ's wastewater treatment plant operations. Treatment sludge originating from two firms is chemical treatment sludge, and treatment sludge originating from OIZ originates from chemical and biological treatment units. Treatment sludge (hazardous waste), which is approximately 20-25% dry, is collected in containers (crates) separately from other wastes and sent to licensed facilities for disposal. This sludge has been disposed of with the waste code "19 08 13: Sludges containing hazardous substances resulting from industrial wastewater treatment by other methods". The treatment sludge has been collected in sludge collection tanks having impermeable surfaces and disposed of to the licensed facilities regularly. Nowadays, the sludge drying plant project has emerged due to the decrease in the number of licensed companies, the fact that licensed companies do not receive the sludge on time and the increasing costs (transportation and disposal).

Upon the commissioning of the sub-project, the sludge will be dried within the solar sludge drying facility. In this direction, Asım Kibar OIZ plans to establish a 15 tonnes/day solar sludge drying plant and a rooftop solar power plant with a total power of 0.12 MW in order to meet its own heat and electrical energy needs from renewable sources. This will both lower its emissions and increase its supply security.

The sub-project consists of establishing a solar sludge drying facility with an approximate capacity of 15-ton sludge/day near the existing wastewater treatment plant of the OIZ. The solar sludge drying facility will be on the land allocated for the treatment plant area with parcel no 164/34. The solar sludge drying facility will aim to decrease the sludge's water content to an 85% solid content rate. The total area of the solar sludge drying facility is 5,000 m^2, where 3,360 m^2 of it will be used for drying halls. There will be two drying halls, each 12 m in width and 140 m in length. Sludge will be dried with heat of solar energy in these drying halls. The electricity to be used for electrically powered equipment of the solar sludge drying facility will be supplied by the electricity grid system of the OIZ. The construction period is expected to last 340 days.

In addition to the drying facility, a rooftop solar power plant with 0.12 MW power is planned to be installed on the existing wastewater recovery facility of the OIZ, similarly on the land allocated for the treatment plant area with parcel no 164/34. The electricity generated by the rooftop solar power plant will be supplied to the electricity grid system of the OIZ and will indirectly feed energy to the electrically powered equipment of the solar sludge drying facility. The total area of the solar panels to be installed on the roof of the existing wastewater recovery facility is 1,217 m^2.

2.2 Project Location

The Asım Kibar OIZ is situated in the Alikahya Atatürk Neighborhood of İzmit district within Kocaeli. İzmit district itself spans an area of 58,4 square kilometers and has an elevation of 3 meters above sea level. Asım Kibar OIZ, which is located on an area of 235 ha (34 ha expansion area), has a total of 28 industrial parcels (9 in use and no construction) and is adjacent to the E80 and O7 motorways (Northern Marmara Highway).

The Project will be constructed on the existing WWTP land which is in the existing OIZ's built-up industrial area. The allocated area for the WWTP is 40,395.43 ha. The Project does not require land acquisition. The Project land is owned by the OIZ (Parcel no: 164/34) and 5,000 m^2 of land will be utilised for the solar sludge drying plant. There is also a wastewater recovery facility within this parcel. A rooftop solar power plant with 0.12 MW power is planned to be installed on the existing wastewater recovery facility. The energy requirement during the operation phase of sludge drying plant will be provided by solar panels to be installed on the roof of the wastewater recovery plant building with an area of 1,217 m^2.

No expropriation or addition of land is required within the scope of the project.

Figure 1 Project Location on Google Earth

A figure showing the treatment plant area, water recovery facility building (rooftop) and sludge drying facility area is given as Figure 1. The project area is not currently used and there are bushes in the area. The site photographs of the area where the solar sludge drying will be installed and the water recovery facility where the solar panels will be installed are given in Figure 2.

Figure 2 Sludge Drying Facility Area and Water Recovery Facility Building

Maps prepared for application in the ESMP within the scope of the Project are given in Annex-2. In order to have an overview of the project vicinity, map of the area of influence that is defined in detail under Section 5.1 is given in Figure 3.

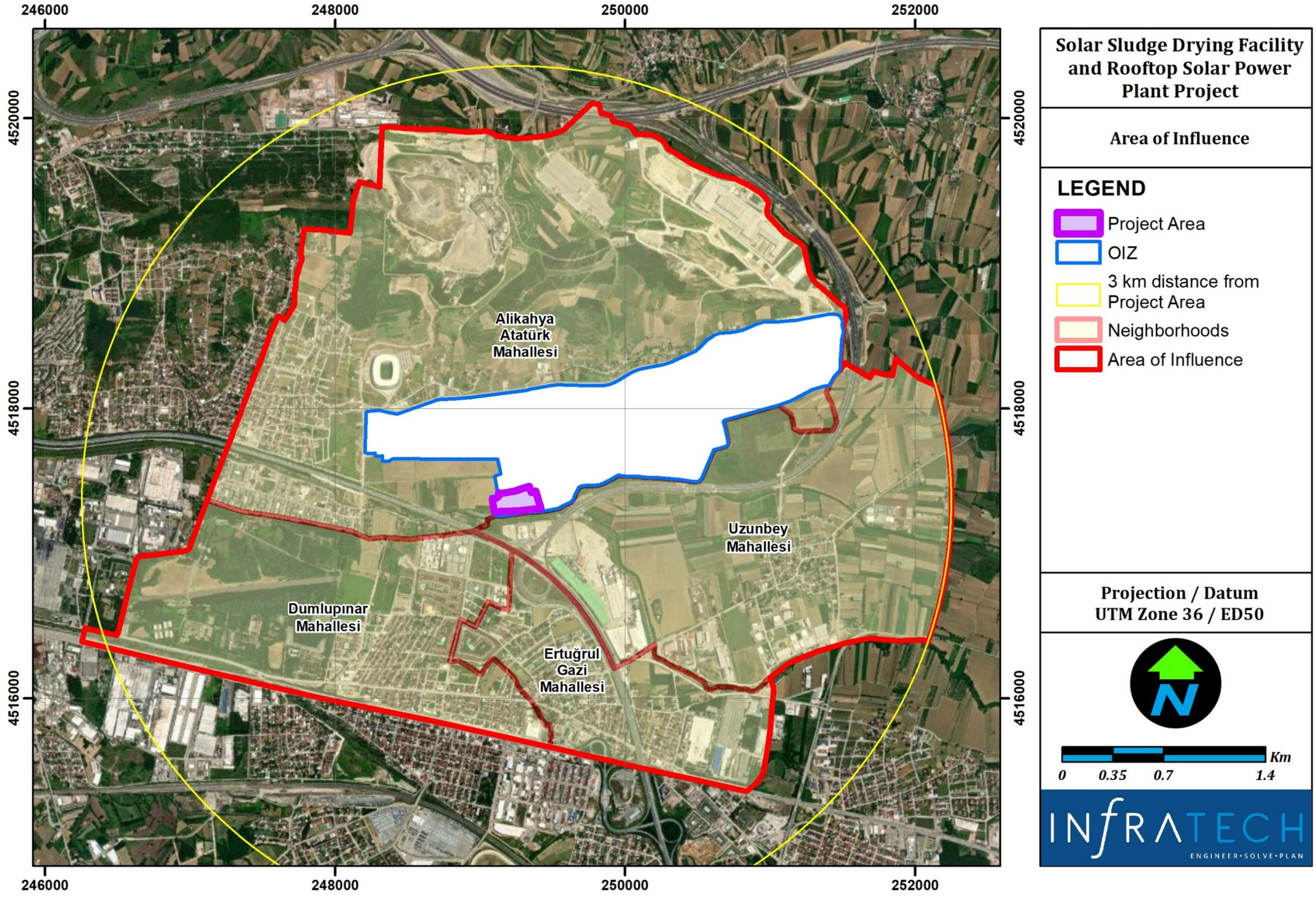


Figure 3 Area of Influence

As seen in Figure 3, the project area is located in Alikahya Atatürk Neighborhood. Dumlupınar and Uzunbey neighborhoods border the south of this neighborhood. The project parcel almost borders the Uzunbey Neighborhood and is approximately 17 meters away. Considering the neighborhood boundaries, the distance between the project parcel and Dumlupınar and Ertuğrul Gazi Neighborhoods is 182 and 264 meters respectively.

2.3 Project Components and Timeline

The project consists of the establishment of a solar sludge drying facility with a capacity of 15-ton sludge/day and electricity distribution line connection within the same parcel from solar sludge drying facility to the electricity system of the existing wastewater treatment facilities. In addition, a rooftop solar power plant with 0.12 MW power is planned to be installed on the existing wastewater recovery facility of the OIZ with an electrical connection to the electricity system of the wastewater recovery facility.

The following equipment will be included in the Sludge Drying Facility planned to be established.

1. Automatic Mixing Equipment for Wastewater Treatment Sludge

The unit basically consists of a corrosion-resistant painted steel bridge and a height-adjustable mixing equipment attached to the bridge. There are blades on the mixing equipment. With these blades, the solid layer formed on the surface of the sludge is broken and the lower parts are ventilated effectively. The height of the mixing equipment is adjusted by two mechanically interconnected gears and the main motor. The mixing equipment rotates at a speed of 45 rpm and carries the sludge downwards with the effect of rotation. The unit can move and rotate in two directions. The system is equipped with sensors and control instruments. The parts in direct contact with sludge are made of AISI 316 material. The installed power of the machine is 16 kWh.

Figure 4 Automatic Mixing Equipment

Table 3 Mixing Equipment Technical Information

Energy Source	Solar Energy
Installed Power	16 kW
Rotating Speed of Mixer	30-60 rpm
Linear Speed	0.4-8.0 m/min
Weight	1000

2. Control Panel for Automatic Mixing Equipment

All active units in the facility are controlled by a central control panel with a single programmable controller within the control cabinet. Control cabinets (including programmable controllers) are generally installed at the front of the drying bed. SPS Touch screen and software are included in the scope of supply. These systems can be integrated into SCADA systems.

All equipment (ventilation systems, weather station, mixing machine, sludge feeding system, security system, odor control system) can be controlled and adjusted from the control cabinet.

2.1. Cable and Cable Transport System

Electrical busbar system method is a modular approach to electrical wiring, where instead of a standard cable wiring to every single electrical device, the electrical devices are mounted onto an adapter which

is directly fitted to a current carrying busbar. This modular approach is used in distribution boards, automation panels and other kinds of installation in an electrical enclosure.

Busbar systems are subject to safety standards for design and installation along with electrical enclosure according to IEC 61439-1 and vary between countries and regions.

Figure 5 Cables

2.2. Safety Systems

Safety Sensor: Each drying bed has a safety line at both ends (inlet and outlet end). When this safety line/emergency stop is activated, the machine and all its moving parts stop immediately.

2.3. Instrumental Analysis Devices

Two separate sets of instrumental analysis devices will be installed inside and outside the greenhouse. Wind, temperature-humidity, radiation and rain measurements will be made outside the greenhouse, as well as temperature and humidity measurements inside the greenhouse for each greenhouse. Meteorological data will be monitored automatically from the automation system.

2.4. Circulation and Exhaust Fans — Ventilation System

In order to achieve the best results in drying the sludge in the greenhouse, a ventilation system with optimum temperature-humidity conditions and high efficiency will be provided in the greenhouse.
In order to continuously distribute the moisture accumulated on the sludge surface and ensure air circulation, 12 circulation fans will be used, one circulation fan placed every 10 meters, considering the length of the drying bed.

In order to remove hot and humid air from the system, 4 exhaust fans located at the entrance of the drying bed will be used.

3. Steel Construction with Polycarbonate Sheet

Wall material: 80% light transmittance, 8 mm polycarbonate
Roof material: 90% light transmittance, 0.8 mm polycarbonate
Steel structure design: Steel construction is made of hot dipped galvanized steel. Heat transfer coefficient: 4.2 W/m^{2}K,
Steel construction will be designed and constructed in accordance with the standards specified below:

- TS EN 13031-1 standards (Greenhouses: Design and Construction)
- TS 498 Standards (Design Loads for Structures)
- TS EN 1993 Eurocode-3 standards (Steel Construction Design)

Figure 6 Building Material of Sludge Drying Facility

4. Automatic Sludge Discharge System

Treatment sludge dried in the sun will accumulate in a 2.5 meter area reserved at the end of the drying hall. For discharge, the mixer machine will be put into discharging mode and the dried sludge will be fed to a chain conveyor with a length of 26 m and a width of 50 cm.

The chain conveyor will convey the mud on the floor to the screw conveyor bunker at the end of the halls by sweeping.

The 8 m long screw conveyor will enable the products to be transferred vertically to the truck. Chain carrying profiles will be AISI 316 L stainless steel, chains will be specially hardened black steel, and carrying plates will be teflon. The screw conveyor body will be made of AISI 316 L stainless steel, and the screw will be made of St-52 material to avoid any breakage problems.

5. Odor Removal Units

The odor control and removal system is designed to suck and expel polluted air in the environment and has a capacity of 7 cycles per hour. The dirty air sucked in with the help of fans and ducts will be purified using chemical air spray scrubbers.

6. Solar Power Plant

The block diagram of a solar power plant is given below. Most PV modules are made from semiconductor materials, usually some type of silicon. When photons from sunlight hit the semiconductor material, free electrons are produced, and these electrons then flow through the material to generate a direct electric current (DC). DC current must be converted to alternating current (AC) using an inverter before it can be used in electrical appliances or supplied to the electricity grid.

The technology and components of solar energy systems are briefly shown below:

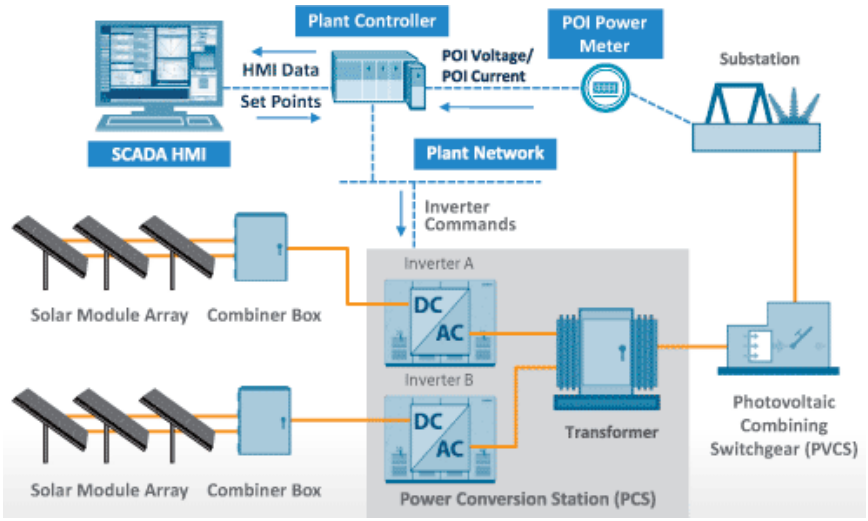


Figure 7 Technology and Components of Solar Energy

PV module is a group of photovoltaic cells mounted in an aluminum frame. Photovoltaic cells use sunlight as an energy source and generate direct current electricity. Sequence is formed by connecting PV modules in series.

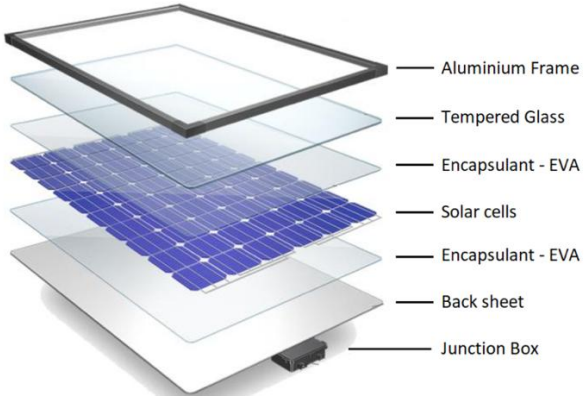


Figure 8 PV Module Components

Photovoltaic modules use light energy (photons) from the sun to generate electricity through the photovoltaic effect. Most modules use wafer-based crystalline silicon cells or thin film cells. The structural (load bearing) element of a module can be the upper layer or the back layer. Cells must be protected from mechanical damage and moisture. Most modules are rigid, but semi-flexible ones are also available. Cells are electrically connected one after another in series until the desired voltage is achieved, and then these PV module strings are connected in parallel to the inverter to increase the amperage. The wattage of the module is the mathematical product of the module's voltage and amperage. Properties on PV modules are values obtained under standard conditions.

A PV junction box (J-box) is installed behind the solar panel and acts as the output interface. Most photovoltaic modules use MC4 connectors for external connections.

Figure 9 J-Box and MC4 Connector

Some special solar PV modules contain concentrators that focus the light into smaller cells. This allows cost-effective use of cells with a high cost per unit area (such as gallium arsenide).

Over the last decade, with various innovative approaches, PV modules have improved significantly in terms of their efficiency and power output. The efficiency of silicon cells approached 29.4%, the maximum achievable limit called the Auger limit. While it was possible to exceed 22% efficiency with cells produced only in the laboratory environment ten years ago, it can be done in industrial environments today. Cell prototypes are currently achieving efficiency values of over 26%. Some innovations raise the bar for the solar industry in terms of power output, higher efficiency, quality, reliability, production efficiency, and improve system performance.

Innovations followed in the sector:

- PERC / PERT, HJT, IBC and two-face technology to increase system performance and energy efficiency
- Advantages of half-cut cells
- Introduction of 1,500 V modules and their impact on overall BOS cost reduction

Until 2018, polycrystalline silicon PV modules were frequently used in the global PV market due to their cost advantages. After 2018, monoperc modules have dominated the market. Costs are reduced as PERC modules generate more energy per unit area.

1,500 V DC systems minimize the balance of system requirements and contribute to lowering overall PV system costs. For this reason, 1,500 V is preferred for grounding installation, especially in large power plants.

String Inverters

Most small solar power systems use string inverter technology. In this solar technology, each solar panel is connected to strings. The electricity generated by the solar panel goes to the inverter, and eventually, the inverter converts direct current into alternating current by imitating the grid. Therefore, inverters will not work when the mains are cut.

Figure 10 String Inverter

While selecting the string inverters, it should be checked whether it contains an internal DC fuse or not. If it does not, DC fuses must be used at the string inputs. Sequence-based current-voltage values can also be monitored in these inverters.

The most important advantage of string inverters is that when an insulation failure occurs, the power plant does not experience large power losses. They are simpler to maintain and can be easily backed up. Connecting strings located at different inclinations to inverters with a high number of Maximum Power Point Trackings (MPPTs) will not reduce the efficiency.

In designs made with these inverters, the length of AC cable is more, and the unit cost is higher than the central.

Mounting Structures

In flat roofs, the carrier system can be ballasted to prevent damage to the ground. Since the parapets on the roof will prevent strong wind from entering under the panels, the concrete blocks, panel and carrier system remain in place thanks to the weight. The metal structure can be produced at the desired angle.

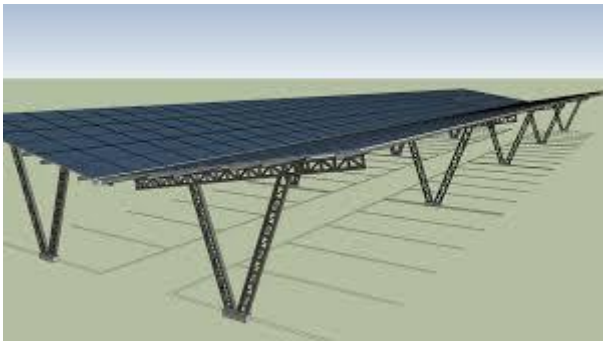


Figure 11 Carport Mounting Structure

Only aluminum purlins and fasteners are used on sloping roofs. Connection type should be chosen according to the roofing type. Aluminum purlins should be continuous in terms of grounding integrity and strength. In trapezoidal roofs, panel carrier purlins should be mounted on the beams that carry the roof covering. If there is a sandwich panel roof covering, purlins carrying PV modules should be fixed from at least four points from the sides, not from the top of the ribs.

Figure 12 Sloping Roof Mounting Structure

To capture the maximum light intensity, the string needs to be focused on the sun position so that the effective area is maximized, and direct beam radiation is received. Viewers increase production by more than 20 percent compared to the constant slope. The facility will not only see increased annual production, but will also see increased production during peak hours, which will add value in regions with Lifetime ratios.

The carrier system is made of hot dip galvanized. It must be resistant to outdoor conditions. Purlins are made of aluminum material.

Wiring for Electrical Connection

It is preferred that DC cables are of H1Z2Z2-K type in terms of efficiency and life, and the cross section is at least 6 mm^2. MC4 connectors are used for module, string and inverter connections. Cables are run through duct and pipe without being exposed to direct sunlight. It is recommended to connect the pans not to the roofing material, but to the module carrier system to prevent impermeability.

These are the cables used between the inverter - SPP panel board and SPP panel board - transformer. Copper or aluminum cable with suitable cross-section can be used for low and medium voltage cables.

PV System Monitoring

Wi-fi datalogger will be used for inverters. In this way, it will be possible to monitor on the basis of series via web portals and on the basis of panels if an optimizer is used. Many values such as production, fault alarms, current and voltage values, CO_2 emissions, performance ratio, radiation and temperature can be remotely monitored. A low voltage panel will be built next to the SPP panel board and communication equipment will be placed inside.

In addition, a SCADA system compatible with the Sakarya Electricity Distribution Co. (SEDAŞ) system will be installed. The regional distribution company will also be able to monitor the power plant remotely.

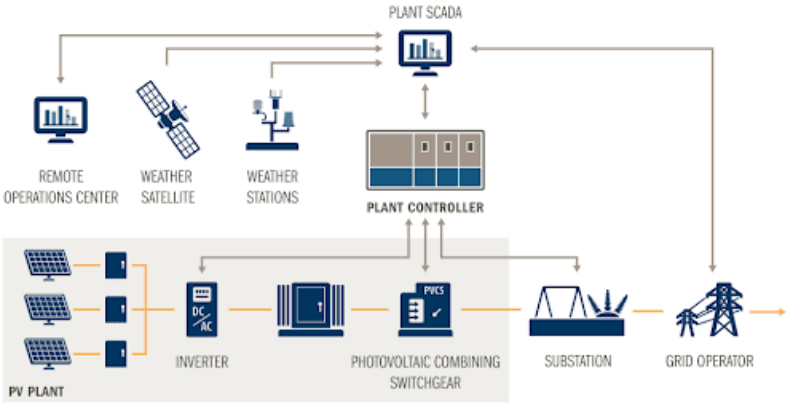


Figure 13 Scada

Project Schedule

According to the information obtained from Asım Kibar OIZ, the consultancy tender phase of the Project will last for two months. After the consultancy period, the design review and revisions by consultant, which will take four months for the project. The bid preparation, bidding and bid evaluation phase are planned to last three months. After these phases, contract signing and construction phase will last 11 months. After construction phase and commissioning of the sub-project, the Defect Notification Period (DNP) will last 12 months. The anticipated schedule of the Project is provided in Table 4.

Table 4 Time Schedule of the Project

Time Schedule for Implementation of Sub-project																																
Months	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Selection of Consultant for Design Review and Construction Control																																		
Design Review and Revisions (by Consultant)																																		
Bid preparation, bidding and bid evaluation																																		
Contract signing and Construction																																		
Commissioning of the solar sludge drying plant and solar power plant																																		
Defect Notification Period																																		

2.4 Permits and Management System of the OIZ

2.4.1 Management Systems of the OIZ

According to the Organized Industrial Zones (OIZs) Implementing Regulation (Official Gazette No. 30674 dated 02.02.2019), OIZ managements are the highest regional authority that are responsible for the construction, maintenance and operation of wastewater infrastructure plants within OIZs. In this regard, OIZ managements are responsible for the compliance with the requirements of the Water Pollution Control Regulation published in the Official Gazette No. 25687 dated 31.12.2004.

In accordance with the Regulation on Permits and Licences Required by the Environmental Law, it is mandatory to obtain an environmental permit as of April 1, 2010 for the discharge of industrial wastewater into the receiving environment. WWTP Project Approval of Asım Kibar OIZ was given by the Ministry of Environment, Urbanization and Climate Change (MoEUCC) on 12 June 2014.

The organisation chart of Asım Kibar OIZ is given in Annex-10. At the top of the management is the enterprising committee. This is followed by the Board of Directors and the Regional Director. The Board of Directors is supervised by the Audit Board. Consultants (legal, financial, technical) and Assistant Regional Manager work under the Regional Manager. Consultancy services here are outsourced.

Financial Affairs Manager, Administrative Affairs Manager, Zoning and Construction Affairs Manager, Mechanical and Treatment Plant Manager, Electricity and Information Technology Manager and Environmental Manager are shown in the OIZ Management. As indicated in the organisation chart, the Environment Manager is in that position by proxy. There are many managers, foremen, responsible personnel and support staff under these directorates.

Asım Kibar OIZ has received ISO 9001:2015 Quality Management System and ISO 14001:2015 Environmental Management System certificates in line with the services and activities carried out within the scope of the Organised Industrial Zones Law and Implementation Regulation. The validity date of these certificates is April 10, 2025 for both. These certificates are given in Annex-11.

In addition, there are several management plans, procedures and instructions prepared by Asım Kibar OIZ on environmental, social and OHS issues, including but not limited to the following:

- Corrective Actions Procedure
- Integrated Management System Handbook
- Document and Records Control Procedure
- Internal Audit Procedure
- Management Review Procedure
- Environmental Emergency Procedure
- Hazard, Risk and Opportunity Procedure
- Monitoring and Measurement Procedure
- Calibration Instruction
- Supplier Evaluation Instruction
- Legal and Other Requirements Procedure
- Waste Management Procedure
- Zero Waste Procedure
- Preparation of Environmental Management Programme
- Environmental and Licence Procedures
- OHS Procedure
- Procedure For the Determination and Assessment of Environmental Dimensions
- Zero Waste Directive
- Work Leave Instructions
- Instruction on Safe Use and Control of Chemical Substances
- Waste Control Instruction
- Emergency Procedure
- Emergency Instruction
- Personnel Regulation
- Contact Procedure
- Communication Matrix

Asım Kibar OIZ currently has a Zero Waste Certificate and the last inspection of its existing facilities within the scope of this certificate was carried out by the Ministry of Environment and Urbanization on June 6, 2020 (see Annex 15). The validity period of the certificate is 5 years.

2.4.2 Permits

The Project-related permits to be taken are as follows:

- Rooftop SPP EIA Regulation Out of Scope letter (obtained in 2023)
- Solar sludge drying plant EIA Regulation Out of Scope letter (obtained in 2022)
- Environmental Permit Certificate on Wastewater Discharge (valid until 9th of June, 2025)
- Letter of Compliance in terms of Environmental Legislation for WWTP and Water Recovery Facility (obtained on 16th of March, 2020)
- Three-year Industrial Waste Management Plan from Provincial Directorate of Environment, Urbanization and Climate Change (obtained in 2022)
- Zero Waste Certification (valid until 12th of June, 2025)
- Hazardous Waste Liability Insurance by insurance companies (valid until 24th of March, 2025)
- Wastewater Treatment Plant Project Approval from Provincial Directorate of Environment, Urbanization and Climate Change (obtained on 12th of June, 2014)
- Construction License from OIZ Directorate by Contractor (in pre-construction phase of the Project),
- Building License from OIZ Directorate by Contractor (in pre-construction phase of the Project),
- Temporary Certificate of Operation from Provincial Directorate of Environment, Urbanization and Climate Change (after construction phase of the Project),
- Obtaining building and workplace opening licence AKOIZ has an electricity distribution certificate, therefore there is no need to obtain permission from SEDAŞ.
- A letter of conformity approved by Kocaeli Municipality stating that the building is suitable for additional loads (snow, ice and wind load and the load of the solar energy system to be installed) and that the SPP facility with roof and/or facade application can be built.
- Project Base Map (Plankote) Approval from the Industrial Zones Ministry of Industry and Technology, General Directorate (in planning phase of the Project)

3 LEGAL FRAMEWORK

This chapter presents the main aspects of the legal and administrative framework followed in the design of this ESMP. In this project, in addition to determining which standards to follow, a gap analysis is conducted between national legislation and ESF is carried out and how these gaps will be closed in this project. Various national legislation and international conventions and standards explained in the following sections are also to be complied with during different stages of the Project, including pre-construction, construction and operation.

3.1 National Legislation

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

3.1.1 National Environmental, Health and Safety Legislation

Environmental Law No. 2872, which is ratified in August 1983 (Official Gazette dated 11.08.1983 and numbered 18132), is one of the principal legislations related to the Project. Several by-laws and decrees are enforced under the Environmental Law.

Occupational Health and Safety Law No. 6331, which is ratified June 2012 (Official Gazette dated 30.06.2012 and numbered 28339), is other principal legislation related to the Project. Occupational Health and Safety Law enforces various by-laws and decrees to regulate and uphold health and safety standards.

The out of scope of EIA Regulation Opinion from the Provincial Directorate of Environment, Urbanization, and Climate Change regarding the proposed solar sludge drying facility was obtained by the AKOIZ. The out of scope of EIA Regulation Opinion of the Provincial Directorate of Environment, Urbanisation and Climate Change (PoEUCC) regarding the rooftop solar power plant was also obtained in October 2023 (See Annex 3).

Asım Kibar OIZ shall comply with the requirements of the current national legislation and codes of practice and fulfil all other legal requirements. Therefore, during each stage of the planned Project and implementation of related management plans, all activities will be carried in accordance with certain standards and limits set by the laws and regulations attached in Annex 5 and any license and/or permit required for the upcoming stages of the Project will be acquired accordingly.

3.2 International Agreements and Standards

3.2.1 World Bank Environmental and Social Framework (ESF)

Since the main finance source of the Project is WB, the Project must comply with the WB ESF, WBG General EHS guidelines, and good internaitonal industry practices alongside the national legislation.

The project is classified as Moderate Risk according to WB's E&S Policy, which states that for moderate risk projects the potential risks and impacts and issues are likely to have the following characteristics: (i) predictable and expected to be temporary and/or reversible, (ii) low in magnitude, (iii) site-specific, without likelihood of impacts beyond the actual footprint of the project and (iv) low probability of serious adverse effects to human health and/or the environment (e.g., do not involve use or disposal of toxic materials, routine safety precautions are expected to be sufficient to prevent accidents, etc.).

The reasons for the risk characterization of the Project is given below:

- The activities include land preparation and construction for a sludge drying facility and installation works for a rooftop solar power plant, which could pose common environmental risks/impacts

associated with waste generation, noise nuisance, dust, and exhaust emissions. Those are considered predictable, site-specific, and temporary and can be easily mitigated with adequate mitigation and management measures to be implemented following the provisions given in the national regulation, WB ESSs, and WB Group's Environmental, Health and Safety (EHS) Guidelines.

- The adjacent agricultural land, creek, and groundwater are considered sensitive environmental receptors, and wastes and emissions could pose a risk to the subject receptors. The risks are predictable, mostly temporary, and could be managed once adequate measures are applied to avoid the risks on the subject receptors.
- All activities will be carried out within the OIZ boundaries. The land allocated as a treatment plant area will be used.
- The impact on vegetation, soil, and ecosystem is site-specific, and the associated risk is low in magnitude.
- Land acquisition or resettlement will not be needed,
- There are occupational health and safety risks during the operation stage that can be mitigated through additional measures and precautions,
- Excessive labour influx will not be generated,
- The livelihoods of households with the project AoI, specifically vulnerable groups and formal-informal users on land, will not be damaged, and
- Impacts will be very low in scale and will not be differentiated on women and men, different ethnic groups, or social classes. National legislation and WB ESSs will be applied to fair employment, equal access, and employment opportunities for women.

The World Bank Group (WBG) Environmental, Health and Safety (EHS) Guidelines constitutes technical reference resources that include general and sector specific examples of international good sector practices. It includes the information on applicable environmental, the health and safety issues for all industrial sectors. WBG uses the EHS Guidelines as a technical source of information during Project appraisal. EHS Guidelines include performance levels and measurements that can be achieved at newly installed facilities using WBG's available technologies at reasonable cost.

3.2.2 Comparison of Turkish EIA Regulation and WB ESSs

Since the main finance source of the Project is WB; the Project must comply with the good international industry practice, including compliance withWBG EHS guidelines, WB ESSs and best practices documents alongside the national legislation.

The World Bank (WB) Environmental and Social Framework reflects the World Bank's commitment to sustainable development through ten Environmental and Social Standards (ESS) that are designed to support Borrowers' environmental and social (E&S) risk management.

The Project and the social and environmental elements in the Area of Influence (AoI) of the Project include elements or activities that are related to the scope of ESS1, ESS2, ESS3, ESS4, ESS6 and ESS10. The main objectives of these standards within the scope of the Project are presented below.

- ESS1: Assessment and Management of Environmental and Social Risks and Impacts,
- ESS2: Labour 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.

The gap analysis between the WB ESSs triggered by the Project and Turkish EIA Regulation is provided in Annex 5, including measures to bridge identified gaps which sets the standards to be followed in the present project.

3.3 Project Standards[1]

Table 5 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 Date/Number: 30.11.2022/32029) • Annex- 2 "Table-1 Limit Values for ambient noise level"	Noise source: Industrial Facilities, Transportation: Day time (07:00-19:00): $LA_{eq,\ 5\ min.}$< 65 dB(A) Evening time (19:00-23:00): $LA_{eq,\ 5\ min.}$< 60 dB(A) Night time (23:00-07:00): $LA_{eq,\ 5\ min.}$< 55 dB(A)	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.	Receptor Residential; institutional, educational: • Day time (07:00-22:00): • One Hour LAeq dB(A) < 55 dB(A) • Night time (22:00-07:00): • One Hour LAeq dB(A) < 45 dB(A) Receptor Industrial, commercial: • Day time (07:00-22:00): • One Hour LAeq dB(A) < 70 dB(A) • Night time (22:00-07:00): • One Hour LAeq dB(A) < 70 dB(A)	Receptor: Residential, industrial, commercial[2]: Day time (07:00-19:00): $LA_{eq,\ 5\ min.}$< 65 dB(A) Evening time (19:00-23:00): $LA_{eq,\ 5\ min.}$< 60 dB(A) Night time (23:00-07:00): $LA_{eq,\ 5\ min.}$< 55 dB(A)
2	Air Quality	• Regulation on the Assessment and Management of Air Quality (Official Gazette Date/Number: 06.06.2008/26898) Annex-1	PM_{10} 1-Year: 40 µg/m3 24-Hour: 50 µg/m3 (not to be exceedance more than 35 times per year)	WBG General EHS Guidelines: Environmental Air Emissions and Ambient Air Quality Table 1.1.1.: WHO Ambien Air Quality Guidelines	PM_{10} 1-Year: 20 µg/m3 24-Hour: 50 µg/m3 (99th percentile (i.e. 3-4 exceedance days per year) $PM_{2.5}$ 1-Year: 10 µg/m3 24-Hour: 25 µg/m3 (99th percentile (i.e.3-4 exceedance days per year)	Turkish Legislation has not described a limit value for $PM_{2.5}$. Therefore, in the assessment of the measurement result, the limit value set forth by the Ambient Air Quality and Cleaner Air for Europe (Directive 2008/50/EC) and WBG 24-hour limit values are used, which is 25 µg/m3 for both of them. PM_{10} 1-Year: 20 µg/m3 24-Hour: 50 µg/m3 (99th percentile (i.e. 3-4 exceedance days per year) $PM_{2.5}$1-Year: 10 µg/m3 24-Hour: 25 µg/m3 (99th percentile (i.e. 3-4 exceedance days per year)
		• Industrial Air Pollution Control Regulation (Official Gazette Date/Number: 03.07.2009/27277 revised in the Official Gazette Date/Number: 06.11.2020/31296) Annex- 2.1 "Table-2 Mass Flows"	Non-stack Mass Flow CO: 50 kg/h Dust: 1 kg/h NOx: (as NO_2) 4 kg/h SOx: 6 kg/h (These limits are for exhaust gas emissions from the working of construction machinery)	WBG General EHS Guidelines: Environmental Air Emissions and Ambient Air Quality	WBG General EHS Guidelines: Environmental Air Emissions and Ambient Air Quality mention that: "Emissions do not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and standards by applying national legislated standards, or in their absence, the current WHO Air Quality Guidelines" Since National Standards exist, compliance with National Standards will be ensured.	The limit values for exhaust gas defined in Industrial Air Pollution Control Regulation will be complied in Project. Non-stack Mass Flow CO: 50 kg/h Dust: 1 kg/h NOx: (as NO_2) 4 kg/h SOx: 6 kg/h

[1] *All parameters were evaluated based on the most stringent one.*

[2] *Since there are residential, industrial and commercial commercial areas within the project area of influence, this project standard was selected specifically for noise.*

Environmental Standards						
No	**Topic**	**National Standards/ Requirements**	**Limit Values in National Legislation**	**International Standards/ Requirements**	**Limit Values in International Legislation**	**Project Standards**
3	Effluent Water Quality	Regulation on Water Pollution Control (Official Gazette Date/Number: 31.12.2004/25687 and revised in the Official Gazette Date/Number 12.05.2023/32188) Wastewater Discharge Standards Defined in Table 19-Discharge Standards of Mixed Industrial Wastewater to The Receiving Environment (Small and Large Organized Industrial Zones and Other Industries for Which Sector cannot be Determined)	Discharge Standards for the Treated Process Water to Receiving Environment in the Regulation on Water Pollution Control for WWTP : COD: 250 mg/L TSS: 200 mg/L Oil and grease: 20 mg/L Total Phosphorus (P): 2 mg/L Total Chrome: 2 mg/L Chrome (Cr^{+6}): 0.5 mg/L Lead (Pb): 2 mg/L Total Cyanide (CN-): 1 mg/L Cadmium (Cd): 0.1 mg/L Ferrous (Fe): 10 mg/L Fluoride (F-): 15 mg/L Copper (Cu): 3 mg/L Zinc (Zn): 5 mg/L Mercury (Hg): 0.05 mg/L Sulphate (SO_4^{-2}): 2500 mg/L[3] Total Kjeldahl Nitrogen (TKN): 20 mg/L Fish Bioassay (TDF): 10 Color: 280 Pt-Co pH:6-9	WBG General EHS Guidelines: Environmental Wastewater and Ambient Water Quality	WBG General EHS Guidelines Environmental-Wastewater and Ambient Water Quality mention that: "Compliance with national or local standards for sanitary wastewater discharges or, in their absence, the indicative guideline values applicable to sanitary wastewater discharges shown in Table 1.3.1." Since National Standards exist, compliance with National Standards will be ensured.	The discharge criteria of the WWTP have been decided on the basis of the Water Pollution Control Regulation, Urban Wastewater Treatment Regulation, EU directives and WBG EHS Guidelines: Environmental Wastewater and Ambient Water Quality. Limit values of Surface Water Quality. COD: 250 mg/L TSS: 200 mg/L Oil and grease: 20 mg/L Total Phosphorus (P): 2 mg/L Total Chrome: 2 mg/L Chrome (Cr+6): 0.5 mg/L Lead (Pb): 2 mg/L Total Cyanide (CN-): 1 mg/L Cadmium (Cd): 0.1 mg/L Ferrous (Fe): 10 mg/L Fluoride (F-): 15 mg/L Copper (Cu): 3 mg/L Zinc (Zn): 5 mg/L Mercury (Hg): 0.05 mg/L Sulphate (SO4-2): 2500 mg/L Total Kjeldahl Nitrogen (TKN): 20 mg/L Fish Bioassay (TDF): 10 Color: 280 Pt-Co pH:6-9

[3] It was stated by the General Directorate of Environmental Management in 2016 that the concentrated waters that will be formed as a result of the recovery of the treated waters originating from the OIZ will be discharged to the Yirim Stream discharging into the Marmara Sea and considering that the pollution load to be given to the receiving environment will not change in cases where the treated wastewaters are discharged directly or as concentrated after the recovery application, 2500 mg/L value can be allowed for the SO4 parameter in the discharge of the concentrated stream to the receiving environment. However, recovery rates should be adjusted so as not to exceed the limit values for other parameters.

Environmental Standards

<table>
<tr><th>No</th><th>Topic</th><th>National Standards/ Requirements</th><th>Limit Values in National Legislation</th><th>International Standards/ Requirements</th><th>Limit Values in International Legislation</th><th>Project Standards</th></tr>
<tr>
<td>4</td>
<td>Surface Water Quality</td>
<td>Regulation on Surface Water Quality-Water Quality Classes (Official Gazette Date/Number: 30.11.2012/ 28483) Annex – 5)</td>
<td>
<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="3">Surface Water Quality Regulation
Water Quality Classes</th></tr>
<tr><th>I
(very good)</th><th>II
(good)</th><th>III
(moderate)</th></tr>
<tr><td>Ammonium (NH_4^+)</td><td>mg/L</td><td><0.2</td><td>1</td><td>>12</td></tr>
<tr><td>Colour</td><td>m^{-1}</td><td>RES 436 nm: ≤ 1,5
RES 525 nm: ≤ 1,2
RES 620 nm: ≤ 0,8</td><td>RES 436 nm: 3
RES 525 nm: 2,4
RES 620 nm: 1,7</td><td>RES 436 nm: > 4,3
RES 525 nm: > 3,7
RES 620 nm: 2,5</td></tr>
<tr><td>Oil and Grease</td><td>mg/L</td><td><0.2</td><td>0.3</td><td>>0.3</td></tr>
<tr><td>Biological Oxygen Demanded BOD(BOD_5)</td><td>mg/L</td><td><4</td><td>8</td><td>>8</td></tr>
<tr><td>Dissolved Oxygen (DO)</td><td>mg/L</td><td>>8</td><td>6</td><td><6</td></tr>
<tr><td>Conductivity</td><td>µS/cm</td><td><400</td><td>1000</td><td>>1000</td></tr>
<tr><td>Chemical Oxygen Demanded (COD)</td><td>mg/L</td><td><25</td><td>50</td><td>>50</td></tr>
<tr><td>Nitrate (NO_3^-)</td><td>mg/L</td><td><3</td><td>10</td><td>>10</td></tr>
<tr><td>pH</td><td>-</td><td>6-9</td><td>6-9</td><td>6-9</td></tr>
<tr><td>Total Phosphorus, (TP)</td><td>mg/L</td><td><0.08</td><td>0.2</td><td>>0.2</td></tr>
<tr><td>Ortophosphate (o-PO_4)</td><td>mg/L</td><td><0.05</td><td>0,16</td><td>>0.16</td></tr>
<tr><td>Total Kjeldahl Nitrogen(, TKN)</td><td>mg/L</td><td><0.5</td><td>1.5</td><td>>1.5</td></tr>
<tr><td>Total Nitrogen, (TN)</td><td>mg/L</td><td><3.5</td><td>11.5</td><td>>11.5</td></tr>
<tr><td>Floride</td><td>µg/L</td><td>≤1000</td><td>1500</td><td>>1500</td></tr>
<tr><td>Manganese</td><td>µg/L</td><td>≤100</td><td>500</td><td>>500</td></tr>
<tr><td>Selenium</td><td>µg/L</td><td>≤10</td><td>15</td><td>>15</td></tr>
<tr><td>Sulphur</td><td>µg/L</td><td>≤2</td><td>5</td><td>>5</td></tr>
</table>
</td>
<td>WBG General EHS Guidelines: Environmental Wastewater and Ambient Water Quality</td>
<td>WBG General EHS Guidelines Environmental-Wastewater and Ambient Water Quality mention that: " Discharges to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria or, in the absence of local criteria, other sources of ambient water quality."

Since National Standards exist, compliance with National Standards will be ensured.</td>
<td>
<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="3">Surface Water Quality Regulation
Water Quality Classes</th></tr>
<tr><th>I
(very good)</th><th>II
(good)</th><th>III
(moderate)</th></tr>
<tr><td>Ammonium (NH_4^+)</td><td>mg/L</td><td><0.2</td><td>1</td><td>>12</td></tr>
<tr><td>Colour</td><td>m^{-1}</td><td>RES 436 nm: ≤ 1,5
RES 525 nm: ≤ 1,2
RES 620 nm: ≤ 0,8</td><td>RES 436 nm: 3
RES 525 nm: 2,4
RES 620 nm: 1,7</td><td>RES 436 nm: > 4,3
RES 525 nm: > 3,7
RES 620 nm: 2,5</td></tr>
<tr><td>Oil and Grease</td><td>mg/L</td><td><0.2</td><td>0.3</td><td>>0.3</td></tr>
<tr><td>Biological Oxygen Demanded BOD(BOD_5)</td><td>mg/L</td><td><4</td><td>8</td><td>>8</td></tr>
<tr><td>Dissolved Oxygen (DO)</td><td>mg/L</td><td>>8</td><td>6</td><td><6</td></tr>
<tr><td>Conductivity</td><td>µS/cm</td><td><400</td><td>1000</td><td>>1000</td></tr>
<tr><td>Chemical Oxygen Demanded (COD)</td><td>mg/L</td><td><25</td><td>50</td><td>>50</td></tr>
<tr><td>Nitrate (NO_3^-)</td><td>mg/L</td><td><3</td><td>10</td><td>>10</td></tr>
<tr><td>pH</td><td>-</td><td>6-9</td><td>6-9</td><td>6-9</td></tr>
<tr><td>Total Phosphorus, (TP)</td><td>mg/L</td><td><0.08</td><td>0.2</td><td>>0.2</td></tr>
<tr><td>Ortophosphate (o-PO_4)</td><td>mg/L</td><td><0.05</td><td>0,16</td><td>>0.16</td></tr>
<tr><td>Total Kjeldahl Nitrogen(, TKN)</td><td>mg/L</td><td><0.5</td><td>1.5</td><td>>1.5</td></tr>
<tr><td>Total Nitrogen, (TN)</td><td>mg/L</td><td><3.5</td><td>11.5</td><td>>11.5</td></tr>
<tr><td>Floride</td><td>µg/L</td><td>≤1000</td><td>1500</td><td>>1500</td></tr>
<tr><td>Manganese</td><td>µg/L</td><td>≤100</td><td>500</td><td>>500</td></tr>
<tr><td>Selenium</td><td>µg/L</td><td>≤10</td><td>15</td><td>>15</td></tr>
<tr><td>Sulphur</td><td>µg/L</td><td>≤2</td><td>5</td><td>>5</td></tr>
</table>
</td>
</tr>
<tr>
<td>5</td>
<td>Groundwater Quality</td>
<td>Regulation on the Protection of Groundwater Against Pollution and Deterioration (Official Gazette Date/Number: 07.04.2012/ 28257) (Annex – 3)</td>
<td>Nitrate: 50 mg/L
Total Pesticide: 0.5 µg/L

For the other parameters given below (included in Annex-3 of the Regulation) no limit value is defined.

Ammonium
Arsenic
Mercury
Conductivity
Cadmium
Chloride
Lead
Sulfate
Tetrachloroethylene
Trichloroethylene
Salinity</td>
<td>WBG General EHS Guidelines: Environmental Wastewater and Ambient Water Quality</td>
<td>Environmental-Wastewater and Ambient Water Quality mention that: Properly designed and installed in accordance with local regulations and guidance to prevent any hazard to public health or contamination of land, surface or groundwater.
Although there is a national regulation, no limit value is set in the regulation. So, limit values for surface water are used for the assessment.</td>
<td>Nitrate: 50 mg/L
Total Pesticide: 0.5 µg/L

For the other parameters (Ammonium, Arsenic, Mercury, Conductivity, Cadmium
Chloride, Lead, Sulfate, Tetrachloroethylene, Trichloroethylene, Salinity) limit values defined for the surface waters will be used.</td>
</tr>
</table>

Environmental Standards						
No	**Topic**	**National Standards/ Requirements**	**Limit Values in National Legislation**	**International Standards/ Requirements**	**Limit Values in International Legislation**	**Project Standards**
6	Soil Quality	The Regulation on Soil Pollution Control and Point Source Contaminated Fields (Official Gazette Date/Number: 08.06.2010/27605, revised in the Official Gazette Date/Number 11.07.2013/28704), Annex-2).	[4]Antimony: 31 mg/kg Arsenic: 0.4 mg/kg Boron: - Cadmium: 70 mg/kg Chromium (VI): 235 mg/kg Copper: 3129 mg/kg Lead: 400 mg/kg Mercury: 23 mg/kg Nickel: 1564 mg/kg Selenium: 391 mg/kg Silver: 391 mg/kg Zinc: 23464 mg/kg Tin: 46929 mg/kg Titanium: 312857 mg/kg Total Petroleum Hydrocarbons (TPH): - Total Organic Halogens (TOX): -	WBG General EHS Guidelines: Environmental	Since limit values regarding soil quality are not given at WBG General EHS Guidelines: Environmental, compliance with National Standards will be ensured.	Antimony: 31 mg/kg Arsenic: 0.4 mg/kg Boron: - Cadmium: 70 mg/kg Chromium (VI): 235 mg/kg Copper: 3129 mg/kg Lead: 400 mg/kg Mercury: 23 mg/kg Nickel: 1564 mg/kg Selenium: 391 mg/kg Silver: 391 mg/kg Zinc: 23464 mg/kg Tin: 46929 mg/kg Titanium: 312857 mg/kg Total Petroleum Hydrocarbons (TPH): - Total Organic Halogens (TOX):-

Social Standards						
No	**Topic**	**National Laws / Regulations**	**International Standards/ Requirements**	**Project Standards**	**Non-Compliances /Corrective Actions**	
1	Labor and working conditions	Labor Law (No. 4857), published in the Official Gazette no. 25134 dated 10 June 2003	**ESS2** Labor and Working Conditions /Comply with national laws, regulations, international standards	**ESS2** Labor and Working Conditions ESF Guidance Note 2 Labor and Working Conditions Labour Management Procedures of the OIZ project	Gaps between national legal standards and WB ESG are the main non-compliances. Turkish national laws and regulations regarding labour and working conditions largely satisfies ESS2 requirements. Workers' grievance mechanism is the main gap between national legislative requirement and ESS2.These gaps will be bridged through full compliance with the requirements in ESS2. Labor Management Procedures (LMP) is developed as a part of E&S documents of the main project (TOIZP). LMP will also provide guidance on the required mitigations or management implementations such as workers GM, and requirement to issue written contracts to all workers with job description, working hours, wages, rights and duties, Code of Conduct (CoC).	
2	Labor and working conditions	Law on Occupational Health and Safety (No. 6331), published in the Official Gazette no. 28339 dated 30 June 2012	**ESS2** Labor and Working Conditions /Comply with national laws, regulations, international standards	**ESS2** Labor and Working Conditions ESF Guidance Note 2 Labor and Working Conditions WBG "Environmental, Health, and Safety Guidelines for Water and Sanitation"	Occupational Health and Safety plan, risk assessment, emergency response plan, explosion protection document will be prepared.	
3	Labor and working conditions	Regulation on Contractors and Sub-contractors, published in the Official Gazette no. 27010 dated 27 September 2008	**ESS2** Labor and Working Conditions /Comply with national laws, regulations, international standards	**ESS2** Labor and Working Conditions WBG "Environmental, Health, and Safety Guidelines for Water and Sanitation" Labour Management Procedures of the OIZ project	Labor Management Procedures (LMP) is developed as a part of E&S documents. LMP will also provide guidance on the required mitigations or management implementations such as workers GM, and requirement to issue written contracts to all workers with jb description, working hours, wages, rights and duties, Code of Conduct (CoC).	
4	Community Health and Safety	Law on Occupational Health and Safety (No. 6331), published in the Official Gazette no. 28339 dated 30 June 2012	**ESS4** Community Health and Safety /Comply with national laws, regulations, international standards	**ESS4** Community Health and Safety ESF Guidance Note 4 Community Health and Safety English WBG "Environmental, Health, and Safety Guidelines for Water and Sanitation"	Project level management of specific risks such as sexual exploitation and abuse and sexual harassment are the key gaps. The plans such as Traffic Management Plan and Community Health and Safety Plan etc. will be prepared.	

[4] The parameters are selected by considering the classification given in Regulation on Soil Pollution Control and Point Source Contaminated Fields Annex-2, Table-2. NACE Code:1089, NACE Code: 1330, NACE Code:2511 (defined in Pollution Control and Point Source Contaminated Fields). Also limit values given in Regulation on Soil Pollution Control and Point Source Contaminated Fields Annex-1 are taken into consideration.

Social Standards						
No	**Topic**	**National Laws / Regulations**	**International Standards/ Requirements**	**Project Standards**	**Non-Compliances /Corrective Actions**	
5	Stakeholder Engagement	Laws on Right to Information (No. 4982), published in the Official Gazette no 25269 dated 24 October 2003	**ESS1**0 Stakeholder Engagement and Information Disclosure /Comply with national laws, regulations, international standards	**ESS2** Labor and Working Conditions **ESS 10** Stakeholder Engagement and Information Disclosure ESF Guidance-Note 10 Stakeholder Engagement and Information Disclosure English	Effective and transparent stakeholder engagement is the main gap in terms of ESS10 requirement. Accordingly, , a Stakeholder Engagement Plan identifying the different stakeholders (project-affected parties and other interested parties including disadvantaged or vulnerable groups) is prepared. Stakeholder engagement should be a continuous process.	
6	Environmental and Social Risks and Impacts	Regulation on the Environmental Impact Assessment (EIA) published in the official Gazette no. 31907 dated 29 July 2022	**ESS1** Assessment and Management of Environmental and Social Risks and Impacts /Comply with national laws, regulations, international standards	**ESS1** Assessment and Management of Environmental and Social Risks and Impacts	Robust social risk assessments and required plans addressing relevant mitigations are the main gaps between Turkish regulation and ESS1.	

4 METHODOLOGY

The Project's scope includes the development of an Environmental and Social Management Plan (ESMP) compliant with the ESMF of the TOIZsP. Furthermore, while ESMP is not required by national legislation, compliance with national legislation requirements is ensured while assessing relevant portions of the plan. As a result, this ESMP has been prepared to assess and identify the adverse potential environmental and social impacts and risks arising from the Project's development, as well as to identify and plan mitigation measures for significant adverse environmental and social impacts/risks. It also describes the monitoring and institutional requirements required to implement this Plan.

The goal of impact assessment and mitigation is to identify and evaluate the significance of potential impacts (positive or negative) and risks on identified receptors and resources using defined assessment criteria; to develop and describe the measures that will be taken to avoid or minimize any potential adverse effects while enhancing potential benefits; and to report on the significance of residual impacts that remain after mitigation.

The impact assessment took into account the obtained data from the desk research as well as the outcomes of site visits. The assessment of environmental and social impacts/risks has been done based on the criteria presented below, mostly using expert judgement, appropriate standards, and guidelines:

- **Nature of the impact:** Positive (+), Negative (-)
- **Type of Impact:** Direct, Indirect, Cumulative
- **Extent/area of Impact:** On-site/project footprint, Local, Regional, National
- **Duration of Impact:** Short term, Mid-term, Long term, Permanent
- **Likelihood of Impact Occurrence:** Very likely/certain, Likely, Unlikely

The magnitude and severity of the adverse impacts have been assessed based on the criteria given above and significance of the impacts has been determined based on this assessment and sensitivity of the receiver/source exposed to the impact, as much as possible. The matrix given in Table 6 combines the sensitivity information with the magnitude of impacts. The significance of the impact is first designated without mitigation measures and then evaluated with proposed mitigation measures. This evaluation serves to determine the significance of the residual impacts (impact left after employing mitigation measures).

Table 6 Impact Significance Matrix*

Sensitivity of Receptor	Magnitude of Impact			
	High	**Medium**	**Low**	**Negligible/None**
High	High	High	Medium	Negligible/None
Medium	High	Medium	Low	Negligible/None
Low	Medium	Low	Low	Negligible/None

** Adapted from Scottish Natural Heritage – A handbook on environmental impact assessment, 2013.*

An ESMP development methodology involves a systematic process to ensure comprehensive assessment, management and mitigation of environmental and social impacts throughout the life cycle of a project.

Desk Study: It starts with a desk study in which preliminary information is collected by examining the existing literature, reports and data regarding the project area and its surroundings.

Data Collection: Conducting comprehensive data collection involving a variety of sources, including environmental, social and geographic data. This phase includes data from government agencies, existing studies, and private research.

Site-Specific Data Collection Approach: The choice of measurement points is justified by various factors. This includes consideration of proximity to project activities, potential impact zones, and

ecological significance. The rationale lies in ensuring representative coverage of critical areas for accurate assessment of potential impacts.

Area of Influence Definition and Justification: Defining the project's impact area includes determining the geographical area likely to be affected by project activities. The justification is based on scientific methodologies and knowledge of the project's potential impacts on the environment and surrounding communities.

Site Visits and Surveys: Field visits are crucial to make first-hand observations and verify existing data. Surveys conducted during visits help understand local conditions, verify data accuracy, and identify potential environmental and social impacts.

Stakeholder Consultations: Direct stakeholders, such as local communities and businesses, are consulted to inform them about anticipated social and environmental risks and impacts and to understand their concerns and needs. Indirect stakeholders, such as NGOs or government bodies, provide valuable insight into wider social and environmental outcomes.

Impact Assessment Methodology: A comprehensive impact assessment methodology is used to assess potential environmental and social impacts. A comprehensive methodology is used to assess environmental and social impacts, taking into account factors such as air and water quality, biodiversity, socio-economic aspects, etc.

Mitigation Measures Definition: Once impacts are identified, mitigation measures are designed based on the severity and nature of these impacts. The approach involves identifying specific actions to minimize, prevent or compensate for adverse impacts. Mitigation measures are designed to ensure compliance with local regulations and international standards in accordance with stakeholders' concerns and project feasibility.

This structured approach within an ESMP ensures a thorough understanding of potential impacts and the implementation of effective mitigation strategies for sustainable project development.

5 ENVIRONMENTAL BASELINE OF THE PROJECT

5.1 Project Location

The Asım Kibar OIZ is situated in the Alikahya Atatürk Neighborhood of İzmit district within Kocaeli. İzmit district itself spans an area of 58,4 square kilometers and has an elevation of 3 meters above sea level. Asım Kibar OIZ, which is located on an area of 235 ha (34 ha expansion area), has a total of 28 industrial parcels (9 in use and no construction) and is adjacent to the E80 and O7 motorways (Northern Marmara Highway).

The Project will be constructed on the existing WWTP land which is in the existing OIZ's built-up industrial area. The allocated area for the WWTP is 40,395.43 ha. The project area, parcel no. 164/34, does not require land acquisition as it was purchased from a willing seller in 2013. The Project land is owned by the OIZ (Parcel no: 164/34) and 5,000 m^2 of land will be utilised for the solar sludge drying plant. There is also a wastewater recovery facility within this parcel. Under this sub-project, a rooftop solar power plant with 0.12 MW power is planned to be installed on the existing wastewater recovery facility. The energy requirement during the operation phase of sludge drying plant will be provided by solar panels to be installed on the roof of the wastewater recovery plant building with an area of 1,217 m^2.

The Area of Influence (AoI) refers to the area significantly affected, influenced, or impacted by a particular project, development, or activity. In the context of solar sludge drying facility and rooftop SPP, the AoI encompasses areas that may experience direct or indirect effects resulting from the construction and operation of the facility. The AoI selected for this specific project is centred on Alikahya Atatürk Neighbourhood, where Asım Kibar OIZ is located, and includes Uzunbey, Alikahya and Ertuğrul Gazi neighborhoods in the vicinity, considering the location of the project area. This delineation of the AoI n is based on determining the potential of project activities to directly and indirectly affect environmental conditions, and the stakeholders within the surrounding areas. Environmental impacts such as noise, dust emissions, odours and vehicle traffic can have different areas of influence, and social impacts such as loss of employment and livelihoods can have different areas of influence. The nature, type, duration and likelihood of each impact varies. Considering these differences, it has been attempted to define an optimally wide Area of Influence for the potential impacts of the Project. The Project's Area of Influence is given in Annex-2 Figure 34.

5.2 Land Use

The size of areas to be used within the scope of the Project were given in the previous section. No expropriation or land acquisition is required within the scope of the project.

Approximately 81.85% of the total area of the OIZ is used for industrial purposes, and the remaining is used for other facilities. Table 2 gives the distribution of land use referring to the spatial plan. The proposed Project, namely the solar sludge during facility and the rooftop solar power plant, is planned on the Treatment Plant Area where the wastewater treatment plant and the wastewater recovery facility exist.

Table 7. Distribution of Land Use

Types of Land Use	Area (ha)	Percentage (%)
Industrial Area	159.05	81.85
Administrative Facility Area	5.93	3.05
Treatment Plant Area	4.03	2.07
Technical Infrastructure Area	4.52	2.33
Park Area	2.00	1.03
Health Protection Tape Area	4.53	2.33
Road Area	8.49	4.37

Types of Land Use	Area (ha)	Percentage (%)
Service and Support Area	5.77	2.97
Total Area	**194.32**	**100**

The land where the drying facility will be established has grasses and scrubs. The soil condition of the project parcel is in line with the soil condition of the surrounding lands where no studies have been conducted (See Figure 2). Topsoil stripping activities will be carried out even if there are no trees to be cut or affected by Project activities. The land is allocated as a treatment plant area. The land has not been used for any purposes. The solar panels will be installed on the rooftop of the wastewater recovery facility.

Around the OIZ, the land use in the surrounding area is predominantly industrial zones, but residential and agricultural uses are also observed.[5]

According to land use map prepared based on Environmental Master Plan for Kocaeli planning area, the Project Area shows Organized Industrial Zone. The land use map according to Environmental Master Plan is presented in Annex-2 Figure 26. The planned Project will be constructed at the lowest part of the OIZ since it will be located on the wastewater treatment plant parcel.

5.3 Topography

The topography of Kocaeli and İzmit is characterized by coastal plains along the Sea of Marmara, hilly and mountainous terrain inland, and various valleys formed by rivers and streams. The region's development and seismic activity also play significant roles in shaping its landscape.

The Asım Kibar OIZ (Organized Industrial Zone) is situated in the Alikahya Atatürk Neighborhood of İzmit district within Kocaeli. To better understand the topography, a regional Digital Elevation Model (DEM) was generated. The DEM map including the A-A' section profile in N-W direction is also shown in Annex-2 Figure 27.

According to the Digital Elevation Model created, the highest point of the region is approximately 162 m and the lowest point is located at an altitude of approximately 7 m.

5.4 Geology

The geology of İzmit, located in the Kocaeli province of Türkiye, is complex and significant due to its position near the North Anatolian Fault (NAF) Zone. The region's geology is characterized by a variety of rock types, tectonic activity, and significant geological structures. İzmit lies near the NAFZ, a major right-lateral strike-slip fault extending across northern Türkiye. This fault is highly active and responsible for significant seismic activity, including the devastating 1999 İzmit earthquake. The region has a foundation of Mesozoic-aged rocks, primarily consisting of limestone, dolomite, and marl. These rocks were formed in a marine environment and are found in the southern parts of the Kocaeli Peninsula. Overlying the Mesozoic rocks are younger sedimentary rocks from the Cenozoic era, including sandstone, shale, and conglomerate. These formations were deposited in various environments, ranging from marine to fluvial settings. The most recent deposits include alluvial sediments from rivers and coastal areas, consisting of clay, silt, sand, and gravel.

The Project area surroundings has significant karstic aquifers within limestone formations, providing important groundwater resources for drinking and industrial use. Several rivers and streams drain the area, including the Sakarya River to the east and smaller rivers flowing into the Gulf of İzmit.

[5] This is the information provided in the Screening Forms. Although there are agricultural areas within the area of influence, no agricultural land use within the boundaries of the OIZ was observed during the site visits.

The generalized stratigraphic column section of the project area and its surroundings is given in Annex-2 Figure 28.

The project area which is wastewater treatment plant located entirely on Quternary aged alluvium, consisting unconsolidated block, gravel, sand, silt and shale. Geology map of project area and its surroundings is given in Annex-2 Figure 29.

5.5 Climate

The region where the project will be carried out has the climate characteristics of the Marmara region. In winter, it is under the influence of the cold-dry air mass coming from the Black Sea and the cold-rainy air mass coming from the Balkans, especially the warm and rainy southern air masses coming from the Mediterranean. In the whole province, the cold, rainy (northern) weather of the Black Sea and the warm (southwester) weather of the Mediterranean follow each other. There are no big temperature differences between summer and winter, day and night in the province.

According to the records of Izmit Meteorological Station, the prevailing wind direction is south-east and east, and the second-degree prevailing direction is west. Detailed meteorological statistics are presented in Table 8.

Table 8 Long Term Meteorological Data of Kocaeli Province (1929-2023)

Parameter	January	February	March	April	May	June	July	August	September	October	November	December	Annual
	Last Climate Period (1957-2022)												
Avg. Temperature (°C)	6.2	6.7	8.5	13	17.6	21.7	23.8	24	20.5	16.2	12.2	8.4	14.9
Highest Avg. Temperature (°C)	9.7	10.6	13.2	18.5	23.3	27.5	29.6	29.8	26.2	21.1	16.5	12	19.8
Lowest Avg. Temperature (°C)	3.2	3.4	4.8	8.5	12.8	16.6	19	19.3	16.1	12.5	8.8	5.5	10.9
Avg. Sunshine Duration (hour)	2.5	3.1	4	5.7	7.3	8.8	9.5	9	7	4.7	3.6	2.6	5.6
Average Number of Rainy Days	16.93	14.92	14.01	11.29	9.82	8.38	5.78	5.08	7.26	11.39	12.4	16.2	133.5
Average Monthly Amount of Rain (mm)	92.7	76.3	71.8	51.5	48.4	56.2	45.1	42.8	58.8	85.7	79	108.1	816.4
Measurement Period (1957-2022)													
Highest Temperature (°C)	24.9	26.7	30.8	35	37.2	40.7	44.1	42.9	40.2	36.2	30	27.4	44.1
Lowest Temperature (°C)	-13.1	-18	-6.5	-1	1.8	4	10.1	10.9	4.9	2.4	-3.4	-8.8	-18.0

Source: Turkish State Meteorological Service, 2024.

5.6 Soil Quality

Turkish General Directorate for Rural Services database defines the land use capabilities in eight (8) different classes as summarized in Table 9. These classes represent the agricultural potential of the soil. In this classification system, soils are categorized between Class I, which represent the arable lands on which agricultural activities can be conducted in the most efficient, economic and simplest way without causing erosion, and Class VIII, which represent the lands that are not arable, cannot even be used as grassland or forest areas but support only wildlife development or can be used as resting area or national park by human. Characteristics of each class are summarized in Table 9 (*Former Ministry of Agricultural and Rural Services, July 2008*).

Table 9 Agricultural Potentials Represented by Different Land Use Capability Classes and Their Characteristics

Class	Agricultural Potential	Definition of Land Use Capability
Class I	Agricultural lands suitable for agricultural soil cultivation	Class I lands are; flat or near flat, deep, fertile and easily cultivated so that the conventional agricultural methods can be applied; potential for water and soil erosion are minimal; have good drainage; are not prone to flood damage exposure; suitable for hoe plants and other intensively grown crops; Class I irrigated lands with low precipitation rates have slope values less than 1% slope, loamy structure, good water holding capacity and medium level permeability.
Class II		Class II lands are decent lands that can only be processed after taking some special precautions. Their difference from Class I lands is one or more of the limiting factors such as slight slope, moderate exposure to erosion, moderately thick soil, exposure to occasional moderate floods and a moderate level of moisture that can easily be isolated.
Class III		Class III lands are moderately good lands for hoe plants which can generate solid income provided they are utilized with a good cropping system and proper agricultural methods. Moderate slope, increased erosion sensitivity, excessive moisture, exposed soil, presence of stones, having a lot of sand and/or gravel, low water holding capacity and low yield are properties of this type of land.
Class IV		Class IV lands can be constantly utilized as meadows. Field crops can also be occasionally grown. High levels of slope, bad soil characteristics, erosion and climate are the factors limiting agricultural activities on these lands. Soils with low slopes and poor drainage are also classified as Class IV lands. These soils are not subject to erosion, but they are unsuitable for growing many agricultural products as they have a low yield and a tendency to suddenly dry up in the spring. In semi-arid regions, cropping systems incorporating legumes are generally not possible due to climate.
Class V	Agricultural lands not suitable for soil cultivation	Class V lands are reserved for long-life plantations such as meadows and forests as they generally are unsuitable for cultivated plants. A few factors such as stony structure and sogginess hinder cultivation here. The land is flat or near-flat. It is not subject to an excessive amount of wind and water erosion. Grazing and tree logging activities can be carried out on condition that a good soil cover is constantly maintained.
Class VI		Class VI lands require moderate precautions even when they are used as forest or meadow since they have quite a bit of slope and are subject to severe erosion. Exposed, soggy or very dry conditions make this type of land unsuitable for cultivation.
Class VII		Class VII lands have high slope, are stony and have been subject to violent erosion. Exposed soils, dry and/or some unfavorable conditions and swamps can be classified as Class VII soil. These can be used as forest or meadow without showing due care. If the vegetation on these soils diminishes, erosion can get quite violent.
Class VIII	Non-arable lands	Class VIII lands exhibit features that prevent them from being used as forest, meadow or cultivated land. This type of land is habitat to wild life and can also be used for recreational purposes or as catchment basins for streams. These include lands containing marshes, swamps, deserts as well as areas of high mountainous regions, rocky lands or lands with very deep craters.

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

The Major Soil Group Map of the Ministry of Agriculture and Forestry was analysed through the Atlas Portal (atlas.gov.tr) of the Ministry of Environment, Urbanisation and Climate Change. The Project area is located on Alluvial Soils (see Figure 14). In terms of land cover classification, it has the status of "non-irrigated mixed agricultural land" according to the Corine 2018 database. During the field study conducted on 27.06.2024, no pollution was detected by visual observation.

Figure 14 Major Soil Group Map

5.7 Air Quality and Odor

OIZs emit large amounts of greenhouse gases, especially carbon dioxide (CO_2), methane (CH_4), nitrogen oxides (NO_x), sulfur dioxide (SO_2) and fugitive VOCs that contribute to climate change. Since the project area is in the organized industrial zone, there are many companies generating air emissions.

To understand the baseline air quality of the project area, data from continuous monitoring studies by MoEUCC were examined. In the air quality analysis, the data of the station located in İzmit district, which is the closest monitoring station to the project area, was used. Kocaeli-İzmit Air Quality Monitoring Station is located 7.5 km west of the project area. Data obtained from this station (between 11.07.2023-11.07.2024), WBG EHS Guidelines Limit Values and limit values according to Turkish Legislation are presented in Table 10. According to the data in the table, the annual average and 24-hour (maximum) PM_{10} concentration is above the limit values. Although NO_2 concentration in the air is below the limit values, it is close to them. The high annual average values in air pollutant concentrations are thought to be due to the fact that Kocaeli is a highly industrialized city.

Table 10 Air Quality Measurements Result

Parameter	Averaging Period	WBG EHS Guideline Limit Value in µg/m^3	Regulation on the Assessment and Management of Air Quality Limit Value in µg/m$_3$	Kocaeli-İzmit Air Quality Monitoring Station
SO_2	24-Hour	20	20	-
	10-Minute	500		
PM_{10}	1-Year	20	40	55.82
	24-Hour	50	50	252,15
$PM_{2.5}$	1-Year	10	-	-
	24-Hour	25	25	
NO_2	1-Year	40	40	38,52
	1-Hour	200	200	197,05

Source: https://sim.csb.gov.tr/STN/STN_Report/StationDataDownloadNew

During the operation phase, odor-generating components such as NH_3, H_2S, CH_3SH, alcohols, volatile carbon components, etc., can be found in the dryer's exhaust air, depending on the kind of sludge and wastewater sources. Currently, disposal of sludges with high water content without any odor eliminator may cause odor. It was stated by the OSB Environmental Engineer that they have not received any complaints about odor so far.

5.8 Noise

Environmental noise in Türkiye is regulated by the Regulation on Environmental Noise Control (RENC) which is published in the Official Gazette dated 30.11.2022 and numbered 32029. This regulation is intended to ensure that precautions are taken to prevent disturbance to peace and tranquility, and to ensure the physical and mental health of persons potentially exposed to environmental noise. For this purpose, the regulation sets out requirements regarding noise mapping, acoustic reporting, environmental noise assessment for determination of noise exposure levels and preparation and application of action plans to prevent or mitigate negative impacts of noise exposure on human being and the environment.

The baseline studies within the scope of ESMP, noise measurement was not carried out.

The Project activities within the construction phase are associated with a range of activities that generate noise. Since the planned solar sludge drying facility and rooftop SPP are in an industrial area, the closest settlement to the construction site is Uzunbey Neighbourhood, 1.5 km away. There are industries in the neighbouring parcels. There are no sensitive receptors such as health centres, schools, or mosques near the Project Area. The OIZ authorities informed that no noise related complaints have been received. Noise pollution is not considered as a source of concern within the Project area of influence.

5.9 Water Resources and Use

Asım Kibar OIZ has been using water distributed by the Municipality. OIZ management indicated that one of the firms has its permitted groundwater extraction wells in its premises for process water supply. The groundwater utilisation certificate for these wells is given in Annex-12. The firm with a well uses the water produced in the wastewater recovery facility of the OIZ in its process and has not used well water in its process since the installation of this facility

With the wastewater recovery facility suppling process water for the firms, the use of groundwater resources is diminished. The existing wastewater treatment plant of the OIZ discharges its treated water to the Kumla (Yirim) Creek.

The proposed Project area does not coincide with surface water or groundwater resources. The closest surface water is Kumla (Yirim) Creek, 35 m south (See Figure 15)

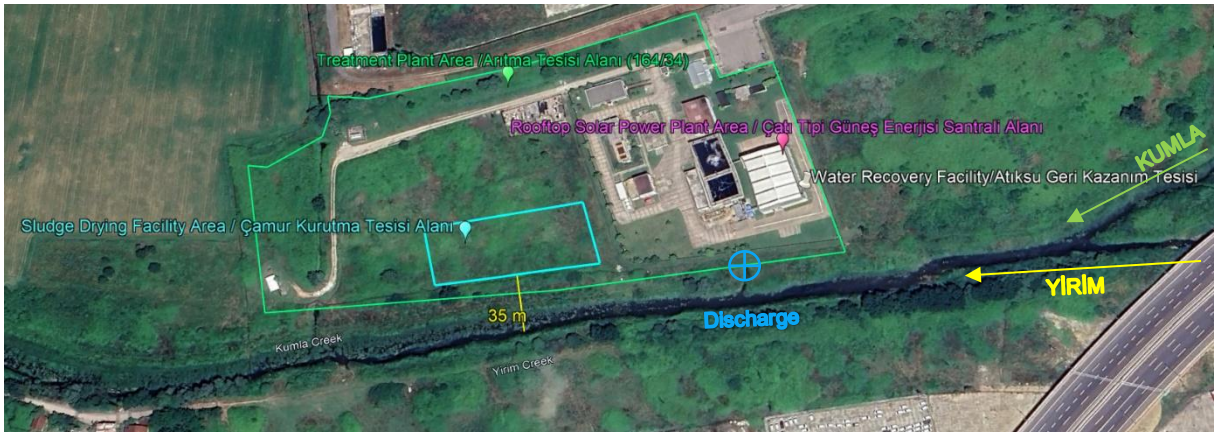


Figure 15 Closest Surface Waters to the Project Area

In Alikahya Atatürk neighbourhood, the neighbourhood where Asım Kibar OIZ is located, the stream formed by seasonal streams is taken into a canal from the entrance gate of the OIZ. The water in this channel is transported within the OIZ and poured into Kumla Creek. Before the discharge of the OIZ's wastewater treatment plant, Kumla Creek merges with Yirmi Creek. The distance to water resources map of Project is presented in Annex-2 Figure 35.

5.10 Wastewater Management

The proposed Project, namely the solar sludge drying facility and the rooftop solar power plant, is planned on the wastewater treatment plant area and the roof of the existing wastewater recovery facility.

Asım Kibar OIZ has been operating its industrial wastewater treatment plant since 2015 and disposing of its sludge with a high-water content following national regulations. OIZ has an industrial and domestic wastewater treatment plant having 4,000 m^3/day capacity. Approximately 427,000 m^3 of treated wastewater from the wastewater treatment plant and subsequent wastewater recovery facility is served to firms as process water annually. All firms within the OIZ boundaries discharge their wastewater either treated or not to the Asım Kibar OIZ's sewage system ending with the OIZ's wastewater treatment plant. The treated wastewater in the wastewater treatment plant is conveyed to the wastewater recovery facility for advanced treatment. The recovered wastewater is used by the firms within the OIZ as process water and the treated effluent is discharged to Kumla (Yirim) Creek at the 35 m south of the existing wastewater treatment facilities. There has been no exceedance in the limit values for effluent discharge.

Wastewater to be generated during all phases of the Project will be treated at the existing wastewater treatment plant of the OIZ and discharged in compliance with legal discharge standards. Treated wastewater will be discharged according to the limit values given for the 2-hour composite sample in "Water Pollution Control Regulation Table 19 - Discharge Standards of Wastewaters to Wastewater Infrastructure Facilities ".

During the operation of the SPP and sludge drying facility, which are the facilities within the scope of the Project, there will be no inflow to the WWTP. Therefore, the quality and quantity of the wastewater inflow to the WWTP will not change.

5.11 Waste Management

According to Environmental Law No. 2872, it is prohibited directly or indirectly to deliver, store, transport, or dispose of any types of waste and residues to the receiving environment in violation of the standards and methods established in the applicable regulation. Asım Kibar OIZ manages waste in compliance with the Waste Management Regulation.

Asım Kibar OIZ currently has a Zero Waste Certificate and the last inspection of its existing facilities within the scope of this certificate was carried out by the Ministry of Environment and Urbanization on June 6, 2020 (see Annex 15). The validity period of the certificate is 5 years.

Domestic wastes generated in Asım Kibar OIZ are not temporarily stored within the borders of OIZ. It is collected by a subcontractor company contracted with the OIZ and transferred to İzaydaş, a company affiliated to Kocaeli Metropolitan Municipality. There is also a hazardous waste storage area in the OIZ, which was authorised for temporary storage by PoEUCC in 2018 (see Figure 16). Asım Kibar OIZ's current industrial waste management plan was prepared in August 2023 and approved by PoEUCC (see Annex-13).

Figure 16 Hazardous Waste Temporary Storage Area

A total of 15-ton sludge/day is being generated within the OIZ. Of the 15-ton sludge, 13-ton sludge was generated by the industrial wastewater treatment plants of two firms operating within the OIZ boundaries and two more tons were generated by the OIZ's wastewater treatment plant operations. The treatment sludge has been collected in sludge collection tanks having impermeable surfaces and disposed of to the licensed facilities regularly[6]. This sludge has been disposed of with the waste code "19 08 13: Sludges containing hazardous substances resulting from industrial wastewater treatment by other methods"

5.12 Natural Disaster Potential

The project area was taken as the center point and the epicenter distribution of earthquakes with magnitude M≥4 that occurred between 1900 and 2024 within a circle with a radius of 50 km is shown in Annex-2 Figure 31. The project area was examined on the interactive earthquake hazard map published by AFAD and it was determined that the maximum ground acceleration (PGA 475) of the project area was 0.687 g and the ground velocity (PGV 475) was 57.787 cm/s for a Recurrence Period of 475 years. Earthquake hazard map of Türkiye where the project area is marked is shown in the Annex-2 Figure 32.

5.13 Biodiversity and Protected Areas

Field studies of the biological environment of this Project Area and the potential impact area were carried out on 27th June, 2024 and details of the studies are given in Annex-6. The studies covered terrestrial and aquatic environment, including flora and fauna species, vegetation and habitat descriptions. The study results are given in detail in Annex-6.

As a consequence of flora-fauna research conducted in and around the project area, terrestrial flora and fauna species have been identified and provided in Annex-6 in tables with Latin-English names, protection status, and endemism status. Additionally, EUNIS habitat classification has been completed, and the map is given in Annex-6.

As a result of the studies carried out within the scope of the project, it was determined that the project area is within the existing facility and is completely under anthropogenic impacts. There are industrial areas and settlements around the project area. Therefore, it is seen that the flora and fauna elements are very limited in the project area, while it has been determined that the flora and fauna of the

[6] İzaydaş İzmit Atık ve Artıkları Arıtma Yakma ve Değerlendirme Anonim Şirketi

surrounding area of the project area have deteriorated due to anthropogenic effects caused by human activities.

According to the flora list created by compiling the field studies carried out within the scope of the project and literature data, it has been determined that there is no endemic, protected and endangered plant taxa among the plant taxa found and likely to be found in and around the project area. The plant taxa in and around the project area are widely distributed throughout the province and this situation prevents the destruction that will occur within the scope of the project from causing irreparable consequences.

National protected areas and internationally recognized areas in the project area and its immediate surroundings have been researched and mapped (Annex-6). As a result, according to research conducted with current databases, there is no nationally protected area in and around the Project Area.

Since the level of anthropogenic impact is high in and around the project area, fauna species distributed in the area have previously left the region. The existing species consist of species adapted to anthropogenic impacts. In addition, it is predicted that the impact of the activity on fauna species will be minimal due to the absence of an endemic species among the identified fauna species, the mobility of fauna species and the presence of alternative habitats to migrate around the project area.

6 SOCIAL BASELINE OF THE PROJECT

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

The Project will be installed within the existing WWTP land in the existing OIZ's built-up area. The project area, parcel no. 164/34, was acquired in 2013 from a willing seller. The Project does not require any other land acquisition and the nearest settlement to the Project construction site is approximately 1.5 km.

The specific AoI selected for this project is centered on Alikahya Atatürk Neighborhood, where Asım Kibar OIZ is located, and also includes the surrounding neighborhoods of Dumlupınar, Uzunbey and Ertuğrul Gazi, considering the location of the project area. The Project AoI given in Figure 3 includes the areas that may be exposed to direct or indirect environmental and social impacts resulting from the construction and operation of the solar sludge drying plant and rooftop SPP and no other AoI has been identified for the social impact assessment.

6.1 Demography and Population

The largest industrial sectors that provide employment in Kocaeli are the chemical, automotive and iron and steel sectors. Moreover, in recent years, there has been a serious increase in employment in the region within the scope of R&D and Innovation. There are 14 organized industrial zones, five technoparks and two free zones in Kocaeli. In addition, there are 35 ports and piers in the Gulf of Izmit.

There are 4 settlements in the social Area of Influence (AoI) of the Project. The distance of these settlements to the Project area and the distribution of the existing population, male and female, are given in Table 11.

Table 11 Population of Settlements at AoI

Settlement	Total	Female	Male	Female %	Male %	Distance
Uzunbey neighbourhood, Kartepe	1,044	541	503	51.8	48.2	17 m
Alikahya Atatürk, İzmit	9,346	4,690	4,656	50.2	49.8	within the borders
Dumlupınar neighbourhood, Kartepe	9,320	4,636	4,684	49.7	50.3	182 m
Ertuğrul Gazi neighbourhood, Kartepe	6,934	3,428	3,506	49.4	50.6	264 m

Source: *TurkStat, 2023*

During the site visit, the mukhtars of Uzunbey and Alikahya Atatürk neighborhoods were interviewed. In addition, telephone interviews were conducted with the mukhtars of Dumlupınar and Ertuğrul Gazi neighborhoods, which we could not meet during the site visit. All the mukhtars stated that there has been no significant change in the population of their neighborhoods in the last 5 years, which was also seen from the last 5-year population data of other neighborhoods obtained from TurkStat.

6.2 Cultural Heritage

In Kocaeli province, there are 654 buildings registered by the Kocaeli Regional Board for the Protection of Cultural Assets. Of these, 290 are in Izmit District and 10 are in Kartepe District. The archaeological site not within the boundaries of the area of influence and the closest archaeological site with a distance of 3800 metres to the project area is Durhasan Village Cemetery III Degree Archaeological Site (see Figure 17).

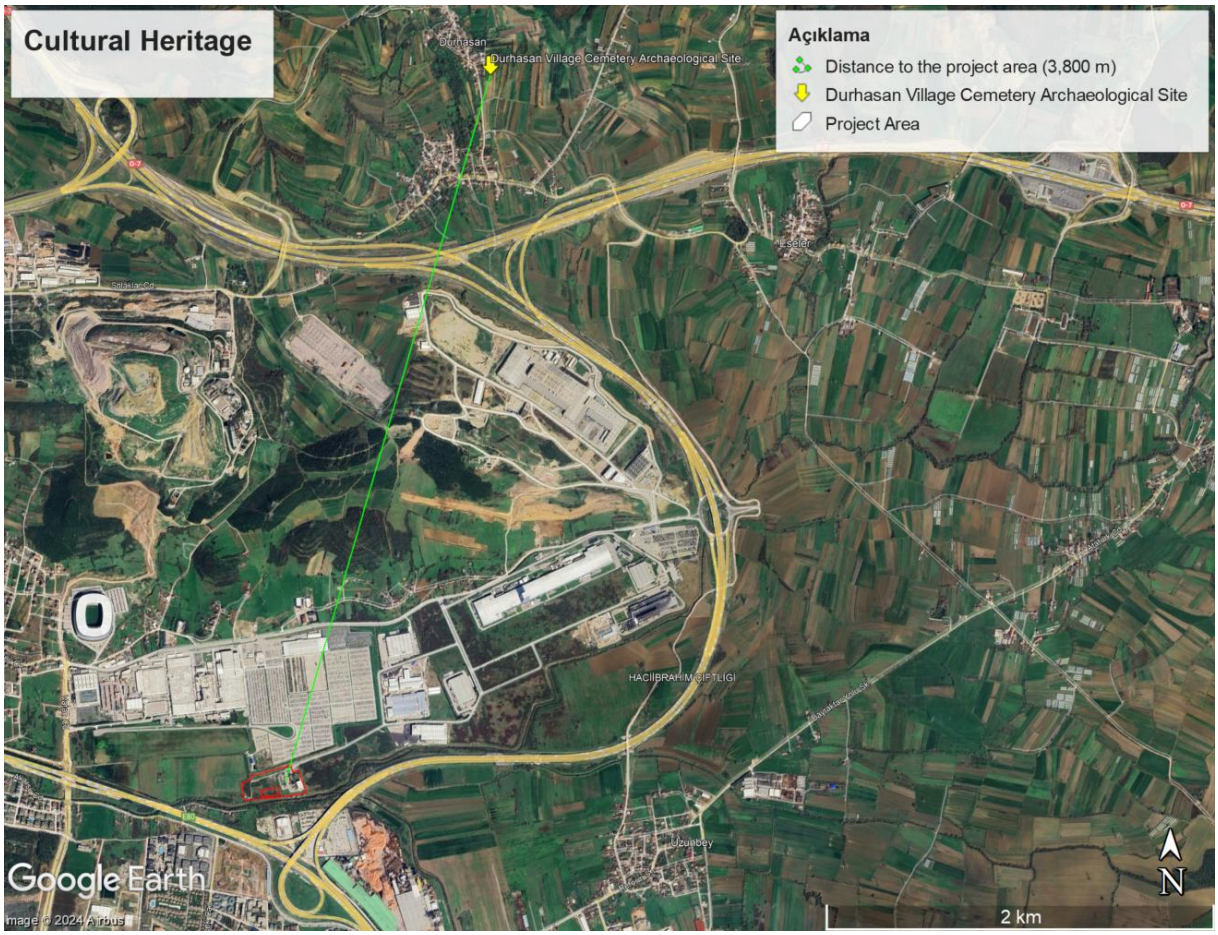


Figure 17 Closest Archaeological Site to the Project Area

There is no known adjacent cultural heritage site and cultural resources in the project area or near the project site. Therefore, the Project will not cause alteration, damage or removal of any known cultural heritage assets and constrain community access to cultural sites. In case of chance findings, chance find procedures will be applied. The chance find procedure is presented as Annex 9.

6.3 Livelihood and Employment

Socio-Economic Development Index studies allow for determining the development index and trends of districts, provinces and regions as well as benchmarking. According to the Socio-Economic Development List of Provinces and Regions Study (2017), Kocaeli is listed as the 4th most developed province out of 81 provinces and located within the 1st degree-developed level (Acar, et al., 2019).

According to Provincial Gross Domestic Product (2021) data (TurkStat, 2023, No: 45867), the industrial and manufacturing sectors have the largest share in Kocaeli with 29.147% and 27.32% respectively. The industry sector is followed by public administration, education, human health and social work activities (4.69%) and real estate activities (4.36%). According to the calculations made at the provincial level, Kocaeli ranked first in terms of gross domestic product (GDP) per capita in 2022 with 302,772.00TL, leaving Istanbul behind. When evaluated on a sectoral basis, it is seen that value-added sectors such as automotive main and sub-industry, machinery manufacturing, iron-steel, chemistry, plastics and rubber, electrical machinery, metal products come to the fore in our province.

According to the Socio-Economic Development Index of Districts Study (2022), İzmit district is listed as the 2nd most developed district of Kocaeli (44 out of 973 districts of Türkiye) and located within the 1st-degree development level (Acar, et al., 2022).

According to the Socio-Economic Development Index of Districts Study (2022), Kartepe district is listed as the 6th most developed district of Kocaeli (157 out of 973 districts of Türkiye) and located within the 2nd-degree development level (Acar, et al., 2022).

In the Alikahya Atatürk neighborhood, where the AKOIZ is located, agriculture and animal husbandry activities are only practiced at very limited scale, and the inhabitants make a living through salaried work, pensions or seasonal work. Only in Uzunbey neighborhood, agriculture and animal husbandry activities have an important place. Products such as corn, barley and wheat are mostly grown in the neighborhood.
No deta

6.3.1 Major Economic Activities in Settlements Located in the Project AoI

From the settlements located in the Project AoI, the mukhtars of the neighborhoods closest to the Project area were interviewed. Information on the major economic activities in the Project AoI was obtained from the neighborhood mukhtars. The main economic activities in the settlements are given in Table 12.

Table 12 Major Economic Activities in the Settlement Located in the Project AoI

Settlement	Primary Economic Activity	Secondary Economic Activity	Tertiary Economic Activity
Alikahya Atatürk	Paid employment	Pension	Seasonal Work
Dumlupınar	Paid employment	Pension	-
Ertuğrul Gazi	Paid employment	Pension	-
Uzunbey	Agriculture	Animal Husbandry	Pension

According to information provided by Asım Kibar OIZ management, Asım Kibar OIZ efforts to allocate employment opportunities to the local settlements.

6.4 Education and Health Services

There are no schools in Uzunbey neighborhoods. Students go to nearby neighborhoods.

There is a primary school and a high school in Alikayha Atatürk Neighbourhood, and primary, secondary and high schools in Dumlupınar and Ertuğrul Gazi Neighbourhoods.

It was learned that there are Family Health Centers in Alikahya Atatürk, Dumlupınar and Ertuğrul Gazi neighborhoods. It has been determined that there is no health service institution in Uzunbey Neighborhood and the residents of the neighborhood go to other nearby neighborhoods.

Education and health centres within the social AoI are shown in Annex-2 Figure 33. The closest educational institution to the project area is a college at a distance of 220 meters.

6.5 Vulnerable Groups and Social Equity

Vulnerable groups refer to people who may be more affected by the potential negative impacts of the project or are less able to access information or get their voices heard and concerns raised. The characteristics of persons may belong to vulnerable groups are as follows:

- Individuals over 65 years of age living alone,
- Physically or mentally handicapped,
- Those who have a chronic illness or are bedridden,
- Women-headed households,
- Refugees,
- Ethnic minority groups,
- Nomads.

According to the information provided by the mukhtar of the neighbourhoods, information about vulnerable/disadvantaged individuals/groups is presented in Table 13.

Table 13 Vulnerable Groups at AoI

Settlement	Individuals over 65 years of age living alone	Poor families*	Physically / Mentally disabled
Alikahya Atatürk	15	60	20
Dumlupınar	15	10	6
Ertuğrul Gazi	10	100	20
Uzunbey	60	0	6

* Households, which are depended on social and economic support are defined as Poor Families by headmen.

6.6 Infrastructure Services

The following table presents the infrastructure services in the neighbourhoods in the social AoI.

Table 14 Infrastructure Services of the neighbourhoods in the social AoI

Settlement	Water Resource	Irrigation Resource	Sewerage System	Domestic Waste Management	Mass Transportation Vehicle
Alikahya Atatürk	Municipal water	-	Sewage system	Collected by the municipality	Municipality buses and private cars
Dumlupınar	Municipal water	-	Sewage system	Collected by the municipality	Municipality buses and private cars
Ertuğrul Gazi	Municipal water	-	Sewage system	Collected by the municipality	Municipality buses and private cars
Uzunbey	Municipal water	-	Sewage system	Collected by the municipality	Municipality buses and private cars

According to the information provided by the mukhtars of Uzunbey neighborhoods, due to the lack of irrigation water in the neighborhoods, the amount and diversity of agricultural products grown is decreasing. .

6.7 Traffic and Transportation

The Project is not expected to cause any transportation/traffic problems. Transportation to the construction site will be made via the existing road in the existing WWTP area, which belongs to the OIZ.

The project area is located within Asım Kibar OIZ. It is possible to access Asım Kibar OIZ via E80 and O7 motorways.

According to the state highways traffic volume map for the year 2022 of the 1st Regional Directorate of Highways published by the General Directorate of Highways, the annual average daily traffic on the Kocaeli section of the E80 Motorway passing south of the OIZ is 60,034 vehicles. Of these vehicles, 50,032 are cars, 3,965 are medium-duty vehicles, 273 are buses, 2,448 are trucks and 3,314 are articulated trucks (KGM, 2023).

7 ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS OF THE PROJECT

7.1 Environmental Risks and Impacts of the Project

The main purpose of an Environmental and Social Management Plan (ESMP) is to identify and assess the potential positive and adverse impacts/risks that may be caused by the Project activities on the natural environment and on the socio-economic well-being and conditions of the population (community and workforce) at local and regional level. The following assessment is based on the Project characteristics and activities and the baseline conditions in the Project area.

As a result of this assessment, relevant mitigation measures were developed to avoid, minimize, mitigate and off-set significant adverse impacts and enhance beneficial impacts. Furthermore, the significance of Project-induced residual adverse effects on the environment and community after implementation of the mitigation measures are assessed. And finally, planned monitoring activities for checking effectiveness of the proposed mitigation measures are identified. In Table 16, identification of the level of environmental and social impacts for three Project phases (pre-construction, construction and operation phases) is presented. The area of influence map of the project is presented in Annex-2, Figure 34.

Determining the significance of impacts is a crucial step in assessing the environmental and social aspects of a project. The process typically involves a systematic evaluation of various factors to gauge the magnitude and importance of potential impacts. Populating the impact significance matrix is done by utilizing the collected data (baseline studies), assessments (determination of impact criteria, identification and categorization of potential impacts, quantitative and qualitative assessments), and stakeholder input (stakeholder consultations). Before populating the matrix, all impacts are evaluated by factors like severity, duration, reversibility, and cumulative effects to determine their significance.

The anticipated impacts for each phase of the project are presented in this section. The project will overall comply with WBG ESF with the most relevant ESS for each environmental and social topic that is provided. in the Table 15.

Table 15 ESS List Concerning the Project

Physical and Biological Environment	Relevant ESS
7.1.1 Land Use	ESS1, ESS3
7.1.2 Geology	ESS1, ESS3
7.1.3 Hydrogeology	ESS1, ESS3
7.1.4 Climate and Vegetation	ESS1, ESS3
7.1.5 Soil Quality	ESS1, ESS3
7.1.6 Air Quality and Odor	ESS1, ESS3
7.1.7 Noise	ESS1, ESS3
7.1.8 Water Resources and Use	ESS1, ESS3
7.1.9 Wastewater Management	ESS1, ESS3
7.1.10 Waste Management	ESS1, ESS3
7.1.11 Pesticide Use and Management	ESS1, ESS3
7.1.12 Natural Disaster Potential	ESS 1
7.1.13 Biodiversity and Protected Areas	ESS1, ESS6
Socio-Economic Environment	**Relevant ESS**
7.2.1 Population/Demography	ESS1
7.2.2 Cultural Heritage	ESS1, ESS8
7.2.3 Economy/Employment	ESS1
7.2.4 Vulnerable/Disadvantaged Groups	ESS1, ESS10
7.2.5 Land Requirement	ESS1, ESS5
7.2.6 Working Conditions and Labor Management	ESS1, ESS2
7.2.7 Community Health and Safety	ESS1, ESS4
7.2.8 Traffic and Transportation	ESS1, ESS4
7.2.9 Occupational Health and Safety	ESS1, ESS2

Table 16 Environmental and Social Attributes Impact Levels Identification Matrix

No	Environmental and Social Attributes	Impact																		
		Nature		Type			Extent/area				Duration				Likelihood of Occurrence			Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without ESMP	Impact Significance with ESMP
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/ Project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely	High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
A. PRE-CONSTRUCTION PHASE																					
1. Air Quality																					
1	Increase in dust concentration		✓	✓			✓				✓				✓			**Medium**	**Low**	**Low**	**Negligible/ None**
2	Exhaust emissions (SO_2 PM, NO_x)		✓	✓			✓				✓				✓			**Medium**	**Low**	**Low**	**Negligible/ None**
3	GHG emissions (CO_2, CH_4, N_2O)		✓	✓					✓		✓				✓			**Medium**	**Low**	**Low**	**Negligible/ None**
2.Soils and Contaminated Lands																					
1	Loss of topsoil at the project site		✓	✓			✓							✓		✓		**Medium**	**Low**	**Low**	**Negligible/ None**
2	Erosion potential		✓	✓			✓						✓			✓		**Low**	**Low**	**Low**	**Negligible/ None**
3	Contamination of soil		✓	✓			✓						✓			✓		**Medium**	**Low**	**Low**	**Low**
4	Pesticide Use		✓	✓			✓						✓			✓		**Medium**	**Low**	**Low**	**Negligible/ None**
3. Water Resources																					
1	Change in surface water quality		✓	✓				✓			✓						✓	**Medium**	**Low**	**Low**	**Negligible/ None**
2	Change in groundwater quality		✓	✓			✓				✓						✓	**Medium**	**Low**	**Low**	**Negligible/ None**

No	Environmental and Social Attributes	Impact																		
		Nature		Type			Extent/area				Duration				Likelihood of Occurrence			Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without ESMP	Impact Significance with ESMP
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/ Project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely	High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
4. Noise and Vibration																					
1	Increase in noise level		✓	✓				✓			✓				✓			**Medium**	**Low**	**Low**	**Low**
2	Increase in vibration level		✓	✓			✓				✓				✓			**Medium**	**Low**	**Low**	**Negligible/ None**
5. Resources and Waste																					
1	Resources used during works		✓	✓				✓			✓				✓			**Low**	**Low**	**Low**	**Negligible/ None**
2	Improper waste management		✓	✓				✓			✓					✓		**Medium**	**Low**	**Low**	**Low**
6. Landscape and Visual (Aesthetics)																					
1	Impairment of quality of life due to the overall presence of annoying construction works and activities and altered landscape		✓	✓				✓			✓				✓			**Low**	**Low**	**Low**	**Negligible/ None**
7. Biological Environment																					
1	Damage or loss of terrestrial habitats and flora species		✓	✓				✓			✓					✓		**Low**	**Low**	**Low**	**Negligible/ None**
2	Disturbing/harming of terrestrial fauna species		✓		✓			✓			✓					✓		**Low**	**Low**	**Low**	**Negligible/ None**
3	Damage or loss of aquatic habitat and/or aquatic species		✓		✓			✓			✓					✓		**Low**	**Low**	**Low**	**Negligible/ None**
8. Socioeconomic Environment																					
1	Infrastructure damage		✓	✓				✓			✓					✓		**Low**	**Low**	**Low**	**Negligible/ None**

No	Environmental and Social Attributes	Impact																		
		Nature		Type			Extent/area				Duration				Likelihood of Occurrence			Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without ESMP	Impact Significance with ESMP
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/ Project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely	High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
9. Community Health and Safety and Security																					
1	Trespassing and community encroachment		✓	✓			✓				✓						✓	**High**	**Low**	**Medium**	**Low**
2	Gender Based Violence (GBV), Sexual Exploitation Abuse / Sexual Harassment (SEA/SH)		✓	✓				✓					✓			✓		**High**	**Low**	**Medium**	**Low**
10. Labor Force and Working Conditions																					
1	Working conditions and protecting the workforce		✓	✓			✓				✓				✓			**High**	**Low**	**Medium**	**Low**
2	Workers' exposure to work-related occupational health and safety (OHS) risks		✓	✓			✓				✓				✓			**High**	**Low**	**Medium**	**Low**
3	Workers Engaged by Third Parties and the Supply Chain		✓	✓			✓				✓				✓			**High**	**Low**	**Medium**	**Low**
B. CONSTRUCTION PHASE																					
1. Air Quality																					
1	Increase in dust concentration		✓	✓			✓				✓				✓			**Medium**	**Low**	**Low**	**Negligible/ None**
2	Exhaust emissions (SO_2 PM, NO_x)		✓	✓			✓				✓				✓			**Medium**	**Low**	**Low**	**Negligible/ None**
3	GHG emissions (CO_2, CH_4, N_2O)		✓	✓					✓		✓				✓			**Medium**	**Low**	**Low**	**Negligible/ None**
2. Soils and Contaminated Land																					
1	Loss of topsoil due to improper		✓	✓			✓							✓		✓		**Medium**	**Low**	**Low**	**Negligible/**

No	Environmental and Social Attributes	Impact																		
		Nature		Type			Extent/area				Duration				Likelihood of Occurrence			Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without ESMP	Impact Significance with ESMP
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/ Project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely	High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
	storage																				**None**
2	Erosion potential		✓	✓			✓						✓			✓		**Low**	**Low**	**Low**	**Negligible/ None**
3	Contamination of soil		✓	✓			✓						✓			✓		**Medium**	**Low**	**Low**	**Low**
4	Pesticide Use		✓	✓			✓						✓			✓		**Medium**	**Low**	**Low**	**Negligible/ None**
3. Water Resources																					
1	Change in surface water quality	✓		✓					✓			✓			✓			**Medium**	**Low**	**Low**	**Negligible/ None**
2	Change in groundwater quality		✓		✓			✓			✓						✓	**Medium**	**Low**	**Low**	**Negligible/ None**
4. Noise and Vibration																					
1	Increase in noise level		✓	✓				✓			✓				✓			**Medium**	**Low**	**Low**	**Low**
2	Increase in vibration level		✓	✓			✓				✓				✓			**Medium**	**Low**	**Low**	**Negligible/ None**
5. Resources and Waste																					
1	Resources used during works		✓	✓				✓			✓				✓			**Low**	**Low**	**Low**	**Negligible/ None**
2	Improper waste management		✓	✓				✓			✓					✓		**Medium**	**Low**	**Low**	**Low**
6. Landscape and Visual (Aesthetics)																					
1	Impairment of quality of life due to the overall presence of annoying construction works and		✓	✓				✓			✓				✓			**Low**	**Low**	**Low**	**Negligible/ None**

No	Environmental and Social Attributes	Impact																		
		Nature		Type			Extent/area				Duration				Likelihood of Occurrence			Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without ESMP	Impact Significance with ESMP
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/ Project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely	High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
	activities and altered landscape																				
7. Biological Environment																					
1	Damage or loss of terrestrial habitats and flora species		✓		✓			✓			✓					✓		**Low**	**Low**	**Low**	**Negligible/ None**
2	Disturbing/harming of terrestrial fauna species		✓		✓			✓			✓					✓		**Low**	**Low**	**Low**	**Negligible/ None**
3	Damage or loss of aquatic habitat and/or aquatic species		✓		✓			✓			✓					✓		**Low**	**Low**	**Low**	**Negligible/ None**
8. Socioeconomic Environment																					
1	Infrastructure damage		✓	✓			✓			✓					✓			**Low**	**Low**	**Low**	**Negligible/ None**
9. Community Health and Safety and Security																					
1	Trespassing and community encroachment		✓	✓				✓			✓				✓			**High**	**Low**	**Medium**	**Low**
2	Gender Based Violence (GBV), Sexual Exploitation Abuse / Sexual Harassment (SEA/SH)		✓	✓				✓			✓				✓			**High**	**Low**	**Medium**	**Low**
10. Labor Force and Working Conditions																					
1	Working conditions and protecting the workforce			✓			✓				✓					✓		**High**	**Low**	**Medium**	**Low**
2	Workers' exposure to work-related occupational health and safety (OHS) risks		✓	✓			✓				✓					✓		**High**	**Low**	**Medium**	**Low**
3	Workers Engaged by Third		✓	✓				✓			✓					✓		**High**	**Low**	**Medium**	**Low**

No	Environmental and Social Attributes	Impact																			
		Nature		Type			Extent/area				Duration				Likelihood of Occurrence			Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without ESMP	Impact Significance with ESMP
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/ Project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely	High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
	Parties and the Supply Chain																				
C. OPERATION PHASE																					
1. Air Quality and Odor																					
1	Odorous gas emission	✓		✓				✓					✓		✓			**Positive**			
2	Exhaust emissions (SO_2 PM, NO_x)	✓		✓			✓						✓		✓			**Positive**			
3	GHG emissions (CO_2, CH_4, N_2O)	✓			✓				✓				✓		✓			**Positive**			
2. Geology, Soils and Contaminated Land																					
1	Contamination of Soil		✓		✓		✓					✓					✓	**Low**	**Low**	**Low**	**Negligible/ None**
3. Water Resources																					
1	Change in overall physicochemical water quality of Kumla Creek	✓		✓					✓				✓		✓			**Medium**	**Low**	**Low**	**Negligible/ None**
2	Change in groundwater quality		✓		✓			✓			✓						✓	**Medium**	**Low**	**Low**	**Negligible/ None**
4. Noise and Vibration																					
1	Increase in Noise Levels		✓	✓			✓							✓		✓		**Low**	**Low**	**Low**	**Negligible/ None**
5. Resources and Waste																					
1	Resources used for operation		✓		✓			✓					✓		✓			**Low**	**Low**	**Low**	**Negligible/ None**
2	Generation of different types of		✓	✓				✓					✓			✓		**Medium**	**Low**	**Low**	**Low**

No	Environmental and Social Attributes	Impact																		
		Nature		Type			Extent/area				Duration				Likelihood of Occurrence			Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without ESMP	Impact Significance with ESMP
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/ Project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely	High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
	waste in the Sludge Drying Facility																				
3	Sludge generation	✓		✓				✓			✓				✓			**Positive**			
6. Landscape and Visual (Aesthetics)																					
1	The existence of the Sludge Drying Facility and Rooftop SSP		✓	✓				✓						✓		✓		**Low**	**Low**	**Low**	**Low**
7. Biological Environment																					
1	Damage or loss terrestrial habitats and flora-fauna species		✓		✓			✓			✓					✓		**Low**	**Low**	**Low**	**Negligible/ None**
2	Damage or loss of aquatic habitat and/or aquatic species		✓		✓			✓			✓					✓		**Low**	**Low**	**Low**	**Negligible/ None**
8. Socioeconomic Environment																					
1	Infrastructure damage		✓	✓				✓			✓					✓		**Low**	**Low**	**Low**	**Negligible/ None**
9. Community Health and Safety																					
1	Trespassing and community encroachment		✓	✓			✓										✓	**Low**	**Medium**	**Low**	**None/ Negligible**
2	Community's exposure to disease due to improper handling of sludge		✓	✓				✓			✓						✓	**Low**	**Medium**	**Low**	**Negligible/ None**
3	Failure of operation		✓	✓					✓		✓					✓		**Medium**	**Medium**	**Medium**	**Low**
10. Labor Force and Working Conditions																					
1	Working conditions and protecting the workforce		✓	✓			✓				✓				✓			**Medium**	**Low**	**Low**	**Low**

No	Environmental and Social Attributes	Impact																		
		Nature		Type			Extent/area				Duration				Likelihood of Occurrence			Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without ESMP	Impact Significance with ESMP
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/ Project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely				
																		High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
2	Gender Based Violence (GBV), Sexual Exploitation Abuse / Sexual Harassment (SEA/SH)		✓	✓				✓					✓			✓		**Medium**	**Low**	**Low**	**Low**
3	Workers' exposure to work-related occupational health and safety (OHS) risks		✓	✓			✓				✓				✓			**High**	**Low**	**Medium**	**Low**
4	Workers Engaged by Third Parties and the Supply Chain		✓	✓			✓				✓				✓			**Medium**	**Low**	**Low**	**Low**

7.1.1 Land Use

The total area of the solar sludge drying facility is 5,000 m^2, where 3,360 m^2 of it will be used for drying halls. The Project area is located in Kocaeli Province, İzmir District, Alikahya Atatürk Neighborhood, parcel 164/34. The area of the parcel is 40,395.43 ha. The property owner of the Project area is Asım Kibar OIZ.

Changes in land use happen often and on a variety of sizes, and they can have distinct and cumulative effects on air and water quality, watershed function, waste production, extent and quality of wildlife habitat, climate, and human health (*Land use | U.S. Environmental Protection Agency* 2021).

Land use activities are classified into two categories based on their potential environmental and health impacts: land development and agricultural uses. Because the assigned area is in an organized industrial zone and hence has no significance or value for wildlife or agricultural usage, this report will exclusively cover land development.

The land where the drying facility will be established has grasses and scrubs. The soil condition of the project parcel is in line with the soil condition of the surrounding lands where no studies have been conducted. Topsoil stripping activities will be carried out even if there are no trees to be cut or affected by Project activities.The land is allocated as a treatment plant area. The land has not been used for any purposes. The solar panels will be installed on the rooftop of the wastewater recovery facility. For this Project, the impacts related to land development are due to the impermeable surfaces to be constructed within the scope of the Project. Three possible impacts for this Project are as follows:

- contributing to non-point source water pollution by limiting the soil's capacity to filter water flow, resulting in the accumulation of rainwater and the release of more pollutants into water bodies,
- blocking of the groundwater aquifers' ability to renew, and
- higher concentrations of certain air pollutants due to increased vehicle and energy use.

In addition to the possible impacts defined above, legal obligations regarding land use, and visual effects of landscaping are assessed in the following sub-sections for the pre-construction, construction and operation phases of the Project. All phases of the project will meet ESS1 and ESS3 in terms of land use.

7.1.1.1 Pre-Construction Phase

Considering that the sludge drying plant is a wastewater treatment plant component, proper planning, monitoring and compliance with environmental and safety regulations are critical to minimise risks associated with land use during pre-construction activities.

Permit Violations: Failure to obtain the necessary permits and/or non-compliance with permit conditions can result in regulatory fines and delays. Environmental Regulations: Violations of environmental regulations can lead to legal consequences and additional costs for remediation and mitigation.

In the pre-construction phase of the Project, topsoil stripping will be carried out during the land preparation process. It is estimated that a minimum of 30 cm of topsoil stripping will be carried out in the 5,000 m^2 area where the sludge drying plant is planned. Topsoil stripped during the pre-construction phase of the project will be used in landscaping areas within the boundaries of the Asım Kibar OIZ.

During the pre-construction phase, only topsoil stripping will be carried out, therefore no impacts related to land use are expected during this phase. However, there will be impacts on air quality due to dusting and exhaust emissions during topsoil stripping. There is no impact related to land use within the scope of rooftop SPP. Impacts on air quality and odor are given in Chapter 7.1.6 of this report. As a result, impacts related to land use for pre-construction phase are short term, direct, and low severity thus assessed as low to *negligible* in significance with mitigations in Chapter 8.

7.1.1.2 Construction Phase

During the construction phase of the Project, since the solar sludge drying facility consist of impermeable materials (concrete, steel, polycarbonate etc.), the creation of impermeable surfaces is expected in the Project area. However, it was stated by the OIZ Environmental Engineer that there is an existing storm water network in Asım Kibar OIZ. After the completion of the construction phase, the impact of impermeable areas will be minimized by connecting the storm water collection channels of the Project facility, units, and roads to the existing Asım Kibar OIZ storm water collection line.

In addition to the operation of construction machinery and equipment may disturb the landscape of the Project area. The use of steel construction and temporary use of tower cranes etc. may cause landscape and visual impacts. As a result, impacts related to land use for construction phase are short term, direct, and *low* severity thus assessed as low to *negligible* in significance with mitigations in Chapter 8. There is no impact on land use within the scope of rooftop SPP during the construction phase.

7.1.1.3 Operation Phase

In the operational phase, no impacts on the landscape other than the sludge drying facility area are expected. The possible impacts during the operation phase will be the maintenance periods of the equipment in this facility. During the maintenance works, as the works will be done in a limited area, the landscape of the site will not be affected in a significant way. However, during maintenance works, the work area will be determined and limited to that area to minimize impacts on the landscape.

Since Asım Kibar OIZ has an existing storm water collection line that the Project's components will be connected to, the impact of impermeable areas will be minimal in operation phase as well. As a result, impacts related to land use for operation phase are short term, direct, and *low* severity thus assessed as low to *negligible* in significance with mitigations in Chapter 8.

7.1.2 Geology

7.1.2.1 Pre-Construction Phase

Ground liquefaction should be mitigated to the extent possible. The flats would be built according to the Building Earthquake Regulations. The project's geological impacts for the pre-construction phase are minimal, hence they are classified as *negligible*.

7.1.2.2 Construction Phase

Necessary measures should be taken against the risk of ground liquefaction. Construction of the units would be in accordance with the Building Earthquake Regulations. Impacts caused by the project, related to geology for construction phase are minimal thus assessed as *negligible* in significance.

7.1.2.3 Operation Phase

The risk of ground liquefaction should be mitigated. The project's geological impacts for the operation phase are minimal, hence they are considered *negligible* in significance.

7.1.3 Hydrogeology

7.1.3.1 Pre-Construction Phase

Leakage and spill of fuels, and oils to be used for the construction machinery and equipment may create soil contamination risk. All chemical storage containers, including diesel fuel and hazardous liquid waste drums/containers, should be located to minimize the risk of soil, surface water, and groundwater contamination during construction. There is no hydrogeological impact on the SPP project at this stage. On the other hand, there are no discharges into groundwater resources. As a result, impacts related to

hydrogeology for pre-construction phase are short term, indirect, and low severity thus assessed as *negligible* in significance.

7.1.3.2 Construction Phase

Construction activities may create the potential for accidental release/leak of petroleum-based products such as lubricants, hydraulic fluids or fuels during storage, transportation or use in equipment. All chemical storage containers, including diesel fuel and hazardous liquid waste drums/containers, should be located to minimize the risk of soil, surface water, and groundwater contamination during construction. There is no hydrogeological impact on the SPP project at this stage. On the other hand, there are no discharges into groundwater resources. As a result, impacts related to hydrogeology for construction phase are short term, indirect, and low severity thus assessed as *negligible* in significance..

7.1.3.3 Operation Phase

No wastewater will be generated in the solar sludge drying facility and the water in the sludge will be discharged as steam. Dried sludge will be securely stored in contained units to prevent leachate formation and groundwater contamination. Impermeable liners will be placed under sludge drying areas to prevent any leachate from infiltrating the soil and contaminating groundwater. The facility will be equipped with drainage systems that will direct stormwater runoff away from sludge storage and drying areas to prevent water contamination.

Since it is a rooftop SPP, the SPP project has no hydrogeological impact at this stage. On the other hand, there is no discharge to underground water resources. The impacts will be mostly related to accidental spills/leakages and poor management of generated wastes and sludge. All chemical storage containers, including diesel fuel and hazardous liquid waste drums/containers, should be located to minimize the risk of soil, surface water and groundwater contamination. As a result, impacts related to hydrogeology for operation phase are long term, direct, and low severity thus assessed as *negligible* in significance.

7.1.4 Climate and Vegetation

The impacts on climate and vegetation prior to project construction can vary based on the type of development, location, and environmental conditions.

Using solar energy for sludge drying significantly reduces greenhouse gas (GHG) emissions compared to conventional fossil fuel-based methods. Lower overall carbon footprint due to the renewable nature of solar power, contributing to climate change mitigation. The use of solar energy for sludge drying facilities presents a sustainable approach with significant positive impacts on climate and vegetation. Moreover, the Project area is a confined area that is located within the organized industrial zone limiting the negative impacts on the vegetation; thus, no significant long-term negative impacts on vegetation are expected.

Assessments on the Project’s impacts on climate change and vegetation during the pre-construction, construction and operation phases is given in the following sub-sections.

7.1.4.1 Pre-Construction Phase

Land clearing for construction typically involves the removal of vegetation, which can result in the loss of plant species and habitat disruption for local wildlife. The elimination of vegetation exposes the soil to erosion, as plants help to stabilize it. Erosion transports waste and sediments (soil, pebbles, etc.) to surrounding water bodies, potentially harming aquatic ecosystems.

The energy consumption (fuel for construction machinery and generators, electricity for utilities, equipment, and heating, and LPG for construction machinery and heating) and resource consumption for the Project, which will increase greenhouse gas (CO_2, CH4, and N2O) emissions, are the main causes of the Project's pre-construction impacts on climate change. The Project’s contribution to climate

change through GHG emissions during pre-construction phase is assessed as a negative, short term and direct impact while impacts on vegetation is assessed as negative, short term and direct.

7.1.4.2 Construction Phase

Until the land restoration process is finished, which is one of the last tasks performed during the construction phase, the removed earth from the pre-construction phase still presents a risk of erosion. Furthermore, compacting the soil with heavy construction equipment reduces its suitability for plant growth. The ability of plants to regrow after construction may be impacted by this.
During the construction phase, the Project's energy consumption (fuel for generators and construction machinery, electricity for utilities, equipment, and heating, and LPG for heating and machinery) and resource consumption will increase greenhouse gas (CO_2, CH_4, and N_2O) emissions. These factors will have an impact on climate change. The Project's contribution to climate change through GHG emissions during construction phase is assessed as a negative, short term and direct impact while impacts on vegetation is assessed as negative, short term and direct.

7.1.4.3 Operation Phase

The contribution of the Project to climate change during the operational phase will be different from the pre-construction and construction phases. Since the energy requirement of the solar sludge drying plant will be met from the rooftop SPP within the scope of the project, no fossil fuelled equipment/machinery will be used. One of the most important points in the project is that with the decrease in the amount of sludge to 1/3 ratio, greenhouse gas emissions will also decrease as a result of the reduction in transport activities. The contribution of the Project to climate change through GHG emissions during the operational phase is assessed as a positive, short-term and direct impact, while the significance of the impact on vegetation is assessed as low to *negligible* with mitigations in Chapter 8.

7.1.5 Soil Quality

Construction projects can have a variety of effects on the soil environment, including disruptions to the natural soil structure caused by operations such as soil stripping, levelling, and excavation. Common problems include soil layer mixing, contamination threats from construction machinery fuels and materials, potential soil pollution due to waste mismanagement, and incorrect soil restoration.

The possible impacts mentioned above are assessed in the following sub-sections for the pre-construction, construction and operation phases.

7.1.5.1 Pre-Construction Phase

The impacts on the soil environment are restricted to the construction site. These impacts that could occur on the soil environment during pre-construction phase are listed below:

- Construction activities may disrupt natural soil and land structure, including stripping, levelling, excavation, and filling.
- Excavation may cause soil layers to mix.
- Construction machinery and equipment may leak and spill fuels, paints, and oils, posing a soil contamination risk.
- Uncontrolled storage or disposal of solid and liquid wastes can lead to soil pollution.
- Soil was not properly replaced in its original position.

There is a temporary storage area (see Figure 16) for hazardous wastes in OIZ. Wastes accumulated in non-hazardous waste storage areas are sent to various licensed facilities and the facilities to which the waste will be sent are specified in the Industrial Waste Management Plan in Annex-13. Hazardous and non-hazardous wastes may be generated due to the project. These impacts can be easily managed and mitigated to negligible from low in significance with the implementation of the mitigation measures presented in Chapter 8.

7.1.5.2 Construction Phase

The impacts on the soil environment are restricted to the construction site. These impacts that could occur on the soil environment during construction phase are listed below:

- Refill actions may cause soil layer mixing.
- Construction machinery and equipment may leak and spill fuels, paints, and oils, posing a soil contamination risk.
- The Project may cause soil pollution due to uncontrolled storage or disposal of solid and liquid waste.

These impacts can be easily managed and mitigated to negligible in significance with the implementation of the mitigation measures presented in in Chapter 8.

7.1.5.3 Operation Phase

The activities during the Project's operating phase will have limited physical interaction with the soil environment. Under typical operating conditions, no more substantial direct impacts on topography, soil, or land usage are expected during the Project's operation period. The risks associated with the operation phase of the Project include accidental spillage/leakage during sludge drying operations and spillage/leakage of wastewater, oil and chemicals to soil during repair and maintenance activities. The extent of these negative impacts will be limited with the Project's footprint, the significance of the impacts on soil environment would be considered as low if mitigation measures will not be applied accordingly. With the implementation of mitigation measures, the residual impacts will be negligible in significance. The defined mitigation measures are presented in Chapter 8.

7.1.6 Air Quality and Odor

7.1.6.1 Pre-Construction Phase

In the pre-construction phase of the project, topsoil stripping will be carried out during the land preparation process. Calculations showing uncontrolled and controlled dust emissions resulting from topsoil stripping are presented in the Annex 7 of this report. Emission rates were calculated using the emission factors given in Annex 12 of the Regulation on Control of Industrial Air Pollution.

Table 17 Air Quality Project Standards and Calculated Emission Values (in Pre-Construction Phase)

Parameter	Unit	Emission rate from machinery and equipment (kg/h)	Emission rate of PM_{10} from topsoil stripping activities (kg/h)		Project Standard
			Uncontrolled	Controlled	
CO	kg/h	0.0245	-	-	10,000 µg/m^3
SO_2	kg/h	0.0005	-	-	60 µg/m^3
NOx	kg/h	0.15	-	-	-
PM_{10}	kg/h	0.006	3.016	1.508	50 µg/m^3
$PM_{2.5}$	kg/h	0.042	2.111	1.056	25 µg/m^3

These emission rates are estimated under the worst-case scenario. The emission flow rate for controlled and uncontrolled activities exceeds 1 kg/hour, which is the limit value set in the Industrial Air Pollution Control Regulation (IAPCR) for non-stack sources, while the emission flow rate for machinery and equipment activities is below the limit values. When the calculated CO, SO_2, NO_x, PM_{10} and $PM_{2.5}$ values are analyzed (see Table 52), they are likewise found to be less than the limit value established for non-stack sources in IAPCR. Consequently, the impacts of particulate matter emissions will be mitigated by the implementation of the mitigation measures summarised in Chapter 8.

Detailed air quality calculations are described in Annex 7. These impacts can be easily managed and mitigated from low to *negligible* in significance with the implementation of the mitigation measures presented in Chapter 8.

7.1.6.2 Construction Phase

These emission rates are calculated based on the worst-case scenario. It is found that the emission rate for both uncontrolled and controlled activities are above the limit value defined for non-stack sources in IAPCR, which is 1 kg/hour. When the calculated CO, SO_2, NO_x, PM_{10} and $PM_{2.5}$ values are evaluated, it is seen that they are also below the limit value defined for non-stack sources in IAPCR. Therefore, impacts related to dust emissions are in negligible significance. In addition, with implementation of a set of mitigation measures that are presented in Chapter 8, any related impacts on air environment will be reduced.

Detailed air quality calculations are presented in Annex-7, and these impacts can be easily managed and mitigated from low to *negligible* in significance with the implementation of the mitigation measures presented in Chapter 8.

Table 18 Air Quality Project Standards and Calculated Emission Values (in Construction Phase)

Parameter	Emission rates from machinery and equipment (kg/h)	Project Standard
CO	0.0368	10,000 µg/m^3
SO_2	0.00075	60 µg/m^3
NOx	0.225	-
PM_{10}	0.009	50 µg/m^3
$PM_{2.5}$	0.0063	25 µg/m^3

7.1.6.3 Operation Phase

Occasionally, minimal and local odor formation may occur from physical treatment and sludge treatment units of WWTP. An odor removal unit will be installed in the sludge drying plant within the scope of the Project. The odor control and removal system is designed to suck and expel polluted air in the environment and has a capacity of 7 cycles per hour. The dirty air sucked in with the help of fans and ducts will be purified using chemical air spray scrubbers. However, if the effective operation will be provided, there would not be any odor problem. It will even play an important role in reducing the existing sludge odour.

Air quality measurements will be carried out monthly from the beginning of the construction phase. In addition, measurement will be repeated upon grievances. Anyone who has a complaint about odor will be able to use the Grievance Mechanism, which will be active in all phases of the Project.

During the operation phase of the Project, the existing odour of the sludge will decrease, exhaust emissions will also decrease as fewer sludge transfers will be carried out and indirectly greenhouse gas emissions will be reduced. Cumulatively, the impacts on air quality will be *positive* with the mitigation measures given in the ESMP.

7.1.7 Noise

Construction projects may generate noise, affecting both the surrounding environment and nearby communities. Heavy machinery and construction equipment, as well as activities like drilling and hammering, are common noise sources. The loudness might cause disturbances, compromising the health of neighboring humans and wildlife. Potential consequences include increased stress, sleep difficulties, and disruptions to daily routines.

The next subsections for the pre-construction, construction, and operating phases evaluate the aforementioned potential effects. Values showing noise calculations are presented in the Annex-8 of this report.

7.1.7.1 Pre-Construction Phase

During pre-construction phase of the Project, the noise would be potentially generated by vehicles and machinery to be used during land preparation activities. Since the planned solar sludge drying facility and rooftop of SSP are in an industrial area, there are no sensitive receptors such as health centers, schools, mosques in the immediate vicinity of the Project Area (see Figure 33).

Vibration that will affect humans or the structure in the vicinity is not expected to occur as there will be no blasting activity within the Project.

The noise level arising from the machinery/equipment and reaching a certain distance has been calculated as specified in Annex-8. Assuming that all machines will operate at the same time and at the same point, the noise level from machinery and equipment in the pre-construction phase meets the Project standard of 55 dBA at a distance of 100-200 metres from these sources. Considering that all machines will not operate at the same time and at the same point, it can be said that the Project Standard can be achieved at lower distances. Therefore, in the pre-construction phase of the Project, the noise impacts will be direct and negative with short term duration and *low* in significance. These impacts will be mitigated by the implementation of the mitigation measures presented in Chapter 8 and the Project Standard will be ensured.

7.1.7.2 Construction Phase

The Project activities within the construction phase are associated with a range of activities that generate noise. The noise would be potentially generated by transportation vehicles, machinery and outdoor equipment to be used for the preparation of the site and the construction activities. Since the planned sludge drying facility and rooftop SPP is in an industrial area, there are no sensitive receptors such as health centers, schools, mosques in the immediate vicinity of the Project Area.

The noise generated during the installation of rooftop SPPs is temporary and usually lasts for a few days to a couple of weeks, depending on the size of the installation. Drilling can generate noise levels of 70-90 decibels (dB), which is similar to the noise produced by a household vacuum cleaner or a power drill. Cutting tools such as saws can produce noise levels of 80-100 dB, comparable to a lawnmower or chainsaw. Hammering and screwing typically produce noise levels around 60-80 dB, akin to the noise level of a normal conversation or a busy street. In order to minimise noise disturbance to the employees of the Water Recovery Building, they will be informed in advance about the installation programme and possible noise. Modern, quieter vehicles and equipment designed to reduce noise levels will be used. Efficient installation techniques will be utilised to minimise the duration of noisy activities

Vibration that will affect humans or the structure in the vicinity is not expected to occur as there will be no blasting activity within the Project.

The noise level arising from the machinery/equipment and reaching a certain distance has been calculated as specified in Annex-8. Assuming that all machines will operate at the same time and at the same point, the noise level from machinery and equipment in the construction phase meets the Project standard of 55 dBA at a distance of 200-300 metres from these sources. Considering that all machines will not operate at the same time and at the same point, it can be said that the Project Standard can be achieved at lower distances. Therefore, in the construction phase of the Project, the noise impacts will be direct and negative with short - term duration and low in significance. The noise level of the equipment and machinery will be kept at a minimum with proper mitigation measures such as the use of silencers and with regular maintenance which is presented in Chapter 8 and the Project Standard will be endured.

7.1.7.3 Operation Phase

During the operation phase of the Project, the noise will be generated from sludge drying facility equipment such as engines for automatic mixing and ventilation system. The level of noise generated from the equipment is expected to be constant as all equipment will be in operation during the plant operation hours (24 hours). Equipment generating noise during the operation of the plant will be located in isolated closed buildings and some of them will be submerged in wastewater. So, no significant noise is expected to be generated during the operation of the sludge drying facility.

Rooftop solar power plants (SPPs) are known for their quiet operation compared to many other forms of energy generation. However, there are a few potential sources of noise associated with their operation. Inverters convert direct current (DC) from solar panels to alternating current (AC) for use in the grid or home. They can produce a low-level humming or buzzing sound. Typically, inverter noise is around 40-50 decibels (dB), which is comparable to a quiet office or a refrigerator. Installing inverters in well-ventilated but enclosed spaces, away from living areas, can minimize any audible impact.

The sound levels listed in the technical specifications or data sheet will be taken into consideration as good practices when purchasing machinery and equipment. Relevant national legal requirements, their limit values, the WBG General EHS Guidelines, and the Sectoral Guidelines will all be followed in all works performed during the operation.

These impacts will be mitigated by the implementation of the mitigation measures presented in Chapter 8..

7.1.8 Water Resources and Use

During the pre-construction and construction phases, employees' needs will create water supply requirement. The utility water used will be supplied by obtaining a construction site subscription from the network of Asım Kibar OIZ by the Contractor. Asım Kibar OIZ also gets water from Kocaeli Water and Sewerage Administration General Directorate (İSU). In addition, there are 3 authorised wells belonging to the companies within the OIZ. The groundwater utilisation certificate for these wells is given in Annex 12.

The total amount of daily water requirement is calculated based on the multiplication of the number of employees that will be working at the peak time of the phase and the daily water requirement for a person, which is 235 L/cap/day for Kocaeli (TurkStat, 2022).

The calculations regarding water usage mentioned above are given in the following sub-sections for the pre-construction, construction and operation phases.

7.1.8.1 Pre-Construction Phase

The average number of personnel required for the pre-construction phase is determined as 4. Therefore, the daily water requirement of employees during the pre-construction phase will be;

4 employees x 0.235 m^3/cap/day= 0.94 m^3/day

Bottled water will be used for the drinking water needs of the personnel. The quality of drinking water that will be supplied to the Project shall be in compliance with the Regulation Concerning the Water Intended for Human Consumption together with the internationally accepted standards, such as WHO and WBG's General EHS Guidelines.

The needs of employees will determine the water supply requirements during the pre-construction phase. The employees' drinking water requirements will be satisfied by bottled water that they will buy at a nearby retailer.

These impacts will be considered to have *low* impact significance by the implementation of the mitigation measures presented in Chapter 8.

7.1.8.2 Construction Phase

During the construction phase, the needs of the employees will create a water supply requirement. Water to be used for domestic water will be supplied by obtaining a construction site subscription. There will be no accommodation on site and water use will be limited to the working hours of the employees. The required number of personnel is determined as 25. Therefore, the daily water requirement of the employees during the construction phase will be as follows;

25 employees x 0.235 m^3/cap/day= 5.875 m^3/day

Within the scope of the solar sludge drying plant, concrete will be poured for the impermeable floor and then the construction will be carried out with steel construction. There will be no dust suppression as no dust generating activities will be carried out. Since ready-mixed concrete will be used in construction, no additional water is needed for concrete preparation.

Bottled water will be used for the drinking water needs of the personnel. The quality of drinking water that will be supplied to the Project shall be in compliance with the Regulation Concerning the Water Intended for Human Consumption together with the internationally accepted standards, such as WHO and WBG's General EHS Guidelines.

During the construction phase, employees' needs will create water supply requirements. The employees' drinking water requirements will be satisfied by bottled water that they will buy at a nearby retailer.

On the other hand, construction activities may pose the potential for accidental release/leakages of petroleum-based products, such as lubricants, hydraulic fluids, or fuels during their storage, transfer, or use in equipment. All chemical storage containers, including diesel fuel and hazardous liquid waste drums/containers will be placed so as to minimize the risk of soil, surface water and groundwater contamination during the construction.

By implementing adequate measures for preventing spills and chemical leaks, it will be ensured that groundwater quality remains unaffected. These impacts will be considered to have *low* impact significance by the implementation of the mitigation measures presented in Chapter 8.

7.1.8.3 Operation Phase

During the operation phase of the Project, part of the water supply requirement will arise due to employee needs. The number of personnel required is determined as 1. Therefore, the daily water requirement of employees during the construction phase will be;

1 employees x 0.235 m^3/cap/day = 0.235 m^3/day

While solar PV panels generally require water for cleaning to maintain efficiency, the actual water needs vary depending on factors like system size, cleaning method, and local environmental conditions. In this context, it is predicted that water usage will not exceed 1 m^3 per year.

During the operation phase of the sludge drying plant and rooftop SPP, some chemicals such as machine oil, deionised water, isopropyl alcohol and commercial solar panel cleaning solutions will be used and stored for maintenance of the facilities. There is a risk of leakage of such chemical liquids. All storage tanks and drums will be placed in concrete areas with appropriate secondary containment. Where necessary, spill kits, absorbent pads or materials and absorbent sands will be available near chemical storage areas at all times.

By implementing effective stormwater management practices, ensuring proper storage of sludge and regular water quality monitoring, negative impacts on water resources can be minimised and sustainable operation of these facilities can be supported. The sludge drying plant should be surrounded by gratings and containment structures such as retention ponds should be constructed to capture and treat runoff before it reaches natural water bodies. Sludge should be stored in lined and enclosed areas to prevent leachate generation and reduce the risk of contamination. Strict protocols should be established to prevent spills and ensure rapid response measures are taken.

During the operation phase, the wastewater generated will be treated at the existing WWTP. In addition, WWTP discharge will be in compliance with Project Standards. It is highly unlikely that the plant would need a complete shutdown. The capacity of the plant is sufficient for carrying the flow during short term pauses and necessary mitigation measures will be taken in case of any breakdown or natural disaster that may occur during the operation phase. Asım Kibar OIZ will ensure that the contractor will prepare an Emergency Preparedness Plan for the impacts resulting from such problems. In the event of a possible breakdown, the impact will be eliminated in a short time.

During the operating phase, the impact on groundwater may be observed as a result of accidentally oil leaks in regions where subproject equipment is being maintained, as well as incorrect waste disposal. This may have an impact on groundwater quality in the Project Area; if necessary, mitigation measures will be implemented. However, it is possible to assume that the impacts will be minimal provided mitigation measures and good engineering practices are implemented.

Consequently, the impacts of the Project on water resources may be negative without the above-mentioned practices. These impacts of low impact significance will be considered *negligible* impact significance by the implementation of the mitigation measures presented in Chapter 8. During the operation phase of the Project, the impact will be indirect and negative with long-term duration.

7.1.9 Wastewater Management

Asım Kibar OIZ Wastewater Treatment Plant was built with a mechanical capacity of 4,000 m^3/day and a construction capacity of 6,000 m^3/day.

Wastewater will be generated in all phases of the Project. Domestic wastewater resulting from workers will be generated from facilities where the needs of employees are met, such as eating areas, toilets. During the pre-construction, construction and operation phases of the Project, the toilets used by the existing workers working at the WWTP will be used.

According to 2022 TurkStat data, the Kocaeli Municipality's Daily Wastewater Amount is 0.218 m^3/day. The calculations regarding wastewater generation mentioned above are given in the following sub-sections for the pre-construction, construction and operation phases.

7.1.9.1 Pre-Construction Phase

The average number of personnel required for the pre-construction phase is determined as 4. Therefore, the daily wastewater generation of employees during the pre-construction phase will be;

4 employees* 0.218 m^3/day = 0.872 m^3/day

As the number of employees is low, the additional wastewater load will not have a significant impact.

It is estimated that a maximum of 5 m^3 of water will be used daily for dust suppression operations during the pre-construction phase of the Project.

As a result, the Project may have an adverse impact in terms of wastewater management during the pre-construction phase due to use of resources. These low significance impacts will be assessed as *negligible* impact significance with the implementation of mitigation measures presented in Chapter 8.

7.1.9.2 Construction Phase

The average number of personnel required for the construction phase is determined as 25. Therefore, the daily wastewater generation of employees during the construction phase will be;

25 employees* 0.218 m^3/day = 5.45 m^3/day

As the number of employees is low, the additional wastewater load will not have a significant impact.

It is estimated that a maximum of 5 m^3 of water will be used daily for dust suppression operations during the construction phase of the Project.

As a result, the Project may have an adverse impact in terms of wastewater management during the construction phase due to use of resources. These low significance impacts will be assessed as *negligible* impact significance with the implementation of mitigation measures presented in Chapter 8.

7.1.9.3 Operation Phase

During the operation phase of the Project, generated domestic wastewater will be treated and discharged in the existing plant. The number of personnel required for the operation phase is determined as 1. Therefore, the daily wastewater generation of employees during the operation phase will be;

1 employe * 0.218 m^3/day = 0.218 m^3/day

To avoid contamination of natural water resources, systems should be installed on the roof to capture and treat wastewater from cleaning operations before disposal. Mild, environmentally friendly cleaning solutions should be used to minimise environmental impact. Manufacturer recommendations for diluting cleaning agents should be followed to reduce chemical run-off and minimise environmental contamination.

Considering the capacity of the wastewater treatment plant and the wastewater to be generated during the operation phase of the project, the project-derived wastewater load on WWTP is *negligible*.

The Project will not have an adverse impact on wastewater management provided that mitigation measures given in Chapter 8 are implemented. Therefore, the impact significance from wastewater is *negligible* during the operation phase of the project..

7.1.10 Waste Management

Waste is anticipated to be generated during the land preparation including topsoil stripping and land levelling, during the construction of the facility and during the installation activities for the solar panels. The types of waste that can be produced are scraps, cardboard, recyclable packaging materials, contaminated containers, contaminated rags and domestic solid wastes. Since the land levelling will be limited and there will be no excavation, excess excavated material that need to be disposed of is not expected.

To prevent negative effects on nearby water resources, soils, and flora and fauna, all waste produced during the Project's pre-construction, construction, and operation phases must be appropriately managed in accordance with national waste management laws and international good practices. This chapter evaluates the effects of waste generation and identifies the waste that will be produced in this situation.

Waste to be generated in the scope of the Project activities will be managed in accordance with the waste management hierarchy as given in Figure 18. In this respect, waste generation will be avoided/prevented at the source. In cases where prevention is not possible at the source, respectively; minimization of waste generation, selection of materials that will not cause generation of hazardous waste as much as possible, separate collection of waste according to their type (hazardous, non-hazardous, recyclable, etc.), reuse of generated waste at the site as much as possible, assessment of alternatives such as recycling and energy recovery for waste (where reuse is not possible) will be considered. The final step in the hierarchy of waste management involves the final disposal of waste in

accordance with relevant regulations, where reuse, recycling and energy recovery options are not possible..

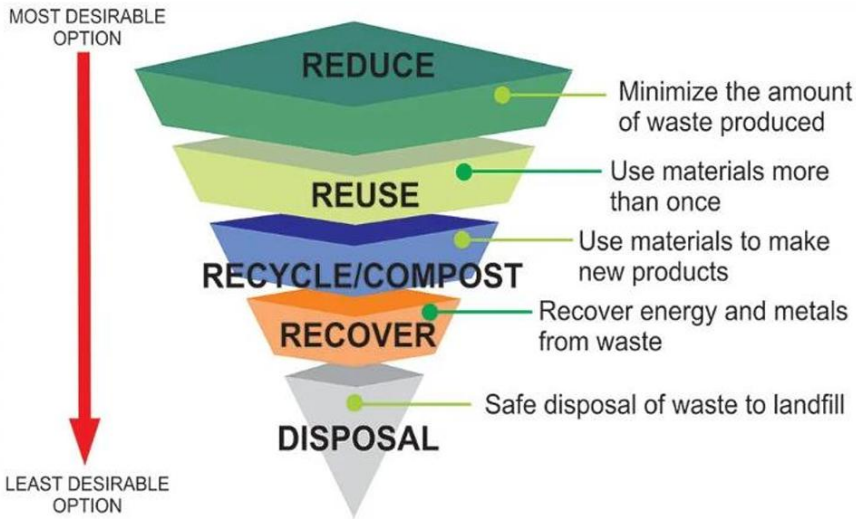


Figure 18 Waste Management Hierarchy[7]

7.1.10.1 Pre-Construction Phase

As in the current situation, the OIZ's Environmental Engineer will be responsible for waste management during all phases of the project. Waste will be managed according to the waste hierarchy. Waste generation in the pre-construction phase is often associated with planning, site preparation, and early material deliveries. Common sources of waste during this phase are:

- Packaging Waste
- Demolition or Deconstruction Waste
- Unused or Surplus Materials
- Hazardous Waste
- Municipal Solid Waste

Efforts to minimize waste during the pre-construction phase involve strategic planning, efficient material use, and waste reduction measures. Implementing a waste management plan, as discussed earlier, can help identify, categorize, and manage the various sources of waste generated in the pre-construction stage.

Topsoil stripped during the pre-construction phase of the project will be used in green areas within the boundaries of the Asım Kibar OIZ.

The construction machinery may require oil changes during the pre-construction phase of the Project, since the oil needs to be replaced at least once in every two-months. Oil changes of the construction machinery will be carried out at services licensed for the maintenance of the machinery. Thus, there will be no waste oil generation in the pre-construction of the Project.

Waste vegetable oil will not be generated at the site during the pre-construction activities as meals for the staff will be provided by catering companies. End-of-life tire generation and storage will not take place due to the fact that the tire changes of the construction machines and other vehicles to be used at this stage will be carried out at the facilities in the region providing service for this purpose. In addition, since there is no infirmary at the project site and in case of any incident during the activities, hospitals /

[7] World Bank Group, Approach Paper, An Evaluation of the World Bank Group's Support to Municipal Solid Waste Management, 2010–20, June 29, 2020

health centres in Izmit District will be used primarily for possible medical interventions. Within the scope of the Project, there will be no significant amount of medical waste generation at the site.

In order to determine the amount of municipal waste to be generated at site, the average daily municipal waste per person in Kocaeli is taken as 0.82 kg according to the municipal waste statistics of TurkStat in year 2022. The estimated amount of municipal waste to be generated during the pre-construction phase and construction phase of the Project, based on the number of people working, is given below. This amount includes also separately collected fractions such as paper, cardboard, glass, metal, plastic, etc. together with biodegradable wastes.

For pre-construction phase:

4 people x 0.82 kg/person/day = 3.28 kg/day

No significant impact resulting from waste generation is expected due to the nature and scale of the Project, as explained above. Therefore, the impact is assessed as direct and negative with short term duration, local and low significance. However, mitigation measures proposed in Chapter 8.2 in order to prevent and/or minimize likely impacts will be implemented.

7.1.10.2 Construction Phase

To reduce negative environmental effects, it is critical to use environmentally friendly construction methods, follow environmental rules, and continuously analyze and improve procedures throughout the project's lifecycle. Environmental impact assessments and extensive planning during the pre-construction phase are critical in striking a balance between construction needs and environmental preservation.

Hazardous waste will be stored in special compartments in the Temporary Storage Area allocated for this purpose, in containers, separated from the non-hazardous waste as indicated in Waste Management Regulation. This area will have an impermeable base/ground and will be protected from the surface flows and rain. Additionally, necessary drainage for the area will be provided. Hazardous wastes will be collected and disposed of by licensed companies. Asım Kibar OIZ will be responsible for selecting a company licensed by the MoEUCC to transfer hazardous wastes.

Table 19 lists the types of waste that can be generated during the pre-construction phase and construction phase of the Project and their waste codes according to the waste lists given in the annexes of the Waste Management Regulation.

Table 19 List of Possible Waste Types to be generated during Pre-construction and Construction Phase of the Project

Waste Code	Definition of Waste Code
13	**Oil Wastes and Liquid Fuel Waste (Excluding Edible Oils, 05 and 12)**
13 02	Waste Engine, Transmission and Lubrication Oils
15	**Waste Packages, Unspecified Absorbents, Wipes, Filter Materials and Protective Clothing**
15 01	Packaging Waste (Including Packaging Waste Separately Collected by the Municipality)
15 02	Absorbents, Filter Materials, Cleaning Cloths and Protective Clothing
16	**Waste Not Specified Otherwise in the List**
16 06	Batteries and Accumulators
17	**Construction and Demolition Waste (Including Excavations from Contaminated Sites)**
17 01	Concrete, Brick, Tile and Ceramic
17 02	Wood, Glass and Plastic
17 04	Metals (Including Alloys)
17 05	Soil (Including Excavations from Contaminated Sites), Stones and Dredging Sludge
17 09	Other Construction and Demolition Waste

Waste Code	Definition of Waste Code
20	**Municipal Waste Including Separately Collected Fractions (Domestic and Similar Commercial, Industrial and Institutional Waste)**
20 01	Separately Collected Fractions (Except 15 01)
20 03	Other Municipal Waste

Municipal waste within the scope of the Waste Management Regulation is referred to as domestic waste or commercial, industrial and institutional waste similar to domestic waste in terms of its content or structure, which are defined with waste code of 20, in the Waste List given in Annex-4 of the Regulation and of whose management responsibility belongs to the Municipality. Therefore, these types of waste will be stored separately from hazardous waste and recyclable waste and will be collected regularly by the municipality. Municipal waste will be managed in the same way as it is currently managed in Asım Kibar OIZ. Domestic waste will be collected and sent to Kocaeli Metropolitan Municipality Waste Disposal Area operated by İzaydaş. Other wastes will be given to licensed organizations within the framework of the legislation.

In order to determine the amount of municipal waste to be generated at site, the average daily municipal waste per person in Kocaeli is taken as 0.82 kg according to the municipal waste statistics of TurkStat in year 2022. The estimated amount of municipal waste to be generated during the construction phase of the Project, based on the number of people working, is given below. This amount includes also separately collected fractions such as paper, cardboard, glass, metal, plastic, etc. together with biodegradable wastes:

25 people x 0.82 kg/person/day= 20.5 kg/day

There will be no cafeteria at the site of the construction. As a result, no food preparation-related waste is envisaged. Meals will be provided by catering services.

Waste Declaration of Asım Kibar OIZ for 2023 is given in Annex-14. The waste load that the Project will generate during the construction phase will be negligible compared to the amount of waste generated throughout the OIZ.

Waste vegetable oil will not be generated at the site during the construction activities as meals for the staff will be provided by catering companies. End-of-life tire generation and storage will not take place due to the fact that the tire changes of the construction machines and other vehicles to be used at this stage will be carried out at the facilities in the region providing service for this purpose. In addition, since there is no infirmary at the project site and in case of any incident during the activities, hospitals / health centres in Izmit District will be used primarily for possible medical interventions. Therefore, within the scope of the project, there will be no medical waste generation at the site.

The construction machinery will require oil changes during the construction phase of the Project, at least once in every two-month period of the phase. Oil changes of the construction machinery will be carried out at services licensed for the maintenance of the machinery. Thus, there will be no waste oil generation construction phase of the Project.

The annual amount of waste battery per person in Türkiye is 4-5 and this value corresponds to 135 grams (TAP, 2016). According to this, the annual waste battery production of 25 people to be employed during the construction phase of the Project is calculated as: 3.125 kg (1 year x 135 gram/year-person x 25 person = 3.125 kg).

No excavation will be carried out during the construction of the Solar Sludge Drying Plant and therefore no excavation will occur. If excavation occurs, it will be disposed of in the areas determined by both the Metropolitan Municipality and the District Municipality as specified in the "Regulation on the Control of Excavation Soil, Construction and Demolition Wastes".

During the construction (installation) phase of the Project, it is possible that solar panels may be broken or damaged. The broken/damaged panels will be stored in the temporary waste storage area. The contractor will send the broken/damaged panels to a licensed recycling/disposal facilities for separation and recycling of recyclable parts of the panels during the construction phase.

No significant impact resulting from waste generation is expected due to the nature and scale of the Project, as explained above. Therefore, the impact is assessed as direct and negative with short term duration, local and low significance. However, mitigation measures proposed in Chapter 8.2 in order to prevent and/or minimize likely impacts will be implemented.

7.1.10.3 Operation Phase

In the operation of the solar sludge drying facility, while the dried sludge is a product of the facility, it will be disposed of with the waste code "19 08 13: Sludges containing hazardous substances resulting from industrial wastewater treatment by other methods". Within the scope of the disposal, the dried sludge is to be delivered to a cement factory within the scope of waste reuse to be used as fuel. The dried sludge until its disposal will be stored in impermeable storage areas designated for hazardous waste and will not be stored more than six months following the Waste Management Regulation.

The solar sludge drying facility will aim to decrease the sludge's water content to an 85% solid content rate. The amount of treatment sludge waste coded 19 08 13 will be reduced by 65% when the project is completed.

In the operation phase, there will be waste generation resulting from damaged, malfunctioned or end-of-life equipment and material that could be replaced or controlled during maintenance and repair activities to be performed periodically or in case of a breakdown. Also, procurement of new equipment, pieces and others will also result in the generation of packaging waste. Besides, personal protective equipment, clothes and rags used during maintenance and repair activities might result in a limited amount of waste generation. Generated wastes during operation phase will be collected by Kocaeli Metropolitan Municipality as in construction phase.

1 worker (operator) is expected to be employed in the Project's operation phase. Therefore, municipal waste generation will be 0.82 kg/day.

In the operation phase of the Project, due to the oil change needs of equipment such as sludge mixing equipment, there will be limited amount of waste oil generation.

Solar panels can contain hazardous materials such as cadmium, zinc, lead, CFCs, etc. During the installation and operation phase, if the broken and replacement panels are not managed with appropriate waste management systems or in case of any accident/explosion/fire, these dangerous substances may be released and cause adverse environmental effects. However, the risks will be reduced by managing the waste according to the relevant national legislation and WB Group's General Environmental, Health, and Safety Guidelines. The broken/end-of-life panels should be managed following the Waste Management Regulation and the Zero Waste Regulation. Considering their hazardous content, those shall be delivered to the licensed recycling/disposal facilities. In addition to that, there should be specific emergency response procedures specific for breaking/damage of solar panels.

Solar panel waste code is generally accepted to facilities in 16 02 14 code. Within the scope of 20 01 35 hazardous electronic waste code, solar panel waste code can also be specified. Table 20 lists the waste types and waste codes that may occur during the operational phase of the project, according to the waste lists given in the Waste Management Regulation's Annex. The wastes generated during the operation phase will be stored in a temporary waste storage area.

Table 20 List of Possible Waste Types to be generated during Operation Phase

Waste Code	Definition of Waste Code
13	**Oil Wastes and Liquid Fuel Waste (Excluding Edible Oils, 05 and 12)**
13 02	Waste Engine, Transmission and Lubrication Oils
13 03	Waste Insulation and Heat Conduction Oils
15	**Waste Packages, Unspecified Absorbents, Wipes, Filter Materials and Protective Clothing**
15 01	Packaging Wastes (Including Packaging Waste Separately Collected by the Municipality)
15 02	Absorbents, Filter Materials, Cleaning Cloths and Protective Clothing
16	**Waste Not Specified Otherwise in the List**
16 02	Electrical and Electronic Equipment Waste
16 06	Batteries and Accumulators
19	**Waste from Waste Management Facilities, Offsite Wastewater Treatment Plants and Water Preparation Facilities for Human Consumption and Industrial Use**
19 08	Wastewater Treatment Plant Waste Not Described otherwise
20	**Municipal Waste Including Separately Collected Fractions (Domestic and Similar Commercial, Industrial and Institutional Wastes)**
20 01	Separately Collected Fractions (Except 15 01)
20 03	Other Municipal Wastes

It will be ensured that all sludge management practices comply with local, national and international regulations on handling, treatment and disposal.

The impact is assessed as direct and positive with long term duration, local and low in significance. However, mitigation measures proposed in Chapter 8 in order to prevent and/or minimize likely impacts will be implemented.

7.1.11 Pesticide Use and Management

In accordance with ESS3, WB attaches importance to the use and management of pesticides in projects. According to WB ESF, the Borrower will ensure that all pesticides used will be manufactured, formulated, packaged, labeled, handled, stored, disposed of, and applied according to relevant international standards and codes of conduct, as well as the EHSGs.

The following criteria apply to the selection and use of such pesticides: (a) they will have negligible adverse human health effects; (b) they will be shown to be effective against the target species; and (c) they will have minimal impact on nontarget species and the natural environment. The methods, timing, and frequency of pesticide application are aimed to minimize damage to natural enemies.

No pesticide use is planned at any stage of the Project activities. Thus, no impact is expected in this regard in any phase of the Project.

7.1.11.1 Pre-Construction and Construction Phases:

There will be soil removal and relocation during the land preparation and construction phases. Therefore, pesticide control during these phases on formerly agricultural land involves management and mitigation requirement for environmental and health risks if there is a historical pesticide use because pesticides will not be used in these phases. Pesticide-free construction practices are adopted to prevent the introduction of new pesticides, accompanied by worker training on safety and proper handling. Ongoing monitoring and testing of soil and water quality will be done, coupled with transparent communication with regulatory authorities and the local community, contribute to a proactive and compliant approach. Overall, the goal is to facilitate the responsible transformation of the land for non-agricultural purposes and construction of project while minimizing environmental impact.

Since there is no pesticide use in the area, there will be no impact due to pesticide use during the pre-construction and construction phases..

7.1.11.2 Operation Phase:

If there are any green spaces or landscaping in an industrial location, pest control measures, such as the use of pesticides, may be required. Stormwater runoff from the industrial zone may carry pesticides into nearby aquatic bodies. By using effective stormwater management techniques, this risk can be reduced. The maintenance of utilities, roads, and other infrastructure may require the use of herbicides to control vegetation. Pesticide spills during transit could happen if they are utilized for landscaping or other objectives.

Excessive accumulation of sludge cake during the operation phase may cause problems with insects, flies or rodents. For this reason, the sludge to be transported by licensed companies will be sent to disposal before it accumulates too much or if it has to wait, measures such as adding lime will be taken to prevent odour formation and accumulation of insects, flies and rodents. Asım Kibar OIZ has stated that pesticides will not be used in the planned solar sludge drying plant. Therefore, it is expected that the Project will not be affected by the use of pesticides during the operation phase.

7.1.12 Natural Disaster Potential

7.1.12.1 Pre-Construction Phase

Kocaeli province is located in an area of high earthquake risk. Construction of the units will be in accordance with the Building Earthquake Regulations. Considering the project's scale, the project's impacts alone are not sufficiently affecting its environment to trigger or significantly contribute to another trigger of any natural disaster, therefore assessed as negligible in significance on natural disasters.

7.1.12.2 Construction Phase

Kocaeli province is located in an area of high earthquake risk. Construction of the units will be in accordance with the Building Earthquake Regulations. Considering the project's scale, the project's impacts alone are not sufficiently affecting its environment to trigger or significantly contribute to another trigger of any natural disaster, therefore assessed as negligible in significance on natural disasters.

7.1.12.3 Operation Phase

Kocaeli province is located in an area of high earthquake risk. Construction of the units will be in accordance with the Building Earthquake Regulations. The sludge drying plant will be single storey and steel construction. Considering the project's scale, the project's impacts alone are not sufficiently affecting its environment to trigger or significantly contribute to another trigger of any natural disaster, therefore assessed as negligible in significance on natural disasters.

7.1.13 Biodiversity and Protected Areas

In this section, the sensitivity of terrestrial and aquatic ecosystems, as well as the identified flora and fauna species within the project and impact areas will be assessed, followed by a magnitude impact on biodiversity and impact assessment.

The Project areas will not be located within any internationally recognized areas of high biodiversity value (such as World Heritage Natural Sites, Biosphere Reserves, Ramsar Wetlands of International Importance, Key Biodiversity Areas, Important Bird Areas, and Alliance for Zero Extinction Sites. The nearest internationally recognized area is Sapanca Lake, 11 kilometres away.

Critical Habitat

The WB ESS6, Biodiversity Conservation and Sustainable Management of Living Natural Resources criteria were used to identify Critical Living Areas in the Study Area. WB criteria for identifying Critical Habitats include rules that were used to identify Critical Living Areas in the Study Area. WB criteria for identifying Critical Habitats include:

a) Habitat of significant importance to Critically Endangered or Endangered species, as listed in the IUCN Red List of threatened species or equivalent national approaches;
b) Habitat of significant importance to endemic or restricted-range species;
c) Habitat supporting globally or nationally significant concentrations of migratory or congregatory species;
d) Highly threatened or unique ecosystems; and
e) Ecological functions or characteristics that are needed to maintain the viability of the biodiversity values described above in (a) to (d).

The level of sensitivity of species and habitats are determined according to Table 21, and for the evaluation of the significance of the impacts on biodiversity of pre-construction, construction and operation phases of the project, the categorization matrix given in Chapter 4 is used.

Determining the ecological sensitivity criteria, the criteria used in defining critical habitat in WB ESS6 Guidance Note are considered. Accordingly, if a biodiversity component meets the critical habitat criteria; its sensitivity is evaluated as "High". Habitats and species that are globally widespread but locally or nationally protected species are assessed as "Medium" sensitivity. Natural habitats that do not meet the criteria for either medium or high sensitivity are assessed as low sensitivity. The criteria are also explained in Table 21.

Table 21 Criteria for Sensitivity/Value of Resource/Receptor (Ecology and Biodiversity)

Ecosystem Component	Sensitivity/Value Level		
	High (3)	**Medium (2)**	**Low (1)**
Designated Areas	• Areas that meet the criteria of the IUCN's Protected Area Categories Ia, Ib and II. • Key Biodiversity Areas (KBAs), which encompass Important Bird and Biodiversity Areas (IBAs). • UNESCO Natural and Mixed World Heritage Sites. • Sites that fit the designation criteria of the Alliance for Zero Extinction (AZE).	Nationally designated areas	N/A
Habitats	• Habitats that trigger critical habitat under the (d) and (e) criteria. • Habitats that support species of High sensitivity.	Areas of habitat that represent >1% distribution within Türkiye or are threatened at a national level. Habitats that support species of Medium sensitivity.	Natural habitats that do not meet the criteria for either medium or high sensitivity. Habitats that support species of Low sensitivity.
Species	• Species populations that trigger critical habitat under the (a), (b) and (c) criteria	Nationally/ regionally important concentrations of a Vulnerable (VU) species, or locally important concentrations of Critically Endangered (CR) and/or Endangered (EN) species. Locally important populations of endemic / rangerestricted species. Populations of migratory species that represent >1 % of the national population.	Locally important populations of Near Threatened (NT) or Vulnerable (VU) species, or locally important populations of species listed on Annexes to the Bern Convention.

Asım Kibar OIZ will avoid adverse impacts on biodiversity and habitats. When avoidance of adverse impacts is not possible, Asım Kibar OIZ will implement measures to minimize adverse impacts and restore biodiversity in accordance with the mitigation hierarchy provided in ESS1 and with the requirements of ESS6. When necessary, Asım Kibar OIZ will ensure that competent biodiversity

expertise is utilized to conduct the environmental and social assessment and the verification of the effectiveness and feasibility of mitigation measures. Where significant risks and adverse impacts on biodiversity have been identified, a Biodiversity Management Plan will be developed and implemented.

As a result, in assessment according to Table 21, terrestrial and aquatic habitats and flora and fauna species determined in the Project Area are considered not sensitive.

7.1.13.1 Pre-Construction Phase

The primary impact of the Project on terrestrial habitats and flora species will be in the pre-construction period. Topsoil stripping will be carried out during the pre-construction phase, and this will cause the populations and habitats of the flora species lost from the area. Since the habitat of the area is currently modified, the abundance and number of species in the area are low, and the species in question are not of critical or endemic importance, the threat status of these species is not expected to change due to the Project.

Aside from the loss of habitat in the Project Area, the overall impact of pre-construction activities, such as waste and effluent generation and air emissions, on vegetation and flora species is considered minimal. It is known that dust emissions that may occur, especially during the land preparation phase, will prevent plants from photosynthesizing by closing their stomata. In this context, the mitigation measures given in Chapter 8 will be followed.

As explained in the previous title, the habitat and flora species identified in the Project Area are not considered sensitive. As a result, the Project's impact on terrestrial flora species and habitats during the pre-construction phase is considered low.

Terrestrial fauna species in the Project Area and its vicinity will be affected by disturbance from pre-construction activities because of topsoil stripping and habitat loss. The fauna species that depend partly or totally on the habitats to be lost are the ones that will be mainly affected by the Project. The fauna determination studies were carried out, and no sensitive species were determined in the Project and impact area.

The impacts of pre-construction activities on fauna can be considered as follows: First is the direct impacts because of the degradation and loss of habitats due to pre-construction activities. Indirect impacts are disturbances from noise, dust and human activity in the pre-construction area. Secondly, impact of the pre-construction phase will be the vehicle traffic. The fauna species which have limited mobility will be prone to fauna mortality. All these effects can be eliminated by taking appropriate measures (see Chapter 8).

Most fauna species will leave the construction sites due to pre-construction impacts and move towards similar habitats in the immediate vicinity. As a result, the Project's low impact on terrestrial fauna species during the pre-construction phase is considered *negligible* with the mitigations in Chapter 8.

As a requirement of the Project, a flora/fauna survey is to be conducted by the Contractor prior to the start of construction to confirm and identify potential additional measures.

7.1.13.2 Construction Phase

The primary impact that may occur on flora and habitats during the construction works to be carried out within the scope of the Project is waste and air emissions. In this context, the mitigation measures given in Chapter 8 will be followed. As a result, the Project's impact on terrestrial habitats and flora species during the construction phase is considered low without any mitigation measures.

The impacts of construction activities on fauna are disturbances from noise, dust and human activity in the construction area. Another impact will be the vehicle traffic. Most fauna species will leave the construction sites due to impacts and move towards similar habitats in the immediate vicinity. As a result,

the Project's impact on fauna species during the construction phase is considered *negligible* with the mitigations in Chapter 8.

7.1.13.3 Operation Phase

The operation activities of the Project are not anticipated to have an adverse impact on terrestrial species and habitats. Terrestrial fauna species that have already adapted to anthropogenic influences are expected to persist in similar habitats near the Project Area once the construction works are concluded. The impact of the Project's operation phase on terrestrial biodiversity has been assessed as low impact significance without any mitigation measures.

As a result, the Project's impacts on terrestrial habitats and flora-fauna species during the operation phase are considered *negligible* with the mitigations in Chapter 8

7.2 Social Impacts of the Project

7.2.1 Population/Demography

7.2.1.1 Construction Phase

It is foreseen that the Project will create temporary employment. It is planned to employ twenty-five (25) personnel during the construction phase of the project. The construction of the solar sludge drying facility and rooftop SPP is planned to take 340 days from the date of project approval.

As the construction activities of the Project will be carried out in Asım Kibar OIZ which is about 8.5 km from İzmit City centre, it is anticipated by Asım Kibar OIZ that no accommodation facilities will be constructed for the workers within the scope of the Project. No negative impact is expected from the Project in terms of population level in the settlements expected to be affected during the construction phase of the Project.

Labour influx as a result of construction is not expected during the project. The construction activities do not require additional/skilled labour from outside the locality. While the majority of the workforce is expected to be locally sourced, rental accommodation may be considered as a contingency plan for specialized tasks or unforeseen workforce needs. Containers can be placed in the Project area for those who will work on the Project to rest, eat and for sanitary facilities.

To avoid any negative impact on the local community due to the presence of workers during the construction phase and their potential interaction with the local community, contractors will be responsible for providing code of conduct training to each worker. The contractor will inform all workers orally and in writing about the code of conduct during the recruitment phase and the code of conduct document will be signed. The Asım Kibar OIZ will ensure that the contractors establish the code of conduct and check that the workers have received training on communication with the public before starting work. Although the number of personnel to be employed within the scope of the Project is not at a level that will cause labor influx, Asım Kibar OIZ will still minimize this low-level impact by hiring local people. In fact, prioritizing local employment will be included in the contract terms of the contractor and possible subcontractors.

As a result, no change in the population is expected due to the project.

7.2.1.2 Operation Phase

In the operation phase, 5 personnel are expected to be employed by Asım Kibar OIZ. Asım Kibar OIZ plans to employ all the required personnel locally. As a result, no change in the population is expected due to the project.

7.2.2 Cultural Heritage

The project area is within the boundaries of Asım Kibar OIZ. Necessary evaluations were made by the authorized institutions and organizations related to Cultural Assets during the selection of the OIZ location. Therefore, the project will not cause alteration, damage or removal of any known cultural heritage assets and constrain access to cultural sites for the communities.

If any cultural property is found during construction (excavation) works ("chance find"), the Chance Find Procedure will be implemented, and any findings will be reported to the local authorities. Chance Finds Procedure is given in Annex 9. In such cases, construction works will be stopped immediately, the area will be taken under protection, and the Kocaeli Cultural Heritage Conservation Regional Board Directorate will be notified. The construction works will not resume unless permitted by the relevant authority.

7.2.3 Economy/Employment

7.2.3.1 Construction Phase

It is foreseen that the Project will create temporary employment. The construction of the solar sludge drying facility and rooftop SPP is planned to take 340 days from the date of project approval. The construction activities do not require additional/skilled labour from outside the locality and do not attract forced labour and/or child labour. During the construction phase, it is planned to employ 25 (twenty-five) people. Asım Kibar OIZ and Contractor will hire local people as much as possible.

Regarding procurements of goods and services, priority will be given to contributing to the local economy through the use of local materials during the construction period and paying attention to procuring various goods and services locally.

Work permits of the workers to be employed within the operational scope of the Project will be monitored by Asım Kibar OIZ and recruitment will be carried out within the framework of legal practices. Legal work permits will be checked, and recruitment will be carried out in accordance with the working conditions detailed in Chapter 7.2.6 during construction and operation phases. Unregistered, child or forced labour will not be allowed.

As a result, the labor relations under the project will be guided by the Labor Management Procedure (LMP) of the TOIZsP and the Contractor will produce own Labor Management Plan in compliance with the LMP.

7.2.3.2 Operation Phase

In the operation phase, 5 personnel are expected to be employed by Asım Kibar OIZ. It is expected that the the factories that will benefit from the facility will create economic development in the region and create additional jobs. Installing the Solar Sludge Drying Facility and Rooftop Solar Power Plant Project will increase the interest in the OIZ and attract new investments.

The project will provide benefits for local communities through new employment opportunities during the construction phase and, to a lesser extent, at the operating phase, and opportunities for local businesses.

7.2.4 Vulnerable/Disadvantaged Groups

Vulnerable groups according to the information provided by the headman of neighbourhoods are presented in Chapter 6.5. Construction works for the Project will have a short-term and temporary impact. The Project does not require any relocation or land acquisition.

The project does not involve access restriction, resettlement, or physical displacement of any persons. No damage to livelihood income for the vulnerable groups is foreseen. Therefore, vulnerable/disadvantaged groups within the Project impact area are not expected to be adversely affected by the Project. Considering the social benefits (e.g. increased employment opportunities,

prevention of environmental pollution) of the Project, the Project has the potential to benefit vulnerable/disadvantaged groups.

7.2.5 Land Requirement

The Project will be installed within the existing WWTP land in the existing OIZ's built-up area. The project area, parcel no. AKOIZ owns 164/34, acquired in 2013 from a willing seller. The total land area of the parcel is 4.03 ha. The Project does not require any other land acquisition. The land is not subject to pending title transfer, compensation payment, ownership disputes, etc. No permanent or temporary damage or loss of housing, facilities, other assets, or natural resources use are expected to be caused by this Project.

7.2.6 Working Conditions and Labour Management

Labor Management Procedures (LMP) have been prepared for Türkiye Organized Industrial Zones Project. It aims to protect workers' rights and ensure the management and control of activities that may pose labour-related risks. It describes how MoIT will comply with the requirements of World Bank Environmental and Social Standard 2 (ESS 2), "Labor and Working Conditions", and with Turkish labour, employment and occupational health and safety laws.

Labour relations are governed by the provisions of the Turkish Labor Law (4857 numbered). The Law of Turkish on Occupational Health and Safety (numbered 6331) provides for provisions on occupational health and safety and applies to direct and contracted workers, including foreign workers. Social Security and General Health Insurance Law (Law No: 5510) regulates social insurance and general health insurance.

Asım Kibar OIZ will be responsible for human resources during the construction and operation phases. The Project will comply with national labour, social security and occupational health and safety laws and the principles and standards. The Project Owner is responsible for complying with the LMP, providing minimum legal labour standards as per International Labor Organization (ILO) regulations (child/forced labour, no discrimination, working hours, minimum wages). Full compliance with all Turkish Laws and International Labor Organization Conventions regarding child labour, forced labour, discrimination, freedom of association, collective bargaining, working hours and minimum wages.

Asım Kibar OIZ will be responsible for the followings:

- Not use or employ children during the construction phase under 18 years of age,
- Not use or employ forced labour and ensure a Human Resources Policy in compliance with the European Convention on Human Rights and the Turkish Constitution,
- Elimination of discrimination based on language, race, sex, political opinion, philosophical belief, and religion in labour relations,
- Ensuring workers' access to the right to collective bargaining (Law No. 6356 on Trade Unions and 4857 Labour Law on Collective Bargaining),
- Ensure access to an effectively functioning Project grievance mechanism.
- Ensure workers are provided with written contracts containing i.a. job description, working hours, information about their rights and duties, code of conduct and information of workers' GM.
- In order to reduce the possible impacts on the neighbourhoods, facilities such as food, sanitary facilities and resting areas will be provided within the Project Area in accordance with the use of the employees.
- Review and approve the contractor's labour management plans that should be in line with the LMP prior to the construction phase,
- Review and approve the contractor's OHS plan prior to the construction phase,
- Monitor that contractors/subcontractors fulfil their obligations to contracted workers as set out in relevant procurement documents in accordance with ESS2, LMP, national labour and OHS laws,
- Keeping records of recruitment and employment processes of direct reports,

- Monitor the potential risks of child labour, forced labour and serious safety issues in relation to primary support workers,
- Monitor the training of relevant project staff,
- Ensure that a grievance mechanism for project workers is established and implemented and that workers are informed about it,
- Monitor the training of employees on Code of Conduct and to monitor their compliance,
- Monitor that occupational health and safety standards are met in workplaces in line with national occupational health and safety legislation, ESS2 OHS requirements, occupational health and safety plan,
- Monitoring employees' compliance with work behaviour rules, and Code of Conduct
- Establish and implement a procedure for documenting specific project-related incidents such as occupational accidents, illnesses and time-loss accidents.
- In cases of severe, fatal and mass accidents, informing law enforcement, Social Security Institution and MoIT.

In addition to legal requirements and the Labor Management Procedure, the contractor will be responsible for the followings:

- Employ or engage qualified social, labour and occupational safety experts to implement the project-specific labour management plan, occupational health and safety plans and manage the performance of subcontractors,
- Develop a labour management plan based on the LMP for review and approval of Asım Kibar OIZ,
- Develop an OHS plan for review and approval of Asım Kibar OIZ,
- Ensure labour management plan and OHS plan are in place and applied by all contract and subcontracted workers,
- Supervise subcontractors' adherence to the labour management procedure and OHS plans,
- Keeping records of the recruitment and employment processes of contracted employees,
- Follow up the employment process of subcontracted workers to ensure that it is carried out in accordance with this labour management procedure and national labour law,
- Developing and implementing a grievance mechanism for employees, evaluating complaints from contracted and subcontracted workers,
- Provide written contracts to the contracted workers with job descriptions, wages, working hours, rights and duties fully described,
- Provide regular induction training to employees, including but not limited to OHS, social familiarization, Code of Conduct, Sexual Harassment/Sexual Abuse prevention training,
- Ensure that all contractor and subcontractor employees understand and sign the Code of Conduct before starting work,
- Establish and implement a procedure for recording/ documenting specific project-related incidents such as occupational accidents, illnesses and time-loss accidents,
- Notify law enforcement, Social Security Institution and OIZ in case of severe, fatal and mass accidents.

7.2.6.1 Construction Phase

Personnel will be employed by the Contractor during the construction phase of the Project. During the project construction, it is anticipated that 25 workers will be mobilized. Asım Kibar OSB and the Contractor will employ local people as much as possible in the recruitment processes.. Child labour and forced labour shall be prohibited. All Turkish Laws and International Labor Organization (ILO) Conventions on child labour, forced labour, discrimination, freedom of association and the right to collective bargaining will be complied with.

Labour influx is a risk arising from the prolonged stay of workers during construction. However, since the number of personnel to work on the project is limited, no labour influx is expected. To the extent possible, labour and other employees shall be recruited locally. However, there may be employees who

are experts in their fields and come from outside the city, and they will require accommodation. Rental accommodation residences in the city centre will be considered.

7.2.6.2 Operation Phase

A labour force of 5 personnel shall be required during the operation phase of the project. Considering the number of personnel to work, no labour flow is expected. Asım Kibar OIZ plans to employ all of the required personnel locally. Child labour and forced labour shall be prohibited. All Turkish Laws and International Labor Organization (ILO) Conventions on child labour, forced labour, discrimination, freedom of association and the right to collective bargaining will be complied with.

7.2.6.3 Training

On-the-job and OHS training of all employees will be given and recorded within the scope of the Regulation on the Procedures and Principles of Occupational Health and Safety Trainings of Employees published in the Official Gazette numbered 30430 and dated 05.2018.

According to LMP, project workers will receive OHS training at the beginning of their employment, as induction, and regularly thereafter, to cover legislative requirements. Training will cover the relevant aspects of OHS associated with daily work, including the ability to stop work without imminent danger and respond to emergencies.

The consultant will also provide training to the personnel about environmental and social standards of the project, ESMP and SEP. The Contractor shall inform its personnel, subject to the supervision of the Asım Kibar OIZ, on the implementation of all measures to prevent and/or minimize environmental and social impacts during construction.

Training on the code of conduct will be provided to workers. The scope of the Code of Conduct will be:

- General conditions
- Human rights and labour rights
- International humanitarian law
- Protection of the environment
- Anti-corruption
- Gender-Based Violence (GBV), Sexual Harassment, Sexual Exploitation and Abuse (SH/SEA)
- Grievance Mechanism

The contractor will also provide GBV, SEA/SH and GM trainings to the employees. The scope of this training will be:

- Prevention of Gender-Based Violence (GBV), Sexual Harassment, Sexual Exploitation and Abuse
- Grievance Mechanism.

Training will be repeated at regular intervals, taking into account the changing and emerging new risks specified in the Regulation on the Procedures and Principles of Occupational Health and Safety Trainings of Employees. Information and training activities will be carried out not only for employees but also on measures to be taken for public health and safety.

Measurement and evaluation should be carried out at the end of the training. According to the results of the evaluation, it can be determined whether the training is effective or not and if necessary, changes can be made in the training programme or trainers, or the training can be repeated.

Training records will be kept on file. These records will include a description of the training, the number of hours of training provided, training attendance records, and results of evaluations.

7.2.7 Community Health and Safety

Community Health and Safety is covered under the WB ESF ESS4. ESS4 addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of Borrowers to avoid or minimize such risks and impacts, with particular attention to people who, because of their particular circumstances, may be vulnerable.

7.2.7.1 Construction Phase

Public health and safety issues are associated with risk factors that may arise from the construction and operation periods of the Project. The following potential impacts were identified during the construction phase of the Project.

- Increased traffic and road traffic accidents and injuries,
- Impact of the project area on accessibility for the community
- Damage to existing infrastructure, increased demand on existing infrastructure and disruption of services,
- Noise and vibration,
- Threat to community culture, safety and security linked to the presence of construction workers and business opportunists
- Risk of infectious diseases such as sexually transmitted diseases due to labour flows and interaction of temporary workers with host communities,

The project area has many alternative routes for transportation. The most important transportation routes to the region are; Istanbul-Ankara D-100 highway, E80 highway, Northern Marmara highway and OIZ internal roads. Local roads that are used to access settlements will not be used. Therefore, negative impacts related to transportation and traffic will not be caused.

The project does not involve access restriction; therefore, the project will not have an impact on accessibility for the community.

The project area is within the OIZ and the OIZ has infrastructure, there is no situation that will disrupt public services in the project area.

The Project activities within the construction phase are associated with a range of activities that generate noise. Since the planned solar sludge drying facility and rooftop SPP are in an industrial area, the closest settlement to the construction site is Uzunbey Neighbourhood, 1.5 km away. There exist industries in the neighbouring parcels. There are no sensitive receptors such as health centres, schools, or mosques near the Project Area.

There will be no impact on community culture and safety as there will be no interaction with society and no impact on community transportation and sensitive groups is expected. As the Project area is located within the OIZ and the OIZ is currently surrounded by fences, warning signs and additional security measures will be implemented so that access and negative impacts on public health will be prevented.

As mentioned above, the contractor will also provide GBV, SEA/SH and GM trainings to the employees. Besides awareness-raising activities will be organized for workers and security personnel to prevent cultural problems due to inappropriate behaviour of workers and/or security personnel towards the population of the area. Specific attention to behaviour related to gender-based violence (GBV) and sexual exploitation and abuse and sexual harassment and activities that disrupt the environment such as noise.

7.2.7.2 Operation Phase

During the operation phase of the project, there will be no potential impact. Entry to the project area will be prevented except for authorized persons. Wire fences for this purpose will be checked. Thus, the negative effects that may occur due to uncontrolled entry will be prevented.

During the operation phase of the project, it is not expected to be an activity that will create emissions. On the other hand, in case suitable operating conditions are not provided, odour problems may occur. Properly managed solar sludge drying plants will help control odours compared to other sludge processing and disposal methods. If odour generation is observed in the future operations staff will check and revise operational conditions.

Solar sludge drying significantly reduces the number of pathogens and contaminants in sludge, making it safer for further processing, disposal or use as fertiliser.

Rooftop solar systems offer significant benefits for public health and safety, particularly through the reduction of air pollution and the promotion of renewable energy. Addressing potential negative impacts with appropriate mitigation strategies will ensure that these systems can be safely and effectively integrated. It will help preserve the structural integrity of buildings and lower the risk of fire by making sure solar PV systems are installed by trained specialists. Regular maintenance and inspections will increase the solar PV system's lifespan and help avert possible electrical issues. Solar panels' glare can be minimized and their visual impact lessened by using anti-reflective coatings. Safe and compliant solar installation practices must be realised by adhering to local building codes and requirements.

7.2.8 Traffic and Transportation

The project area has many alternative routes for transportation. The most important transportation routes to the region are; Istanbul-Ankara D-100 highway, E80 highway, Northern Marmara highway and OIZ internal roads. Local roads that are used to access settlements will not be used.

Therefore, negative impacts related to transportation and traffic will not be caused. Considering the current traffic and capacity of the state highway, the project will not bring additional traffic load to the state highway.

However general measures such as driver training, speed limits, limiting unnecessary use of noisy equipment, etc. will be implemented.

7.2.8.1 Construction Phase

The transportation of the construction materials to and from construction sites, vehicle movement during the construction activities and need to relocate services/utilities (and therefore dig up roads and access ways) will create temporary traffic disruptions, disturbances for the local community and pose a risk to pedestrians.

Local roads which are used to access settlements will not be used. Therefore, negative impacts related to transportation and traffic will not be caused. However general measures such as driver training, speed limits, limiting unnecessary use of noisy equipment, etc. will be implemented. Maintenance of the construction machinery will be followed and contractor will install all signs, barriers and control devices needed to ensure the safe use of the road by traffic and pedestrians.

7.2.8.2 Operation Phase

The Project will not cause any transportation/traffic problems. Transportation to the project site will be made via the existing road in the existing WWTP area, which belongs to the OIZ.

The reduction in the amount of sludge will even reduce the number of transport trips and have a positive effect on the traffic load. In the operation phase, 5 workers are expected to be employed by Asım Kibar OIZ. No traffic impact is expected during the operation phase of the Project.

7.2.9 Occupational Health and Safety

During the construction of the Project, the general risks will be working at height, moving objects, slips, trips and falls, noise, material & manual handling, collapse, electricity, etc. One of the most common hazards on construction sites is the risk of falls from heights, which can be mitigated through safety harnesses, guardrails, and scaffolding. Electrical hazards are also a concern, as workers may come into contact with exposed wiring or electrical equipment, resulting in electric shocks or burns. To prevent these accidents, workers must be trained in proper electrical safety procedures, such as wearing insulated gloves and shoes. Heavy machinery is another major risk on construction sites, as workers can be struck by or caught in machinery, leading to serious injury or even death. To reduce these risks, employers should provide proper training and safety equipment, such as reflective clothing and hard hats, and enforce strict safety protocols. Dust and other airborne pollutants are also a concern on construction sites, as they can cause respiratory issues for workers and nearby residents. Respiratory protection such as dust masks or respirators should be provided to reduce these risks and exposure to these pollutants should be limited.

For the construction period, emergency plans and procedures will be implemented by the Contractor according to the national legislation. The OIZ will prepare its emergency plans to support the establishments for the operation phase.

National laws/ regulations and international conventions/ standards related with Occupational Health and Safety are;

- Law on Occupational Health and Safety (No. 6331, Published on Official Gazette dated: 30.06.2012),
- Labor Law (No. 4857, Published on Official Gazette dated: 10.06.2003),
- Law of Obligations (No. 6098, Published on Official Gazette dated: 04.02.2011)
- General Health Law (No. 1590, on Official Gazette dated: 06.05.1930)
- Social Insurance and General Health Insurance Law (No. 5510, Published on Official Gazette dated: 16.06.2006)
- Regulation on Occupational Safety and Health Services (No: 28512, Published on Official Gazette dated: 29.12.2012)
- Regulation on Duties, Rights and Responsibilities of OSEs (No: 28512, Published on Official Gazette dated: 29.12.2012),
- Regulation on Occupational Health and Safety in Construction Works (No: 28786, Published on Official Gazette dated: 05.10.2013),
- Regulation on the Use of Personal Protection Equipment at Workplaces (No: 28695 Published on Official Gazette dated: 02.07.2013),
- Regulation on Emergency Situations in Workplaces (No: 28681, Published on Official Gazette dated: 18.06.2013),
- Regulation on the Procedures and Principles of Occupational Health and Safety Training of Employees (No: 18371, Published on Official Gazette dated: 15.05.2013),
- Regulation on Health and Safety Precautions Regarding Working with Chemicals (No: 28733, Published on Official Gazette dated: 12.08.2013),
- Regulation on the Protection of Workers from Noise Related Risks (No: 28721, Published on Official Gazette dated: 28.07.2013),
- Regulation on the Protection of Workers from Vibration Related Risks (No: 28743, Published on Official Gazette dated: 22.08.2013),
- Regulation on Protection of Workers from Explosive Hazards (Published on Official Gazette dated: 30.04.2013, numbered: 28633)
- Regulation on Management of Dust (Published on Official Gazette dated: 05.11.2013, numbered: 28812),

- Regulation on Health and Safety Signs (Published on Official Gazette dated: 11.09.2013, numbered: 28762),
- Regulation on the Occupational Health and Safety for Temporary or Fixed Term Jobs (Published on Official Gazette dated: 23.08.2013, numbered: 28744),
- First Aid Regulation (Published on Official Gazette dated: 29.07.2015, numbered: 29429),
- Regulation on Personal Protection Equipment (Published on Official Gazette dated: 01.05.2019, numbered: 30761),
- Manual Handling Operations Regulation (Published on Official Gazette dated: 24.07.2013, numbered: 28717),
- Regulation on the Procedures and Principles of Employment of Children and Young Workers (Published on Official Gazette dated: 06.04.2004, numbered: 25425),
- Regulation on Risk Assessment for Occupational Health and Safety (Published on Official Gazette dated: 29.12.2012, numbered: 28512),
- Regulation on Health and Safety Conditions Regarding Use of Work Equipment (Published on Official Gazette dated: 25.04.2013, numbered: 28628),
- Communiqué on Occupational Health and Safety Hazard Classes List (Published on Official Gazette dated: 26.12.2012, numbered: 28509),
- ILO Conventions including Occupational Safety and Health Convention (No. 155), Occupational Health Services Convention (No. 161), and Safety and Health in Construction Convention (No. 167),
- WB ESS2,
- WB EHS Guidelines for Water and Sanitation,
- WB EHS Guidelines for Waste Management Facilities,
- Türkiye Organized Industrial Zones Project Labor Management Procedure.

7.2.9.1 Pre-Construction Phase

During the pre-construction phase (before construction works start), the contractor will prepare a Risk Assessment Report, Emergency Preparedness and Response Plan and Occupational Health and Safety Management Plan in accordance with Turkish legislation, WB ESS 2 and WB EHS Guidelines for Water and Sanitation, WBG General EHS Guidelines: Occupational Health and Safety, and ILO standards.

Occupational Health and Safety Management Plan will include the assessment of below topics as applicable:

- General Facility Design and Operation
- Communication and Training
- Physical Hazards
- Chemical Hazards
- Biological Hazards
- Radiological Hazards
- Personal Protective Equipment (PPE)
- Special Hazard Environments
- Monitoring

Specifically, the objectives associated with the Occupational Health and Safety Management Plan are:

- Minimize the risk of occupational health and safety hazards to the workers,

- Prevention of work-related accidents, reporting near misses, personnel injuries and occupational illnesses,
- Ensure compliance with all applicable occupational health and safety regulations and other legal and contractual requirements,
- Integrate health and safety procedures and safe work practices into every operational activity,
- Encourage employees to maintain a healthy and safe workplace through periodic reviews of operational procedures, and provision of training,
- Ensure the availability of resources to fully implement the Health and Safety policy.

According to the relevant provision of the national laws/ regulations and international conventions/ standards, all contractors and sub-contractors shall manage the construction site in such a way that the workers and communities are properly protected against possible OHS risks. The following OHS standard requirements should as a minimum be included in the OHS Plan to be prepared by the contractors:

- Risk assessment procedure,
- Work permitting for hazardous work (working at heights, hot work, work on energized lines, work within confined spaces),
- Golden rules for life-threatening works,
- Emergency response procedure,
- Fall prevention and working at heights procedure,
- Excavations safety, ladders and scaffolders safety; welding and cutting safety; Cranes, Derricks, and forklifts safety; power and hand tools safety,
- Respiratory prevention of chemical and airborne hazards procedure (including dust, silica and asbestos);
- Electrical safety procedure (hazardous energies control, lock out tag out, energy verification, safe distance work, wiring and design protection, grounding, circuit protection, arc fault protection, PPE and dielectric tools);
- Hazards communication procedure; noise and vibration safety; steel erection safety; fire safety; material handling safety; concrete and masonry safety,
- Using PPE procedure,
- OHS training procedure, and
- Refuse to work policy.

The Occupational Health and Safety Management Plan shall be periodically revised by the contractor whenever there is a major accident, changes in organization, processes, procedures, approved materials (including risk assessment), legislation, and work patterns. In addition, the Occupational Health and Safety Management Plan will, among other issues, also include roles and OHS responsibilities. The contractor will appoint its own OHS staff that will be responsible for the implementation and supervision of the OHS.

For a possible accident and emergency, an Emergency Preparedness and Response Plan shall be prepared by the contractor, emergency teams shall be established, and drills and trainings shall be conducted in accordance with emergency scenarios. The emergency Preparedness and Response Plan will include;

- Emergency scenarios and relevant emergency preparedness and response actions with the allocations of responsibilities to local communities and authorities where appropriate,
- First aid training,
- Special trainings to be given to extinguishing, rescue and protection teams,
- Specific stakeholder engagement based on consultation and participation with government and communities regarding the nature and potential consequences of the Project-related risks,

- Training of the personnel for the response to emergencies in accordance with the requirements outlined in the specifications,
- Emergency drills to be conducted, at least once a year and in formats according to Regulation on Emergencies in Workplaces,
- Evaluation of findings and lessons learnt from drills and corrective actions.

7.2.9.2 Construction Phase

As defined in previous section, OHS Plan that is prepared in pre-construction stage will be implemented by contractor. As a general approach, main OHS risks are summarized as follows:

7.2.9.2.1 Working at Height

Work at height is the biggest single cause of fatal and serious injury in the construction industry, particularly on smaller projects. Working from a level difference and the possibility of injury as a result of falling are considered for the employees as “working at height”.

Ladders, scaffolds, mobile elevating work platforms and suspended access equipment will be used during the construction and falls occur from them. The risk related to working at height will be mitigated by the implementation of the mitigation measures presented in Chapter 8.

7.2.9.2.2 Working with Chemicals

Many products used at construction sites consist of chemicals. Workers may be exposed to dangerous chemicals during construction activities. These include lead, silica, carbon monoxide, and paints. The chemicals can exist in several forms and can enter the body in a variety of different ways including inhalation (breathed in), ingestion, absorption and injection. Chemical exposure causes acute and chronic health problems.

The risk related to working with chemicals will be mitigated by the implementation of the mitigation measures presented in Chapter 8.

7.2.9.2.3 Fire and Explosion

Flammable materials, electrical equipment and heat sources will be present at the construction site. This means that there’s a multitude of sources for fires or explosions. Hazards that can cause fires and explosions during the construction period are given below:

- There will be many hazards of high heat and sparks on construction sites. Equipment, such as those used in welding, cutting, and grinding, may create sparks when being used that can catch fire.
- Electrical errors, i.e. electrical wires short-circuit, are insufficient ground fault protection causes fires.
- Defective equipment, for example tools, heating equipment, and electrical wiring can cause a fire when being used.
- Sources of fuel, such as propane, gas lines, and acetylene on construction sites can cause a fire if they come in contact with a heat source.
- Chemical explosions (open solvents/fuels, fuel tanks and chemical tanks or drums), fires (open solvents and vehicles/heavy equipment), pressurized container explosions (vehicle tires, pipes/pipelines and water tanks) and arc flashes/blasts (switchboards, circuit breakers, transformers, other electrical wiring and parts) might cause to construction site explosions.
- Temporary lighting and lamps - where necessary the illumination of work areas is from temporary lighting installed or from specific task lighting. The hazards from such lighting come from placing light units too close to combustible items not allowing the lamps to cool or from broken lamp units where hot surfaces are exposed. Lighting units should be secured in a position away from combustible material to prevent them from being dislodged. Halogen and halide lights should not

be used due to their high operating temperatures. Lamp holders should be provided that ensure bulbs of different operating voltages cannot be interchanged and those not fitted with a bulb should be capped off. Light units should be inspected periodically and broken units should be removed immediately.

- Portable heaters should only be permitted where necessary and then portable heaters should be regarded in the same category as 'hot work' and an assessment should be made of the suitability of the heater and its location; the most hazardous types of portable heaters should be avoided.

In all applications Regulation on Protection of Workers from Explosive Hazards will be complied with. Explosion protection document which is necessary according to the regulation will be prepared by the contractor. The risk related to fire and explosion will be mitigated by the implementation of the mitigation measures presented in Chapter 8.

7.2.9.2.4 Noise

During the construction phase, noise will be generated due to excavation and construction works. This impact can be mitigated with general measures such as arranging the working hours during which the noisy activities will be carried out and providing the necessary information to the enterprise. Besides, the measures (e.g., regular maintenance of the equipment, selection of low noise machines, use of personnel protective equipment etc.) will be taken to reduce the noise to acceptable limits (below the (LEX, 8 hour) = 87 dB(A)) for the health and safety of the workers in accordance with the Regulation on Protection of the Workers from the Noise Risks (28.07.2013/28721).

These impacts will be mitigated by the implementation of the mitigation measures presented in Chapter 8.

7.2.9.2.5 Vibration

Workers will be exposed to vibration when using grinders, polishers, strimmers, chainsaws, power drills, breakers, crashers and concrete vibrators. Vibration can lead to permanent injury of the hands and arms. The vibration effect will be low for the workers.

In all applications limits mentioned in Regulation on the Protection of Workers from Vibration Related Risks will be complied with. Daily exposure action value for an eight-hour working period (the value that, if exceeded, requires controlling the risks that may arise from the employee's exposure to vibration) 2.5 m/s^2 for hand-arm vibration; 0.5 m/s^2 for whole body vibration. The daily exposure limit value for an eight-hour working period (the value to which employees should never be exposed to vibration above this value) is 5 m/s^2 for hand-arm vibration; 1.15 m/s^2 for whole body vibration.

7.2.9.3 Operation Phase

Prior to starting operation, Occupational Health and Safety Management Plan will be prepared. This Plan will include the assessment of below topics as applicable:

- General Facility Design and Operation
- Communication and Training
- Physical Hazards
- Chemical Hazards
- Biological Hazards
- Radiological Hazards
- Personal Protective Equipment (PPE)
- Special Hazard Environments
- Monitoring

As a general approach, main OHS risks are summarized as follows:

7.2.9.3.1 Pathogens and Contaminants

Workers may be exposed to biological hazards, including bacteria, viruses, and parasites present in the sludge. Personal protective equipment (PPE) such as gloves, masks and protective clothing will be used. Hygiene practices such as hand washing and disinfectant use will be implemented. Vaccinations (e.g. hepatitis) will be carried out for employees, if any.

7.2.9.3.2 Odor and Air Quality

Unpleasant odours and harmful gases (e.g. hydrogen sulphide, ammonia) can affect respiratory health. Appropriate ventilation systems will be installed, odour control technologies (e.g. biofilters) will be used and respiratory protection for workers will be provided where necessary.

7.2.9.3.3 Working at Height

Although necessary precautions will be implemented at the working areas at height by covering ground-mounted safety railing and compliant handrail systems, lifelines, and working/maintaining platforms, there is a risk of falling due to working at height during monitoring, maintenance and repair.
When workers are at risk of falling from roofs during installation and maintenance, it is recommended to use fall protection equipment, such as safety nets, guardrails, and belts, and to make sure that workers are properly taught in safe height-working procedures and that safety laws are followed.

Although the risk is low, the risk will be mitigated by the implementation of the mitigation measures presented in Chapter 8.

7.2.9.3.4 Working with Chemicals

Within the scope of the Project, only sludge will be dewatered and no operations will be carried out regarding the chemicals used in sludge treatment processes. Nevertheless, proper labelling and storage of chemicals, use of appropriate PPE and training of employees in safe handling procedures will be ensured.

Adequate ventilation systems will be installed in all areas where chemicals are stored or used to ensure that air quality standards are maintained, and the risk of exposure is minimized.

Chemical management procedures will be updated for implementation during the operation phase of the Project.

7.2.9.3.5 Physical Hazards

Slip, trip and fall risks and injuries from machinery may occur due to wet and slippery surfaces. It is necessary to implement cleaning protocols to keep surfaces clean and dry, use non-slip mats, provide appropriate footwear and place handrails around hazardous areas. Regular maintenance and safety checks of machinery will be carried out.

7.2.9.3.6 Heat Stress

Exposure to high temperatures, especially in enclosed drying areas, can lead to heat stress. Methods such as the provision of cooling systems, access to water and shaded rest areas and the implementation of work/rest cycles to avoid overheating will be used to reduce heat stress.

7.2.9.3.7 Electrical Safety

Electric shocks or burns from live cables and components pose a risk, especially during the installation and maintenance of Rooftop SPP. Appropriate electrical safety training, use of personal protective equipment (PPE) such as insulated gloves and tools, and ensuring that installations are carried out according to electrical regulations and standards will be ensured.

Some community members may be concerned about Electromagnetic Fields (EMF) exposure from solar PV systems, even though EMF levels are often low and safe. To allay worries and guarantee that installations adhere to pertinent safety regulations, information and training need to be given.

7.2.9.3.8 Fire and Explosion

Electrical fires in rooftop solar power plants can be caused by faulty wiring, shoddy installation techniques, or equipment malfunctions. This danger can be reduced by using high-quality materials and components, hiring qualified specialists to design and install systems correctly, installing fire detection and extinguishing systems, and performing routine maintenance.

In all applications Regulation on Protection of Workers from Explosive Hazards will be complied with. As stated in the Explosion Protection Document Regulation; An explosion protection document will be prepared to protect the health and safety of employees from the dangers of explosive atmospheres that may occur in workplaces. The explosion protection document will be prepared before the start of work and will be revised whenever there is a significant change, expansion or modification of the workplace, work equipment or work organization. The risk related to fire and explosion will be mitigated by the implementation of the mitigation measures presented in Chapter 8.

7.2.9.3.9 Noise

The following types of operational noise associated with sludge drying facility will be:

- Noise from the operation of mechanical equipment, including automatic mixing motors and the ventilation system,
- Noise from backup power generation equipment (e.g. backup generators for the sludge drying plant during power failure),

Equipment generating noise during the operation of the plant will be located in isolated closed buildings and some of them will be submerged in wastewater Besides, measures (e.g., regular maintenance of the equipment, selection of low noise machines, use of personnel protective equipment etc.) will be taken to reduce the noise to acceptable limits (below the (LEX, 8 hour) = 87 dB(A)) in accordance with the Regulation on Protection of the Workers from the Noise Risks (28.07.2013/28721) for health and safety of the workers in the sludge drying facility. So, no significant noise is expected to be generated during the operation of the sludge drying facility and rooftop SPP.

7.2.9.3.10 Vibration

Vibration may occur from the operation of mechanical equipment at sludge drying facility. While these activities are not anticipated to pose significant risks to occupational health, appropriate protective equipment will be provided to all personnel involved.

8 ENVIRONMENTAL AND SOCIAL ASPECTS, AND BEST PRACTICE MITIGATION MEASURES

This chapter presents cost effective and feasible measures to reduce adverse environmental and social impacts to an acceptable level. The mitigation measures are presented in Table 22, Table 23 and Table 24. During the implementation of the mitigation plan, Project Standards as described in Chapter 3 will be complied with.

The mitigation measures to be applied as a minimum for the project are as follows[8]:

[8] *These measures are from driven from Environmental and Social Code of Practices of WBG. ESCOPs are pre-prepared environmental and social risks management measures for standard construction, livelihood or household support activities. To manage and mitigate potential negative environmental impacts, the project applies Environmental Codes of Practice (ESCOPs); outlined in this document. The ESCOPs contain specific, detailed and tangible measures that would mitigate the potential impacts of each type of eligible subproject activity under the project. They are marked as relevant for the pre-construction phase, the construction phase, or the operation phase of activities. They are intended to be simple risk mitigation and management measures, readily usable to the Borrower and contractors.*

8.1 Mitigation Plan for the Pre-Construction Phase

Table 22 Mitigations for the Pre-Construction Phase

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Physical Environment						
Air Quality: Dust Emissions	Reducing air quality surrounding the Project Area, Temporarily reduced line of sight on nearby roads and highways, Possible health hazards due to extended exposure to high dust emissions in the Project Area. Possibility of erosion with strong winds.	Low	• Asım Kibar OIZ will ensure that the contractor will prepare and implement an Air Quality and Emissions Management Plan that is in line with the WB ESS1 and WBG EHS Guidelines (both general and sector specific). The Air Quality and Emissions Management Plan will be prepared by the Contractor 30 days prior to commencement of the works to ensure; This condition will be included within Contractor's contract. The employees will be trained on the Air Quality and Emissions Management Plan; • Dust will be minimized from open area sources, including storage piles, by using control measures such as installing enclosures and covers and increasing the moisture content; • The drop height of potentially dust generating materials will be kept as low as possible; • Dust suppression methods will be applied at construction sites to mitigate Project-related dust emissions. In this respect, the upper layers of the work sites/materials will be kept at a humidity level of about 10%. Watering will be applied at any time necessary including night time, weekends or off-days by using pressurized distribution or spraying systems that would ensure even distribution of water; • If there is traffic flow on the existing roads near the work sites, dust suppression measures will be continuously applied to ensure traffic safety. If there is no traffic existing in the local roads, dust suppression measures will be applied only at local residential areas; • All vehicles to be used in transportation activities will obey the speed limits set out in the Regulation on Highway Traffic. Vehicle speeds are proposed to be limited to 30 km/h on unpaved surfaces; • When there will be windy weather conditions (wind speed is above 30 km/hour) in the Project Area, excavation will not be carried out or additional measures such as placement of wind shields/barriers will be taken to prevent dust dispersion; • Loading and unloading operations will be performed without throwing/scattering; • Wind shields/barriers will be placed at work sites such as material storage areas to prevent dust dispersion where necessary; • Solid screens or barriers that are at least as high as any stockpiles on site will be erected at the boundaries of the construction site adjacent to the crops and/or field; • Any damage caused by insufficient or lack of dust suppression (transportation of dust to a residential area, wind borne dust deposits etc.) measures will be compensated by the contractor. • The asphalt roads will be used as much as possible, • Compliance with the air emission limit values stipulated in project standards will be ensured. • Dust measurements will be conducted if any grievance regarding dust generation is received and mitigation measures will be enhanced in this respect such as increasing wet suppression/watering activities, further reducing speed/traffic if deemed necessary, considering project standards. • Compliance with the air emission limit values stipulated in national legislation and WB Compliance with the air emission limit values stipulated in national legislation and WB	Negligible/ None	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Air Quality: Exhaust Emissions	Reducing air quality surrounding the Project Area, Possible health hazards due to extended exposure to high emissions in the Project Area. Increase in SO_2, PM, NO_x emissions. Increase in GHG emissions (CO_2, CH_4, N_2O)	Low	• All vehicles to be used in transportation activities will be issued an emission control stamp which is renewed every year by measuring the emissions from the exhausts; • Relevant provisions of the Regulation on Air Pollution Control Sourced from Industry, the Regulation on Exhaust Gas Emission Control and Regulation on the Assessment and Management of Air Quality will be complied with to minimize air emissions sourced from construction machinery and trucks; • Vehicles that can provide European Euro VI standards will be selected; • Exhaust systems of the vehicles (daily and periodically) will be controlled regularly. Daily maintenance will be carried out in each shift; and the working time of each vehicle will be registered by the operator in order to follow the total working hours for periodic maintenance. • Vehicle speed will be controlled when passing through public transport areas, thus minimizing dust dispersion from vehicle transportation. • Optimal utilization of the available construction equipment and materials in such a way that reduces greenhouse gas emissions; • Speed restrictions will be adopted by construction vehicles and optimal use of equipment to optimize fuel efficiency; • Regular maintenance of construction vehicles and equipment will be applied; • Idling of vehicles and machinery will be avoided. • Energy uses associated with construction vehicles and equipment will be monitored; • Training will be performed for project personnel regarding energy efficiency.	Negligible/ None	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Soil Environment: Preserving Topsoil	Loss of topsoil, Possibility of increased risk of erosion	Low	• Asım Kibar OIZ will ensure that the contractor will prepare and implement a Soil Management Plan that is in line with the WB ESS1 and WBG General EHS Guidelines (both general and sector specific). The Soil Management Plan will be prepared by the Contractor 30 days prior to commencement of the works and the employees will be trained on the Soil Management Plan; This condition will be included within Contractor's contract. • Where there is topsoil, topsoil will be stripped to a sufficient depth (15- 30 cm, depending on the topsoil depth) prior to the start of the land preparing activities. To avoid soil compaction, stripping operation will not be done when soil is wet. The average height of top soil stacks will be 1.5 meters. The side slope of these stacks will not exceed 3:1 (h:v); • Stripping of topsoil will not be conducted earlier than required to prevent the erosion of soil (wind and water); • At the end of the land preparing phase, the stored at the project site topsoil will be used for landscaping; • The stripped topsoil will not be used for agribusiness.	Negligible/ None	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Soil Environment: Erosion Potential	Possibility of increased risk of erosion, Possibility of increased dust emissions caused by wind erosion.	Low	• The contractor will take additional mitigation measures, such as soil sampling, in case of a requirement revealed by the monitoring and/or any complaint. • By establishing a suitable drainage system in the field, the potential impact of surface runoff will be minimized. In this context, drainage channels will be constructed in accordance with the topographical conditions of the site; • Pre-construction activities will be undertaken in the dry weather condition as much as possible to avoid surface runoff effects on stripped topsoil; • Stripping of topsoil will not be conducted earlier than required to prevent the erosion of soil (wind and water); • Circulation of heavy machinery to In the Project Area will be limited; • The disturbed areas and soil stock piles will be kept moist to avoid wind erosion of soil and the pile height will not be higher than 2 m; • Topography will be restored to provide stabilization immediately after the completion of construction at each location. • Once the work is completed, construction areas will be quickly covered with topsoil and revegetated. • Mulch, sod or compacted soil will be used to stabilize exposed areas.	Negligible/ None	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Soil Environment: Soil Contamination	Contamination of soil, Possibility of contamination of underground waters close to the surface, Scatter/dispersion of contaminated soil due to improper handling, transferring and disposal of the contaminated soil, Improper reuse of contaminated soil as landscaping,	Low	• In order to minimize the impacts on soil environment, the amount of soil that could be subject to compaction and contamination/pollution will be minimized by ensuring the use of only the designated work sites and routes for the construction machinery and equipment and field personnel; • The fuel required for the construction equipment and vehicles to be used within the site during pre-construction phase will be supplied primarily from the nearest station; if deemed necessary, fuels that may possibly be stored at site will be stored in the areas where necessary impermeability precautions (including secondary containment) are taken; • Machinery and equipment will be checked regularly for leaking oil and fuel; • The provisions of the Regulation on the Control of Excavation Soil, Construction and Demolition Wastes shall be complied with during pre-construction phase of the Project; • Wastes and wastewater to be generated during the pre-construction phase of the Project will be stored and disposed in a controlled manner in accordance with the Waste Management Regulation and Regulation on the Control of Excavation, Construction and Demolition Wastes, WB ESS1, WBG General EHS Guidelines and in line with the management practices described in this report; • According to requirements specified in the Regulation on the Control Soil Pollution and Sites Contaminated by the Point Source, in terms of a possible soil contamination in the area, Asım Kibar OIZ is obliged to notify the MoEUCC on possible soil pollution in the Project Area according to the procedure defined in the regulation. Based on the inspections that will be carried out by the MoEUCC, if the site will be defined as a contaminated site that needs to be cleaned up, the site will be cleaned up by firms authorized by the MoEUCC and Asım Kibar OIZ will be the responsible entity to ensure clean up. Within the scope of cleanup activities, the following measures will be taken for the contaminated areas during the pre-construction phase: o Vehicles containing any stripped soil will be suitably covered to limit potential dust emissions and truck bodies and tailgates will be sealed to prevent any discharge during transport; o Only licensed waste haulers will be used to collect and transport contaminated soil to an appropriate treatment/disposal site and illegal disposal of the soil will be prohibited; o Speed control for the trucks carrying contaminated soil will be enforced; • The use of contaminated soil for landscaping will be prohibited.	Low	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Water Resources: Quality Change in Water Bodies (surface water and groundwater)	Possibility of leakage of generated municipal wastewater that may cause to degradation in surface water and groundwater qualities, Increased possibility of surface runoff occurrence, Deterioration of quality in nearby water bodies due to wastes carried by surface runoff, erosion, waste dispersion or improper waste storage, handling and transfer.	Low	• Asım Kibar OIZ will ensure that the contractor will prepare and implement a Water Resources Management Plan that is in line with the WB ESS1 and WBG EHS Guidelines (both general and sector specific). The Water Resources Management Plan will be prepared by the Contractor 30 days prior to commencement of the works and employees will be trained in the Water Resource Management Plan; This condition will be included within Contractor's contract. • Surface runoff resulted from rain/storm water or wastewater generation due to dust suppression activities will be prevented; • Stripping of topsoil will not be conducted earlier than required to prevent the erosion of soil (wind and water); • Pre-construction activities may pose the potential for accidental release/leakages of petroleum-based products, such as lubricants, hydraulic fluids, or fuels during their storage, transfer, or use in equipment. All chemical storage containers, including diesel fuel and hazardous liquid waste drums/containers will be placed in secondary containment in temporary storage area so as to minimize the risk of soil, surface water and groundwater contamination during the construction; • For a case of possible breakdown and natural disaster situation, Asım Kibar OIZ will ensure that that contractor will prepare, implement and monitor an Emergency Preparedness Plan and the employees will be trained on the plan. • The flow of natural waters should not be obstructed or diverted to another direction, which may lead to drying up of river beds or flooding of settlements. • Activities should not affect the availability of water for drinking and hygienic purposes. • No polluted substances, solid waste, toxic or hazardous substances will be stored, spilled or disposed of in water bodies for dilution or disposal.	Negligible/ None	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Noise Management	Possible health hazards due to extended exposure to high noise and vibration in/around the Project Area. Over exposure to increased noise and vibration levels may disturb routine life of human and animal populations nearby.	Low	• Asım Kibar OIZ will ensure that the contractor will prepare and implement a Noise and Vibration Management Plan that is in line with the WB ESS1 and WBG EHS Guidelines (both general and sector specific) prior to the pre-construction works and the employees will be trained on the Plan. This condition will be included within Contractor's contract. • The machinery and equipment to be used during the pre-construction phase will not be operated at the same point/location but homogeneously distributed in the site if possible; • During vehicle and equipment procuring/leasing process for the Project, item with lower noise levels than equivalent ones will be preferred, if feasible; • The maintenance of the construction machinery and equipment will be carried out regularly and periodically. Daily maintenance will be carried out in each shift; and the working time of each vehicle will be registered by the operator in order to follow the total working hours for periodic maintenance. Periodic maintenance will be conducted at every 50, 250, 500, 1000, 2000 working hours. Maintenance forms will be filled out regularly; • All vehicles to be used in transportation activities will obey the speed limits set out in the Regulation on Highway Traffic; • Noise measurements will be conducted by an authorized environmental laboratory in case of any grievance and mitigation measures will be enhanced in this respect such as use of noise barriers; • Construction works will be performed between 07:00 - 19:00 hours. Unless absolutely necessary, no construction activities will be done at night. In case night operations are deemed necessary and the noise levels would be high, the public will be informed 1 week in advance about the time of construction activities; • All construction activities will be carried out in compliance with the noise limits set out in the Regulation on Environmental Noise Control (RENC) and WBG EHS Guidelines and the contractor will take additional mitigation measures in case of a requirement revealed by the monitoring; • A grievance mechanism will be established to manage noise related grievances as well. • The work schedule will be adjusted by communicating with sensitive receptors.	Low	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Resource Management	Resources used/consumed during works	Low	• Asım Kibar OIZ will supervise the construction contractor via construction supervision consultant to select the most appropriate raw materials and resources by evaluating clean production options.	Negligible/ None	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Waste Generation	Inefficient management of resources and increased amount of waste due to not separating waste and/or storing, handling or transferring wastes improperly. Possibility of increased public health hazard risks, deterioration of surface water, underground water and air quality, and/or soil contamination due to improper storage, handling and transfer of hazardous wastes, Possibility of air and/or soil pollution risk due to unauthorized burial and burning of waste on the site.	Low	• Asım Kibar OIZ will ensure that the contractor will prepare and implement a Waste Management Plan that is in line with the WB ESS1 and WBG EHS Guidelines (both general and sector specific). The Waste Management Plan will be prepared by the Constructor 30 days prior to the commencement of the works and the employees will be trained on the plan. This condition will be included within Contractor's contract. • Waste to be generated within the scope of the Project will be managed in accordance with the waste management hierarchy; • Waste will be separated (i.e., hazardous / non-hazardous, recyclable / non-recyclable) and stored in designated temporary storage areas; • All kinds of implementations that may threaten personnel or public health will be avoided in all activities involving collection, temporary storage, transport and disposal of waste throughout the Project; • Waste recycling, transport and disposal will be carried out by means of licensed companies and/or relevant İzmit Municipality's vehicles; • Incineration or burying of waste by any means at site and/or dumping of waste to nearby roads or water resources will not be allowed; • Waste to be temporarily stored on site will be delivered to licensed transport vehicles appropriate to the type of waste for disposal. Information related to the operations in this context will be recorded and the records will be kept in the administrative building; • Waste oils originating from machinery and vehicles will be stored in impervious tanks and containers that would be situated on impervious foundation in accordance with the "Regulation on Control of Waste Oils". Tanks and containers will be equipped with apparatus that would prevent over filling and will be filled till the designated level mark. Tanks and containers will have a red color and will be labeled as "waste oil". Disposal of waste oils will be controlled by the Asım Kibar OIZ; • Waste batteries from construction site and accumulators from vehicles will be disposed of in compliance with the consumer responsibilities specified in Article 13 of the "Regulation on Control of Waste Batteries and Accumulators". Accordingly, used batteries will be collected separately (from municipal wastes) and transferred to the TAP battery collection center; • All other hazardous materials will be disposed of in accordance with the Waste Management Regulation; • Hazardous waste to be temporarily stored on site will be delivered to licensed transport vehicles appropriate to the type of waste for disposal. Information related to the operations in this context will be recorded and the records will be kept in the administrative building; • Hazardous or non-hazardous inscription, waste code, stored waste amount and storage date will be indicated/labelled on waste temporarily stored by classifying according to their properties. The reaction of waste with each other will be prevented by the measures taken in the Temporary Storage Area, which will have impermeable ground, proper drainage for accidental leaks/spills, top cover and designated rooms for different types of waste, etc. The permit for the temporary Waste Storage Area will be taken from the Provincial Directorate of Environment, Urbanization and Climate Change. • Spill kits will be available at the Temporary Storage Area and necessary precautions will be taken against possible fires such as provision of appropriate firefighting equipment. • Workers will be trained in the proper transfer and handling of fuels and other materials and will require the use of gloves, boots, aprons, goggles and other protective equipment for protection when handling highly hazardous materials.	Low	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Biological Environment						
Pesticide Use	Pesticides can run off into water bodies, contaminating rivers, lakes, and groundwater. This can harm aquatic life and affect water quality. Pesticides may reduce soil fertility by killing beneficial microorganisms, leading to long-term soil health issues. Non-target organisms such as bees, birds, and other wildlife can be affected, leading to a decline in biodiversity.	Low	• Pesticide control during these phases on formerly agricultural land involves management and mitigation requirement for environmental and health risks if there is a historical pesticide use because pesticides will not be used in this phase. • Pesticide-free construction practices are adopted to prevent the introduction of new pesticides, accompanied by worker training on safety and proper handling. • Ongoing monitoring of soil and water quality will be done, coupled with transparent communication with regulatory authorities and the local community, contribute to a proactive and compliant approach.	Negligible/ None	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Terrestrial habitats and flora species	Damage or loss of terrestrial habitats and flora species	Low	• Minimize land clearing and vegetation removal to preserve as much natural habitat as possible for flora. • After construction, implement revegetation programs using native species to restore habitats and promote biodiversity. • Use dust suppression techniques to reduce air pollution that could harm flora.	Negligible/ None	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Terrestrial fauna species	Disturbing/harming of terrestrial fauna species	Low	• Implement a species relocation plan to move Testudo graeca to suitable nearby habitats if found within the construction zone. • Mark sensitive areas where vulnerable species are located to prevent accidental disturbance. • Limit habitat disturbance by minimizing land clearing to preserve existing habitats for fauna. • Establish buffer zones around areas where Testudo graeca and other sensitive species are present, restricting access to construction activities. • Avoid heavy machinery use outside designated areas to prevent soil compaction that could impact burrowing species. • Schedule construction to avoid critical breeding or nesting seasons for Testudo graeca and other wildlife. • Install temporary fencing around construction zones to prevent animals from entering dangerous areas. • Enforce strict speed limits for vehicles to avoid collisions with wildlife.	Negligible/ None	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Socio-economic Environment						
Stakeholder Engagement	Objections and obstruction efforts during the project/design phase due to lack of information to the people who are likely to be affected by the project Suspension of the project due to lack of Stakeholder Engagement Process and not receiving suggestions and complaints Insufficient stakeholder engagement activities and public consultation	Low	• Before the start of construction works, the local people and all relevant stakeholders will be informed of the works to be performed, anticipated risks and adverse impacts and the mitigation measures to be taken. • Comprehensive information on stakeholder engagement is included in the SEP dated 1st March 2021 included in the Project Documents and the project-specific SEP included in this ESMP will be implemented throughout the Project. • Informing the persons or organizations likely to be affected by the project about the project • Establishing a grievance and suggestion mechanism in order to inform the persons and organizations that are likely to be affected by the Project as specified in this SEP, about any adverse environmental and social risks and how to submit any grievances, if required. • Collection and evaluation of suggestions and complaints about the project	Low	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Occupational Health and Safety	Risk of occupational health and safety hazards to the workers Work-related accidents (near misses, personnel injuries and occupational illnesses, fatalities) Noncompliance with all applicable occupational health and safety regulations and other legal and contractual requirements GBV and SEA/SH related incidents	High	• Preparation of the following plans and procedures for the approval of the OIZ and the Supervision Consultant by the Contractor before the commencement of construction works. These will be included within Contractor's contract: ○ Occupational Health and Safety (OHS) Plan based on construction site OHS risk assessment, including work procedures (such as permit to works etc.), checklists and daily record forms ○ Emergency Preparedness and Response Plan, ○ Labor Management Plan (including Worker Code of Conduct) in line with the LMP ○ Grievance Mechanism Procedure for workers including Grievance Register ○ Accident investigation and root cause analyze • GM, GBV, SEA/SH, Code of Conduct, OHS trainings will be given to whole personnel before the construction.	Low	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Community Health and Safety	Risk of health and safety hazards to the community members such as access from outside etc.	Low	• Preparation and implementation of the Community Health and Safety Plan such as • Informing community about the risks • Installing warning signs, fence/curtain for the perimeter of the construction area, etc. • Access to Grievance Mechanism	Low	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

8.2 Mitigation Plan for the Construction Phase

Table 23 Mitigations for the Construction Phase

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Physical Environment						
Air Quality: Dust Emissions	Reducing air quality surrounding the Project Area, Temporarily reduced line of sight on nearby roads and highways, Possible health hazards due to extended exposure to high dust emissions in the Project Area. Possibility of erosion with strong winds.	Low	• Asım Kibar OIZ will ensure that the contractor will implement an Air Quality and Emissions Management Plan that is in line with the WB ESS1 and WBG EHS Guidelines (both general and sector specific). This condition will be included within Contractor's contract. • The employees will be trained on an Air Quality and Emissions Management Plan; • Dust will be minimized from open area sources, including storage piles, by using control measures such as installing enclosures and covers and increasing the moisture content; • Speed limitations will be defined and obeyed for construction vehicles; • The drop height of potentially dust generating materials will be kept as low as possible; • Dust suppression methods will be applied at construction sites to mitigate Project-related dust emissions. In this respect, the upper layers of the work sites/materials will be kept at a humidity level of about 10%. Watering will be applied at any time necessary including night time, weekends or off-days by using pressurized distribution or spraying systems that would ensure even distribution of water; • If there is traffic flow on the existing roads near the work sites, dust suppression measures will be continuously applied to ensure traffic safety. If there is no traffic existing in the local roads, dust suppression measures will be applied only at local residential areas; • All vehicles to be used in transportation activities will obey the speed limits set out in the Regulation on Highway Traffic. Vehicle speeds are proposed to be limited to 30 km/h on unpaved surfaces; • When there will be windy weather conditions (wind speed is above 30 km/hour) in the Project Area, excavation will not be carried out or additional measures such as placement of wind shields/barriers will be taken to prevent dust dispersion; • Loading and unloading operations will be performed without throwing/scattering; • During transportation, excavated materials will be covered with nylon canvas or materials with grain size larger than 10 mm; • Wind shields/barriers will be placed at work sites such as material storage areas to prevent dust dispersion where necessary; • Solid screens or barriers that are at least as high as any stockpiles on site will be erected at the boundaries of the construction site adjacent to the crops and/or field; • Any damage caused by insufficient or lack of dust suppression (transportation of dust to a residential area, wind borne dust deposits etc.) measures will be compensated by the contractor. • The asphalt roads will be used as much as possible, • Compliance with the air emission limit values stipulated in national legislation and WBG General EHS Guidelines will be ensured. • Dust measurements will be conducted if any grievance regarding dust generation is received and mitigation measures will be enhanced in this respect such as increasing wet suppression/watering activities, further reducing speed/traffic if deemed necessary, considering both national and WBG EHS Guidelines limit values. •	Negligible/ None	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Air Quality: Exhaust Emissions	Reducing air quality surrounding the Project Area, Possible health hazards due to extended exposure to high emissions in the Project Area. Increase in SO_2, PM, NO_x emissions. Increase in GHG emissions (CO_2, CH_4, N_2O)	Low	• All vehicles to be used in transportation activities will be issued an emission control stamp which is renewed every year by measuring the emissions from the exhausts; • Relevant provisions of the Regulation on Air Pollution Control Sourced from Industry, the Regulation on Exhaust Gas Emission Control and Regulation on the Assessment and Management of Air Quality will be complied with to minimize air emissions sourced from construction machinery and trucks; • Vehicles that can provide European Euro VI standards will be selected; • Relevant provisions of the Regulation on Air Pollution Control Sourced from Industry and Regulation on the Assessment and Management of Air Quality will be complied with to minimize air emissions sourced from construction machinery and trucks; • Exhaust systems of the vehicles (daily and periodically) will be controlled regularly. Daily maintenance will be carried out in each shift; and the working time of each vehicle will be registered by the operator in order to follow the total working hours for periodic maintenance. • Optimal utilization of the available construction equipment and materials in such a way that reduces greenhouse gas emissions; • Speed restrictions will be adopted by construction vehicles and optimal use of equipment to optimize fuel efficiency; • Regular maintenance of construction vehicles and equipment will be applied; • Idling of vehicles and machinery will be avoided. • Energy uses associated with construction vehicles and equipment will be monitored; • Training will be performed for project personnel regarding energy efficiency.	Negligible/ None	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Soil Environment: Erosion Potential	Possibility of increased risk of erosion, Possibility of increased dust emissions caused by wind erosion.	Low	• By establishing a suitable drainage system in the field, the potential impact of surface runoff will be minimized. In this context, drainage channels will be constructed in accordance with the topographical conditions of the site; • Construction activities (especially excavation works) will be undertaken in the dry weather condition as much as possible to avoid surface runoff effects on excavated soil; • Circulation of heavy machinery to In the Project Area will be limited; • The disturbed areas and soil stock piles will be kept moist to avoid wind erosion of soil and the pile height will not be higher than 2 m; • Topography will be restored to provide stabilization immediately after the completion of construction at each location.	Negligible/ None	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Soil Environment: Soil Contamination	Contamination of soil, Possibility of contamination of underground waters close to the surface, Scatter/dispersion of contaminated soil due to improper handling, transferring and disposal of the contaminated soil, Improper reuse of contaminated soil as landscaping,	Low	• Asım Kibar OIZ will ensure that the Contractor will continue to comply with the Soil Management Plan that was prepared in line with the WB ESS1 and WBG EHS Guidelines (both general and sector specific) before the commencement of the works. The Contractor will ensure all the employees are trained on the Oil and Chemical Spill Contingency Management Plan and renew the training if necessary; • In order to minimize the impacts on soil environment, the amount of soil that could be subject to compaction and contamination/pollution will be minimized by ensuring the use of only the designated work sites and routes for the construction machinery and equipment and field personnel; • The fuel required for the construction equipment and vehicles to be used within the site during construction phase will be supplied primarily from the nearest station; if deemed necessary, fuels that may possibly be stored at site will be stored in the areas where necessary impermeability precautions (including secondary containment) are taken; • Machinery and equipment will be checked regularly for leaking oil and fuel; • The provisions of the Regulation on the Control of Excavation Soil, Construction and Demolition Wastes shall be complied with during construction phase of the Project; • Provisions of the Regulation on the Control of Soil Pollution and Sites Contaminated by Point Sources shall be complied with within the scope of the Project; • Wastes and wastewater to be generated during the construction phase of the Project will be stored and disposed in a controlled manner in accordance with the Waste Management Regulation and Regulation on the Control of Excavation, Construction and Demolition Wastes, WB ESS1, WBG General EHS Guidelines and in line with the management practices described in this report; • According to requirements specified in the Regulation on the Control Soil Pollution and Sites Contaminated by the Point Source, in terms of a possible soil contamination in the area, Asım Kibar OIZ is obliged to notify the MoEUCC on possible soil pollution in the Project Area according to the procedure defined in the regulation. Based on the inspections that will be carried out by the MoEUCC, if the site will be defined as a contaminated site that needs to be cleaned up, the site will be cleaned up by firms authorized by the MoEUCC and Asım Kibar OIZ will be the responsible entity to ensure clean up. Within the scope of cleanup activities, the following measures will be taken for the contaminated areas during the construction phase: o Vehicles containing any excavated soil will be suitably covered to limit potential dust emissions and truck bodies and tailgates will be sealed to prevent any discharge during transport; o Only licensed waste haulers will be used to collect and transport contaminated soil to an appropriate treatment/disposal site and illegal disposal of the soil will be prohibited; o Speed control for the trucks carrying contaminated soil will be enforced; • The use of contaminated soil for landscaping will be prohibited.	Low	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Water Resources: Quality Change in Water Bodies	Possibility of leakage of generated municipal wastewater that may cause to degradation in surface water and groundwater qualities, Increased possibility of surface runoff occurrence, Deterioration of quality in nearby water bodies due to wastes carried by surface runoff, erosion, waste dispersion or improper waste storage, handling and transfer.	Low	• Asım Kibar OIZ will ensure that the Contractor will continue to comply with the Water Resources Management Plan that was prepared in line with the WB ESS1 and WBG EHS Guidelines (both general and sector specific) before the commencement of the works. The Contractor will ensure all the employees are trained on the Water Resources Management Plan and renew the training if necessary. This condition will be included within Contractor's contract. • Surface runoff resulted from rain/storm water or wastewater generation due to dust suppression activities will be prevented; • The water to be used for dust suppression will be monitored and recorded in m^3; • Discharge of wastewater, residues or other waste into groundwater or into surface water will be avoided. Portable toilets will be supplied for the workers at the construction sites. The limited amount of domestic wastewater generated at the construction site will be stored on impermeable tanks and will be collected with septic trucks to be sent to the existing OIZ's sewage system. • The units of the Project that are in touch with water, wastewater and chemicals will be constructed using concrete with appropriate cement ratio and durability in order to provide basement impermeability. Thus, no leakages to soil and groundwater will occur during the operation phase of the Project; • Construction activities may pose the potential for accidental release/leakages of petroleum-based products, such as lubricants, hydraulic fluids, or fuels during their storage, transfer, or use in equipment. All chemical storage containers, including diesel fuel and hazardous liquid waste drums/containers will be placed in secondary containment in temporary storage area so as to minimize the risk of soil, surface water and groundwater contamination during the construction; • For a case of possible breakdown and natural disaster situation, Asım Kibar OIZ will ensure that that contractor will prepare, implement and monitor an Emergency Preparedness Plan and the employees will be trained on the plan. • It will be ensured that the facility is designed and constructed to be resistant to natural disasters. • Activities should not affect the availability of water for drinking and hygienic purposes. • No polluted substances, solid waste, toxic or hazardous substances will be stored, spilled or disposed of in water bodies for dilution or disposal. • The flow of natural waters should not be obstructed or diverted to another direction, which may lead to drying up of river beds or flooding of settlements.	Negligible/ None	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Noise Management	Possible health hazards due to extended exposure to high noise and vibration in/around the Project Area. Over exposure to increased noise and vibration levels may disturb routine life of human and animal populations nearby.	Low	• Asım Kibar OIZ will ensure that the contractor will prepare and implement a Noise and Vibration Management Plan that is in line with the WB ESS1 and WBG EHS Guidelines (both general and sector specific) prior to the construction works and the employees will be trained on the Plan. • The machinery and equipment to be used during the construction phase will not be operated at the same point/location but homogeneously distributed in the site if possible; • During vehicle and equipment procuring/leasing process for the Project, item with lower noise levels than equivalent ones will be preferred, if feasible; • The maintenance of the construction machinery and equipment will be carried out regularly and periodically. Daily maintenance will be carried out in each shift; and the working time of each vehicle will be registered by the operator in order to follow the total working hours for periodic maintenance. Periodic maintenance will be conducted at every 50, 250, 500, 1000, 2000 working hours. Maintenance forms will be filled out regularly; • All vehicles to be used in transportation activities will obey the speed limits set out in the Regulation on Highway Traffic; • Noise measurements will be conducted by an authorized environmental laboratory in case of any grievance and mitigation measures will be enhanced in this respect such as use of noise barriers; • Construction works will be performed between 07:00 - 19:00 hours. Unless absolutely necessary, no construction activities will be done at night; • All construction activities will be carried out in compliance with the noise limits set out in the Regulation on Environmental Noise Control (RENC) and WBG EHS Guidelines and the contractor will take additional mitigation measures in case of a requirement revealed by the monitoring; • A grievance mechanism will be established to manage noise related grievances as well. • The work schedule will be adjusted by communicating with sensitive receptors.	Low	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Resource Management	Resources used/consumed during works	Low	• Asım Kibar OIZ will supervise the construction contractor via supervision consultant to select the most appropriate raw materials and resources by evaluating clean production options.	Negligible/ None	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Waste Generation	Inefficient management of resources and increased amount of waste due to not separating waste and/or storing, handling or transferring wastes improperly. Possibility of increased public health hazard risks, deterioration of surface water, underground water and air quality, and/or soil contamination due to improper storage, handling and transfer of hazardous wastes, Possibility of air and/or soil pollution risk due to unauthorized burial and burning of waste on the site.	Low	• Asım Kibar OIZ will ensure that the Contractor will continue to comply with the Waste Management Plan that was prepared in line with the WB ESS1 and WBG EHS Guidelines (both general and sector specific) before the commencement of the works. The Contractor will ensure all the employees are trained on the Waste Management Plan and renew the training if necessary; • Waste to be generated within the scope of the Project will be managed in accordance with the waste management hierarchy; • Waste will be separated (i.e., hazardous / non-hazardous, recyclable / non-recyclable) and stored in designated temporary storage areas; • All kinds of implementations that may threaten personnel or public health will be avoided in all activities involving collection, temporary storage, transport and disposal of waste throughout the Project; • Waste recycling, transport and disposal will be carried out by means of licensed companies and/or relevant municipality's vehicles; • Incineration or burying of waste by any means at site and/or dumping of waste to nearby roads or water resources will not be allowed; • Waste to be temporarily stored on site will be delivered to licensed transport vehicles appropriate to the type of waste for disposal. Information related to the operations in this context will be recorded and the records will be kept in the administrative building; • Removal of the excavated material, which will not be used for backfilling, from the site will be performed at regular intervals without waiting. These materials will be transferred to the nearest licensed landfill facility by licensed transportation companies; • Waste oils originating from machinery and vehicles will be stored in impervious tanks and containers that would be situated on impervious foundation in accordance with the "Regulation on Control of Waste Oils". Tanks and containers will be equipped with apparatus that would prevent over filling and will be filled till the designated level mark. Tanks and containers will have a red color and will be labeled as "waste oil". Disposal of waste oils will be controlled by the Asım Kibar OIZ; • Waste batteries from construction site and accumulators from vehicles will be disposed of in compliance with the consumer responsibilities specified in Article 13 of the "Regulation on Control of Waste Batteries and Accumulators". Accordingly, used batteries will be collected separately (from municipal wastes) and transferred to the TAP battery collection center; • All other hazardous materials will be disposed of in accordance with the Waste Management Regulation; • Hazardous waste to be temporarily stored on site will be delivered to licensed transport vehicles appropriate to the type of waste for disposal. Information related to the operations in this context will be recorded and the records will be kept in the administrative building; • Hazardous or non-hazardous inscription, waste code, stored waste amount and storage date will be indicated/labelled on waste temporarily stored by classifying according to their properties. The reaction of waste with each other will be prevented by the measures taken in the Temporary Storage Area, which will have impermeable ground, proper drainage for accidental leaks/spills, top cover and designated rooms for different types of waste, etc. The permit for the temporary Waste Storage Area will be taken from the Provincial Directorate of Environment, Urbanization and Climate Change. • Removal of the excavated material, which will not be used for backfilling, from the site will be performed at regular intervals without waiting. • Spill kits will be available at the Temporary Storage Area and necessary precautions will be taken against possible fires such as provision of appropriate firefighting equipment.	Low	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Landscape and Visual (Aesthetics) Concerns	Creation of visual pollution. Impairment of quality of life due to the overall presence of annoying construction works and activities and altered landscape	Low	• Construction works will be performed between 07:00 - 19:00 hours. Unless absolutely necessary, no construction activities will be done at night. In case night operations are deemed necessary and the noise levels would be high, the public will be informed 1 week in advance about the time of construction activities; • The construction schedule will be disclosed to the public via website of Asım Kibar OIZ.	Negligible/ None	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Biological Environment						
Pesticide Use	Pesticides can run off into water bodies, contaminating rivers, lakes, and groundwater. This can harm aquatic life and affect water quality. Pesticides may reduce soil fertility by killing beneficial microorganisms, leading to long-term soil health issues. Non-target organisms such as bees, birds, and other wildlife can be affected, leading to a decline in biodiversity.	Low	• Pesticide control during these phases on formerly agricultural land involves management and mitigation requirement for environmental and health risks if there is a historical pesticide use because pesticides will not be used in this phase. • Pesticide-free construction practices are adopted to prevent the introduction of new pesticides, accompanied by worker training on safety and proper handling. • Ongoing monitoring of soil and water quality will be done, coupled with transparent communication with regulatory authorities and the local community, contribute to a proactive and compliant approach.	Negligible/ None	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Terrestrial habitats and flora species	Damage or loss of terrestrial habitats and flora species	Low	• Limit the Project activities with the boundaries of the construction area, including traffic routes to avoid impact on the adjacent vegetation. • Select the location of the topsoil stockpiles with consideration of environmental safeguards	Negligible/ None	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Terrestrial fauna species	Disturbing/harming of terrestrial fauna species	Low	• On-site vehicle speed limits will be implemented to avoid potential road-kills. • Limit habitat disturbance by minimizing land clearing to preserve existing habitats for fauna. • Establish buffer zones around areas where Testudo graeca and other sensitive species are present, restricting access to construction activities. • Schedule construction to avoid critical breeding or nesting seasons for Testudo graeca and other wildlife. • During the construction phase, any animals found should be removed and released to a safe refugia.	Negligible/ None	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Socio-economic Environment						
Cultural Heritage	Loss of cultural heritage	Low	• Any cultural asset found during the construction works will be indicated and recorded as “chance finds”. A “Chance Find Procedure” has been prepared for the steps to be followed and implemented after the chance finding. Annex 9 shows Chance Find Procedure. • The Cultural and Natural Assets Conservation Boards will be informed about the chance finds and the approval of the Conservation Board, which is responsible for the area where the construction site is located, will be required. No demolition/construction work will be carried out when awaiting the said approval.	Negligible/ None	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Employment / Economy	Missed Economic Opportunities, Missed Training and Capacity Building of the Local Workforce	Low	• Care will be taken to contribute to the local economy through the use of local materials and to procure various goods and services from local resources. • Priority should be given to the local labour where possible and practical. • Efforts will be exercised to allocate employment opportunities to the local parties and the settlements within the AoI.	Low	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Community Health and Safety	Potential Community Disturbance Access from outside and accidents that may occur due to lack of security in the project area	Low	• The OIZ will ensure that contractors establish the code of conduct and will check that workers will be given training, especially on communication with local people of foreign nationality public before starting work, so that local people of foreign nationality will not be adversely affected by external workers. • The operations to be carried out during construction works will be performed not to restrict/hinder the social and economic life of local people. • To avoid any impact on the safety and daily life of communities, safety and information signs will be placed on site before the work. • The perimeter of the construction areas will be blocked with a wire fence and warning signs will be hung.	Negligible/ None	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Labour and Working Conditions	Improper Working Conditions, Child labour, forced labour and unregistered employment	Low	• Preparation and implementation of Labour Management Plan in compliance with LMP of TOIZsP. • Workers will be informed about the Grievance mechanism and will be required to be aware of this Mechanism. • All workers will be given training on discrimination and codes of conduct. The training given to the employees will be explanatory about the concepts of sexual harassment and abuse, sexual exploitation, gender-based violence, abuse, and intervention with harassment. • Minimum legal labour standards will be met (prevention of child/forced labour, anti-discrimination, working hours, minimum wages) as per International Labor Organization (ILO) regulations. • At the same time, national laws/ regulations and international conventions/ standards will be complied with in terms of the working conditions. • Discrimination based on language, race, gender, political thought, philosophical belief and religion will be avoided in business relations.	Low	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Labour and Working Conditions	Work suspension due to legal noncompliance in Human Resources and Workforce Management	Medium	• Concluding written contracts with workers upon recruitment, including job description, working hours, wages, terms and conditions of employment and rights in accordance with national legislation and Code of Conduct, access to workers' GM • Keeping personnel data files including contracts, training records, signed codes of conduct, health reports	Low	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Occupational Health and Safety (OHS)	Inadequate workers' health and safety conditions	Medium	• The contractor and construction supervision consultant will include a full time A or B Class (preferably A Class) OHS expert. • The PMU will include an OHS expert with A or B Class (preferably A Class) specialization certificate who will take part full-time and effectively control the implementation of the Project. She/he shall monitor the site implementations. • The consultant and the OIZ will make sure that the measures provided below are taken by the contractor and enforce necessary actions/sanctions in case of lack of these measures on-site. In accordance with the Occupational Health and Safety Regulation in Construction Works, the required person, information, plan, and organization will be provided. • An Emergency Response Plan will be prepared and shared with all employees. • The OIZ will require all employees and contractors to adhere to local and international health and safety legislation and guidelines. Workers will be provided with all necessary personal protective equipment (PPE) (hard hats, safety harnesses, protective coveralls, glasses, gloves, safety shoes, etc.). • Non-smoking areas will be allocated at the construction site. • Appropriate hand and face washing facilities will be provided to the employees, and also shower facilities for dusty works. • Technical and OHS training, including the code of conduct indicating the possible risks regarding the work site and works to be carried will be given to workers by the contractor.	Low	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Occupational Health and Safety	Work suspension due to work accident (lack of appropriate OHS measures/ unsafe work environment)	Medium	• Implementing OHS Plan, Emergency Preparedness and Response Plan, Accident/incident Investigation and Reporting and Root Cause Analysis Procedure, Non-Conformity / Non-Compliance and Corrective / Preventive Action Procedure and Risk Assessment Procedure. • Placing safety barriers and warning signs around work areas. • Conducting occupational safety meetings/toolbox talks with workers before starting work every day. • Legal periodic inspection of work equipment at the construction site by an authorized expert. • Daily control of work equipment by its operators. • First aid boxes for each work team for first aid response. • Providing certified first aid training to workers. • Establishment of a first aid team consisting of workers for each work zone. • Providing workers with Personal Protective Equipment (PPE) specific to their tasks. • Provide a safe and healthy work environment for the workers. Provide equipment that meets international standards in terms of performance and safety • Inform all workers about the required safety rules, risks, and related regulations to be followed at the construction site throughout the construction period. • Establish emergency teams and carry out training/drills according to the emergency scenarios • Record all accidents and incidents (fatalities, lost time incidents, any significant events including spills, fire, pandemic outbreak or infectious diseases, social unrest, etc.) as well as near misses. The project owner will ensure that all OHS measures are taken by the Contractor and enforce necessary actions/sanctions in case of lack of these measures on sites. • The Contractor will promptly notify the OIZ in case of any incident or accident related to the Project which has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public and workers such as OHS accidents or that result in threatening community health and safety and the OIZ will immediately (not later than 48 hours) inform MoIT, and MoIT will inform the World Bank. In such cases, the OIZ will provide sufficient details regarding the incident or accident, findings of the Root Cause Analysis (RCA), indicating immediate measures taken or that are planned to be taken to address it, compensation paid, and any information provided by any contractor and supervising entity/consultant, as appropriate. The OIZ will submit the incident report, including root cause analysis, precautions and compensation measures taken, to MoIT within 30 business days. MoIT will forward the incident report to the Bank immediately upon receipt from the OIZ. • Within the scope of electrical safety, work will not be carried out other than authorized and competent persons. • Providing periodic training to the workers on OHS issues including emergency response such as firefighting and recording all provided training. • Providing appropriate type and number of fire extinguishing equipment in each working area • Machinery and equipment to be used during land preparation and construction activities will not be operated at the same point/place, but will be distributed homogeneously on the site, • Care will be taken to select equipment with low noise levels within the scope of the project, • Maintenance of construction machinery and equipment will be done regularly and periodically, • In case of complaints, noise measurements will be conducted and additional mitigation measures (such as noise barriers, etc.) will be applied if the measured values exceed the project standards. • Equipment and vehicles used externally will be regularly maintained. • "Low noise" equipment will be used as much as possible during the construction phase. Where construction equipment is provided with impermeable acoustic covers or enclosures, covers will be kept closed while the equipment is in operation. • When equipment is not working, it will be turned off or reduced to the minimum level. • Vibration levels will be monitored in case of complaints, and measures will be taken to reduce vibration if standards are exceeded. • Noise exposure measurement will be carried out with reference to an 8-hour working day in order to determine and control individual noise exposure of employees.	Low	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Traffic and Pedestrian Safety	Direct and indirect threats posed by construction activities against traffic and pedestrians	Low	• Traffic safety will be provided through a combination of engineering, enforcement, education, and emergency response strategies in order to reduce accidents and enhance the overall safety of road users.	Low	Included in construction cost	Contractor (implementation)

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
			• All vehicles to be used in transportation activities will comply with the speed limits specified in the Highway Traffic Regulation, • Traffic and warning signs will be placed around and near the project area. • The project area will be made visible. • Local people will be informed about potential hazards and risks through brochures and posters left in common areas frequently used by local people such as headman's offices, hospitals, health centres, mosques, coffee houses and marketplaces. • The activities affecting the local traffic will be planned considering the rush hours of the traffic as much as possible. • Vehicles carrying construction machinery and materials will not park outside the project area and parking lot • Setting speed limits • Protectors carrying work machines and materials must have appropriately qualified persons. • Hanging warning signs about speed limit in the Project Area • All drivers involved in the project will be informed about road safety, speed limits, and traffic rules to be followed during the project, and requirements to be observed.			Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

Stakeholder Engagement	Lack of communication with the stakeholders.
	Insufficient stakeholder engagement activities and public consultation.
		Low	• Adequate timing will be planned for interaction/communication with communities and for engagement.
			• Regular public awareness and sufficient public engagement will be carried out with the authorities and communities regarding
			  ○ Information about current progress of the Project
			  ○ Implementation of project-specific Grievance Mechanism (GM)
			• Grievance mechanisms and tools other than project-specific GM implementations.
				Low	Included in construction cost	Contractor (implementation)
						Asım Kibar OIZ (following-up and coordination with the MoIT PIU)
						Construction Supervision Consultant (supervision/monitoring)

Grievance mechanism	Insufficient and/or ineffective grievance mechanism for the internal and external stakeholders.	Low	• An efficient Grievance mechanism will be initiated to allow potentially affected individuals to voice their concerns on the Project in accordance with the national legislation and WB ESS10. • All grievances will be collected, recorded and resolved/closed in a short period of time. • All stakeholders/grievance holders will be given feedback regarding the complaints, suggestions and requests. • Contractor will be required to establish an effective workers' grievance mechanism working in coordination with the Project Owner.	Low	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

8.3 Mitigation Plan for the Operation Phase

Table 24 Additional mitigations for the Operation Phase

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Physical Environment						
Air Quality: Odorous Gas Emissions	Odor problems around WWTP.	Positive	• Asım Kibar OIZ will prepare and implement an Odor Management Plan that is in line with the WB ESS1 and WBG General EHS Guidelines (both general and sector specific) and the employees will be trained on the plan. • The first level measures for odor problem are as follows: o Prevention of wastewater influents which exceed treatment plant capacity; o Reduction of solid waste and activated sludge amounts; o Increasing disposal frequency of screenings; o Proper and timely disposal of sludge in order to prevent flies and odor; o Increasing aeration rate in biological treatment process; o Addition of lime to activated sludge; o Keeping water level under control in order to prevent turbulence as a result of instant decrease of water. • If odor nuisance prevails after the proper implementation of first level measures, the second level measures shall be taken. These are: o Addition of oxidizing material (such as hydrogen peroxide, sodium hypochlorite) (oxidizing materials, prevent the generation of especially hydrogen sulfide). Addition of sodium hydroxide can also be considered. Sodium hydroxide will dissolve hydrogen sulphur gas in water. o Preventing anaerobic bacteria with control of pH levels or disinfection. o Oxidizing odorous compounds by the help of chemicals. o Planting trees in the project area and the buffer zone around the treatment plant for the prevention of odor distribution. • If nuisance still prevails after implementation of first and second measures, the final measure shall be determined as: o Enclosing the Preliminary Treatment Units • As a general measure: an operating grievance mechanism will be established to manage odor related grievances.	Positive	Included in operation cost	Asım Kibar OIZ
Air Quality: Exhaust Emissions	Reducing air quality surrounding the Project Area, Possible health hazards due to extended exposure to high emissions in the Project Area. Increase in SO_2, PM, NO_x emissions Increase in GHG emissions(CO_2, CH_4, N_2O)	Positive	• Well and adequately maintained vehicles will be used. Regular maintenance of machinery and equipment will be ensured; • Exhaust systems of the vehicles will be controlled regularly (daily and periodically); • All vehicles to be used in transportation activities will be issued an emission control stamp; • Operation phase vehicles will not be permitted to keep engines running while waiting or standing by for duty. • Relevant provisions of the Regulation on Air Pollution Control Sourced from Industry, the Regulation on Exhaust Gas Emission Control and Regulation on the Assessment and Management of Air Quality will be complied with to minimize air emissions sourced from machinery, equipment, and vehicles that are used in operation phase; • Speed restrictions will be adopted by operation phase vehicles and optimal use of operation phase equipment to optimize fuel efficiency; • Regular maintenance of operation phase vehicles and equipment will be applied; • Energy uses associated with operation phase vehicles and equipment will be monitored; • Regular maintenance of WWTP machinery, and equipment will be applied; • Energy uses associated with WWTP units and utility facilities will be monitored; • Training will be performed for project personnel regarding energy efficiency.	Positive	Included in operation cost	Asım Kibar OIZ

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Soil Environment: Soil Contamination	Contamination of soil, Possibility of contamination of underground waters close to the surface, Scatter/dispersion of contaminated soil due to improper handling, transferring and disposal of the contaminated soil, Improper reuse of contaminated soil as landscaping,	Low	• The staff will be trained in proper management of liquid waste to avoid soil contamination during maintenance and repair works; • The amount of soil that could be subject to contamination will be minimized by ensuring the use of only the designated worksites and routes for the machinery and equipment and field personnel during maintenance and repair works; • Machinery and equipment will be checked regularly for leaking oil and fuel; • In the event of an accident, leak or spill, necessary repair works and/or replacement of parts will be performed promptly in accordance with the standards; • Provisions of the Regulation on the Control of Soil Pollution and Sites Contaminated by Point Sources will be complied with; and • After dewatering, the sludge cake will be transferred to a covered and appropriate container. After that, the excess sludge will be sent to licensed facility (after determining its waste class status by an accredited laboratory). The sludge dried in the licensed facility will be sent to cement factories as fuel.	Negligible/ None	Included in operation cost	Asım Kibar OIZ
Water Resources: Quality Change in Water Bodies	Improving water quality of Kumla Creek	Low	• The effluent water quality of the existing WWTP will be consistent with the limit values stipulated in the Table 19 of the Water Pollution Control Regulation, at minimum; • If the water lines will be periodically flushed to remove accumulated sediments or other impurities that have accumulated in the pipe, the water will be flushed into the municipal sewerage system. • Activities should not affect the availability of water for drinking and hygienic purposes. • No polluted substances, solid waste, toxic or hazardous substances will be stored, spilled or disposed of in water bodies for dilution or disposal. • The flow of natural waters should not be obstructed or diverted to another direction, which may lead to drying up of river beds or flooding of settlements.	Negligible/ None	Included in operation cost	Asım Kibar OIZ
Noise Control	Increase in background noise.	Low	• During the procurement of equipment and machinery, sound levels given in the technical specifications/data sheet will be taken into consideration; • Relevant provisions and limit values of Regulation on the Environmental Noise Emissions Caused by Equipment Used Outdoors and Regulation on Environmental Noise Control (RENC) and WBG General EHS Guidelines and Sectorial Guidelines will be complied with during the operation phase; • If necessary nosie-control methods such as fences, barriers or deflectors will be used Equipment generating noise during the operation of the plant will be located in isolated closed buildings and some of them will be submerged in wastewater, if necessary. A grievance mechanism will be established to manage noise related grievances as well. • The work schedule will be adjusted by communicating with sensitive receptors.	Negligible/ None	Included in operation cost	Asım Kibar OIZ

Resource Management	Resources used/consumed during works	Low	• Starting from the operation phase, Asım Kibar OIZ will seek assistance from technical consultants to reduce energy consumption and related costs through optimization of the following:
			  ○ Energy conservation,
			  ○ Process efficiency,
			  ○ Aeration devices and oxygen transfer,
			  ○ Process flow configuration,
			  ○ Biogas quantities,
			  ○ Biogas utilization,
			  ○ Time of day consumption of energy.
				Negligible/ None	Included in operation cost	Asım Kibar OIZ

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Waste and Wastewater Management: Waste Generation	Inefficient management of resources and increased amount of waste due to not separating waste and/or storing, handling or transferring wastes improperly. Possibility of increased public health hazard risks, deterioration of surface water, underground water and air quality, and/or soil contamination due to improper storage, handling and transfer of hazardous wastes, Possibility of air and/or soil pollution risk due to unauthorized burial and burning of waste on the site.	Low	• Waste Management Plan will be updated by Asım Kibar OIZ to reflect the operation phase conditions before commencement of the operation phase. Relevant measures defined for the construction phase also apply also to the operation phase. The updated plan will provide procedures for the management of waste other than sludge; • The broken/end-of-life panels should be managed following the Waste Management Regulation and the Zero Waste Regulation. Considering their hazardous content, those shall be delivered to the licensed recycling/disposal facilities; • Waste to be generated within the scope of the Project will be managed in accordance with the waste management hierarchy; • Waste recycling, transport and disposal will be carried out by means of licensed companies and/or Kocaeli Metopolitan Municipality; • Domestic waste will be collected and sent to Kocaeli Metropolitan Municipality Waste Disposal Area operated by İzaydaş. Other wastes generated will be given to licensed organizations within the framework of the legislation. • Incineration or burying of waste by any means on site and/or dumping of waste to nearby roads or water resources will absolutely not be in question; • All kinds of implementations that may threaten personnel or public health will be avoided in all activities involving collection, temporary storage, transport and disposal of waste throughout the Project; • Waste to be temporarily stored on site will be delivered to licensed transport vehicles appropriate to the type of waste for disposal. Information related to the operations in this context will be recorded and the records will be kept in the administrative building; • Waste will be separated (i.e., hazardous / non-hazardous, recyclable / non-recyclable) and stored in designated temporary storage areas; • Temporary storage of waste will be labelled with an indication of hazardous or non-hazardous inscription, waste code, stored waste amount and storage date and classification according to their properties. The reaction of wastes with each other will be prevented by the measures taken in the Temporary Storage Area; and • Hazardous wastes will be stored in designated impermeable waste storage areas. • Impermeability will be provided on the floors of the Temporary Storage Area and a suitable drainage system will be installed. Spill kits will be available at the Temporary Storage Area and necessary precautions will be taken against possible fires such as provision of appropriate firefighting equipment.	Negligible/ None	Included in operation cost	Asım Kibar OIZ

Waste and Wastewater Management:
Wastewater Generation
	Wastewater generation in the WWTP,
	Deterioration of quality in nearby water bodies due to wastes carried by waste dispersion or improper solid waste storage, handling and transfer.
		Low	• Asım Kibar OIZ will prepare and implement monitor a Water Resources and Effluent Management Plan that is in line with WB ESS1 and WBG EHS Guidelines (both general and sector specific) should be prepared and the employees will be trained on the plan, prior to the operation phase to ensure that:
			• The effluent water quality of the WWTP will be consistent with Water Pollution Control Regulation and Urban Wastewater Treatment Regulation requirements or internationally accepted standards;
			• System overflows will be prevented as much as possible by using level-meters;
			• Since the water system leaks and loss of pressure is rather significant for the operation phase of WWTP,
			  ○ Regular inspection and maintenance should be conducted;
			  ○ A leak detection and repair program should be implemented (including records of past leaks and unaccounted-for water to identify potential problem areas);
			  ○ Mains having a greater potential for leaks because of their location, pressure stresses, and other risk factors should be replaced.
			• Machinery and equipment will be checked regularly for leaking oil and fuel; to prevent contamination of near surface water and groundwater resources during operation and maintenance activities.
			• Establish safe delivery/storage/handling procedures in accordance with material safety data sheets (MSDSs),
			• Immediately contain and cleanup any spilled material.
				Low	Included in operation cost	Asım Kibar OIZ

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Waste Management: Sludge Generation	Generation of sludge at the end of the water treatment process.	Medium	• Asım Kibar OIZ will prepare and implement a Sludge Management Plan in line with WB ESS1 and WBG General EHS Guidelines (both general and sector specific) and the employees will be trained on the plan; • The Sludge Management Plan will determine more sustainable alternatives than landfilling. If there is no option other than final disposal, the procedure to be followed for disposal should be defined within the scope of the management plan; • Final sludge will be stored in special containers designated for this purpose only; • Dried sludge will be sent to nearest appropriate licensed company (after determining its waste class status by an accredited laboratory) with licensed trucks.	Low	Included in operation cost	Asım Kibar OIZ
Landscape and Visual (Aesthetics) Concerns	Creation of visual pollution.	Low	• Trees will be planted at the borders of the WWTP; • Asım Kibar OIZ should paint the visible buildings to colors suitable to the background.	Low	Included in operation cost	Asım Kibar OIZ
Biological Environment						
Pesticide Use	Soil, Water and Air Pollution, Biodiversity loss	Low	• For handling highly toxic pesticides, additional PPE such as chemical-resistant suits or full-face respirators may be required. • Pesticides should be stored in a secure, designated area, such as a locked cabinet or a chemical storage room, away from food, drink, and incompatible chemicals. • All pesticide containers must be clearly labeled with the name of the pesticide, active ingredients, hazard warnings, and the date of receipt or preparation. • Only the minimum necessary amount of pesticide should be handled at any one time to reduce the risk of spills or accidental exposure. • Immediate and proper spill cleanup procedures should be in place, including the use of spill kits specifically designed for chemical or pesticide spills. • Work surfaces where pesticides are handled should have secondary containment (e.g., trays or liners) to catch any spills or leaks.	Negligible/ None	Included in operation cost	Asım Kibar OIZ
Terrestrial habitats and flora species	Damage or loss of terrestrial habitats and flora species	Low	• Encourage the growth of native plants around the Advanced Environmental Laboratory. Native flora supports local wildlife and helps maintain ecosystem health. • Limit maintenance activities that require heavy machinery, and avoid unnecessary land clearing.	Negligible/ None	Included in operation cost	Asım Kibar OIZ
Terrestrial fauna species	Disturbing/harming of terrestrial fauna species	Low	• Properly manage waste generated during operations to prevent contamination of soil and water, which can adversely affect terrestrial habitats. • Schedule maintenance and operational activities to avoid critical periods for local fauna, such as breeding or nesting seasons.	Negligible/ None	Included in operation cost	Asım Kibar OIZ
Socio-economic Environment						
Community Health and Safety	Community health and safety risks	Low	• The public, nearby institutions and organizations, and hospitals and schools will be informed at least two days before starting repair/maintenance works that may cause disturbance. • The grievance mechanism officer will be introduced to the local people and updated information about the grievance mechanism will continue to be provided. In case of an update in the documents, the updated information will be announced to the local people through the relevant headman's office.	Low	Included in operation cost	Asım Kibar OIZ
Labour and Working Conditions	Improper Working Conditions Child Labor, forced Labor and unregistered employment	Low	• Concluding written contracts with workers upon recruitment, including job description, working hours, wages, terms and conditions of employment and rights in accordance with national legislation and Code of Conduct • Workers will be familiar with the grievance mechanism officer and will be enabled to have access to and be aware of the Grievance mechanism. • Minimum legal labour standards will be met (child/forced labour, anti-discrimination, working hours, minimum wages) as per ILO regulations. • At the same time, national laws/ regulations and international conventions/ standards will be complied with in terms of the working conditions. • Monitoring of compliance with above	Low	Included in operation cost	Asım Kibar OIZ

Issue	Potential Impact	Impact Significance Before Mitigation	Mitigation Measure	Impact Significance After Mitigation	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
Occupational Health and Safety	Inadequate workers health and safety conditions	Medium	• Prior to start operation, Occupational Health and Safety Plan will be prepared based on operational OHS risks. • Before starting work, employees will be knowledgeable about job descriptions, responsibilities, relationships with the local people, and risks that may threaten occupational health and safety. • Workers will be provided with appropriate induction, health and safety training and information. • All equipment used during the operation phase will be kept in good working condition. • Emergency Plans" will be prepared for a potential accident or emergency. Emergency teams will be formed, and drills and training programs will be carried out in line with emergency scenarios. • Employees will have a good command of emergency plans, and the grievance will be reported to the authorized teams and resolved if they require urgent action. • In case of any potential accident involving injury during the operation phase, the equipment for first aid will be kept available at the rehabilitation centre, taking into account that first aid response may be required before the casualty is referred to the nearest healthcare provider. • The OIZ formally agrees that all work will be carried out in a safe and disciplined manner and is designed to minimize risks to neighbouring residents and the environment. • All activities will be implemented in line with both the Law on Occupational Health and Safety and its relevant regulations, and also the WBG's EHS Guidelines. • Both training and incidents (fatalities, lost time incidents, outbreak of pandemic or communicable diseases, social unrest, etc.) will be recorded. • In the event of any significant incident (e.g. environmental, social, labour or lost-time incidents) the OIZ shall inform the MoIT and WB within three business days. Then, within 30 days, a report on the root causes of the incident and the corrective actions to be taken will be presented to the MoIT and WB. • Equipment that meets international standards in terms of performance and safety will be used in the Project • The chemicals will be stored indoors by taking sealing precautions and only experienced personnel will handle chemicals, while employees will have minimal contact with them in terms of quantity and duration. • Adequate ventilation systems will be installed in all areas where chemicals are stored or used to ensure that air quality standards are maintained, and the risk of exposure is minimized. • Necessary precautions will be implemented at the working areas at height by covering ground-mounted safety railing and compliant handrail systems, lifelines, working/maintaining platforms	Low	Included in operation cost	Asım Kibar OIZ
Grievance mechanism	Grievance Issues. Insufficient and/or ineffective grievance mechanism for the internal and external stakeholders.	Low	• An efficient grievance mechanism will be initiated to allow potentially affected community members and employees to voice their concerns on the Project.	Low	Included in operation cost	Asım Kibar OIZ
Stakeholder Engagement	Lack of communication with the stakeholders. Insufficient stakeholder engagement activities and public consultation.	Low	• Interaction/communication will be established with communities, and adequate timing will be planned for engagement activities. Additionally, regular consultations will be carried out with the authorities and communities regarding the project management.	Low	Included in operation cost	Asım Kibar OIZ

9 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

Monitoring is essential to ensuring the effectiveness and continuity of the put into practice mitigation management measures. Evaluating how well the requirements and mitigation strategies outlined in this ESMP are being implemented is the primary goal of the Monitoring Plan.

Throughout the whole project, management plans can be enhanced with the use of monitoring data. Impact assessments make an effort to identify all relevant potential impacts, as well as to include appropriate responses for these impacts. However, unforeseen impacts can still occur, and these can be managed or mitigated using the information gathered through monitoring before they become a problem. Thus, monitoring will guarantee that the mitigation and management plans are implemented successfully and maximize environmental protection through best practices at every phase of the project.

As a result, monitoring studies will guarantee that effect mitigation strategies are implemented correctly and that environmental protection is optimized throughout the Project by utilizing best practices.

Engineering design studies determine a portion of the monitoring parameters. Monitoring studies will guarantee that effect mitigation strategies, contract requirements, and project standards are followed.

Monitoring activities are submitted in tabular form in Table 25, Table 26 and Table 27 for pre-construction and construction, and operation phases, respectively.

Table 25 Monitoring Plan for the Pre-Construction Phase

Issue	**Parameters to be monitored** *(What parameter is to be monitored?)*	**Target/Threshold Value***	**Monitoring location** *(Where the parameter is to be monitored?)*	**Monitoring Method** **(How** *is the parameter to be monitored/ type of monitoring equipment?)*	**Timing/Frequency of Monitoring** *(When is the parameter to be monitored- frequency of measurement or continuous?)*	**Cost of Monitoring** *(What is the cost of equipment or contractor charges to perform monitoring?)*	**Responsible Party/Parties**	**Supervision observation and comments** *to be filled out during supervision with reference to adequate measuring reports*
Air quality	Settled dust, PM_{10} and $PM_{2.5}$	Below the Project standards PM_{10}: Daily mean value will not exceed 50 µg/m^3 more than 35 times in a year and annual mean value will not exceed 40 µg/m^3 $PM_{2.5}$: Annual mean value will not exceed 10 µg/m^3. Settled Dust: Long-term limit value: 390 mg/m^2day, Short-term limit value: 210 mg/m^2day No air quality related grievance received	In case of a complaint, in the relevant area[9]	Sampling/analysis via an authorized environmental laboratory Visually, on the basis of irritation of the respiratory system	One monitoring from the start of the pre-construction phase (land preparation, topsoil stripping Upon grievance	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	
	Maintenance and exhaust decal records of all machinery and equipment	Below the Project Standards: CO: 50 kg/h Dust: 1 kg/h NOx: (as NO_2) 4 kg/h SOx: 6 kg/h TOC: 3 kg/h	Administration office of Contractor for the follow-up of records	Maintenance records	Monthly during the pre-construction phase	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	
Storage and usage of topsoil	Amount of stripped and reused topsoil by indicating reuse locations Storage conditions of topsoil (humidity and pile height)	No loss of topsoil	Construction site and storage areas	Visual observation Records	Once in a week starting from the initialization of pre-construction phase	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	
Storage and usage of chemicals including fuels	Conditions of the storage area Number of leaks, spills, etc.	No chemical spill incident	Entire Project Area and chemical storage locations	Visual observation Site inspections Environmental incident registry	Once in a week starting from the initialization of pre-construction phase	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	

[9] The prevailing wind direction is southeast and east, indicating the wind's origin. To account for annual variation, measurements are recommended west of the project area, near the substation building, 60 meters west (249055.5 E, 4517140.2 N).

Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value*	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method **(How** *is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties	Supervision observation and comments *to be filled out during supervision with reference to adequate measuring reports*
Water resources	Surface water / groundwater quality analysis and measurements that include spill-related pollutants including the parameters of pH, BOD, COD, TSS, TDS, TP, TKN, nitrate, nitrite, TN, salinity, etc.	Prevention of water quality deterioration compared to current surface water and groundwater quality COD: 250 mg/L TSS: 200 mg/L Oil and grease: 20 mg/L Total Phosphorus (P): 2 mg/L Total Chrome: 2 mg/L Chrome (Cr^{+6}): 0.5 mg/L Lead (Pb): 2 mg/L Total Cyanide (CN-): 1 mg/L Cadmium (Cd): 0.1 mg/L Ferrous (Fe): 10 mg/L Fluoride (F-): 15 mg/L Copper (Cu): 3 mg/L Zinc (Zn): 5 mg/L Mercury (Hg): 0.05 mg/L Sulphate (SO_4^{-2}): 2500 mg/L Total Kjeldahl Nitrogen (TKN): 20 mg/L Fish Bioassay (TDF): 10 Color: 280 Pt-Co pH:6-9	At the upstream and downstream of Kumla Creek At related water resources (wells, fountains, etc.)	Sampling and in situ / laboratory measurements via an authorized environmental laboratory Spill notices/correspondences to authorities in case of major spills	In case of a major spill In case of a leak/spill reaches water bodies	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	
Noise	Noise levels	Not exceeding the limit values defined in Project Standards Day time (07:00-19:00): $LA_{eq,\ 5\ min.}$< 65 dB(A) Evening time (19:00-23:00): $LA_{eq,\ 5\ min.}$< 60 dB(A) Night time (23:00-07:00): $LA_{eq,\ 5\ min.}$< 55 dB(A)	In case of a complaint, in the relevant area	At least 24-hr noise measurements via an authorized environmental laboratory	Monthly starting from the initialization of pre-construction phase when the all machineries (scheduled to work that month) are operating Upon grievance	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	
	Number of complaints	No noise related grievance received	Administration office of Contractor for the follow-up of records	Grievance Registration	Monthly during the pre-construction phase	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	
Waste	Type and amount of waste generated	Adhering to the TurkStat estimation of 0.82 kg/person/day waste generation Minimizing the amount of waste to be sent for disposal and implementing waste management hierarchy	Treatment plant site, storage areas	Visual inspection regarding proper collection and temporary storage of waste and records kept regarding their coordinated recycle / disposal via licensed firms Waste Records Site inspections Disposal truck register	Once in a month starting from the initialization of the pre-construction phase	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	

Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value*	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method **(How** *is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties	Supervision observation and comments *to be filled out during supervision with reference to adequate measuring reports*
Resources	Types and amounts of materials/resources used	Use of recycled materials whenever possible Reducing energy consumption	Administration office	Material/resource procurement/consumption records	Quarterly during the pre-construction phase	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	
Infrastructure Damage	Number and nature of cases and amount of compensation paid	No infrastructure cases	Administration office	Incident records Receipts of compensation payments	Monthly during the pre-construction phase	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	
Trespassing	Trespassing cases	No trespassing	Administration office	Security reports Visitor logs	Weekly during the pre-construction phase	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	
	Condition of CCTV system			System checks	Daily during the pre-construction phase			
Community Health and Safety	Health and safety signs and traffic signs placed in appropriate locations, Health and Safety Plan prepared, Emergency Action Plan prepared	A limited number of cases occurring and effective response to them within prescribed time	AoI	Visual observation Site inspection	Daily basis Upon grievance	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	
Working Conditions	Workers' grievances	A limited number of cases 100 percent of satisfactorily resolved grievances within stipulated time	Project area	Grievance records	Weekly during the pre-construction phase	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	

Issue	**Parameters to be monitored** *(What parameter is to be monitored?)*	**Target/Threshold Value***	**Monitoring location** *(Where the parameter is to be monitored?)*	**Monitoring Method** **(How** *is the parameter to be monitored/ type of monitoring equipment?)*	**Timing/Frequency of Monitoring** *(When is the parameter to be monitored- frequency of measurement or continuous?)*	**Cost of Monitoring** *(What is the cost of equipment or contractor charges to perform monitoring?)*	**Responsible Party/Parties**	**Supervision observation and comments** *to be filled out during supervision with reference to adequate measuring reports*
Occupational Health and Safety	Number of incidents	No OHS incidents occurred	Construction site	Incident records Site inspections and OHS audit	Daily basis starting from the initialization of the pre-construction phases Monthly during the pre-construction phase	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	
	Incident investigation	No OHS incidents occurred		Incident investigation records	Daily basis starting from the initialization of the pre-construction phases			
	Period of disease occurrence	No infectious disease is recorded		Disease follow-up register	Daily basis starting from the initialization of the pre-construction phases			
	Training requirements	100 percentage of prescribed staff duly trained, and with satisfactory result		Annual Environmental, Social Health, and Safety (ESHS) training plan	Annually during the pre-construction phase			
	Adequate OHS organizational structure.	1 fulltime OHS staff throughout the life of the Project		Site implementation Site inspection	Monthly during the pre-construction phase			
	Total hours worked by employee	As specified in the LMP , total hours worked should be less than 11 hours/worker/day including overtime and the total of overtime working hours cannot exceed 270 hours/worker/year.		Timesheets, Grievance records	Monthly, yearly			
Protecting the Workforce and Prevention of use of forced labour	Age of candidate employee Total working hours Wages and benefits Grievances Non-discrimination practices	No case of child labor 100% of workers receive timely wages and overtime compensation. Compliance with minimum wage standards for 100% of workers All workers receive statutory benefits (social security, leave, etc.). 100% of workers have formal contracts. All contracts include terms on wages, hours, and grievance mechanisms. All worker grievances resolved within 30 days of submission. 100% of grievances documented and tracked. Zero incidents of discrimination or harassment. Equal pay for equal work for all workers. Evidence of worker freedom to join unions or associations. Zero reports of interference in worker organization.	Administration office and Project area	Age verification with National ID Timesheets Payroll audits Grievance records Worker interviews	Before each recruitment Monthly, yearly	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	

Issue	**Parameters to be monitored** *(What parameter is to be monitored?)*	**Target/Threshold Value***	**Monitoring location** *(Where the parameter is to be monitored?)*	**Monitoring Method** **(How** *is the parameter to be monitored/ type of monitoring equipment?)*	**Timing/Frequency of Monitoring** *(When is the parameter to be monitored- frequency of measurement or continuous?)*	**Cost of Monitoring** *(What is the cost of equipment or contractor charges to perform monitoring?)*	**Responsible Party/Parties**	**Supervision observation and comments** *to be filled out during supervision with reference to adequate measuring reports*
Workers Engaged by Third Parties and the Supply Chain	Contractor and sub-contractor agreements	No nonconformity is observed with the ESMP	Administration office	Contract reviews by ESHS expert(s)	Before each agreement made	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	
Gender Based Violence (GBV), Sexual Exploitation Abuse / Sexual Harassment (SEA/SH)	GBV and SEA/SH related incidents / grievance records GM, GBV, SEA/SH trainings	No GBV and SEA/SH related issue/ grievance record and in case of such issues, prescribed procedure ensuring confidentiality observed	Administration office and Project area	Document review Review of grievance logs Training logs	Monthly Upon relevant grievances	Included in pre-construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)	

**In cases where the Turkish requirements differ from the levels and measures presented in the WBG's EHS Guidelines, the more stringent one (such as the most stringent discharge and emission standards) will be applied in the project specifications.*

Table 26 Monitoring Plan for the Construction Phase

Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value*	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties
Air quality	Settled dust, PM_{10} and $PM_{2.5}$	Below the Project Standards PM_{10}: Daily mean value will not exceed 50 µg/m^3 more than 35 times in a year and annual mean value will not exceed 40 µg/m^3 $PM_{2.5}$: Annual mean value will not exceed 10 µg/m^3. Settled Dust: Long-term limit value: 390 mg/m^2day, Short-term limit value: 210 mg/m^2day No air quality related grievance received	In case of a complaint, in the relevant area Where sampled during the pre-construction phase	Sampling/analysis via an authorized environmental laboratory Visually, on the basis of irritation of the respiratory system	Monthly starting from the initialization of construction phase Upon grievance	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
	Maintenance and exhaust decal records of all machinery and equipment	Below the Project Standards: CO: 50 kg/h Dust: 1 kg/h NOx: (as NO_2) 4 kg/h SOx: 6 kg/h TOC: 3 kg/h	Administration office of Contractor for the follow-up of records	Maintenance records	Quarterly during the construction phase	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Soil contamination	Amount of contaminated soil	No soil contamination resulting from project activities	Project Area	Visual observation	After each incident	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Storage and usage of chemicals including fuels	Conditions of the storage area Number of leaks, spills, etc.	No chemical spill incident	Entire Project Area and chemical storage locations	Visual observation Site inspections Environmental incident registry	Once in a week starting from the initialization of construction phase	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Storage and use of excavation waste	Amount of refilled, stored and disposed excavation materials	Proper management of excavation wastes	Construction site and storage areas	Visual observation Records	Once in a week starting from the initialization of construction phase	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

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
Water resources	Surface water / groundwater quality analysis and measurements that include spill-related pollutants including the parameters of pH, BOD, COD, TSS, TDS, TP, TKN, nitrate, nitrite, TN, salinity, etc.	Prevention of water quality deterioration compared to current surface water and groundwater quality COD: 250 mg/L TSS: 200 mg/L Oil and grease: 20 mg/L Total Phosphorus (P): 2 mg/L Total Chrome: 2 mg/L Chrome (Cr^{+6}): 0.5 mg/L Lead (Pb): 2 mg/L Total Cyanide (CN-): 1 mg/L Cadmium (Cd): 0.1 mg/L Ferrous (Fe): 10 mg/L Fluoride (F-): 15 mg/L Copper (Cu): 3 mg/L Zinc (Zn): 5 mg/L Mercury (Hg): 0.05 mg/L Sulphate (SO_4^{-2}): 2500 mg/L Total Kjeldahl Nitrogen (TKN): 20 mg/L Fish Bioassay (TDF): 10 Color: 280 Pt-Co pH:6-9	At the upstream and downstream of Kumla Creek At related water resources (wells, fountains, etc.)	Sampling and in situ / laboratory measurements via an authorized environmental laboratory Spill notices/correspondences to authorities in case of major spills	In case of a major spill In case of a leak/spill reaches water bodies	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Noise	Noise levels	Not exceeding the limit values defined in Project Standards: Receptor: Industrial, commercial: Day time (07:00-19:00): $LA_{eq,\ 5\ min.}$< 65 dB(A) Evening time (19:00-23:00): $LA_{eq,\ 5\ min.}$< 60 dB(A) Nighttime (23:00-07:00): $LA_{eq,\ 5\ min.}$< 55 dB(A)	In case of a complaint, in the relevant area	At least 24-hr noise measurements via an authorized environmental laboratory	Monthly starting from the initialization of construction phase Upon grievance	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
	Number of complaints	No noise related grievance received	Administration office of Contractor for the follow-up of records	Grievance Registration	Quarterly during the construction phase	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Waste	Type and amount of waste generated	Adhering to the TurkStat estimation of 0.82 kg/person/day waste generation Minimizing the amount of waste to be sent for disposal and implementing waste management hierarchy	Treatment plant site, storage areas	Visual inspection regarding proper collection and temporary storage of waste and records kept regarding their coordinated recycle / disposal via licensed firms Waste Records Site inspections Disposal truck register	Once in a month starting from the initialization of the construction phase	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

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
Resources	Types and amounts of materials/resources used	Use of recycled materials whenever possible Reducing energy consumption	Administration office	Material/resource procurement/consumption records	Quarterly during the construction phase	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Infrastructure Damage	Number and nature of cases and amount of compensation paid	No infrastructure cases	Administration office	Incident records Receipts of compensation payments	Monthly during the construction phase	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Trespassing	Trespassing cases	No trespassing	Administration office	Security reports Visitor logs	Weekly during the construction phase	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
	Condition of CCTV system			System checks	Daily during the construction phase		
Community Health and Safety	Health and safety signs and traffic signs placed in appropriate locations Number of Grievances,- number and nature of grievances Number of incidents, Number of accidents	No community health and safety incidents occurred No community health and safety accidents occurred 100 percent of satisfactorily resolved grievances within stipulated time	Project Area	Visual observation Site inspection Grievance logs, Accident investigation and root cause records	Daily basis Upon grievance	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Working Conditions	Workers' grievances – number and nature of grievances Training records Recruitment documentations	All employees will be trained on OHS, GM, GBV, SEA/SH and other E&S issues. All grievances closed-out within the target timeframe.	Administration office	Grievance records Accident/incident records, On-site inspections	Weekly during the construction phase	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Occupational Health and Safety	Number of incidents	No OHS incidents occurred	Construction site	Incident records	Daily basis starting from the initialization of the construction phases	Included in construction cost	Contractor (implementation)

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
	Incident investigation	No OHS incidents occurred		Incident investigation records Site inspections and OHS audit	Daily basis starting from the initialization of the construction phases Monthly during the construction phase		Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
	Period of disease occurrence	No infectious disease is recorded		Disease follow-up register	Daily basis starting from the initialization of the construction phases		
	Training requirements	100 percentage of prescribed staff duly trained, and with satisfactory result		Annual Environmental, Social Health, and Safety (ESHS) training plan	Annually during the construction phase		
	Adequate OHS organizational structure.	1 fulltime OHS staff to be		Site implementation Site inspection	Monhly during the construction phase		
	Total hours worked by employee	As specified in the LMP, total hours worked should be less than 11 hours and the total of overtime working hours cannot exceed 270 hours in a year.		Timesheets, Grievance records	Monthly, yearly		
Protecting the Workforce and Prevention of use of forced labour	Age of candidate employee Total working hours Wages and benefits Grievances Non-discrimination practices	No cases of child labor No complaints about forced labor	Administration office and Project area	Age verification with National ID Timesheets Payroll audits Grievance records Worker interviews Labour Audit	Before each recruitment Upon grievance	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Workers Engaged by Third Parties and the Supply Chain	Contractor and sub-contractor agreements	No nonconformity is observed with the ESMP	Administration office	Contract reviews by ESHS expert(s)	Before each agreement made	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)
Gender Based Violence (GBV), Sexual Exploitation Abuse / Sexual Harassment (SEA/SH)	GBV and SEA/SH related incidents Grievance records	No GBV and SEA/SH related issues and in case of such issues, prescribed procedure ensuring confidentiality observed Minimum 1 annual refresher training for SEA/SH and GBV	Administration office and Project area	Document review Review of grievance logs Training records	Montly Upon relevant grievances Yearly	Included in construction cost	Contractor (implementation) Asım Kibar OIZ (following-up and coordination with the MoIT PIU) Construction Supervision Consultant (supervision/monitoring)

**In cases where the Turkish requirements differ from the levels and measures presented in the WBG's EHS Guidelines, the more stringent one (such as the most stringent discharge and emission standards) will be applied in the project specifications.*

Table 27 Monitoring Plan for the Operation Phase

Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value*	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring **(When** *is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties
Soil and Contaminated Land	Number of spills/leaks Amount of contaminated soil Soil quality, including heavy metals, petroleum hydrocarbons, organic halogens	No soil contamination resulting from project activities	Entire construction site	Environmental incident reports Sampling and analysis by an authorized environmental laboratory	Monthly during the operation phase After each incident Upon grievance	Included in operation cost	Asım Kibar OIZ
Water quality of the receiving environment	Water quality analysis parameters including Ammonium, Oil and Grease, Biological Oxygen Demanded BOD, Dissolved Oxygen DO, Conductivity, Chemical Oxygen Demanded COD, Nitrate, pH, Total Phosphorus, TP, Ortophosphate, Total Kjeldahl Nitrogen, TKN, Total Nitrogen, TN, Floride, Manganese, Selenium, Sulphur	Prevention of water quality deterioration compared to current surface water COD: 250 mg/L TSS: 200 mg/L Oil and grease: 20 mg/L Total Phosphorus (P): 2 mg/L Total Chrome: 2 mg/L Chrome (Cr^{+6}): 0.5 mg/L Lead (Pb): 2 mg/L Total Cyanide (CN-): 1 mg/L Cadmium (Cd): 0.1 mg/L Ferrous (Fe): 10 mg/L Fluoride (F-): 15 mg/L Copper (Cu): 3 mg/L Zinc (Zn): 5 mg/L Mercury (Hg): 0.05 mg/L Sulphate (SO_4^{-2}): 2500 mg/L Total Kjeldahl Nitrogen (TKN): 20 mg/L Fish Bioassay (TDF): 10 Color: 280 Pt-Co pH:6-9	Kumla Creek	In-situ measurements and laboratory measurements and analysis via an authorized environmental laboratory Spill notices/correspondences to authorities in case of major spills	Quarterly during the operation phase	Included in operation cost	Asım Kibar OIZ
Odor	Odor Level	All grievances, resolved adequately, fast and to the satisfaction of the complainants.	Location of Grievance	Grievance records Measurement via an authorized environmental laboratory	Upon grievance	Included in operation cost	Asım Kibar OIZ
Effluent water quality	COD, TSS, Oil and grease, TP, Total Chromium, Chromium (Cr+6), Lead (Pb), Total Cyanide (CN-), Cadmium (Cd), Iron (Fe), Fluoride (F-), Copper (Cu), Zinc (Zn), Mercury (Hg), Sulphate (SO4-2), Total Kjeldahl Nitrogen (TKN), Fish Bioassay (TDF), Colour, pH	Effluent discharge compliant with the discharge standards	Kumla Creek	Automatic measurement for relevant parameters and laboratory analysis for others via an authorized environmental laboratory	Continuous monitoring for the detectable by automatic measurement devices Twice a month for the others (at minimum 24 samplings in a year)	Included in operation cost	Asım Kibar OIZ
Noise	Noise level	Not exceeding the limit values defined in Regulation on Environmental Noise Control and WB standards No noise related grievance received	In case of a complaint, in the relevant area	At least 24-hr noise measurements via an authorized environmental laboratory	Once in a year Upon grievance	Included in operation cost	Asım Kibar OIZ
Waste	Type and amount of waste generated including sludge	Adhering to the TurkStat estimation of 0.82 kg/person/day waste generation Minimizing the amount of waste to be sent for disposal and implement waste management hierarchy	Treatment plant site and storage areas	Visual observation Waste Records Site inspections Disposal truck register	Weekly basis starting from the initialization of the operation phase of the Project	Included in operation cost	Asım Kibar OIZ
Resources	Types and amounts of materials/resources used	Use of recycled materials whenever possible Reducing energy consumption	Administration office	Material/resource procurement/consumption records	Annually starting from the initialization of operation phase	Included in operation cost	Asım Kibar OIZ

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
Infrastructure Damage	Number and nature of cases and amount of compensation paid	No infrastructure cases	Administration office	Incident records Receipts of compensation payments	Monthly during the operation phase	Included in operation cost	Asım Kibar OIZ
Trespassing	Trespassing cases	No trespassing	Administration office	Security reports Visitor logs	Weekly during the operation phase	Included in operation cost	Asım Kibar OIZ
	Condition of CCTV system			System checks	Daily during the operation phase		
Community Health and Safety	Health and safety signs and traffic signs placed in appropriate locations	All cases that cause health and safety problems to be prevented	Project Area	Visual observation Site inspection	Daily basis Upon grievance	Included in operation cost	Asım Kibar OIZ
Working Conditions	Workers' grievances	Proper management of provisions given in ESMP	Administration office	Grievance records	Weekly during the operation phase	Included in operation cost	Asım Kibar OIZ
Occupational Health and Safety	Number of incidents	No OHS incidents occurred	Administration office	Incident records	Daily basis starting from the initialization of operation phase	Included in operation cost	Asım Kibar OIZ
	Incident investigation	No OHS incidents occurred		Incident investigation records	Daily basis starting from the initialization of operation phase		
	Period of disease occurrence	No infectious disease is recorded		Disease follow-up register	Daily basis starting from the initialization of operation phase		
	Number of personnel who are infected with an infectious disease	No infectious disease occurred		Training records	Monthly during the operation phase		
	Training requirements	Every training defined in the Annual ESHS is completed		Annual ESHS training plan	Annually during the operation phase		
	Total hours worked by employee	Total hours worked should be less than 11 hours/worker/day The total of overtime working hours cannot exceed 270 hours in a year.	Administration office	Timesheets, Grievance records	Monthly, yearly		
Protecting the Workforce	Age of candidate employee	No case of child labor	Administration office	Age verification with National ID	Before each recruitment	Included in operation cost	Asım Kibar OIZ
Gender Based Violence (GBV), Sexual Exploitation Abuse / Sexual Harassment (SEA/SH)	GBV and SEA/SH related incidents Grievance records	No GBV and SEA/SH related issues and in case of such issues, prescribed procedure ensuring confidentiality observed Minimum 1 annual refresher training for SEA/SH and GBV	Administration office	Document review Review of grievance logs Training records	Quarterly Upon relevant grievances Yearly	Included in operation cost	Asım Kibar OIZ

10 INSTITUTIONAL ARRANGEMENT AND TRAINING

The main responsible organization for the implementation of this ESMP is Asım Kibar OIZ. Asım Kibar OIZ/PMU does not yet have the personnel and resources to ensure the implementation of the Environmental and Social Management Plan (ESMP), which covers all stages of the Project and consists of management plans on different issues. A PMU will be established to carry out operational and administrative tasks. The PMU consists of the Asım Kibar OIZ's own staff.

Besides, on different phases of the Project, various parties (contractors, Construction Supervision Team, Ministry of Industry and Technology (MoIT), etc.) will take responsibility for various works in the scope of the ESMP. All mentioned works will be coordinated by the Asım Kibar OIZ. Mitigation and monitoring tables, which are given in this ESMP, summarize the relevant responsibilities.

In that scope, it is suggested to add below mentioned liabilities to tender documents of any possible contractor(s):

- The full ESMP,
- Environmental, social and occupational health and safety liabilities,
- Other environmental and social issues that can show-up.
- Additional management plans (have been listed Table 2).

10.1 Roles and Responsibilities

The entire Project will be financed by the WB. MoIT is responsible for the coordination of the Project and acting as the contracting authority. Asım Kibar OIZ is the sub-borrower.

The draft ESMP will be made available to the public in both Asım Kibar OIZ's and MoIT's webpages prior to being finalized and approved. MoIT Project Implementation Unit (PIU) will include an environmental specialist, a social expert and an OHS specialist to supervise the implementation of the ESMP. The specialist will supervise the implementation of the ESMP by Asım Kibar OIZ and document performance, recommendations and any further actions required. He/she will provide guidance to Asım Kibar OIZ officials on WB procedures, consultation and disclosure requirements. In addition, Asım Kibar OIZ will inform MoIT and WB on any project changes or unforeseen circumstances in the approved project documents.

Asım Kibar OIZ will be responsible for providing technical and data support during the supervision of contractors and the preparation of technical and financial feasibility reports regarding projects. Moreover, Asım Kibar OIZ holds ultimate responsibility for the environmental and social performance of the overall Project, including the performance of its contractors and any other contractors. A PMU will be established to carry out operational and administrative tasks. The PMU staff will be the Asım Kibar OIZ's own staff.

The parties responsible for the monitoring progress are contractor, supervision consultant and Asım Kibar OIZ/PIU during the construction phase, while only Asım Kibar OIZ/PMU is responsible for monitoring progress during the operation phase of the Project. Depending on the monitoring plan, the Contractor will prepare monthly Environmental and Social Monitoring Reports (ESMRs) to be submitted to Asım Kibar OIZ; whereas Asım Kibar OIZ will review and submit ESMRs to MoIT monthly. Environmental engineer/expert will appoint a representative on site to lead the development of this ESMP and its onsite implementation.

Regarding implementation of the ESMP, a team (project management unit) to be established by the OIZ management will be specified to include team members detailed as follows and indicated in the below chart.

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.

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.

Social Specialist

- Adopt and implement the project-specific Stakeholder Engagement Plan (SEP),
- Establish an easily accessible public and workers' 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.

OHS Specialist

- Ensure that implementation and supervision of Occupational Health and Safety Management Plan,
- Preparedness and response to emergency situations according to Emergency Response Plan
- Notify MoIT PIU immediately about 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.

Technical Specialist

- Responsible for the project design,
- Coordinating the actions and evaluations in case of a change due to engineering/design changes.

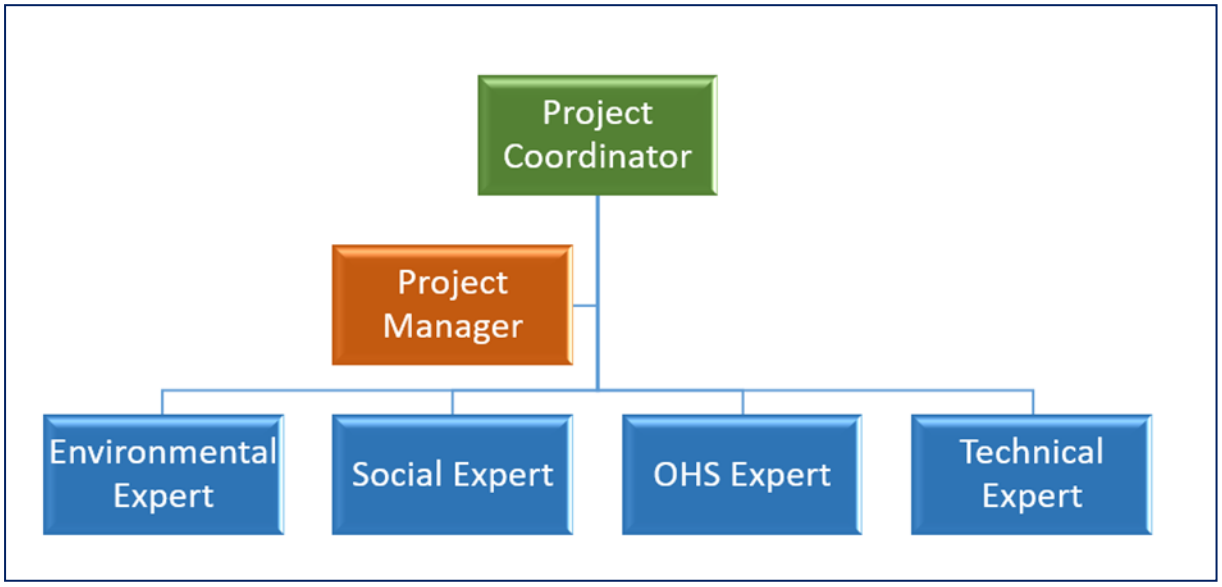


Figure 19 Organizational Chart of Project Management Unit (PMU)

A table defining the responsibilities for the MoIT PIU, OIZ PMU, E&S consultant, construction supervision Consultant and contractor is given below. The roles and responsibilities of the relevant institutions which are involved in the management, monitoring, implementation and finalization of the Project in line with both national and WB ESF requirements are summarized in the table below.

Table 28 Parties Responsible for the Management of the Project in Accordance with the ESMF of the TOIZsP

Institution	Responsibilities
MoIT Project Implementation Unit (PIU)	• Providing guidance to OIZ and the consultant that is responsible for preparation of this ESMP in line with ESMF of the TOIZP and 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 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, construction supervision consultant and OIZ PMU specialists before the construction activities

Institution	Responsibilities
OIZ Project Management Unit (PMU)	• Assigning/hiring one environmental, one social expert and one OHS specialist with sufficient qualifications and skills • 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 • Providing support to implementation of the mitigation measures and commitments given in the ESMP on site • Sharing the ESMP with the Contractor and Construction Supervision Consultant, • Guiding the Contractor in preparing and approving the sub-management plans, including contractor's Labour Management Plan and GM • 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 consultant and contractor, • Auditing 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, • OHS, GM, GBV, SEA/SH and Code of Conduct trainings to the employees and rest of the project personnel by the PMU before the construction, which will be repeated yearly. Suspending work in any situation that threatens environment and community and occupational health and safety and informing MoIT PIU, • Analyzing 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 3 business days,* • Notifying MoIT PIU immediately about any contingencies such as environmental, social and labor 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 in 30 business days,
E&S Consultant	• Preparation and finalizing this ESMP following consultations of the draft ESMP with as per the concerns/opinions of the stakeholders of the Project for the approval of MoIT PIU and WB, • Supporting the PMU to organize and carry out the stakeholder engagement and information meeting for the draft version of this ESMP, • Organizing and delivering a training to the respective OIZ PMU 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.

Institution	Responsibilities
Construction Supervision Consultant	• Supervision of construction and/or rehabilitation works and installation of equipment, • Identification and management of risks and impacts related to environmental, social and OHS issues, • Ensuring initiation of corrective actions where necessary, ensuring implementation of mitigation measures by the contractor, and sufficient capacity in the team (at least one Social Expert, one Environmental Expert and one full-time OHS Expert) to perform E&S supervision effectively within the scope of this ESMP in accordance with the WB requirements, • The E&S Team will 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, • 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,* • Follow up and audit the contractor's activities on a daily basis in line with the measures and commitments given in this ESMP, • Ensuring and monthly reporting the E&S performance of the contractor to the OIZ PMU, • Using the contractual authority and notifying MoIT PIU and the OIZ PMU on time If any non-compliances are encountered, • Monitoring and evaluating the performance of the services provided by the Contractor, • To provide CoC, GM, GBV, SEA/SH, OHS training to the project personnel before construction activities and repeat annually. Training records will be kept. • Providing guidance to the OIZ PMU and contractor on the WB's requirements (documents and procedures), • Any non-conformities found during the inspections will be managed by a process adapted to the severity of the case, • 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 OIZ in a timely manner if necessary.

Institution	Responsibilities
Contractor	• Fulfillment 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, such a contractor ESMP, Labour Management Plan based on the LMP, including OHS plans before construction, as part of their method statement and submit to the OIZ PMU and MoIT PIU for reviewing and approval, • Ensuring compliance with project standards, obtaining all relevant permits and licenses, • Implementing 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 PMU and MoIT PIU, • To provide CoC, GM, GBV, SEA/SH, OHS training to the project personnel before construction activities and repeat annually. Training records will be kept. • Employment of competent Environmental, Social and OHS Experts (at least one Social Expert, one Environmental Expert and one full-time OHS Expert) within the scope of the project, • Training its own and subcontractor's staff on environmental, social and OHS issues, • Carrying out the environmental and social audits to monitor the ESMP practices on site and report on this to the supervision Consultant, • Submission of Environmental and Social Progress Reports (ESPRs) on environmental and social issues, mitigation, results and findings throughout the construction period to the construction supervision consultant and OIZ PMU, • Notifying immediately of the contingencies such as environmental, social and labor issues or accidents, incidents or loss of time to construction supervision consultant and OIZ PMU 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 construction supervision consultant and OIZ PMU within 30 days, • On the basis of the project's Labor Management Procedures, the Labor Management Plan which will be prepared by the contractor will also comply with the Labor Legislation (4857 Labor Law), Occupational Health and Safety Plan and Procedures (6331 Occupational Health and Safety Law) and 5510 Social Insurance Law. • Developing and implementing Labour Management Plan (based on Project's LMP) including working conditions, fair treatment, non-discrimination, equal opportunity, vulnerable/disadvantaged workers, GBV, SEA/SH, prevention of child labor and forced labor issues under the project's Labor and Employment Policy for construction phase. • Establishment and implementation of project specific grievance mechanism for the Project construction activities in coordination with OIZ PMU.

10.2 Reporting

Reporting process that should be followed during the implementation phase of the project is an important tool to record and chase project activities in compliance with the national and WB standards. Therefore, the requirements of such processes are presented in Table 29.

Table 29 Requirements of Such Processes

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 in the ESMP 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 visits will be included in the quarterly ESRs. • CoC, OHS, GM, GBV, SEA/SH training will be given to OIZ PMU, Supervision Consultant and Contractor's Environmental and Social Specialists and training records will be kept.

Responsible Party	Roles & Responsibility
OIZ Project Management Unit (PMU)	• Review and submit monthly ESMRs to MoIT PIU • Submitting the monthly GMR to cover both Consultant's GMR and Contractor GMR to MoIT PIU • This ESMP implementation CoC, OHS, GM, GBV, SEA/SH training will be given to employees and training records will be kept.
Construction Supervision Consultant	• Prepare and submit monthly ESMR to OIZ PMU including monthly Environmental and Social Progress Report (ESPR) from the contractor. Monthly ESMRs will highlight any issues arising from non-compliance with ESMP requirements and how it has been/is being addressed from the ESF point of view. • Submit the monthly Grievance Mechanism Report to OIZ prepared in line with the complaint received and combine it with monthly the Grievance Mechanism Report prepared by the Contractor • CoC, OHS, GM, GBV, SEA/SH training will be given to employees and training records will be kept.
Contractor	• Prepare and submit monthly ESPRs covering the progress of the construction activities and environmental and social issues to the Construction Supervision Consultant • Submit the monthly GMR to Construction Supervision Consultant • CoC, OHS, GM, GBV, SEA/SH training will be given to employees and training records will be kept.

Regarding the reporting process, workflow is summarized in the chart below.

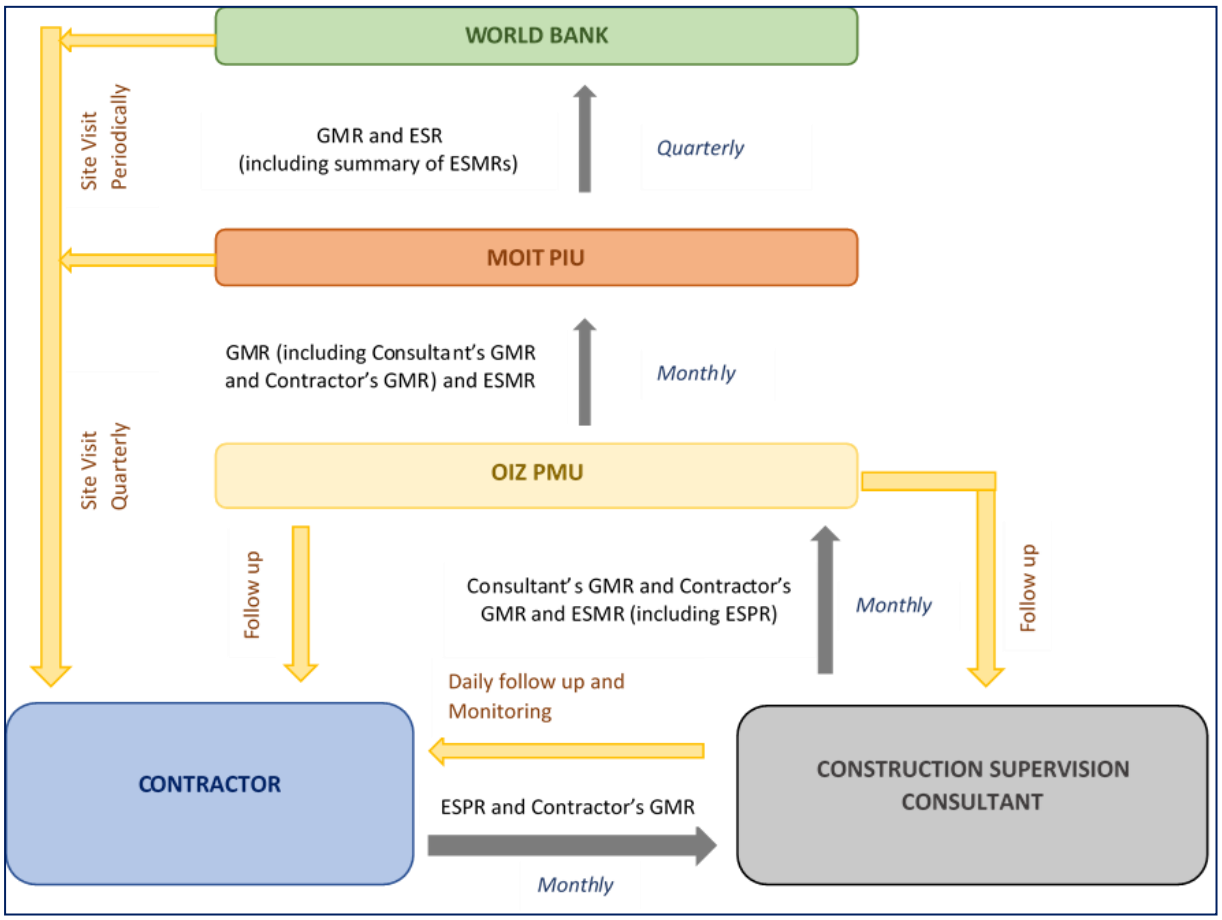


Figure 20 Reporting Process on ESMP Implementation

10.3 Training

One of the main necessities of the ESMP is training for the Project Owner's and contractor's top-level management and employees.

Necessary training will be given to the personnel immediately after the recruitment and training will also be refreshed during the work period and conducted at different of levels. Some short-term training is required for the Environment Expert, other staff members of the PIU and the contractor staff to raise their levels of environmental and social awareness. The training can be conducted by either some external experts or with the help of in-house expertise of the PIU and the consultants and help of MoIT and WB. In the long-term training, special environmental and social issues will be investigated, and likely solutions provided to the PIU.

The mentioned training will take place over a maximum two (2) days. This period will be determined by considering the responsible trainer's opinion on how many days it takes to explain the relevant subject the evaluation of the trainees' prior knowledge and capacities on the relevant subjects and the detailed scope of the syllabus that has been prepared. The PIU is also responsible for the monitoring of the Contractor's actions on training. The training will be given after signing the works contracts and refresher trainings will be held as needed depending on work progress and construction activities. Measurement and evaluation will be performed at the end of the training given to the personnel. This is to measure the effectiveness of the training and to measure the trainees' level of knowledge and competence. According to the review results, the training program can be modified, or trainers can be replaced, or training can be repeated, if needed, upon determining whether the training is effective.

The basic training that are planned to be given are as follows, but not limited to:

- Waste Management,
- Energy Efficiency,
- Safe Driving,
- Occupational Health and Safety,
- Chance Find Procedure,
- Induction training including Code of Conduct, GBV & SEA/SH, GM, EHS and ESMP Requirements, and
- First-Aid and Emergency Preparedness Measures
- Root cause analyze

Table 30 provides examples of the basic training for the ESMP implementation. The training programs will be developed annually and delivered by the PIU.

Table 30 Training Program

Training Topics	Responsible Party (Trainer Party)	Target Group	Duration	Time	Cost
• Overview of potential impacts and mitigation measures • Requirements of environmental monitoring • Occupational Health and Safety Training • Role and responsibilities of the contractor • Content and methods of implementation of environmental mitigation measures • Response and risk control • Preparation and submission of report • Risk response and control	PMU with support of MoIT PIU Contractor Construction Supervision Consultant	OIZ, Construction Supervision Consultant, Contractor, related authorities: On-site construction management staffs, environmental staffs of contractor, related authorities	Two (2) days of training twice a year to be repeated on a yearly basis depending on needs.	After signing the works contract	-

Training Topics	Responsible Party (Trainer Party)	Target Group	Duration	Time	Cost
• Other areas to be determined • Code of conduct training • GM training • SEA/SH and GBV training/ awareness					
• Trainings for the E&S documents	Environmental and Social Consultant	Contractor, Construction Supervision Consultant, PMU	One (1) day	Before construction	-
• General environmental and social management relating to the Project • Requirements on environmental and social monitoring • Monitoring and implementation of mitigation measures • Guide and supervise contractor in implementation of the ESMP • Documentation and reporting • Risk response and control • Other areas to be determined	OIZ PMU	Whole personnel related to the Project.	Two (2) days of training twice a year to be repeated on a yearly basis until the end of the DNP.	Soon after the Project effectiveness but at least one (1) month before the construction of the contract. The follow-up training will be scheduled as needed.	-

In addition, the training program/modules shall address a range of issues, including but not limited to:

- Purpose of ESMP regarding the Project activities,
- Requirements in management plans and monitoring activities to be performed within the scope of this plan,
- Understanding of the sensitive environmental and social receptors within the project area and its vicinity, and
- Awareness-raising about the potential risk and impacts from the project activities,
- Grievance mechanism developed within the scope of the project, grievance mechanism officer and employee rights,
- Community health and safety risks and measures,
- OHS, first aid, emergency preparedness,
- Code of conduct and clothing,
- Communication with the local community,
- Code of conduct training, including prevention of gender-based violence, sexual harassment, sexual exploitation and abuse,
- Traffic and road safety principles, and
- Training aiming at the sorting, storage and environmental planning of waste.

11 STAKEHOLDER MANAGEMENT UNDER ESMP

This chapter contains a brief description of stakeholder engagement. As mentioned above, the TOIZsP Stakeholder Engagement Plan (SEP) will be used for this sub-project and all project parties (including contractor, construction supervisor, 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.

Table 31 Stakeholders and Relevance to the Project

Stakeholder Group			Relevance of Stakeholders to the Project
Project Affected Parties (PAP)	Communities (residents and businesses)	Alikahya Atatürk Neighborhood (with a population of 9,346) (the neighborhood where the project area is located) Dumlupınar Neighborhood (with a population of 9,320) (distance to the project area 182 m) Ertuğrul Gazi neighbourhood (with a population of 6,934) (distance to the project area 264 m) Uzunbey Neighborhood (with a population of 1,044) (distance to the project area 17 m)	Exposed to potential noise and dust emission during the construction phase
	Business and Employees	Firms operated in Asım Kibar OIZ	Exposed to potential noise and dust emission during the construction phase, Exposed to potential problems due to the traffic load during both the pre-construction and construction phases User/ beneficiary after commissioning
		Employees of Firms: About 6,004 Employees	Exposed to potential noise and dust emission during the construction phase
	Contractor	Employees of Contractor	Exposed to potential noise and dust emission during the construction phase
Other Interested Parties	Central and Local Authorities	Kocaeli Provincial Governorate	Responsible for public healthcare, environmental and social services
		District Governorate of İzmit	Responsible for public healthcare, environmental and social services
		District Governorate of Kartepe	Responsible for public healthcare, environmental and social services
		Kocaeli Provincial Directorate of Environmental Urbanism and Climate Change	The authority consulted for the project preparation and implementation phases

Stakeholder Group			Relevance of Stakeholders to the Project
		Kocaeli Industry and Technology Provincial Directorate	Project implementing local partner
		Kocaeli Provincial Directorate of Health	Responsible for public health
		İzmit District Directorate of Health	Responsible for public health
		Kartepe District Directorate of Health	Responsible for public health
		Kocaeli Metropolitan Municipality	Responsible for public services
		İzmit Municipality	Responsible for public services
		Kartepe Municipality	Responsible for public services
	Non-Governmental Organizations	Organized Industrial Zones Association	NGO responsible to protect and develop the common economic, social rights and interests of OIZs and to provide mutual assistance among them.
		Organized Industrial Zones Supreme Organization	NGO responsible for unity of application and cooperation between OIZs and solving the problems of OIZs.
		Kocaeli Chamber of Trade and Industry	Responsible to strive for the development of trade and industry in accordance with general interests,
	Media/ Electronic Media	Kocaeli Gazetesi https://www.kocaeligazetesi.com.tr/	Information disclosure
		Özgür Kocaeli https://www.ozgurkocaeli.com.tr/	Information disclosure
		Çağdaş Kocaeli https://www.cagdaskocaeli.com.tr/	Information disclosure
	Academic Institution	Kocaeli University	Information disclosure
		Gebze Technical University	Information disclosure

11.1 Previous Stakeholder Engagement Activities

A site visit was conducted by Infratech on 27.06.2024 and primary data was collected on the communities living around the Project area and potential Project impacts through key informant interviews with the mukhtars of Uzunbey and Alikahya Atatürk neighborhoods.

The general information obtained from the mukhtars summarizes the current situation of the neighborhoods as stated in Chapter 6 of this document. No evidence of any previous stakeholder engagement activities was found among the information obtained. It was also stated by the OIZ authorities that no stakeholder activitiy has been held yet for the project.

The Mukhtar of Ali Kahya Atatürk Neighborhood was interviewed. During the interview, the Muhtar stated that the population of the neighborhood is approximately 10,000 (9346 according to TURKSTAT data) and the population has increased in the last 5 years due to new constructions. He stated that the main source of income in the neighbourhood is salaried work and pensions, and that seasonal work is also intensive in the neighbourhood. There are disadvantaged groups (disabled, elderly, poor, female-headed households) in the neighborhood and these numbers are shared in Chapter 6.5. During the interview, they were asked about the impact of the OIZ's activities on their neighborhood. The Muhtar stated that so far the OIZ has not had any negative impact on roads, infrastructure, houses, land and fields, livelihoods, noise and pollution, traffic and social cohesion with outside workers. He said it had a positive impact on employment opportunities. He said that if they have any complaints or suggestions regarding the activities of the OIZ, they will contact the OIZ officials they are in contact with. Mukhtar

stated that he has not heard any complaints from local people so far. Mukhtar also stated that the Project in the OIZ will not have any impact other than providing employment.

The Mukhtar of Uzunbey Neighborhood was interviewed. During the interview, the Muhtar stated that the population of the neighborhood is approximately 2,000 (1044 according to TURKSTAT data) and that there has been no significant change in the population in the last 5 years. He stated that the main source of livelihood of the neighborhood is agriculture and animal husbandry, and that most of the residents of the neighborhood receive pensions. There are disadvantaged groups (disabled, elderly, poor, female-headed households) in the neighborhood and these numbers are shared in Chapter 6.5. During the interview, they were asked about the impact of the OIZ's activities on their neighborhood. The Muhtar stated that so far the OIZ has not had any negative impact on roads, infrastructure, houses, land and fields, livelihoods, noise and pollution, traffic and social cohesion with outside workers. He said it had a positive impact on employment opportunities. He said that if they have any complaints or suggestions regarding the activities of the OIZ, they will go to the OIZ to voice their complaints face to face, as there is no authority they are in contact with. Muhtar stated that he has not heard any complaints from local people so far. Mukhtar also stated that he would like to be informed about the Project to be carried out in the OIZ.

The Mukhtar of Dumlupınar Neighborhood was interviewed. During the interview, the Muhtar stated that the population of the neighborhood is approximately 9000 (9320 according to TURKSTAT data) and that there has been no significant change in the population in the last 5 years. He stated that the main source of livelihood of the neighborhood is salaried work and that most of the residents of the neighborhood receive pensions. There are disadvantaged groups (disabled, elderly, poor, female-headed households) in the neighborhood and these numbers are shared in Chapter 6.5. During the interview, they were asked about the impact of the OIZ's activities on their neighborhood. The Muhtar stated that so far the OIZ has not had any negative impact on roads, infrastructure, houses, land and fields, livelihoods, noise and pollution, traffic and social cohesion with outside workers. He said it had a positive impact on employment opportunities. He said that if they have any complaints or suggestions regarding the activities of the OIZ, they will go to the OIZ to voice their complaints face to face, as there is no authority they are in contact with. Muhtar stated that he has not heard any complaints from local people so far.

The Mukhtar of Ertuğrul Gazi Neighborhood was interviewed. During the interview, the Muhtar stated that the population of the neighborhood is approximately 8000 (6934 according to TURKSTAT data) and that there has been no significant change in the population in the last 5 years. He stated that the main source of livelihood of the neighborhood is salaried work and that most of the residents of the neighborhood receive pensions. There are disadvantaged groups (disabled, elderly, poor, female-headed households) in the neighborhood and these numbers are shared in Chapter 6.5. During the interview, they were asked about the impact of the OIZ's activities on their neighborhood. The Muhtar stated that so far the OIZ has not had any negative impact on roads, infrastructure, houses, land and fields, livelihoods, noise and pollution, traffic and social cohesion with outside workers. He said it had a positive impact on employment opportunities. He said that if they have any complaints or suggestions regarding the activities of the OIZ, they will go to the OIZ to voice their complaints face to face, as there is no authority they are in contact with. Muhtar stated that he has not heard any complaints from local people so far.

11.2 Disclosure and Consultation of the ESMP

Following the clearance of the draft version of this ESMP, the time and place of the Stakeholder Consultation Meeting (SCM) was set as February 5, 2025 at the Alikahya Culture Center and the draft ESMP was disclosed on the webpage of Asım Kibar OIZ (https://akosb.com.tr/2025/01/27/paydas-katilim-ve-bilgilendirme-toplantisi/) on January 27, 2025 (9 days prior to the planned SCM) to ensure transparency, enable stakeholder engagement, and demonstrate compliance with environmental and social standards.

Simultaneously with the disclosure of the ESMP, the text of the announcement that a Stakeholder Consultation Meeting will be organized to inform Project stakeholders, including those residing in the vicinity of the Project Area, about the Project and to receive their opinions and suggestions, was also published through the link above. Additionally, on January 27, 2025, announcement texts were posted on the notification board of the OIZ and on the boards of Alikahya Atatürk, Dumlupınar, Ertuğrulgazi and Uzunbey Neighborhood Mukhtars' Offices (see Annex 17.1).

The SCM took place on February 5, 2025 at 11:00 am at Alikahya Culture Center and was attended by 17 participants.[10] The participant profile generally consists of the muhtar of Alikahya Atatürk Neighborhood, Asım Kibar OIZ officials and employees, and the former Mayor of Alikahya Town.

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 was shared with the stakeholders participating in the meeting; and then their opinions and suggestions were received during the question-answer (Q&A) session (no questions or suggestions received during this session). In line with the results of consultations and feedback received from stakeholders, there are no issues that need to be strictly revised in the ESMP. The meeting documents provided in the annex of the ESMP are as follows:

- Stakeholder Engagement and Information Meeting announcements in Annex 17.1,
- Local Newspaper Announcement in Annex 17.2,
- SCM presentation prepared by Infratech in Annex 17.3,
- Minutes of the Q&A session in Annex 17.4,
- Meeting photos in Annex 17.5.

The Asım Kibar OIZ will ensure that the final approved ESMP to be disclosed will be available locally at the Asım Kibar OIZ offices, places easily accessible to affected groups such as headmen's offices and local NGOs and will be published on Asım Kibar OIZ website (https://akosb.com.tr/) and MoIT PIU website (yesilosb.sanayi.gov.tr).

The ESMP is a dynamic document and will be reviewed, updated, and approved as necessary throughout the implementation of the Project. For each approved updated version of this ESMP, the Asım Kibar OIZ and the firm will be responsible for disclosure through the communication channels.

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.

[10] In accordance with the Law on the Protection of Personal Data, the list of participants is not shared and is kept in the Project Management Unit archive for project management purposes only. It will be kept for the duration of the project and will not be shared with third parties.

11.3 Grievance Mechanism

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 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, and
- Provide channels for the stakeholders to provide feedback and raise concerns.

GM at the National Level

Presidency's Communication Center: The Presidency's Communication Centre (CİMER) provides a centralized complaint system for Turkish citizens, legal persons and foreigners. CİMER only allow applications in Turkish.

Through CİMER, applicants can direct their requests directly to the relevant authorities. The requests submitted to CİMER are resolved within 30 days. If the applicants do not receive feedback within this period, they can re-submit their grievance to CİMER or elevate it to the Ombudsman Institution (www.ombudsman.gov.tr).

Webpage:	www.cimer.gov.tr/ www.turkiye.gov.tr/
Call Centre (hotline):	150
Phone number:	+90 312 590 20 00
Fax number:	+90 0312 473 64 94
Official Letter/Petition:	Republic of Türkiye, Directorate of Communications T.C. Cumhurbaşkanlığı Külliyesi 06560 Beştepe/ Ankara
Individual Application:	Community relations desks at governorates, ministries and district governorates.

CİMER will be available to Project stakeholders as an alternative and well-known channel for conveying their Project-related grievances and feedback directly to state authorities.

Foreigners Communication Center: The Foreigners Communication Center (YİMER) provides a centralized complaint system for foreigners. YİMER will be available to Project stakeholders as an alternative and well-known channel for conveying their Project-related grievances and feedback directly to state authorities.

Webpage:	www.yimer.gov.tr
Email:	yimer@goc.gov.tr
Call Centre (hotline):	157
Phone number:	+90 312 515 11 22
Fax number:	+90 312 920 06 09
Official Letter/Petition:	Republic of Türkiye General Directorate of Migration Management, Çamlıca Mahallesi 122. Sokak No: 4 Yenimahalle/ Ankara
Individual Application:	Republic of Türkiye General Directorate of Migration Management

MoIT Level GM: All stakeholders can submit individual applications to the MoIT grievance mechanism established specifically for the Main Project via ways given below.

E-mail	info@sanayi.gov.tr dboneri@sanayi.gov.tr
Website	www.sanayi.gov.tr
Address	Mustafa Kemal Mahallesi Dumlupınar Bulvarı (Eskişehir Yolu 7.km) 2151. Cadde No:154/A 06530 Çankaya/ANKARA
Phone	444 6 100
Fax	+90 (312) 201 58 23

Project Level Grievance Mechanism

On the website[11] of Asım Kibar OIZ, there is a Contact page which is available in Turkish. The grievances/requests related to Asım Kibar OIZ's activities can be communicated through this page and the resolution process is followed. The page includes information on email, phone number and mailing address of Asım Kibar OIZ. There is also an Online Contact Form menu on the page. Name e-mail address and explanation/message/grievance are entered in the online Contact Form. Filling all fields is obligatory on this form. Notification that the application has been received is made via e-mail address.

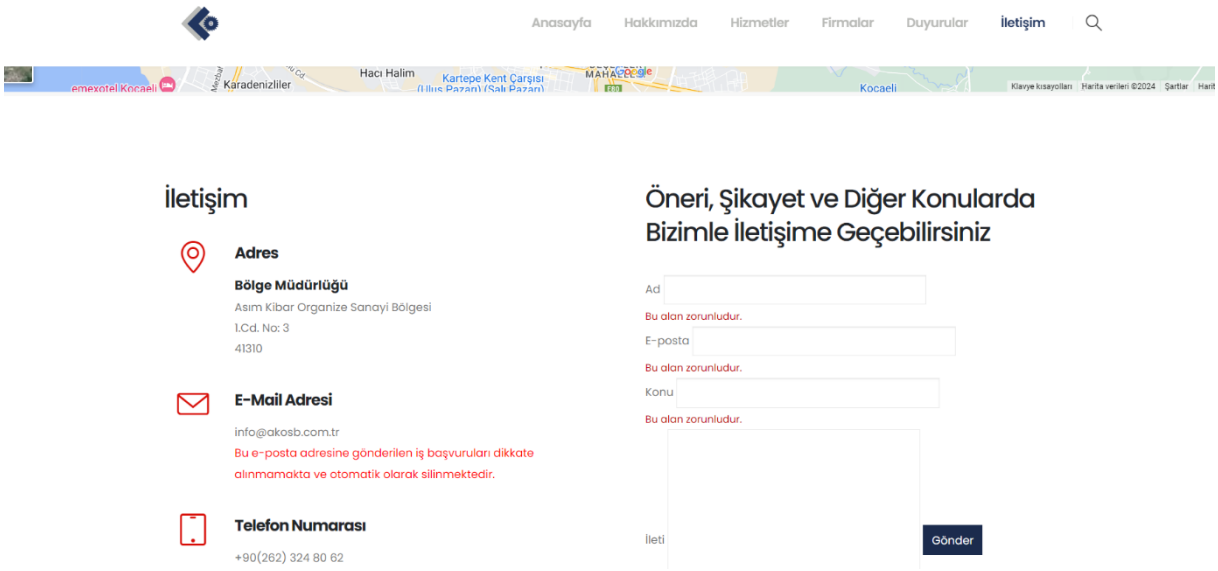


Figure 21 Screenshot of Asım Kibar OIZ Contact Web Page

11.3.1 Procedural Steps of Grievance Mechanism

As per the World Bank's ESS10 requirement, a proper grievance mechanism (GM) will be established for the Project and will be operational before starting construction. For this mechanism to function in a proper and timely manner, a GM focal point who will oversee the entire process has been assigned as a part of the project team of the MoIT. The GM focal point will also be responsible for reporting the grievance process of the project for monitoring purposes. This person will also be responsible for coordinating the grievance mechanism to ensure its smooth functioning within the scope of the project.

As per the GM procedure prepared for the MoIT's project-specific GM, complaints should be reviewed and closed in 15 days. Regardless of general response and resolution timeframes, some complaints

[11] https://akosb.com.tr/

may require immediate attention, for example, an urgent safety issue or where it concerns the livelihood of locals.

There are steps that complete the grievance mechanism. This process has been detailed in the Table below.

Table 32 Steps of Grievance Mechanism

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 Additionaly there is also a Project Level GM	-	Presidency's Communication Center, and Foreigners Communication Center and related authorities MoIT PIU OIZ PMU
Grievance uptake	Grievances can be submitted via telephone, e-mail, letter to Grievance focal points at local facilities, complaint form lodged via any of the above channels (contact information is given in the Annex-16), or walk-ins may register a complaint in a grievance logbook at a facility or suggestion box.	-	Presidency's Communication Center, and Foreigners Communication Center and related authorities MoIT PIU OIZ PMU
Sorting, processing	Complaints are forwarded to PMU, logged in the Grievance Log, and categorized as Level 1, Level 2, or Level 3 complaints[12]. If out of scope, the grievant is notified and an alternative solution is suggested.	-	OIZ PMU
Acknowledgement and follow-up	Receipt of the grievance is acknowledged by PMU/Social Expert or GM focal point within 2 working days through a personal meeting, phone call, or letter. Clarifications are sought if necessary.	2 working days	OIZ PMU/Social Expert or GM focal point
Verification, investigation, action	Investigation of the complaint is led by the Project Manager and/or by the relevant unit/section etc. The Project Manager is notified of Level 1, 2 or 3 grievances. The PMU, as appropriate, supports the Project Manager in deciding who should deal with the grievance and determines whether additional support for the response is necessary. If the complaint is the subject to the Workers' GM a workers representative will be participate in this process	-	Project Manager OIZ PMU Workers' representative

12 Level 1 Complaint: A complaint that is isolated or 'one-off' and essentially local.
Level 2 Complaint: A complaint that is widespread and repeated.
Level 3 Complaint: A one-off complaint, or one which is widespread and/or repeated that, in addition, has resulted in a serious breach of the Project's policies or National law and/or has led to negative national/international media attention, or is judged to have the potential to generate negative comment from the media or other key stakeholders.

Step	Description of Process	Time Frame	Responsibility
Provision of feedback	A response is developed by the delegated team within 15 days. The response identifies a suitable resolution to the grievance and involves further information to clarify a situation, taking measures to mitigate problems or compensate for any damages that have been caused during the Project activities through financial compensation.	Within 15 days	OIZ PMU

In addition to the project's GM for its internal and external stakeholders, ESS 2 requires the establishment of a Workers' Grievance Mechanism (WGM) for the project workers. Worker GRM is defined as complaints from project employees (including both direct and indirect employees). This mechanism is structured with an intention of it being an effective approach for early identification, assessment, and resolution of grievances throughout the project's lifespan.

The scope of the Worker GRM can be summarized as follows, but not limited to; occupational health and safety, labour conditions, wages, problems with the local community or co-workers, hygiene problems in common areas, insufficient food and/or worker safety, etc. Grievance related to OHS would be addressed and managed immediately, where feasible. Procedural steps of Worker GRM is same as described in the Table 32.

The World Bank and the Borrower do not tolerate reprisals and retaliation against project stakeholders who share their views about Bank-financed projects.

11.4 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. These channels are The Presidency's Communication Centre (CİMER), The Foreigners Communication Center (YİMER), MoIT communication channels at National Level and the Contact page on the website of Asım Kibar OIZ at Project Level. 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:

- 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.

12 DEVIATION FROM SCREENING STUDIES

Environmental and Social Screening studies of the Project have been carried out and the final version dated 9th November, 2023 has been used to prepare this plan. While preparing the ESMP, it was concluded that most of the information stated in the screening report reflects the Subproject. However, it can be said that there are some deviations from the screening forms in the ESMP. These deviations are listed below:

- Although it is stated that Asım Kibar OIZ and the project parcel are within the borders of Durhasan Neighbourhood, the OIZ and the project area are in Alikahya Atatürk Neighbourhood. This situation has been detected and verified through İzmit Municipality City Automation System (KEOS). Durhasan neighbourhood is to the north of the OIZ.

Figure 22 Project Location on İzmit Municipality City Automation System

- The screening report of the Project shows the neighborhoods in the vicinity of AKOSB and OIZ (5 km radius) and the area of influence is explained in Section 4.3.1 of the screening report. However, there are 15 neighborhoods within the 5 km radius and only 6 neighborhoods are mentioned in the screening report. During the preparation of this ESMP, 4 neighborhoods were defined for the area of influence within a 3 km radius, including the neighborhood where the project area is located.

13 REFERENCES

- Eruz, E., The Green Belt Problems of İzmit, page: 293.
- Turkish State Meteorological Service, 2024, retrieved from https://www.mgm.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx?m=KOCAELI
- Ö. Coruk And A. Karakaş, "Hydrogeology of Izmit Basin," Su Tüketimi Arıtma Yeniden Kullanım Sempozyumu , Bursa, Turkey, pp.153-163, 2008
- Akman, Y., Ketenoğlu, O., 1987. Vegetation Ecology (Plant Sociology), Ankara University Faculty of Science Publications, No: 146, Ankara.
- Akman Y. 1999. Climate and Bioclimate. Kariyer Matbacılık Ltd. Şti., Ankara.
- Davis PH 1965-1988. Flora of Turkey and the East Aegean Islands Vol: 1-10. Edinburgh Univ. Press, Edinburgh.
- Ekim, T., Koyuncu, M., Vural, M., Duman, H., Aytaç, Z., Adıgüzel, N., 2000. The Red Book of Plants of Turkey, Turkey Nature Conservation Society, Van Yüzüncü Yıl University Publications, 246 p., Ankara.
- Güner, A., 2012. Türkiye Bitkileri Listesi (Vascular Plants), Nezahat Gökyiğit Botanical Garden Publications, Flora Series 1, 1290 p., İstanbul.
- Kılınç, M., Kutbay, H.G., 2004. Plant Ecology, Palme publishing, Ankara.
- Özhatay, N., Kültür, Ş., Aksoy, N., 1999. Check-list of additional taxa to the supplement flora of Turkey II, Turkish Journal of Botany, 23: 151-170.
- Özhatay, N., Byfield, A., Atay, S., 2005. Turkey "s 122 Important Plant Areas (IPAs), WWF Turkey (World Wildlife Fund), Istanbul.
- Özhatay, N., Kültür, Ş., 2006. Check-list of additional taxa to the supplement flora of Turkey III, Turkish Journal of Botany, 30: 281-316.
- Özhatay, N., Kültür, Ş., Aslan, S., 2009. Check-list of additional taxa to the supplement flora of Turkey IV, Turkish Journal of Botany, 33: 191-226.
- Özhatay, F.N., Kültür, Ş., Gürdal, M.B., 2011. Check-list of additional taxa to the supplement Flora of Turkey V, Turkish Journal of Botany, 35: 589-624.
- Regel, V., 1963 (Translation: Asuman Baytop & Rahmiye Denizci) A General Overview of Flora and Vegetation of Turkey, Ege University Faculty of Science Monograph Series, No:1, Izmir.
- Seçmen, Ö., 2004. Vegetation Information, Ege Univ. Science Faculty, Teksirler Series No: 113, Izmir
- Yarcı, C., & Altay, V. (2016). Weed flora of agricultural areas in and around Kocaeli.
- Plants of Kocaeli, 2020. http:// https://kocaelibitkileri.com/
- Baran, I. and Atatür, M. K. (1998). Herpetofauna of Turkey. Ankara: Ministry of Environment.
- Clark, R. J. and Clark, E. D. (1973). Report on a Collection of Amphibians and Reptiles from Turkey. Occasional Papers of California Academy of Sciences, 104, 1-62
- Yaşar, C. (2018). Mapping of Turkey's herpetofauna and creation of predictive distribution models for species using current and future scenarios. Master's Thesis, Ege University, Institute of Science and Technology, Department of Biology, 182.
- Herptil Turkey, 2020. Turkish Society for Observation and Photography of Frogs and Reptiles. http://www.turkherptil.org/
- https://www.inaturalist.org/
- Demirsoy, A. (1996). Amphibians. Ministry of Environment, General Directorate of Environmental Protection, Ankara.
- Sindaco, R., Venchi, A., Carpaneto, G. M., & Bologna, M. A. (2000). The reptiles of Anatolia: a checklist and zoogeographical analysis. Biogeographia-The Journal of Integrative Biogeography, 21(1).
- Mulder, J. (1995). Herpetological observations in Turkey (1987-1995). Deinsea, 2(1), 51-66.
- Yaşar, C. (2018). Mapping of Turkey's herpetofauna and creation of predictive distribution models for species using current and future scenarios. Master's Thesis, Ege University, Institute of Science and Technology, Department of Biology, 182.
- Herptil Turkey, 2020. Turkish Society for Observation and Photography of Frogs and Reptiles. http://www.turkherptil.org/
- https://www.inaturalist.org/
- Demirsoy, A. (1996). Reptiles. Ministry of Environment, General Directorate of Environmental Protection, Ankara.

- Baran, İ., Yılmaz, İ., 1984. Ornithology Lecture Notes. Ege University Faculty of Science Publications, Ege University Press, Izmir, (87):1-323.
- Bilgin, C.C., 1994. Historical development and recent status of the avifauna of Turkey. XII. National Biology Congress, July 6-8, 1994, Trakya University, Edirne, Zoology Section, 6:259-265.
- Cox, G.W., 2010. Bird Migration and Global Change. Islandpress, Washington, Covelo, London, 1-291.
- Ergene, S., 1945. Birds of Turkey. Istanbul University Science Faculty Monographs, Istanbul, (4):1-361.
- Green, I., Moorhouse, N., 1995. A Birdwatchers' Guide to Turkey. Bird Watcher's Guides Prion Ltd., England, 1-122.
- Kasparek, M., Bilgin, C.C., 1996. Species List of Birds of Turkey, 25-88, in: Turkey Vertebrate Species List (A. Kence, C.C. Bilgin, eds), Nurol Matbaacılık A.Ş., Ankara, 1-183.
- Kirwan, G.M., Martins, R.P., Eken, G., Davidson, P., 1998. Checklist of the Birds of Turkey. OSME Sandgrouse Supplement 1, USA, 1-32.
- Kiziroğlu, İ., 1989. Birds of Turkey. General Directorate of Forestry, Department of Education, Publication and Promotion Branch Directorate Printing Facilities. Ankara, 1-312.
- Kiziroglu, I., 2009. Turkey Birds Pocket Book. Ankamat Matbaacılık San. Ltd. Şti., 1-534.
- Newton, I., Dale, L., 2001. A comparative analysis of the avifaunas of different zoogeographical regions. Journal of Zoology, 254(2): 207-218.
- Turan, N., 1990. Turkey's Hunting and Wild Animals / Birds. General Directorate of Forestry Education Department Publication and Promotion Directorate Printing House, Ankara, 1-274
- https://www.inaturalist.org/
- Trakus, 2020. Anonymous birds of Turkey. http://www.trakus.org/
- https://ebird.org/
- https://www.inaturalist.org/
- Demirsoy, A., (1996). Mammals. Ministry of Environment, General Directorate of Environmental Protection, Ankara.
- Çolak, E., Yiğit, N., Sözen, M., Çolak, R., Özkurt, Ş., Kankılıç, T., & Kankiliç, T. (2006). The morphological analysis of Mus domesticus and Mus macedonicus (Mammalia: Rodentia) in Turkey. Turkish Journal of Zoology, 30(3), 309-317.
- https://www.inaturalist.org/
- Tramem, 2020. Anonymous mammals of Turkey. http://www.tramem.org/
- Ministry of Agriculture and Forestry General Directorate of Water Management-Sensitive Area Maps (https://www.tarimorman.gov.tr/SYGM/Link/17/Hassas-Alanlar-Haritalari)
- Ministry Environment, Urbanization and Climate Change, 2023, Air Quality - Station Data retrieved from: https://sim.csb.gov.tr/STN/STN_Report/StationDataDownloadNew
- Turkish State Meteorological Service, 2023, retrieved from https://www.mgm.gov.tr/Veridegerlendirme/il-ve-ilceler-istatistik.aspx?m=KOCAELI
- Turkish Statistical Institute, 2023, retrieved from: https://www.tuik.gov.tr/

ANNEXES

ANNEX-1: LAND REGISTRY

Türkiye Cumhuriyeti

TAPU SENEDİ

İli	KOCAELİ
İlçesi	İZMİT
Mahallesi	
Köyü	DURHASAN
Sokağı	
Mevkii	TURNAOĞLU

Fotoğraf

Satış Bedeli	Pafta No.	Ada No.	Parsel No.	Yüzölçümü ha	Yüzölçümü m²	Yüzölçümü dm²
0,00	G24A21CID	164	34		40.395,43 m2	

GAYRİMENKULÜN

Niteliği	ARSA
Sınırı	Planındadır Zemin Sistem No : 80473435
Edinme Sebebi	Tamamı KOCAELİ ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ adına kayıtlı iken ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ adına Tüzel Kişiliklerin Ünvan Değişikliği işleminden.
Sahibi	ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ Tam

Geldisi		Yevmiye No.	Cilt No.	Sahife No.	Sıra No.	Tarihi	Gittisi	
Cilt No.		15317	98	10567		22/07/2014		Cilt No.
Sahife No.								Sahife No.
Sıra No.								Sıra No.
Tarih								Tarih

Siciline Uygundur.

Yıldız TERZİ

Yetkili Müdür Yardımcısı

NOT * [illegible] tapu kütüğüne müracaat edilmelidir.

** [illegible] gereğince adres değişikliği ilgili Tapu Sicil Müdürlüğüne bildirilecektir.

D.M.O. Basım İşl. Md. Döner Sermaye İşletmesi tarafından bastırılmıştır. Stok No 129

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

INFRATECH ENGINEER • SOLVE • PLAN

ANNEX-2: MAPS

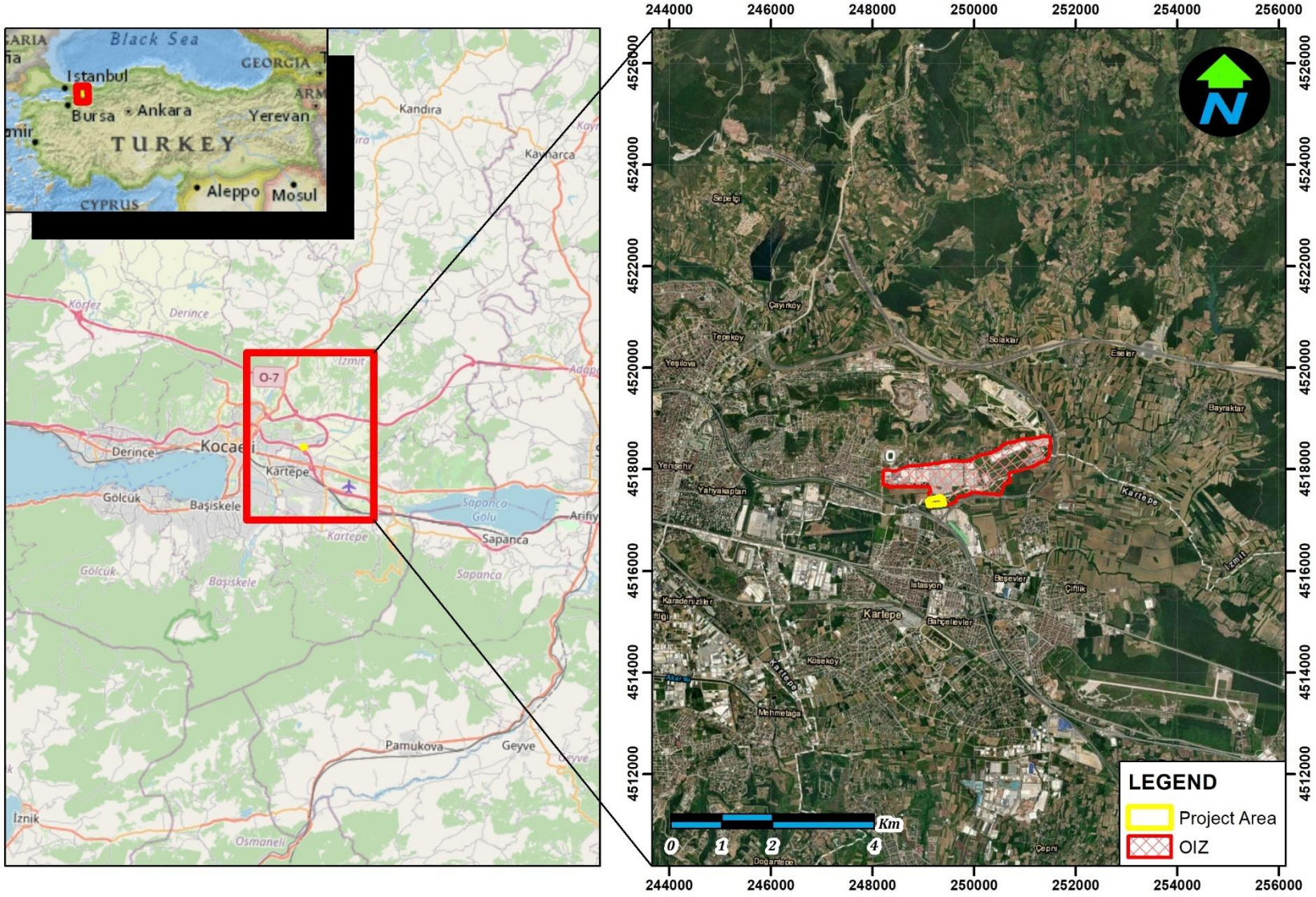


Figure 23 Project Location

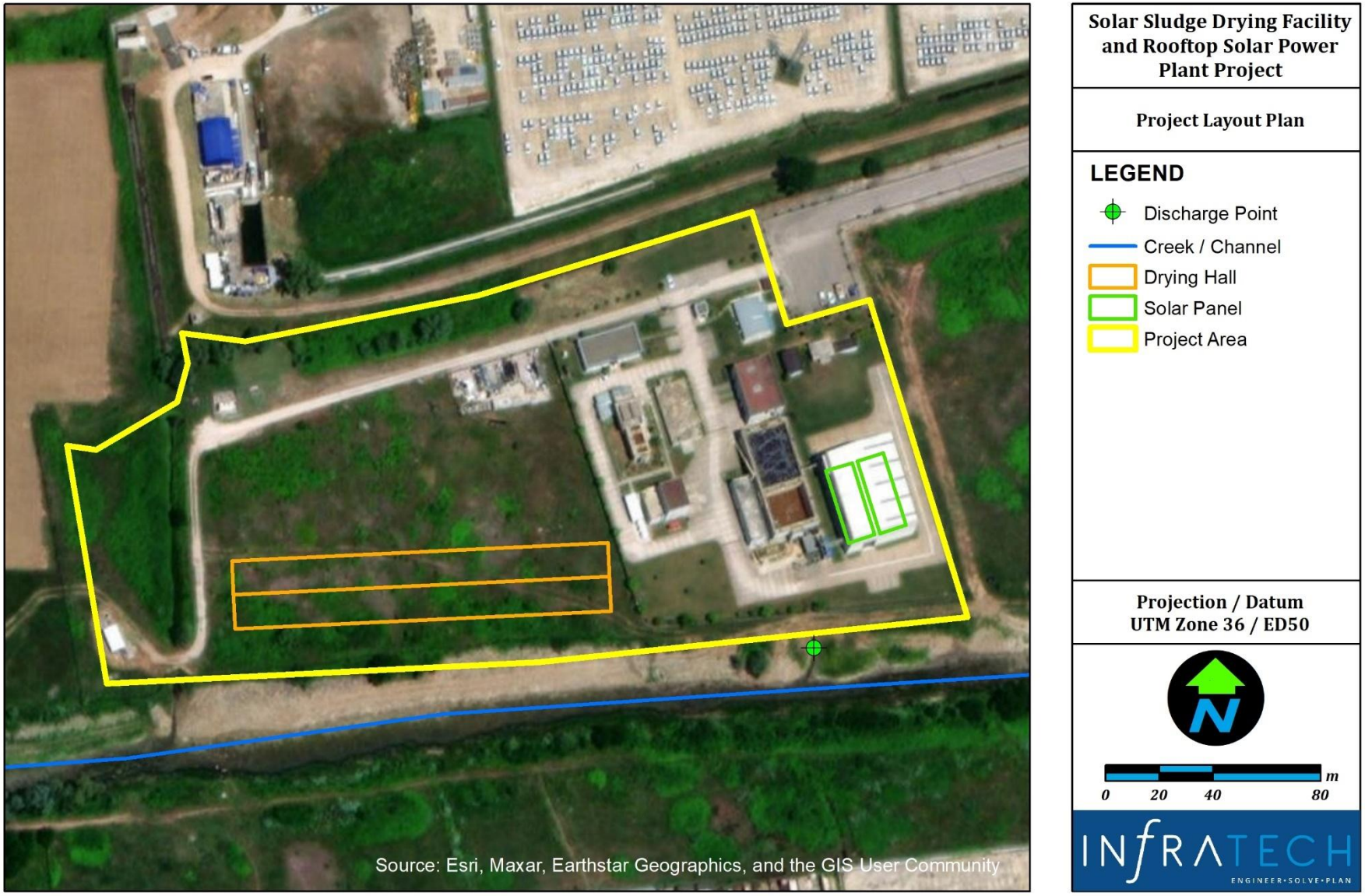


Figure 24 Layout Plan

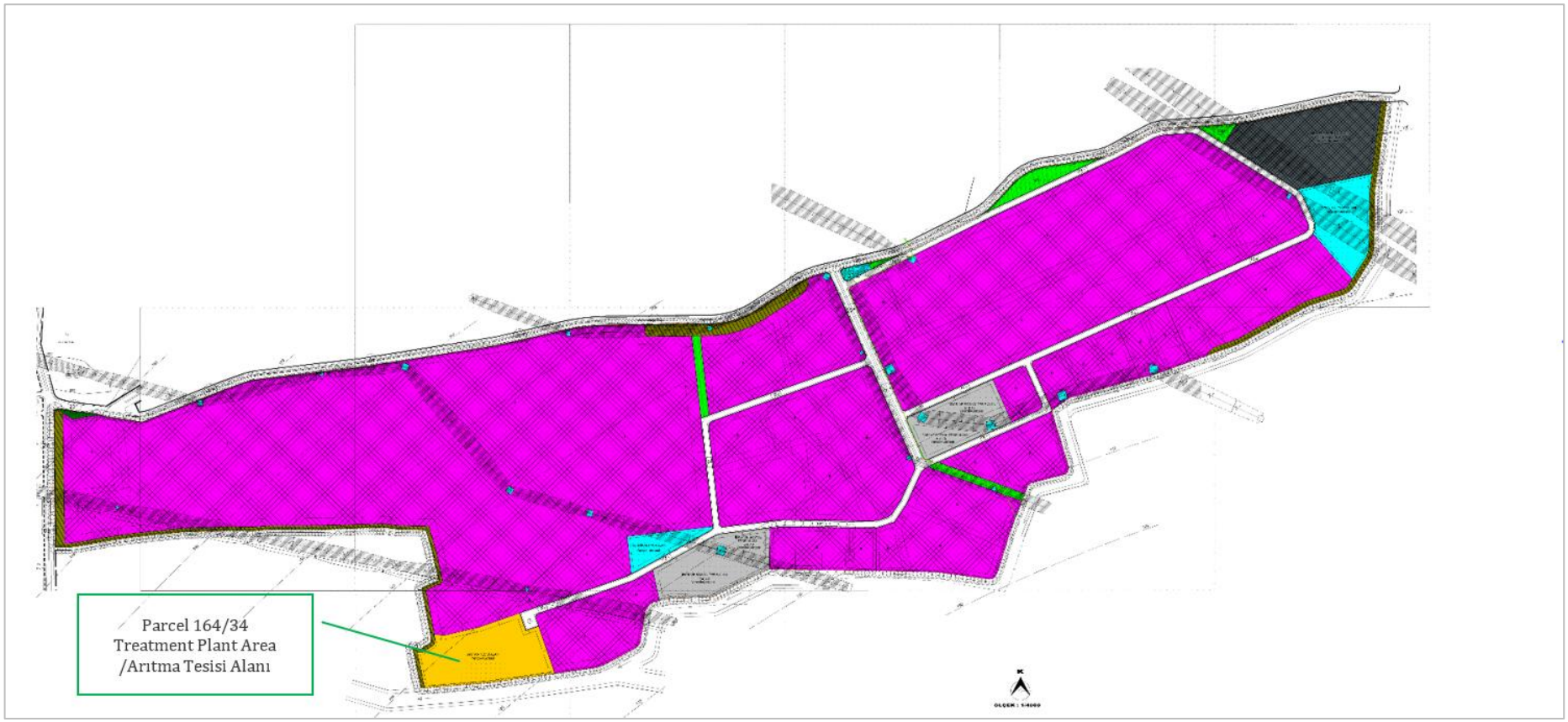


Figure 25 Spatial Plan of the OIZ, including the Proposed Project Location (Source: Asım Kibar OIZ E&S Screening Report, Figure 3)

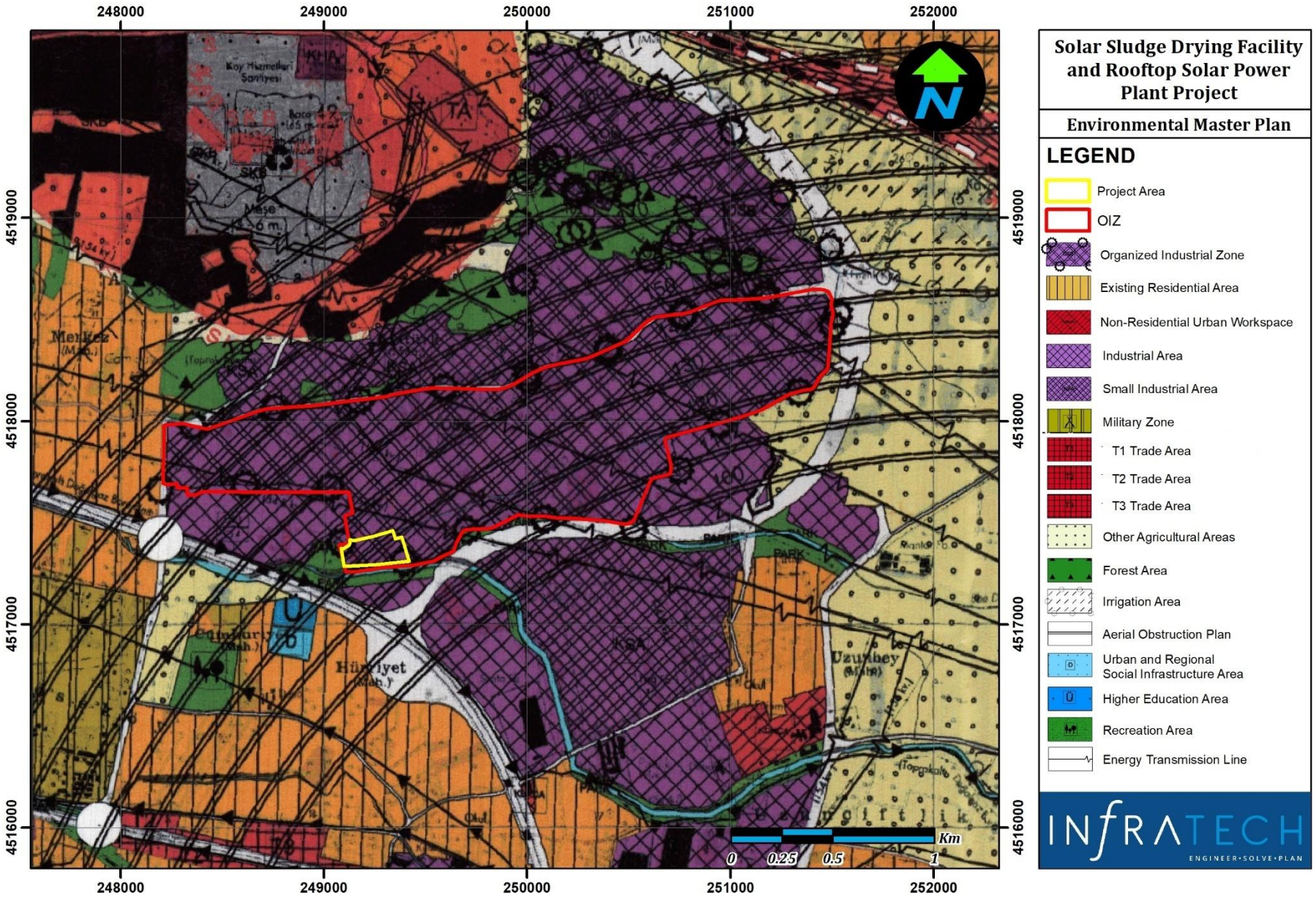


Figure 26 Land Use Map According to Environmental Master Plan

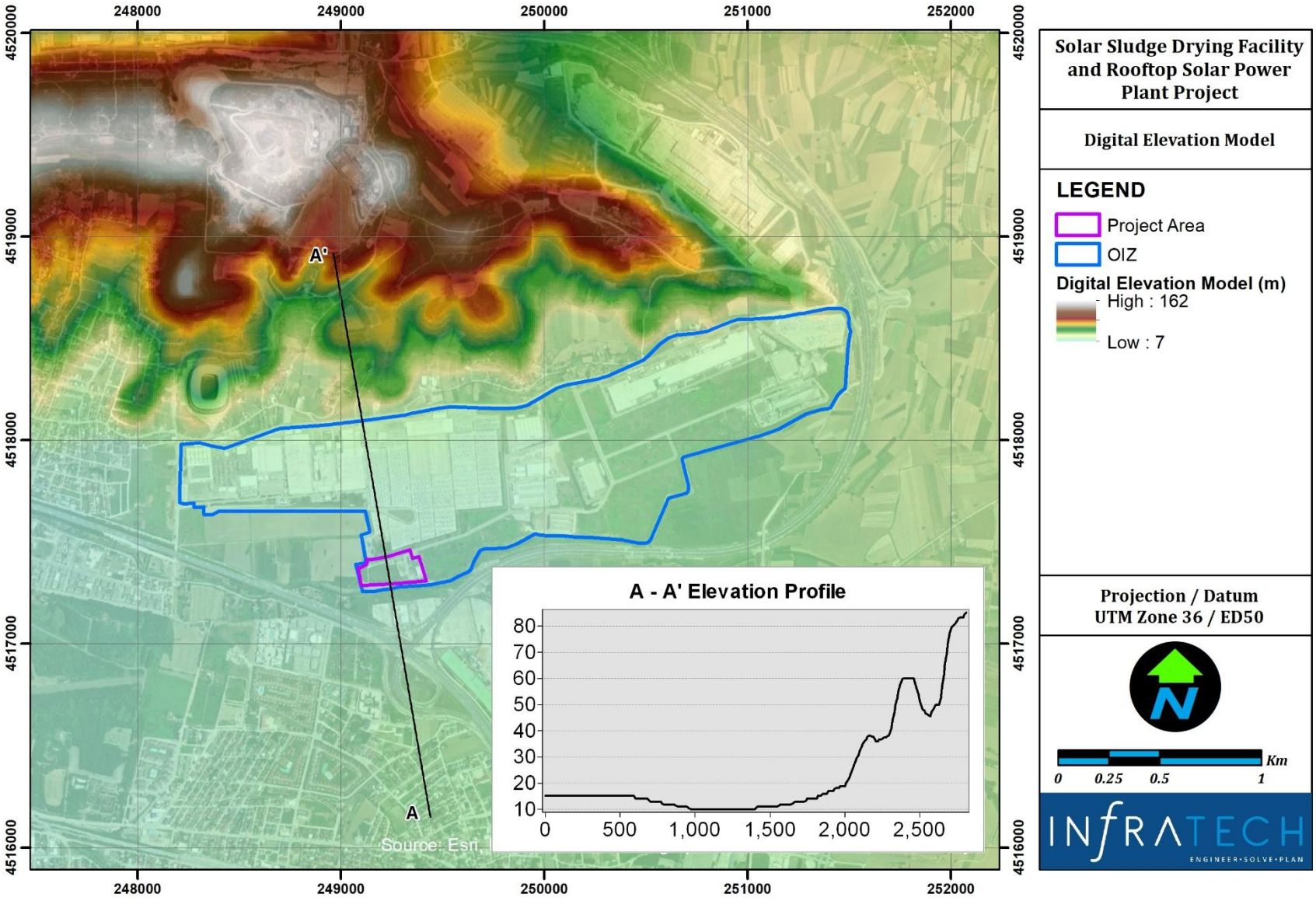


Figure 27 DEM Map of Project Area and Its Vicinity

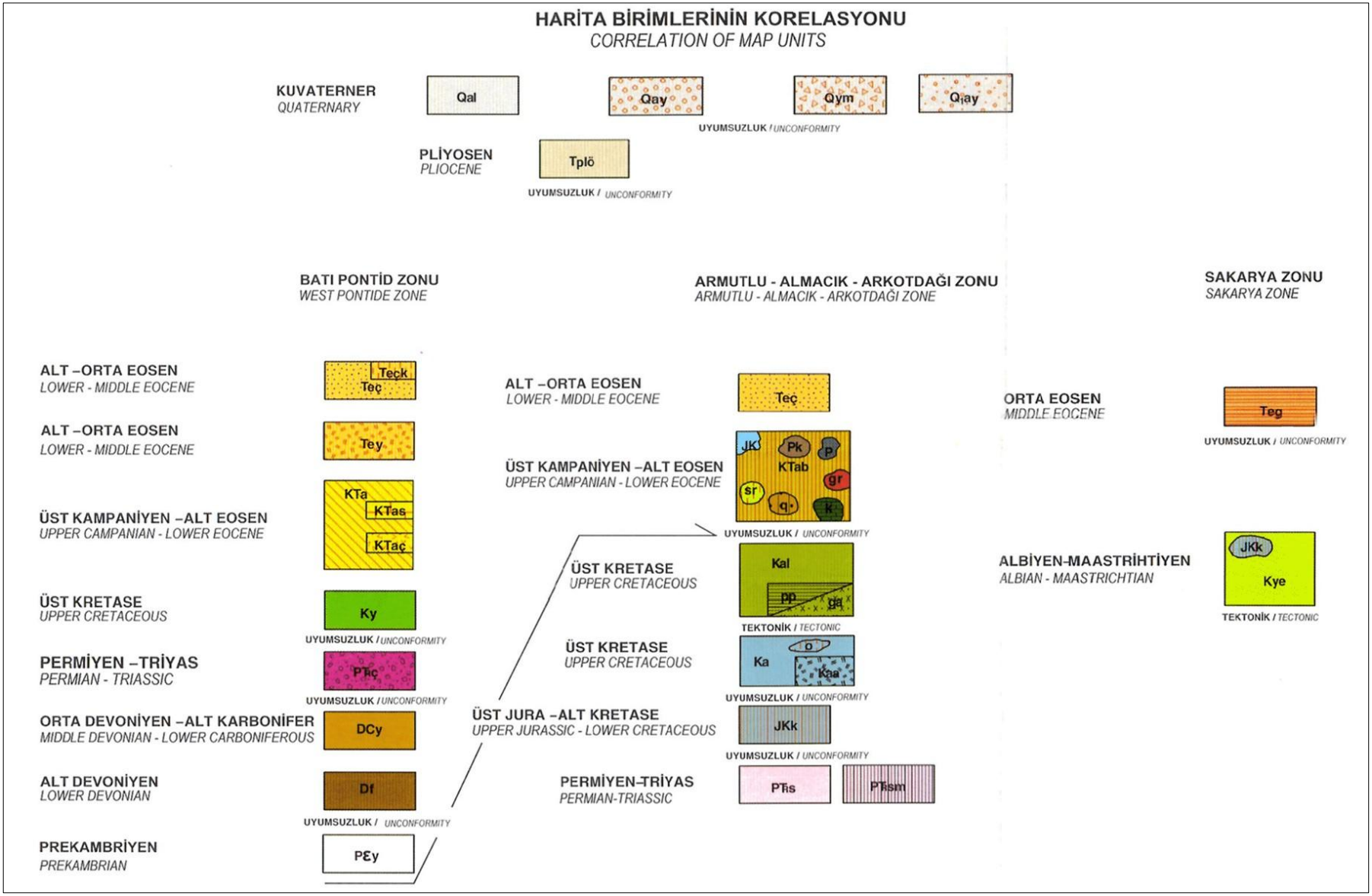


Figure 28 Generalized Stratigraphic Column Section of the Project Area and Its Surroundings

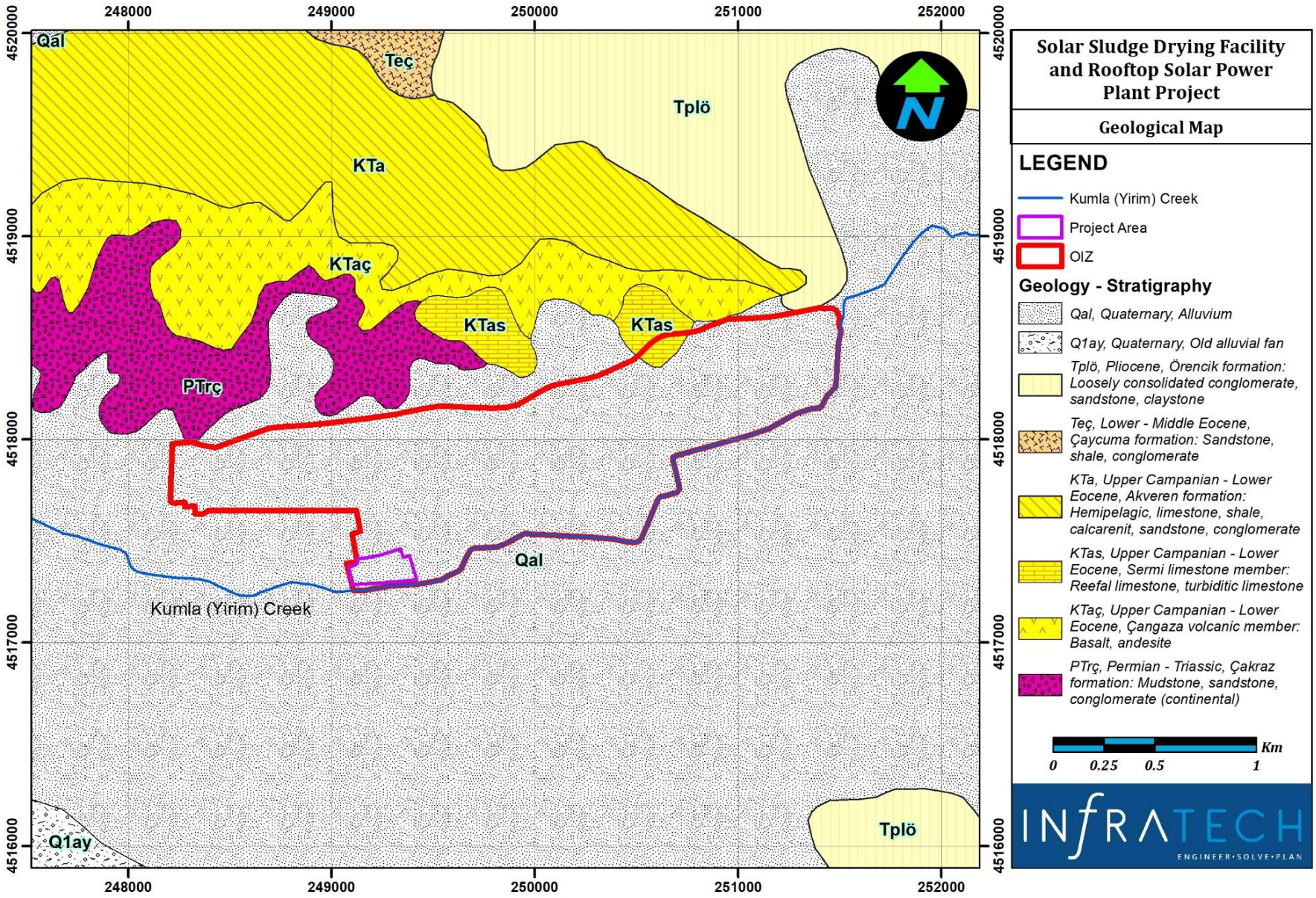
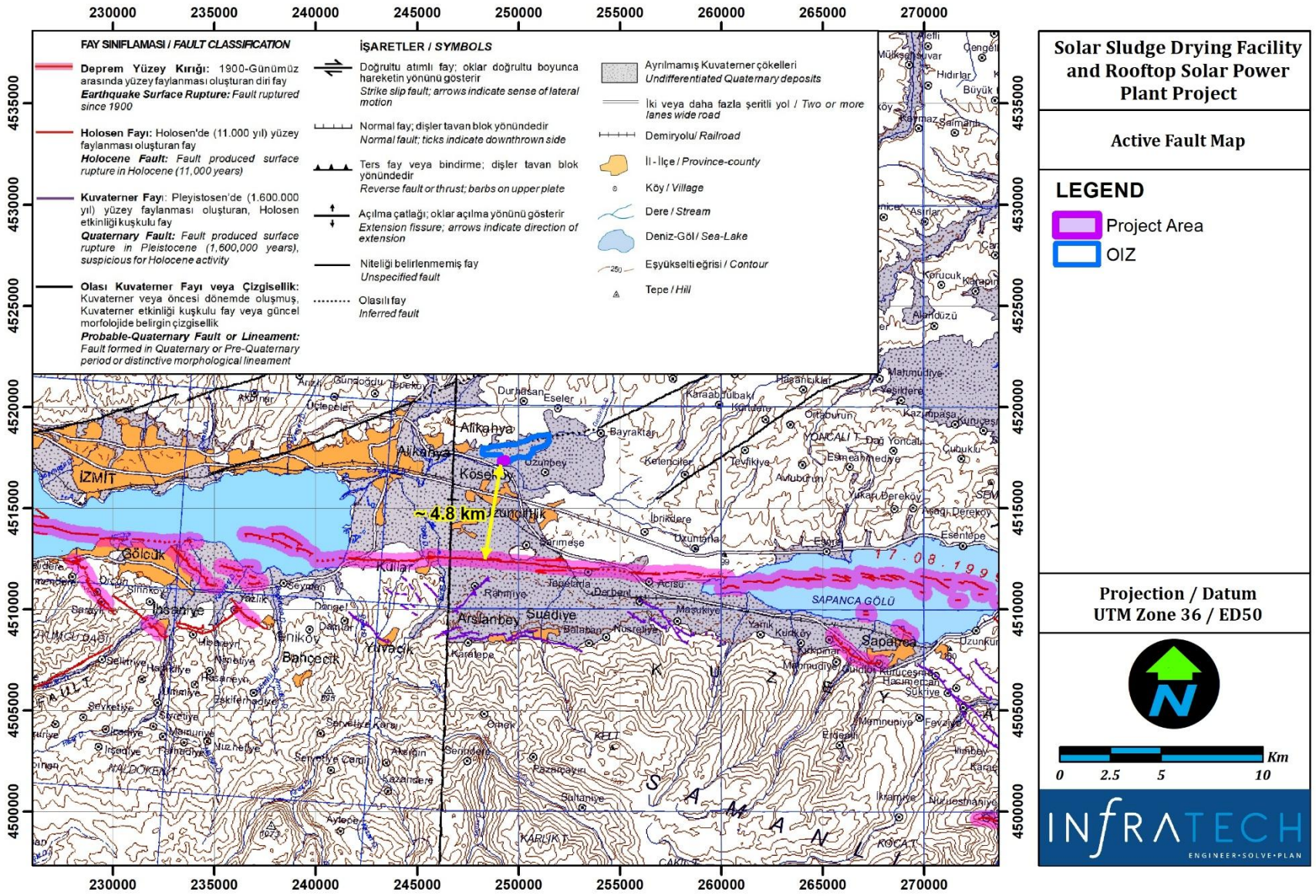


Figure 29 Geology Map of Project Area



Solar Sludge Drying Facility and Rooftop Solar Power Plant Project

Active Fault Map

LEGEND

Project Area

OIZ

Projection / Datum
UTM Zone 36 / ED50

N

0 2.5 5 10 Km

INFRATECH ENGINEER•SOLVE•PLAN

Figure 30 Active Fault Map of the Project Area and Its Vicinity

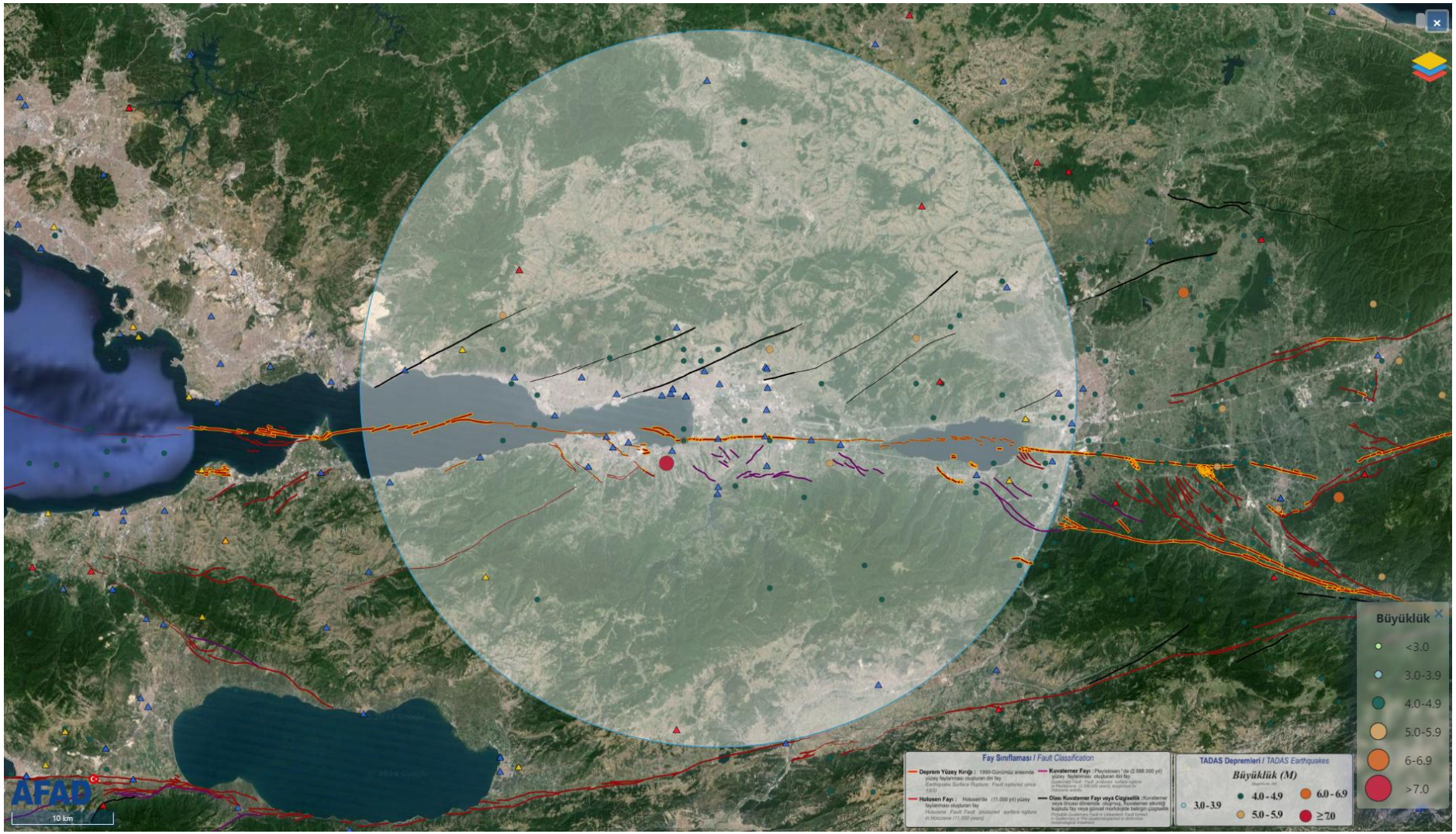


Figure 31 Earthquakes with M>4 with a radius of 50 km and the center point of which is the project area

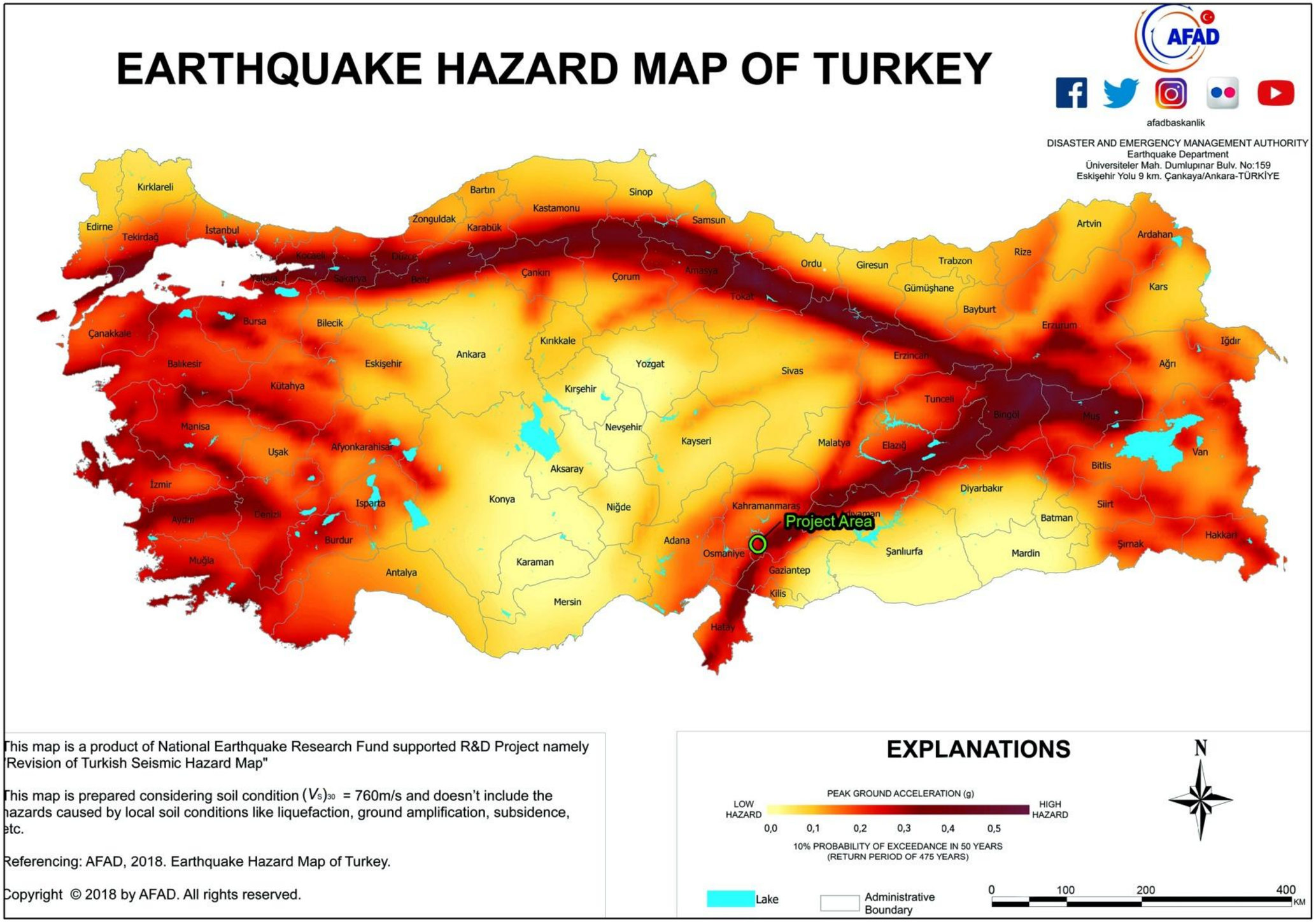


Figure 32 Earthquake Hazard Map of Türkiye

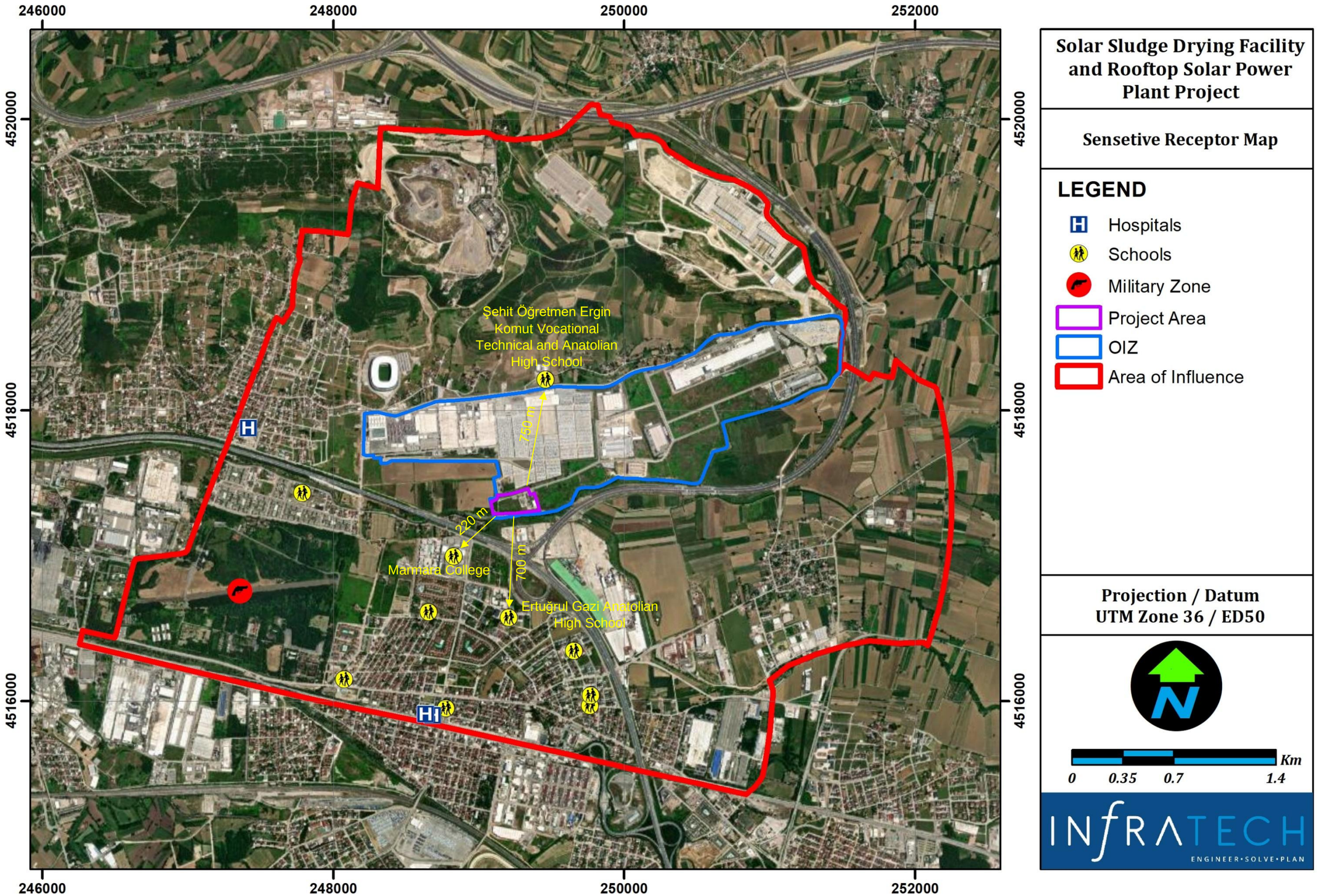


Figure 33 Sensitive Receptors

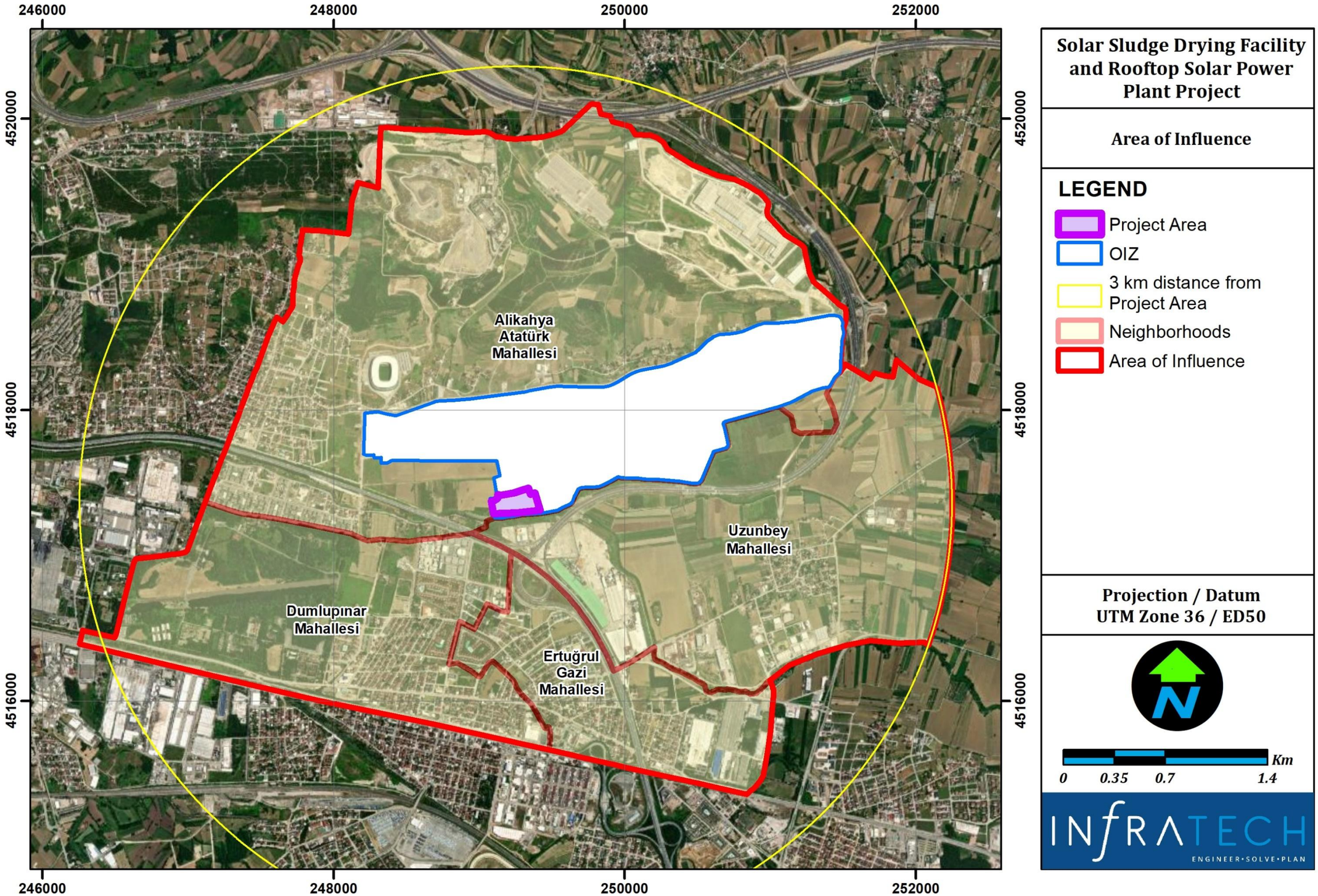


Figure 34 AoI Map

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

INFRATECH
ENGINEER•SOLVE•PLAN

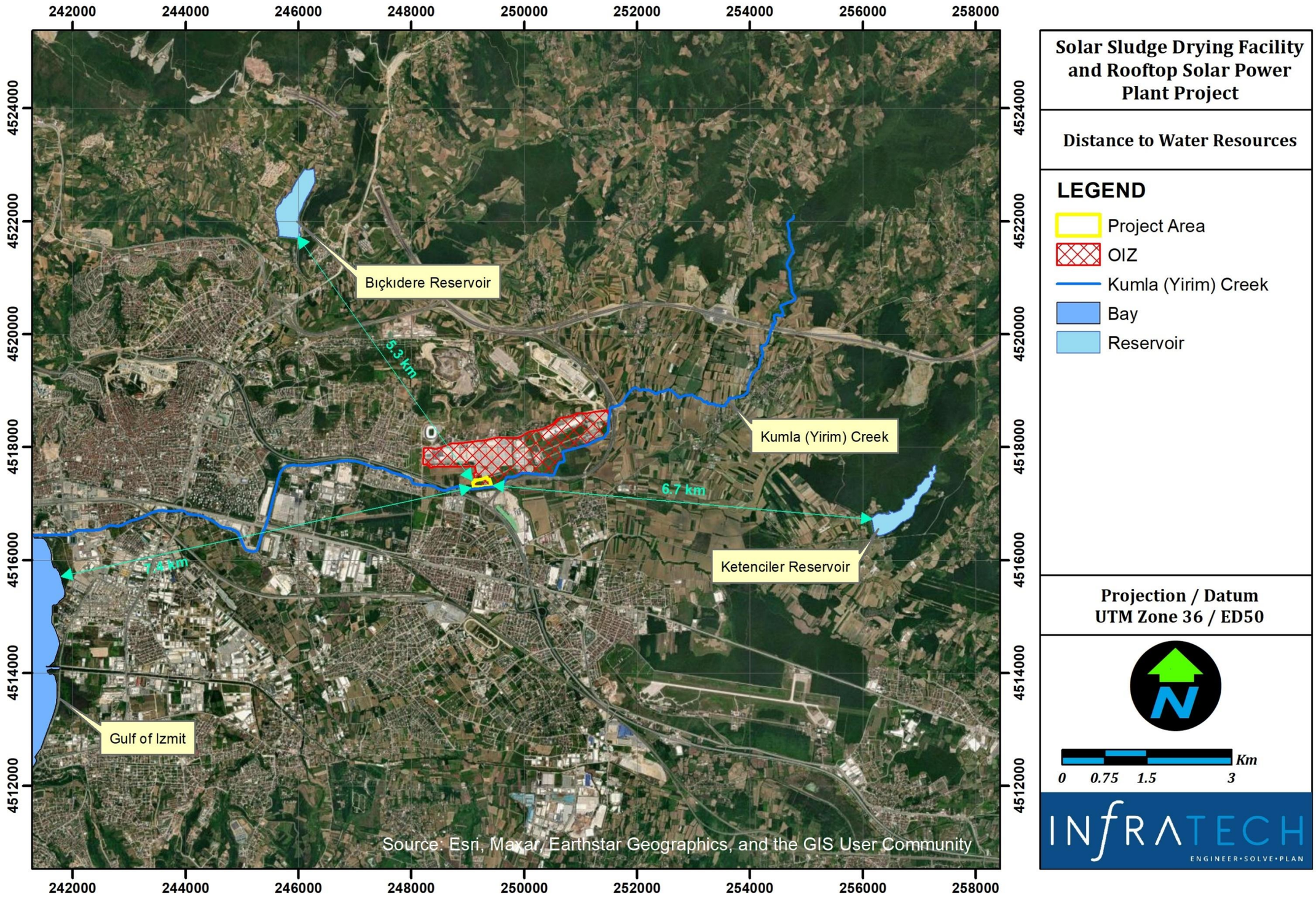


Figure 35 Distance to Water Resources

ANNEX-3: EXEMPTION LETTER FROM THE EIA REGULATION

T.C.
KOCAELİ VALİLİĞİ
Çevre, Şehircilik ve İklim Değişikliği İl Müdürlüğü

Sayı : E-31390780-220.03-7547322
Konu : Çatı Tipi GES Kurulumu ÇED Görüşü

ASIM KİBAR ORGANİZE SANAYİ BÖLGESİNE

İlgi : Asım Kibar Organize Sanayi Bölgesi'nin 26.09.2023 tarihli ve sayılı yazısı.

İlgi kayıtlı yazı ile, Organize Sanayi Bölgenizde, G24A21C1D pafta, 164 ada, 34 parsel numarasında kayıtlı, 40.395,43 m2 yüzölçümlü alan üzerinde, 4.036,00 m2 yüzölçümlü kapalı alanda Atıksu Arıtma Tesisi ve Geri Kazanım tesisi yer aldığı ve geri kazanım tesisi binası çatısı üzerine Çatı Tipi GES (127,4 kWp) kurulması planlandığı ifade edilerek, 29/07/2022 tarih ve 31907 sayılı Resmi Gazete'de yayımlanarak yürürlüğe giren Çevresel Etki Değerlendirmesi (ÇED) Yönetmeliği kapsamında değerlendirilmesi talep edilmiştir.

İlgi yazı ve ekleri üzerinde yapılan inceleme neticesinde; geri kazanım tesisi binası çatısı üzerine Çatı Tipi GES (127,4 kWp) kurulması planlandığı beyan edildiği anlaşılmış olup, bahse konu " Çatı Tipi GES (127,4 kWp) " faaliyetinin anılan ÇED Yönetmeliğinin EK I (Çevresel Etki Değerlendirmesi Uygulanacak Projeler) ve EK II (Çevresel Etkileri Ön İnceleme ve Değerlendirmeye Tabi Projeler) Listelerinde yer almadığı tespit edilmiştir.

Ancak, söz konusu faaliyet ile ilgili olarak 2872 sayılı Çevre Kanunu ile bu Kanuna istinaden çıkarılan Yönetmeliklerin ilgili hükümlerine uyulması ve diğer mer'i mevzuat çerçevesinde öngörülen gerekli izinlerin alınması, ekolojik dengenin bozulmamasına, çevrenin korunmasına ve geliştirilmesine yönelik tedbirlere riayet edilmesi gerekmektedir.

Gereğini rica ederim.

Cengiz ÖZTÜRK
İl Müdür a.
Çevre, Şehircilik ve İklim Değişikliği İl Müdür Yardımcısı

Bu belge, güvenli elektronik imza ile imzalanmıştır.
Doğrulama Kodu: 2D2B9E48-A441-4AD8-9195-9E0131DDCCF3 Doğrulama Adresi: https://www.turkiye.gov.tr

Adres: Ovacık Mahallesi, Hasat Sokak, No:1 Başiskele/KOCAELİ
Tel.No: 0 262 312 11 41 Faks: 0 262 325 31 87 E-posta: kocaeli@csb.gov.tr
KEP Adresi : kocaelicevresehircilik@hs01.kep.tr
Bilgi için:Rıdvan TÜLÜ
Çevre Mühendisi

T.C.
KOCAELİ VALİLİĞİ
Çevre, Şehircilik ve İklim Değişikliği İl Müdürlüğü

Sayı : E-31390780-220.03-7757415
Konu : ÇED Kapsam Dışı

ASIM KİBAR ORGANİZE SANAYİ BÖLGESİNE

İlgi : Asım Kibar Organize Sanayi Bölgesi'nin 20.10.2023 tarihli ve sayılı yazısı.

İlgi kayıtlı yazı ile ; AKOSB Arıtma Tesisi vasıflı G24A21C1D pafta, 164 ada, 34 parseldeki 40.395,43 m2 alana sahip taşınmaz üzerinde kurulması planlanan Solar Kurutma Tesisi Projesi için ÇED kapsam dışı görüşünün alındığı, bahsi geçen yatırımın Dünya Bankası kredisi ile yapılması planlanmakta olduğu ve bu nedenle Sanayi ve Teknoloji Bakanlığı'nın isteği doğrultusunda güncel ÇED görüşü talep edildiği anlaşılmaktadır.

İl Müdürlüğümüz arşiv kayıtlarında yapılna inceleme neticesinde ; solar kurutma tesisi projesi ile ilgili 25/04/2022 tarihli ve E-31390780-220.03-3522075 sayılı ÇED kapsam dışı görüş yazısı verildiği anlaşılmış olup, bahse konu "Solar Kurutma Tesisi Projesi" hususunda yürürlükteki ÇED Yönetmeliği kapsamında yapılacak her hangi bir işlem bulunmamaktadır.

Ancak, bahse konu faaliyetle ilgili olarak ilerleyen zamanda solar kurutma tesisine doğal gazlı ısıtma sisteminin eklenmesinin planlanması halinde Bakanlığımıza başvuru yapılması, ayrıca geçirimsizlik tedbirleri alınarak 2872 sayılı Çevre Kanunu ve bu Kanuna istinaden çıkarılan Yönetmeliklerin ilgili hükümlerine uyulmasına ve diğer ilgili kurum ve kuruluşlarca mer'i mevzuat çerçevesinde öngörülen gerekli tüm izin ve tedbirlerin alınmasına, ekolojik dengenin bozulmamasına, çevrenin korunması ve geliştirilmesine yönelik tedbirlere riayet edilmesi gerekmektedir.

Gereğini rica ederim.

Cengiz ÖZTÜRK
İl Müdür a.
Çevre, Şehircilik ve İklim Değişikliği İl Müdür Yardımcısı

Bu belge, güvenli elektronik imza ile imzalanmıştır.
Doğrulama Kodu: 584F6DFA-DB1E-4493-9123-FB00008B4828 Doğrulama Adresi: https://www.turkiye.gov.tr

Adres: Ovacık Mahallesi, Hasat Sokak, No:1 Başiskele/KOCAELİ
Tel.No: 0 262 312 11 41 Faks: 0 262 325 31 87 E-posta: kocaeli@csb.gov.tr
KEP Adresi : kocaelicevrevesehircilik@hs01.kep.tr
Bilgi için:Rıdvan TÜLÜ
Çevre Mühendisi

ANNEX-4: ENVIRONMENTAL PERMIT CERTIFICATE

T.C.
ÇEVRE VE ŞEHİRCİLİK BAKANLIĞI
ÇED İzin ve Denetim Genel Müdürlüğü

Sayı : 68380212-150/E.8749 08.06.2020
Konu : Çevre İzin Belgesi

ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ
ATATÜRK (OSB) Mahallesi, 4. CADDE, No:21 /1-1, İZMİT / KOCAELİ

İlgi : a) 05.01.2016 tarihli Çevre İzin Belgesi.
b) 15.04.2020 tarih ve 496367 no'lu başvurunuz.

10/09/2014 tarihli ve 29115 sayılı Resmi Gazete'de yayımlanan Çevre İzin ve Lisans Yönetmeliği kapsamında gerçekleştirilen ilgi (a)' da kayıtlı Geçici Faaliyet Belgesi başvurusu uygun bulunmuş ve bu Yönetmeliğin 8 nci maddesi gereğince ilgi (b) yazımız ile Geçici Faaliyet Belgesi verilmiştir.

Bu Yönetmeliğin 9 ncu maddesi gereğince ilgi (c)' de kayıtlı Çevre İzin Belgesi başvurusu yapılmıştır. Söz konusu başvuru Yönetmeliğin 9 ncu maddesi ve ilgili diğer yönetmelikler kapsamında incelenmiş ve ATATÜRK(OSB) Mahallesi, 4. CADDE, No:21 /1-1, İZMİT / KOCAELİ adresinde bulunan işletmeniz için 09.06.2025 tarihine kadar geçerli olmak üzere ÇEVRE İZİN ve LİSANS BELGESİ verilmesi uygun bulunmuştur.

ÇEVRE İZİN ve LİSANS BELGESİ süresi içinde ekte yer alan çalışma şartlarına uygun faaliyet gösterilmesi, aksi durumda ise söz konusu belgenin iptal edileceği ve 2872 sayılı Çevre Kanunu'nun ilgili maddeleri uyarınca idari yaptırım uygulanacağı hususunda;

Bilgilerinizi ve gereğini rica ederim.

e-imzalıdır
Ercan GÜLAY
Bakan a.
Genel Müdür

EKLER:
1) Atık ve DR Kodları
2)Çevre İzin Koşulları

5070 sayılı Elektronik İmza Kanunu gereği bu belge elektronik imza ile imzalanmıştır.

T.C.
ÇEVRE VE ŞEHİRCİLİK BAKANLIĞI
ÇED İzin ve Denetim Genel Müdürlüğü

TESİS İZİN KOŞULLARI

Atıksu Deşarjı

- 31/12/2004 tarih ve 25687 sayılı Resmi Gazete'de yayımlanan Su Kirliliği Kontrolü Yönetmeliği (SKKY) "İzleme" başlıklı 54 üncü maddesi gereğince işletmeciler tarafından yapılan ölçüm ve analizlerin sonuçları raporların asılları ile birlikte dijital ortamda da en az beş yıl süreyle saklanmak zorundadır.
- SKKY'nin "Haber Verme Yükümlülüğü" başlıklı 52 nci maddesi gereğince arıtma tesisi olmayanlar, arızalananlar, çalıştığı halde standartları sağlayamayanlar, faaliyetinde kapasite artırımına gidenler, faaliyetlerini geçici veya sürekli olarak durduranlar ilgili idareye derhal haber vermekle yükümlüdürler.
- Deşarj standartlarının sağlanması amacıyla, atıksuların yağmur suları, soğutma suları, az kirli yıkama suları ve buna benzer az kirli sularla seyreltilmesi yasaktır.
- Atık su debisi 500 m3/gün üzerinde olan işletmelerin atıksu arıtma tesisi çıkış noktasında numune alma bacası, otomatik numune alma ve debi ölçme cihazı bulundurması zorunludur. Atık su debisi 200-500 m3/gün arasında olan işletmelerin atıksu arıtma tesisi çıkış noktasında numune alma bacası ve otomatik numune alma cihazı bulundurması zorunludur.
- İşletmeye ait Atıksu Arıtma Tesinde arıtma çamuru oluşması durumunda ilgili yönetmelikler kapsamında yapılacak olan analiz sonucuna göre belirlenecek uygun bertaraf yöntemiyle bertaraf edilmesi gerekmektedir.
- Debisi 1.001-10.000 (m3/gün) arasında olan arıtma tesislerinin çıkışından iç izlemeye esas onbeş günde bir numune alınmalıdır. **(Çevre ve Şehircilik İl Müdürlüğü tarafından denetime esas asgari üç ayda bir numune alınacaktır.)
- **-Eğer ilk yıl boyunca üç ardışık numune analiz sonuçlarının deşarj standartlarına uyulduğu gösterilebilirse , izleyen yıllarda ilgili sektör tablosunda yer alan pH, KOI, BOI, Yağ-Gres, AKM parametreleri dışındaki diğer parametrelere Çevre ve Şehircilik İl Müdürlüğünü yazıyla bilgilendirmek kaydıyla yılda bir kez bakılması yeterlidir. Eğer parametrelerden biri deşarj standarlarına uymazsa takip eden yıl içerisinde tabloya göre numune alınmalıdır.
- SKKY"deki hüküm ve esaslara uyulması gerekmektedir.

T.C.
ÇEVRE VE ŞEHİRCİLİK BAKANLIĞI
ÇED İzin ve Denetim Genel Müdürlüğü

ÇEVRE İZİN BELGESİ

Belge No	:	226517362.0.1
Başlangıç Tarihi	:	09.06.2020
Bitiş Tarihi	:	09.06.2025
Tesis Adı	:	ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ
Tesis Adresi	:	ATATÜRK (OSB) Mahallesi, 4. CADDE, No:21 /1-1, İZMİT / KOCAELİ
İşletme Vergi No	:	5650493220
Çevre İzin ve Lisans Konusu	:	Atıksu Deşarjı

Yukarıda adı ve açık adresi belirtilen tesise Çevre İzin ve Lisans Yönetmeliği kapsamında ÇEVRE İZİN BELGESİ verilmiş olup 08.06.2020 tarihli ve 68380212-150/E.8749 sayılı yazı ile birlikte geçerlidir. Ayrı kullanılmaz.

e-imzalıdır
Ercan GÜLAY
Bakan a.
Genel Müdür

5070 sayılı Elektronik İmza Kanunu gereği bu belge elektronik imza ile imzalanmıştır.

ANNEX-5: LEGAL FRAMEWORK

I. LEGAL FRAMEWORK

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

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

Ministries are the units of central administration. Local branches of ministries are composed of provincial organizations attached to governors and district organizations attached to the district governors (*Hacettepe University, Department of Political Science and Public Administration, April, 2015*). At the local level, municipality mayors and the headmen of the villages/neighborhoods (mukhtar) are the representatives of the administrative structure.

I.1. National Legislation

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

I.1.1. National Environmental, Health and Safety Legislation

Environmental Law No. 2872, which is ratified in August 1983 (Official Gazette dated 11.08.1983 and numbered 18132), is one of the principal legislations related to the Project. Several by-laws and decrees are enforced under the Environmental Law.

Occupational Health and Safety Law No. 6331, which is ratified June 2012 (Official Gazette dated 30.06.2012 and numbered 28339), is other principal legislation related to the Project. Occupational Health and Safety Law enforces various by-laws and decrees to regulate and uphold health and safety standards.

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

Solar Sludge Drying Plant and Roof SPP Project planned by Asım Kibar OIZ were assessed as "outside the scope of EIA regulation" by Kocaeli Provincial Directorate of Environment, Urbanisation and Climate

Change in 2022 and 2023, respectively. The exemption letters from the EIA Regulation are given in Annex-3.

The rest of the Turkish Legislation that the Project will comply with is presented in Table 33.

Table 33 Turkish EHS Legislation Related to the Project

Legislation	Official Gazette Date	Official Gazette Number	Implications for the Project Phases
National Environmental, Legal and Political Framework			
Waste Management			
Regulation on the Control of Waste Batteries and Accumulators	August 31, 2004	25569	• This regulation applies on battery and accumulator wastes that may occur as a result of office or vehicle use throughout the lifetime of the Project.
Regulation on the Control of Excavation Soil, Construction and Demolition Waste	March 18, 2004	25406	• This regulation applies to activities that will cause to the generation of excavation soil, construction wastes, especially during the construction phase of the Project.
Regulation on the Control of End-of-Life Tires	November 25, 2006	26357	• This regulation applies on waste management of End-of-Life Tires generated during all phases of the project.
Regulation on the Control of End-of-Life Vehicles	December 30, 2009	27448	• This regulation applies on waste management of End-of-Life Vehicles generated during all phases of the project.
Regulation on Waste Management	April 2, 2015	29314	• This regulation is the main regulation applies on regarding the non-hazardous and hazardous wastes that will be generated as a result of all activities to be carried out throughout the lifetime of the Project.
Regulation on the Control of Waste Vegetable Oil	June 6, 2015	29378	• This regulation applies on waste vegetable oils during especially the operation phase of the Project.
Regulation on the Control of Medical Waste	January 25, 2017	29959	• This regulation applies for medical waste to be generated throughout the life of the Project.
Regulation on Zero Waste	July 12, 2019	30829	• This regulation applies on the establishment of zero-waste management system that aims to protect the environment and human health and all resources regarding the wastes that will be generated as a result of all activities to be carried out throughout operation phase.
Regulation on the Management of Waste Oil	December 21, 2019	30985	• This regulation applies on waste oils that may occur as a result of vehicle/equipment maintenance throughout the lifetime of the Project.
Regulation on the Control of Packaging Waste	June 26, 2021	31523	• This regulation applies on packaging waste that will occur as a result of activities that can be carried out throughout the lifetime of the Project.
Regulation on Management of Waste Electrical and Electronic Equipment	December 26, 2022	32055	• This regulation applies on electrical and electronic equipment waste as a result of activities to be carried out throughout the lifetime of the Project.
Water Quality Control and Management			
Regulation on Control of Water Pollution	December 31, 2004	25687	• This regulation applies on discharge of treated effluent during operation phase, wastewater generated by the site staff during pre-construction and construction phases.
Regulation on the Water Intended for Human Consumption	February 17, 2005	25730	• This regulation applies on the monitoring of the suitability for human consumption of water within the scope of the Project during all phases of the project.
Regulation on the Control of Pollution Caused by Hazardous Substances in and around Water Environment	November 26, 2005	26005	• This regulation applies on the hazardous substance impacts on the water and its surroundings that may occur during the Project lifetime.
Regulation on Urban Wastewater Treatment	January 8, 2006	26047	• This regulation applies on effluent quality and treatment efficiencies to be met during the operation phases of existing WWTP.
Regulation on the Protection of Groundwater against Pollution and Deterioration	April 7, 2012	28257	• This regulation applies on protection of groundwater sources against pollution during pre-construction, construction and operation phases.

Legislation	Official Gazette Date	Official Gazette Number	Implications for the Project Phases
Regulation on Surface Water Quality	November 30, 2012	28483	• This regulation applies on discharge of treated effluent and monitoring of water quality at receiving body during operation phase.
Regulation on the Monitoring of Surface Waters and Groundwater	February 11, 2014	28910	• This regulation applies on procedures and principles for revealing the current status of all surface waters and groundwater throughout the country in terms of quantity, quality and hydromorphological elements, monitoring waters with an approach based on ecosystem integrity, and ensuring standardization in monitoring and coordination between institutions and organizations that carry out monitoring during lifetime of Plan.
Regulation on Determination of Sensitive Water Bodies and the Areas Affecting these Bodies and Improvement of Water Quality	December 23, 2016	29927	• This regulation applies on determination of the receiving body sensitivity during pre-construction phase and discharge of treated effluent during operation phase.
Communiqué on Technical Procedures in Wastewater Treatment Plants	March 20, 2010	27527	• This Communiqué applies on the technical principles that will form the basis for wastewater treatment facility project design during pre-construction phase.
Communiqué on Technical Personnel Working in Wastewater Treatment Plants	May 23, 2019	30782	• This Communiqué applies on the procedures and principles regarding the qualifications, certification, duties, authorities and responsibilities of the technical personnel to be employed in order to ensure that the wastewater treatment plants are operated effectively, efficiently and in accordance with the legislation during operation phase.
Air Quality Control and Management			
Regulation on the Air Quality Assessment and Management	June 6, 2008	26898	• This regulation applies on activities that may cause the deterioration of the air quality during the lifetime of the Project, especially the construction phase of the Project.
Regulation on Industrial Air Pollution Control	July 3, 2009	27277	• This regulation applies on activities that may cause air pollution during the lifetime of the Project, especially the construction phase of the Project.
Regulation on the Control of Odor Causing Emissions	July 19, 2013	28712	• This regulation applies on odor nuisance may occur due to activities arising from the WWTP throughout the life of the project.
Regulation on the Monitoring of Greenhouse Gas Emissions	May 17, 2014	29003	• This regulation applies on greenhouse gas emissions during the lifetime of the Project.
Regulation on Exhaust Gas Emission Control	March 11, 2017	30004	• This regulation applies on exhaust gas emissions sourced from project vehicles, machinery and equipment during the lifetime of the Project.
Noise Control and Management			
Regulation on the Environmental Noise Emissions Caused by Equipment Used Outdoors	December 30, 2006	26392	• This regulation applies on the noise emissions caused by equipment used outdoors within the Project especially throughout the construction phase.
Regulation on Environmental Noise Control	November 30, 2022	32029	• This regulation applies on the management of noise emissions during lifetime of the Project.
Soil Quality Control and Management			
Regulation on Soil Pollution Control and Point Source Contaminated Fields	June 8, 2010	27605	• This regulation applies on the protection of soil against pollution during lifetime of the Project.
Environmental Management, Permitting and Planning			
Environmental Law No: 2872	August 11, 1983	18132	• This general law regulates the main environmental rules for all activities to be carried out during the lifetime of the Project.
Organized Industrial Zones Law No: 4562	April 15, 2000	24021	• This law regulates the principles for the establishment and operation of organized industrial zones should be followed at all phases of the project since the Project is Solar Sludge Drying Plant and Roof SPP Project of Asım Kibar OIZ.
Regulation on Environmental Permits and Licensing	September 10, 2014	29115	• This regulation applies on the required environmental permits and licenses at all phases of the Project.

Legislation	Official Gazette Date	Official Gazette Number	Implications for the Project Phases
Regulation on Wastewater Collection and Disposal Systems	January 6, 2017	29940	• This Regulation applies on the procedures and principles regarding the planning, design and projecting, construction and operation of wastewater collection and disposal systems during the lifetime of the Project.
Regulation on Environmental Impact Assessment	July 29, 2022	31907	• This regulation applies on administrative and technical procedures and principles to be followed during the lifetime of the Project as committed in theproject specific and approved PIF..
National Social, Legal and Political Framework			
Community Health and Safety			
Highways Traffic Law No: 2918	October 13, 1983	18195	• This law applies on ensuring traffic order on the highways during the all phases of the Project.
Regulation on Traffic Signs	June 19, 1985	18789	• This regulation applies on traffic sign for the purpose of ensuring traffic order and safety during all phases of the Project.
Regulation on Highway Traffic	July 18, 1997	23053	• This regulation applies on ensuring traffic order on the highways during the all phases of the Project.
Preparation, Completion and Cleaning Works Regulation	April 28, 2004	25446	• This regulation applies on the working conditions in the preparation, completion and cleaning works that must be carried out in order for the main work carried out in a workplace to be carried out in an orderly, healthy and safe manner during lifetime of the Project.
Labor and Working Conditions			
Labor Law No: 4857	June 10, 2003	25134	• This main law applies on the rights and responsibilities of the workers employed based on the labor contract with the employers, regarding the working conditions and working environment during the lifetime of the Project.
Regulation on the Procedures and Principles of Employment of Children and Young Workers	April 06, 2004	25425	• This regulation applies on determine the basis of the way children and young workers work without endangering their health and safety, physical, mental, moral and social development or education, and to prevent their economic exploitation during lifetime of the Project.
Social Security and General Health Insurance Law No: 5510	June 16, 2006	26200	• This law applies on health and safety measures to be taken during lifetime of the Project.
Regulation on the Protection of Buildings from Fire	December 19, 2007	26735	• This regulation applies on measures to be taken for fire protection during construction and operation phases.
Occupational Health and Safety Law No. 6331	June 30, 2012	28339	• This law applies on occupational health and safety measures to be taken during lifetime of the Project.
Communiqué on Occupational Health and Safety Hazard Classes List	December 26, 2012	28509	• This Communiqué applies on determination of hazard classes during lifetime of the Project.
Regulation on Risk Assessment for Occupational Health and Safety	December 29, 2012	28512	• This regulation applies on preparation of occupational health and safety risk assessment and all related principles to be followed during lifetime of the Project.
Regulation on Health and Safety Conditions Regarding Use of Work Equipment	April 25, 2013	28628	• This regulation applies on ensuring the health and safety conditions for the use of work equipment to be used during life of the Project.
Manual Handling Operations Regulation	July 24, 2013	28717	• This regulation applies on health and safety measures to be taken during manual handling activities at all phases of the Project.
Regulation on the Use of Personal Protection Equipment at Workplaces	July 2, 2013	28695	• This regulation applies on personal protection equipment to be used at lifetime of the Project.
Regulation on the Protection of Workers Against the Dangers of Explosive Environments	April 30, 2013	28633	• This regulation applies on measures to be taken in case the use of explosive usage during pre-construction and construction phases.
Regulation on Emergency Situations in Workplaces	June 18, 2013	28681	• This regulation applies on measures to be taken during emergency situations in workplaces during lifetime of the Project.

Legislation	Official Gazette Date	Official Gazette Number	Implications for the Project Phases
Regulation on Health and Safety Precautions Regarding Working with Chemicals	August 12, 2013	28733	• This regulation applies on chemical handling and necessary precautions in workplaces during lifetime of the Project.
Regulation on the Methods and Essentials of Occupational Health and Safety Trainings for Workers	May 15, 2013	28648	• This regulation applies on health and safety training to be performed during lifetime of the Project.
Regulation on the Protection of Workers from Noise Related Risks	July 28, 2013	28721	• This regulation applies on health and safety measures to be taken against the noise impacts during lifetime of the Project.
Regulation on the Protection of Workers from Vibration Related Risks	August 22, 2013	28743	• This regulation applies on health and safety measures to be taken against the vibration impacts during lifetime of the Project.
Regulation on Management of Dust	November 5, 2013	28812	• This regulation applies on management of to be generated dust during pre-construction and construction phases.
Regulation on Health and Safety Signs	September 11, 2013	28762	• This regulation applies on health and safety signs to be placed during lifetime of the Project.
Regulation on the Occupational Health and Safety for Temporary or Fixed Term Jobs	August 23, 2013	28744	• This regulation applies on health and safety measures to be taken for temporary workers during lifetime of the Project.
Regulation on the Occupational Health and Safety in Construction	October 5, 2013	28786	• This regulation applies on constructional health and safety measures to be taken during construction phase.
First Aid Regulation	July 29, 2015	29429	• This regulation applies on in case of a first aid requirement during construction and operation phases.
Regulation on Personal Protection Equipment	May 1, 2019	30761	• This regulation applies on personal protection equipment to be used during construction and operation phases.
Management of Chemicals and Other Dangerous Substances			
Regulation on the Classification, Labelling and Packaging of Materials and Mixtures	December 11, 2013	28848	• This regulation applies on chemicals and mixtures to be used during lifetime of the Project.
Regulation on Material Safety Data Sheets on Hazardous Materials and Mixtures	December 13, 2014	29204	• This regulation applies on preparation and distribution of safety data sheets in order to ensure effective control and surveillance against the negative human health and the environment effects of hazardous substances and mixtures that may be used during lifetime of the Project.
Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals	June 23, 2017	30105	• This regulation applies on to ensure a high level of protection of human health and the environment during the construction and operation phases, to evaluate the damages of the substances used, to have information on the registration, evaluation, permission and restriction of those chemicals.
Regulation on the Road Transportation of Hazardous Goods	June 18, 2022	31870	• This regulation applies on hazardous goods to be transported during lifetime of the Project.
Land Use			
Soil Conservation and Land Use Law No: 5403	July 19, 2005	25880	• This law applies on management of change in the land use during the planning phase of the Project.
Regulation on the Protection, Usage and Planning of Agricultural Lands	December 9, 2017	30265	• This regulation applies on management of change in the land use during the planning phase of the Project.
Stakeholder Engagement			

Legislation	Official Gazette Date	Official Gazette Number	Implications for the Project Phases
Constitution of the Republic of Türkiye	November 09, 1982	17863	• Citizens and foreigner's resident in Türkiye, with the condition of observing the principle of reciprocity, have the right to apply in writing to the administrative authorities and the Grand National Assembly of Türkiye about the requests and complaints concerning themselves or the public. • Regarding with the Project Citizens and foreigners at the AoI have the right to apply in writing to the MoIT and the Grand National Assembly of Türkiye concerning the requests and complaints concerning themselves or the public.
Use of the Right to Petition Law No: 3071	November 10, 1984	18571	• Citizens and foreigners have the right to apply in writing to the MoIT and the Grand National Assembly of Türkiye concerning the requests and complaints concerning themselves or the public.
Right to Information Law No: 4982	October 24, 2003	25269	• Citizens can request information from MoIT and OIZ. • The institutions shall provide the requested information within 15 working days.
Regulation on Environmental Impact Assessment	July 29, 2022	31907	• Inform the investing public, to get their opinions and suggestions regarding the project, Public Participation Meeting. Participants raise issues related to the Project. • As the Project has EIA exemption, the Public Participation Meeting has not been held.
Others			
Law on Conservation of Cultural and Natural Assets No. 2863	July 21, 1983	18113	• The purpose of this Law is to determine the definitions related to movable and immovable cultural and natural assets that need to be protected, to organize the transactions and activities to be carried out, to determine the establishment and duties of the organization that will take the necessary principles and implementation decisions in this regard.
Regulation on the Implementation of the Law Concerning Private Security Services	October 7, 2004	25606	• This regulation applies on private security services to be used during construction and operation services.
Regulation on Contractors and Sub-contractors	September 27, 2008	27010	• This regulation applies on management of the conditions for the establishment of the principal employer-subcontractor relationship, the notification and registration of the workplace belonging to the subcontractor, the issues that should be included in the subcontractor agreement.
Regulation Concerning the Increase in the Efficiencies of Energy Consumption and Energy Resources	October 27, 2011	28097	• This regulation applies on the procedures and principles regarding the effective use of energy, prevention of energy waste, and increasing efficiency in the use of energy resources and energy to protect the environment during lifetime of the Project.
Protection of Personal Data Law No: 6698	April 7, 2016	29677	• This law applies on protection of fundamental rights and freedoms of individuals, especially the privacy of private life, in the processing of personal data during lifetime of the Project.
Regulation Concerning the Ozone Depleting Substances	April 7, 2017	30031	• This regulation applies on ozone depleting substances to be used during construction and operation phases.
Building Earthquake Regulation	March 18, 2018	30364	• This regulation applies on necessary rules and minimum conditions for the design and construction of all or parts of building-type structures under the influence of earthquakes and for the evaluation and strengthening of the performances of existing buildings under the influence of earthquakes during pre-construction and construction phases.

*Relevant amendments of the listed legislation will be applicable.

Asım Kibar OIZ shall comply with the requirements of the current national legislation and codes of practice and fulfil all other legal requirements. Therefore, during each stage of the planned Project and implementation of related management plans, all activities will be carried in accordance with certain standards and limits set by the above-mentioned laws and regulations. Furthermore, any license and/or permit required for the upcoming stages of the Project will be acquired accordingly.

I.2. International Agreements and Standards

International financial institutions follow certain policies and procedures regarding assessment and management of environmental and social impacts/risks of the projects to be financed. As a requirement of international support for the Project, environmental and social impact assessment studies shall be

undertaken to guarantee that the Project's design, construction and operation will be satisfactory for international environmental standards alongside national legislation.

I.2.1. International Environmental Conventions that Türkiye is a Contracting Party

Turkish national policy on protection of cultural heritage and conservation of biological resources has been constituted on the base of relevant international agreements that Türkiye has ratified or acceded by laws or relevant legislation. In addition to these, there are various laws and regulations on protection and conservation of natural habitats, wildlife and cultural heritage.

The international agreements and conventions on biological, cultural heritage, environmental and wildlife conservation that Türkiye had ratified are:

- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) (1972),
- Paris Convention on the Protection of the World Cultural and Natural Heritage (1975),
- Barcelona Convention on the Protection of the Mediterranean Sea Against Pollution (1976),
- The Convention for the Protection of Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) (1981),
- Bern Convention on Protection of Europe's Wild Life and Living Environment (1982),
- Convention on Long Range Transboundary Air Pollution (CLRTAP) (1983),
- Convention on Long-Range Transboundary Air Pollution and the Cooperative Programme for Monitoring and Evaluation of the Long-Range Transmissions of Air Pollutants in Europe (EMEP) (1983),
- Vienna Convention for the Protection of the Ozone Layer (1988),
- Mediterranean Sea Protocol Concerning Specially Protected Areas and Biodiversity (1988), including related protocols,
- Montreal Protocol on Substances Depleting the Ozone Layer (1990),
- Convention on Biological Diversity (Rio Convention) (1992),
- The International Convention on the Established of an International Fund for Compensation for Oil Pollution Damage (FUND 1992),
- International Convention on Civil Liability for Oil Pollution Damage (1992),
- Convention on Wetlands of International Importance, Especially as Waterfowl Habitat (RAMSAR) (1994),
- Basel Convention on the Control of Transboundary Movements of Hazardous Waste and Their Disposal (1994),
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1996),
- Kyoto Protocol (1997),
- UN Convention to Combat Desertification (CCD) (1998),
- United Nations Europe Economic Commission Convention on Transboundary Effects of Industrial Accidents (2000),
- European Landscape Convention (2001),
- Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention) (2001),
- UN Framework Convention on Climate Change (UNFCCC) (2004),
- Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam Convention) (2004),
- Stockholm Convention on Persistent Organic Pollutant (POPs),
- Convention for the Protection of the Black Sea Against Pollution (Bucharest) (1994) and its protocols including the Protocol for the Protection of Biological and Landscape Diversity in the Black Sea (2004),

- International Labor Organization (ILO) Conventions;
    - ILO Convention on Forced Labor (1930),
    - ILO Convention on Freedom of Association and Protection of the Right to Organize (1948),
    - ILO Convention on Right to Organize and Collective Bargaining (1949), ILO Convention on Equal Remuneration (1951),
    - ILO Convention on Abolition of Forced Labor (1957),
    - ILO Convention on Discrimination (Employment and Occupation) (1958),
    - ILO Convention on Minimum Age (1973),
    - ILO Convention on Worst Forms of Child Labor (1999).

Aside from the listed ILO Conventions, which are categorized as fundamental conventions; Türkiye also ratified three out of four governance conventions, 48 out of 177 technical conventions, out of 59 Conventions ratified by Türkiye, of which 55 are in force, three Conventions have been denounced which are C 34 Fee-Charging Employment Agencies Convention, C 58 Minimum Age (Sea) Convention (Revised) and C 59 Minimum Age (Industry) Convention (Revised); one instrument abrogated which is C 15 Minimum Age (Trimmers and Stokers) Convention; none have been ratified in the past 12 months.

I.2.1.1. International Legal and Regulatory Framework for Ecology and Biodiversity

Bern Convention

Bern Convention was put forward in 1982 in order to protect the European wildlife and natural habitats. Species to be protected according to the Bern Convention are listed in four appendices, which are presented in Table 34 with their explanations:

Table 34 Annexes to the Bern Convention

Annex	Explanation
I	Strictly protected flora species
II	Strictly protected fauna species
III	Protected fauna species
IV	Prohibited means and methods of killing, capture and other forms of exploitation

The Convention aims at conserving and promoting biodiversity, developing national policies for the conservation of wild flora and fauna and their natural habitats, protection of the wild flora and fauna from the planned development and contamination, developing trainings for protection practices, promoting and coordinating the researches made regarding this subject. It has been signed by 26member states of the European Council (as well as Türkiye) with the aim of conserving the wildlife in Europe. Species that are not included within the appendices of the Convention are those that do not require any special protection. Species are not listed individually but instead are protected due to the habitat protection approach of the Bern Convention. All the nations that are party to the BERN Convention have signed the Convention on Biological Diversity as well. Parties of this convention are responsible for ensuring sustainable use of resources in line with their national development trends and conserving the threatened species.

CITES

CITES stands for the Convention on International Trade in Endangered Species of Wild Flora and Fauna. It is an international agreement that has been ratified by governments of 164 states (including Türkiye), whose aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. The principles of CITES are based on sustainability of the trade in order to safeguard ecological resources (live animals and plants, vast array of wildlife products derived from them, including food products, exotic leather goods, etc.). CITES was signed in 1973 and entered in force on July 1, 1975. Türkiye ratified the Convention in 1996. Categories and species included in CITES are listed in three different appendices based on their protection statuses. These appendices and their explanations are given in Table 35.

Table 35 Appendices to CITES

Appendix	Explanation
I	Covers the species, which are under the threat of extinction. Trade in the specimens of these species is not allowed except extraordinary circumstances
II	Includes species, which are not threatened with extinction, but trade in specimens is restricted in order to prevent utilization incompatible with their survival
III	For which other parties of CITES is applied for assistance in controlling trade and which are conserved at least in one country.

IUCN

The International Union for Conservation of Nature (IUCN) publishes its Red List of Threatened Species, which intends to draw attention to species whose populations are at risk or under threat. The IUCN places a species on the Red List only after studying its population and the reasons for its decline. Some countries pay greater attention to IUCN-listed species than Bern-listed species, since the Red List relies on more research. The 1994 (ver.2.3) and 2001 (ver.3.1) categories and criteria of the IUCN Red List are presented below in Table 36. The Red List Categories and Criteria had been re-formed through evaluating more open and easier to use systems. As a result, the IUCN Commission made revisions in February 2000 and the new set of categories and criteria were published in 2001.

Table 36 IUCN Red List Categories and Criteria

IUCN Red List Categories and Criteria 1994 (ver. 2.3)		IUCN Red List Categories and Criteria 2012 (ver. 4.0)	
EX	Extinct	EX	Extinct
EW	Extinct in the Wild	EW	Extinct in the Wild
CR	Critically Endangered	CR	Critically Endangered
EN	Endangered	EN	Endangered
VU	Vulnerable	VU	Vulnerable
LR	Lower Risk		
CD	Conservation Dependent	NT	Near Threatened
NT	Near Threatened	LC	Least Concern
LC	Least Concern		
DD	Data Deficient	DD	Data Deficient
NE	Not Evaluated	NE	Not Evaluated

I.2.2. World Bank Environmental and Social Framework (ESF)

The project classified as Moderate Risk according to WB's E&S Policy, which states that for moderate risk projects the potential risks and impacts and issues are likely to have the following characteristics: (i) predictable and expected to be temporary and/or reversible, (ii) low in magnitude, (iii) site-specific, without likelihood of impacts beyond the actual footprint of the project and (iv) low probability of serious adverse effects to human health and/or the environment (e.g., do not involve use or disposal of toxic materials, routine safety precautions are expected to be sufficient to prevent accidents, etc.).

Reasons regarding to the risk characterization of the Project is given below:

- The activities include land preparation and construction for a sludge drying facility and installation works for a rooftop solar power plant, which could pose common environmental risks/impacts associated with waste generation, noise nuisance, dust, and exhaust emissions. Those are considered predictable, site-specific, and temporary and can be easily mitigated with adequate mitigation and management measures to be implemented following the provisions given in the national regulation, WB ESSs, and WB Group's Environmental, Health and Safety (EHS) Guidelines.
- The adjacent agricultural land, creek, and groundwater are considered sensitive environmental receptors, and wastes and emissions could pose a risk to the subject receptors. The risks are predictable, mostly temporary, and could be managed once adequate measures are applied to avoid the risks on the subject receptors.
- All activities will be carried out within the OIZ boundaries. The land allocated as a treatment plant area will be used.

- The impact on vegetation, soil, and ecosystem is site-specific, and the associated risk is low in magnitude.
- Land acquisition or resettlement will not be needed,
- There are occupational health and safety risks during the operation stage that can be mitigated through additional measures and precautions,
- Excessive labour influx will not be generated,
- The livelihoods of the households, specifically vulnerable groups and formal-informal users on land, will not be damaged, and
- Impacts will be very low in scale and will not be differentiated on women and men, different ethnic groups, or social classes. National legislation and WB ESSs will be applied to fair employment, equal access, and employment opportunities for women.

The World Bank Group (WBG) Environmental, Health and Safety (EHS) Guidelines constitutes technical reference resources that include general and sector specific examples of international good sector practices. It includes the information on applicable environmental, the health and safety issues for all industrial sectors. WBG uses the EHS Guidelines as a technical source of information during Project appraisal. EHS Guidelines include performance levels and measurements that can be achieved at newly installed facilities using WBG's available technologies at reasonable cost.

WBG General EHS Guidelines include the following main items;

- Environmental
  - Air Emissions and Ambient Air Quality
  - Energy Conservation
  - Wastewater and Ambient Water Quality
  - Water Conservation
  - Hazardous Materials Management
  - Waste Management
  - Noise
  - Contaminated Land
- Occupational Health and Safety
  - General Facility Design and Operation
  - Communication and Training
  - Physical Hazards
  - Chemical Hazards
  - Biological Hazards
  - Radiological Hazards
  - Personal Protective Equipment
  - Special Hazard Environments
  - Monitoring
- Community Health and Safety
  - Water Quality and Availability
  - Structural Safety of Project Infrastructure
  - Life and Fire Safety
  - Traffic Safety
  - Transport of Hazardous Materials
  - Disease Prevention
  - Emergency Preparedness and Response
- Construction and Decommissioning
  - Environment
  - Occupational Health and Safety
  - Community Health and Safety

The World Bank's Environmental and Social Framework (ESF) aims to create better long-term development outcomes. Environmental and Social Standards in the ESF have a more comprehensive approach, especially on social issues.

In addition to the WBG General EHS Guidelines, WBG Industry Sector Guidelines for Water and Sanitation is also applicable. Moreover, WB Good Practice Note on Addressing Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH), and WB 2010 Access to Information Policy are other specific guides.

I.2.3. Comparison of Turkish EIA Regulation and WB ESSs

The gap analysis between the WB ESSs triggered by the Project and Turkish EIA Regulation is presented in Table 37.

Table 37 The Relevance of WB ESSs with the Project

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	Environmental and Social Measures to be put in place to bridge the gaps identified
ESS1 Assessment and Management of Environmental and Social Risks and Impacts	This Standard sets out Borrower's responsibilities for assessing, managing and monitoring Environmental and social risks and impacts related with each phase of the project supported by the World Bank through Investment Project Financing (IPF), so as to accomplish environmental and social results consistent with the Environmental and Social Standards (ESSs). The objectives of ESS1 are as follows: • To identify, evaluate, and manage the environment and social risks and impacts of the project in a manner consistent with the ESSs. • To adopt a mitigation hierarchy approach to: (a) Anticipate and avoid risks and impacts; (b) Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels; (c) Once risks and impacts have been minimized or reduced, mitigate; and (d) Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible. • To adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and they are not disadvantaged in sharing development benefits and opportunities resulting from the project. • To utilize national environmental and social institutions, systems, laws, regulations, and procedures in the assessment, development, and implementation of projects, whenever appropriate. • To promote improved environmental and social performance, in ways which recognize and enhance Borrower capacity.	**Environmental and Social Assessment and Management System (ESMS)** World Bank's ESF 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 ESSs 2-10. The Borrower will: (a) Conduct an environmental and social assessment of the proposed project, including stakeholder engagement; (b) Undertake stakeholder engagement and disclose appropriate information in accordance with ESS10; (c) Develop an Environmental and Social Commitment Plan (ESCP), and implement all measures and actions set out in the legal agreement including the ESCP; and (d) Conduct monitoring and reporting on the environmental and social performance of the project against the ESSs. Turkish EIA Regulation Environmental risks and impacts of the Project are identified to some extent. However, the range of potential environmental and social impacts has not been identified, for example, there is no social assessment, or assessment of landscape and visual impacts, forestry and in many cases operation of the airport has been omitted in assessing impacts.	Conduct a complete assessment of potential environment and social impacts associated with both WWTP construction and operation. Complete an assessment of potential cumulative impacts. Establish a Project ESMS that describes mitigation and performance improvement measures and actions that address the identified environmental and social risks and impacts of the Project. Where the identified risks and impacts cannot be avoided, the client should identify mitigation and performance measures and establish corresponding actions to ensure the project will be operated in compliance with applicable laws and regulations, and meet the requirements ESSs.
		Organizational Capacity and Competency World Bank's ESF Where the project involves specifically identified physical elements, aspects and facilities that are likely to generate impacts, the ESMS will establish and maintain an emergency preparedness and response system so that the client, in collaboration with appropriate and relevant third parties, will be prepared to respond to	Define project environment and social resources (construction, consortium and operational) in terms of organisation and competency with regard to environment and social issues.

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	Environmental and Social Measures to be put in place to bridge the gaps identified
		accidental and emergency situations associated with the project in a manner appropriate to prevent and mitigate any harm to people and/or the environment. Turkish EIA Regulation Organisational arrangements and the competency of construction personnel have not been incorporated into the EIA.	
		Emergency Preparedness and Response World Bank's ESF Where the project involves specifically identified physical elements, aspects and facilities that are likely to generate impacts, the ESMS will establish and maintain an emergency preparedness and response system so that the client, in collaboration with appropriate and relevant third parties, will be prepared to respond to accidental and emergency situations associated with the project in a manner appropriate to prevent and mitigate any harm to people and/or the environment. This preparation will include the identification of areas where accidents and emergency situations may occur, communities and individuals that may be impacted, response procedures, provision of equipment and resources, designation of responsibilities, communication, including that with potentially Affected Communities and periodic training to ensure effective response. The emergency preparedness and response activities will be periodically reviewed and revised, as necessary, to reflect changing conditions. Turkish EIA Regulation No emergency scenarios, including response mechanisms, have been identified within the EIA.	Prepare and implement an emergency response plan for both construction and operational phases.
		Monitoring and Review World Bank's ESF The project owner should establish procedures to monitor and measure the effectiveness of the management program, as well as compliance with any related legal and/or contractual obligations and regulatory requirements. Where the government or other third party has responsibility for managing specific risks and impacts and associated mitigation measures, the	Once adequate baseline data has been captured and potential environmental and social impacts have been assessed for both construction and operational phases, a monitoring plan should be established to capture data to confirm that the project mitigation plans are delivering the desired results and that no unforeseen impacts are occurring.

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	Environmental and Social Measures to be put in place to bridge the gaps identified
		client will collaborate in establishing and monitoring such mitigation measures. Where appropriate, clients will consider involving representatives from Affected Communities to participate in monitoring activities. The client's monitoring program should be overseen by the appropriate level in the organization. For projects with significant impacts, the client will retain external experts to verify its monitoring information. The extent of monitoring should be commensurate with the project's environmental and social risks and impacts and with compliance requirements. Turkish EIA Regulation Although EIA is more limited in scope, it requires some environmental and social management plans. There is also a monitoring plan that indicates whether the environmental impacts of the project (in terms of air, water quality, noise and vibration) will comply with the Turkish Environmental Law and relevant legislation.	
		External Communications and Grievance Mechanisms World Bank's ESF The project owner should implement and maintain a procedure for external communications that includes methods to (i) receive and register external communications from the public; (ii) screen and assess the issues raised and determine how to address them; (iii) provide, track, and document responses, if any; and (iv) adjust the management program, as appropriate. In addition, clients are encouraged to make publicly available periodic reports on their environmental and social sustainability. Where there are Affected Communities, the client will establish a grievance mechanism to receive and facilitate resolution of Affected Communities' concerns and grievances about the client's environmental and social performance. The grievance mechanism should be scaled to the risks and adverse impacts of the project and have Affected Communities as its primary user. It should seek to resolve concerns promptly, using an understandable and transparent consultative process that is culturally appropriate and readily accessible, and at no cost and without retribution to the party that originated the issue or concern. The mechanism should not impede access	A communications plan and procedure (including identification of Affected Communities) should be prepared that describe mechanisms for external communications on environment and social topics. The plan should define how grievances and concerns can be made to the project and how these will be investigated, responded to and rectified, if appropriate.

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	Environmental and Social Measures to be put in place to bridge the gaps identified
		to judicial or administrative remedies. The client will inform the Affected Communities about the mechanism in the course of the stakeholder engagement process. <u>Turkish EIA Regulation</u> Stakeholder Engagement Plan: It is explained in EIA Regulation as a plan that explains how, what methods and tools will be used to communicate and inform legal/real persons (stakeholders) who may be affected by the project or have an interest in the project, at all stages of the planned project. Regulation does not address the issues of internal, external communication and grievance mechanism.	
		On-going Reporting to Affected Communities <u>World Bank's ESF</u> The project owner should provide periodic reports to the Affected Communities that describe progress with implementation of the project Action Plans on issues that involve on-going risk to or impacts on Affected Communities and on issues that the consultation process or grievance mechanism have identified as a concern to those Communities. If the management program results in material changes in or additions to the mitigation measures or actions described in the Action Plans on issues of concern to the Affected Communities, the updated relevant mitigation measures or actions will be communicated to them. The frequency of these reports will be proportionate to the concerns of Affected Communities but not less than annually. <u>Turkish EIA Regulation</u> The EIA does not define Affected Communities and therefore there is no definition of communication and reporting.	Reporting to Affected Communities should be included within the Communication Plan and Procedure.
ESS2 Labor and Working Conditions	ESS2 recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote sound worker management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions. The objectives of ESS2 are as follows:	<u>World Bank's ESF</u> ESS2 requirements include the documentation and implementation of workforce management procedures applicable to the project. These procedures will specify how project workers will be managed in accordance with the requirements of internal law and this ESS and explain the following; (i) working conditions and management of worker relationship including terms and conditions of employment, non-discrimination and equal	Prepare a Human Resources Policy. Prepare a project handbook that covers working conditions and employment arrangements. Prepare an Equality and Diversity Programme that defines protection of employees, contractors and suppliers. Prepare a Labour Management Plan in accordance with ESS2 Establish a mechanism to protect workers.

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	Environmental and Social Measures to be put in place to bridge the gaps identified
	• To promote safety and health at work. • To promote the fair treatment, non-discrimination, and equal opportunity of project workers. • To protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS) and migrant workers, contracted workers, community workers, and primary supply workers, as appropriate. • To prevent the use of all forms of forced labor and child labor. • To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law. • To provide project workers with accessible means to raise workplace concerns.	opportunities, worker's organizations, (such as the preparation and implementation of workforce management procedures applicable to the project); (ii) protection of the workforce, including the establishment of a minimum age for workers and the prohibition of child labor and forced labor; (iii) grievance mechanism (for workers); (iv) occupational health and safety (OHS) ; (v) contracted workers; (vi) community workers and (vii) primary supply workers. The Borrower will develop and implement written labor management procedures applicable to the project. These procedures will set out the way in which project workers will be managed, in accordance with the requirements of national law and this ESS. The project owner should adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this Performance Standard and national law The project owner should establish a mechanism to maintain, and improve the worker-management relationship and should also promote compliance with national employment and labour laws. The project owner should establish a mechanism to protect workers, including vulnerable categories of workers such as children, migrant workers, forced labour, workers engaged by third parties, and workers in the client's supply chain while it should also provide a tool to promote safe and healthy working conditions, and the health of workers. In countries where national law recognizes workers' rights to form and to join workers' organizations of their choosing without interference and to bargain collectively, the client will comply with national law. Where national law substantially restricts workers' organizations, the client will not restrict workers from developing alternative mechanisms to express their grievances and protect their rights regarding working conditions and terms of employment. The client should not seek to influence or control these mechanisms. The client will provide a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns. The client will inform the workers of the grievance mechanism at the time of recruitment and make it easily accessible to them. The	Provide a Grievance Mechanism.

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	Environmental and Social Measures to be put in place to bridge the gaps identified
		mechanism should involve an appropriate level of management and address concerns promptly, using an understandable and transparent process that provides timely feedback to those concerned, without any retribution. The mechanism should also allow for anonymous complaints to be raised and addressed. The mechanism should not impede access to other judicial or administrative remedies that might be available under the law or through existing arbitration procedures, or substitute for grievance mechanisms provided through collective agreements. <u>Turkish EIA Regulation</u> There is no Human Resources (HR) Policy for the project. There are warnings about how the workers should prevent any harmful effects that may arise during construction and operation phases. However, detailed working conditions or terms of employment are not mentioned in the EIA report The EIA does not address worker employment and therefore, there is no documented or formal policy of non-discrimination, equal opportunity and fair treatment in the EIA.	
ESS3 Resource Efficiency and Pollution Prevention and Management	ESS3 recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services, and the environment at the local, regional, and global levels. The current and projected atmospheric concentration of greenhouse gases (GHG) threatens the welfare of current and future generations. At the same time, more efficient and effective resource use, pollution prevention, and GHG emission avoidance, and mitigation technologies and practices have become more accessible and achievable. This ESS sets out the requirements to address resource efficiency and pollution prevention and management throughout the project life cycle consistent with Good International Industry Practice (GIIP). The objectives of ESS3 are as follows: • To promote the sustainable use of resources, including energy, water, and raw materials.	<u>World Bank's ESF</u> The project owner should implement technically and financially feasible and cost effective measures for improving efficiency in its consumption of energy, water, as well as other resources and material inputs, with a focus on areas that are considered core business activities. Such measures will integrate the principles of cleaner production into product design and production processes with the objective of conserving raw materials, energy, and water. Where benchmarking data are available, the client will make a comparison to establish the relative level of efficiency. The project owner should avoid the release of pollutants or, when avoidance is not feasible, minimize and/or control the intensity and mass flow of their release. This applies to the release of pollutants to air (including GHG emissions), water, and land due to routine, non-routine, and accidental circumstances with the potential for local, regional, and transboundary impacts. Where historical pollution such as land or ground water contamination exists, the project should seek to determine whether it is	Prepare an evaluation of potential resource efficiency during construction and operation. Define potential impacts and develop approaches for avoidance, minimisation and use of alternative materials in order to reduce the project impact on natural and scarce resources. Baseline information must be captured for topics such as potential contaminated land and environmental impacts associated with the soil movement required by the earthworks. All assessments should address current conditions and potential future impacts of project construction and operation

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	Environmental and Social Measures to be put in place to bridge the gaps identified
	• To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. • To avoid or minimize project-related emissions of short- and long-lived climate pollutants. • To avoid or minimize generation of hazardous and nonhazardous waste. • To minimize and manage the risks and impacts associated with pesticide use.	responsible for mitigation measures. It is also important to address potential adverse project impacts on existing ambient conditions, the client will consider relevant factors, including, for example (i) existing ambient conditions; (ii) the finite assimilative capacity of the environment; (iii) existing and future land use; (iv) the project's proximity to areas of importance to biodiversity; and (v) the potential for cumulative impacts with uncertain and/or irreversible consequences. In addition to applying resource efficiency and pollution control measures as required in this Performance Standard, when the project has the potential to constitute a significant source of emissions in an already degraded area, the project should consider additional strategies and adopt measures that avoid or reduce negative effects. These strategies include, but are not limited to, evaluation of project location alternatives and emissions offsets. <u>Turkish EIA Regulation</u> The EIA does not address resource consumption and resource efficiency measures. Baseline information is provided in the EIA on air emissions, wastewater, solid wastes, hazardous wastes and noise. The EIA assessments have focussed on construction phases and have not addressed operational phases for each of these elements. The EIA provides no information regarding the potential contamination of land associated with historical use and does not discuss the environmental and social impacts associated with the volumes of soil movements proposed in the earthworks activities.	
ESS4 Community Health and Safety	ESS4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration or intensification of impacts due to project activities. ESS4 addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of Borrowers to avoid or minimize such risks and impacts, with particular attention to people who, because of their particular circumstances, may be vulnerable. The objectives of ESS4 are as follows:	<u>World Bank's ESF</u> WB's ESF: The project should anticipate and avoid adverse impacts on the health and safety of the Affected Community and ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities. ESS4 requirements are as follows: (i) community health and safety, including infrastructure and equipment design and safety, safety of services, traffic and road safety, ecosystem services, community exposure to health issues, management and safety of hazardous	Assess the safety and security risks associated with construction and operation of the WWTP on the community and develop a plan to mitigate and manage risks..

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	Environmental and Social Measures to be put in place to bridge the gaps identified
	• To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and nonroutine circumstances. • To promote quality and safety, and considerations relating to climate change in the design and construction of infrastructure, including dams. • To avoid or minimize community exposure to project-related traffic and road safety risks, diseases, and hazardous materials. • To have in place effective measures to address emergency events. • To ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.	materials, and emergency preparedness and response and security; and (ii) security personnel. Turkish EIA Regulation The EIA does not address regarding the environmental and social impacts associated with construction camps and the influx of temporary/migrant labour to support construction activities.	
ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources	ESS6 recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development. Biodiversity is defined as the variability among living organisms from all sources, including inter alia, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems. The objectives of ESS6 are as follows: • To protect and conserve biodiversity and habitats. • To apply the mitigation hierarchy and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity. • To promote the sustainable management of living natural resources. • To support livelihoods of local communities, including Indigenous Peoples, and inclusive economic development, through the adoption of practices that integrate conservation needs and development priorities.	World Bank's ESF The environmental and social assessment as set out in ESS1 will consider direct, indirect, and cumulative project-related impacts on habitats and the biodiversity they support. This assessment will consider threats to biodiversity, for example, habitat loss, degradation and fragmentation, invasive alien species, overexploitation, hydrological changes, nutrient loading, pollution and incidental take, as well as projected climate change impacts. It will determine the significance of biodiversity or habitats based on their vulnerability and irreplaceability at a global, regional, or national level and will also take into account the differing values attached to biodiversity and habitats by project-affected parties and other interested parties. The Borrower will avoid adverse impacts on biodiversity and habitats. When avoidance of adverse impacts is not possible, the Borrower will implement measures to minimize adverse impacts and restore biodiversity in accordance with the mitigation hierarchy provided in ESS1 and with the requirements of this ESS. The Borrower will ensure that competent biodiversity expertise is utilized to conduct the environmental and social assessment and the verification of the effectiveness and feasibility of mitigation measures. Where significant risks and adverse impacts on biodiversity have been identified, the Borrower will develop and implement a Biodiversity Management Plan. Turkish EIA Regulation	Robust sampling methodologies and plans should be prepared to inform surveys for all identified habitats and species to ensure that robust baseline data is obtained to inform the assessment of potential impacts, mitigation and compensation strategies.

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	Environmental and Social Measures to be put in place to bridge the gaps identified
		The EIA has provided inadequate baseline data regarding project biodiversity and natural habitats and the potential impacts associated with the project during construction and operation. The EIA reports that ecological species and habitat evaluations were undertaken through habitat evaluation and literature review.	
ESS10 Stakeholder Engagement and Information Disclosure	This ESS recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation. The objectives of ESS10 are as follows: • To establish a systematic approach to stakeholder engagement that will help Borrowers identify stakeholders and build and maintain a constructive relationship with them, in particular project affected parties. • To assess the level of stakeholder interest and support for the project and to enable stakeholders' views to be taken into account in project design and environmental and social performance. • To promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them. • To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible, and appropriate manner and format. • To provide project-affected parties with accessible and inclusive means to raise issues and grievances, and allow Borrowers to respond to and manage such grievances.	<u>World Bank's ESF</u> Borrowers will engage with stakeholders throughout the project life cycle, commencing such engagement as early as possible in the project development process and in a time frame that enables meaningful consultations with stakeholders on project design. The nature, scope, and frequency of stakeholder engagement will be proportionate to the nature and scale of the project and its potential risks and impactsThe process of stakeholder engagement will involve the following: (i) stakeholder identification and analysis; (ii) planning how the engagement with stakeholders will take place; (iii) disclosure of information; (iv) consultation with stakeholders; (v) addressing and responding to grievances; and (vi) reporting to stakeholders. For all Category A and B subprojects proposed for WB funding, the borrower will consult and consider the views of the project-affected groups and non-governmental organizations regarding the environmental impacts of the subproject during the EA process. <u>Turkish EIA Regulation</u> The EIA reports that a single, formal, information disclosure exercise has been carried out regarding the project. This occurred at the start of the EIA process. No further information disclosure activities have been undertaken prior to the EIA report being finalized. The EIA does not describe any stakeholder engagement and therefore it is assumed that none has been undertaken. For the projects included in the list of Annex-I, which therefore require the preparation of an EIA Report, the public information and participation meeting, whose place and date is decided by the Provincial Directorate of Environment, Urbanization and Climate Change, is held not later than 10 days prior to the meeting by disclosing it publicly in local and national newspapers.	A stakeholder engagement plan should be prepared to inform stakeholders about risk and adverse impacts of the project and to establish a plan for engagement with stakeholdlers throughout the duration of the project including an accessible Grievance mechanims This should be a two way process of giving and receiving information. It should involve the local, regional and national communities as applicable to the project.

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	Environmental and Social Measures to be put in place to bridge the gaps identified
		No public information and participation meeting is held for the projects included in the list of Annex-II. <u>Public Information and Participation Meeting:</u> In the Turkish EIA Regulation, public consultation is required for the purpose of "preliminary scope determination" only for projects requiring EIA, and for this purpose, only the environmental assessment must be announced with its justification. However, ESS 10 does not specify how many times and by what method public consultation and public information will be carried out, instead it is requested to adopt a continuous stakeholder participation approach throughout the project life cycle, which will be decided in proportion to the nature, scale and impact size of the project.	

ANNEX-6: ECOLOGY AND BIODIVERSITY

Studies of the biological environment of this Project Area and the potential impact area were carried out on 27th June, 2024. The studies covered terrestrial environment, including flora and fauna species, vegetation and habitat descriptions.

The distribution of flora and fauna species in the Project Area and their biological activities has been determined through the studies carried out with this ESMP report.

Within the scope of biodiversity baseline detection studies, the Project Area and its immediate surroundings have been researched. Research has been conducted to assess terrestrial flora species and vegetation within the footprint of project components.

The Biodiversity Study Area, devised based on expert opinions, was chosen to align with the few homogenous fauna components in the Project Area that have adapted to anthropogenic influences.

Flora

The determination of the floristic structure is based on field observations and a detailed literature study on the floristic and ecological structure of the region. In the flora part of the report, Davis' "Flora of Türkiye and East Aegean Islands" was used for the identification of the plant species collected from the field, a literature study was made from the same work in order to make the flora list complete and complete, and the species were confirmed from the Plants of Türkiye Data Service prepared by TÜBİTAK. In addition, Bizim Bitkiler (Our Plants) website was also used to confirm the species. In addition, floristic studies conducted in the regions close to the area and showing the same ecological characteristics with the area were also utilized in the creation of the flora list.

Türkiye is one of the richest countries of the temperate zone in terms of floristic diversity with nearly 12,000 flowering plant taxa (including subspecies taxa). This diversity is a reflection of climatic, edaphic, topographical, etc. diversity, especially ecosystem diversity.

The flora of Türkiye is related to Central Europe on the one hand and Asia on the other. Considering that there are around 11.000 species in the whole continental Europe from the west of the Urals, it can be said that Türkiye is a continent in terms of floristic diversity. The flora of Türkiye has an important place among other countries with more than 3000 endemic species.

The IUCN endangerment category of the identified plant species was based on the Red Data Book of Turkish Plants (Pteridophyta and Spermatophyta) Ekim, T., Koyuncu, M., Vural, M., Duman, H., Aytaç, Z., Adıgüzel, N. Ankara 2000. In addition, the updates made in the Red List of Plants of Turkey in 2006 were also taken into consideration. For the Turkish name equivalents of the plant species, the book titled "Güner, A., Aslan, S., Ekim, T., Vural, M. and Babac, M. T. Turkey Plants List Vascular Plants, 1st Edition, Istanbul 2012" was used.

Endemic, Rare and Threatened Plant Species and Threat Categories (IUCN, Bern, CITES)

a) Endemic, Rare or Endangered Plant Species

Turkey is very rich in endemic and rare plants as it is a country located in the transcontinental transition zone. According to TUBIVES, there are 344 plant taxa in Kocaeli province and 10 of them (approximately 8.72%) are endemic. Considering that the endemism rate of our country is around 33%, Kocaeli province is weak in terms of endemism (Figure 36).

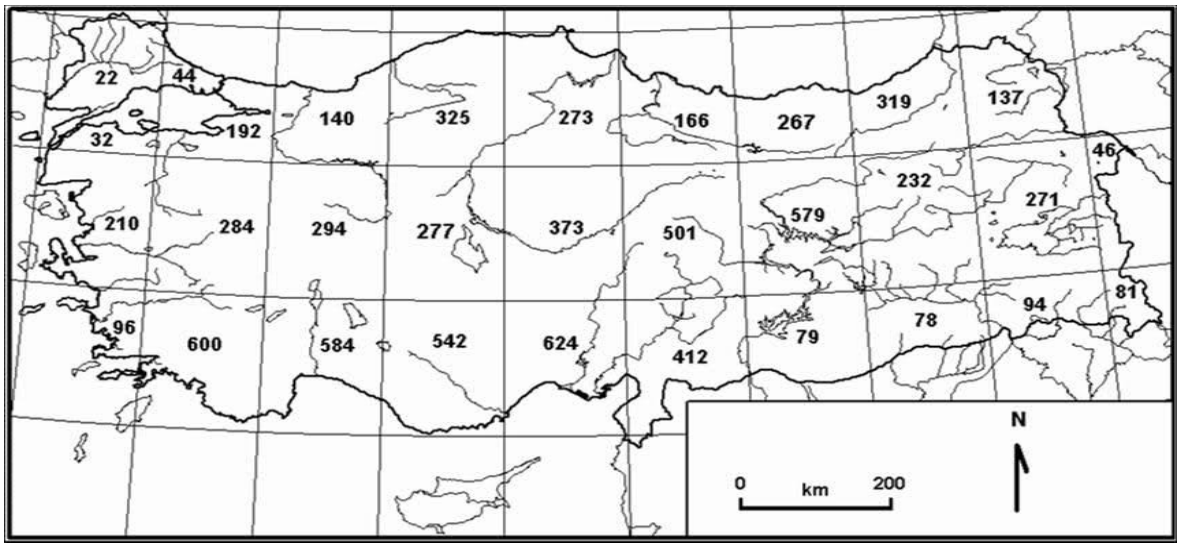


Figure 36 Distribution of endemic plant species according to grid system.

b) IUCN Threat Categories

The IUCN Red Data Book Categories used in the Red Data Book of Plants of Türkiye were used to determine the IUCN categories of the plant species identified in the Project area and impact area. The IUCN Red Data Book Categories used in the Red Book of Plants of Türkiye and their descriptions are given in Table 38.

Table 38 Red Book of Plants of Türkiye IUCN Red Data Book Categories

IUCN CATEGORY	EXPLANATIONS
EX Extinct	This taxon is EX if there is no doubt that the last member has died.
EW Extinct In The Wild	It is placed in this group if the taxon has not been found in the environments where it can be found and in detailed surveys carried out at different times of the year, that is, if it is lost in nature and continues to live only in cultivated form.
CR Critically Endangered (Very Dangerous)	A taxon is placed in this group if it is at risk of extinction in the very near future.
EN Endangered	A taxon is placed in the EN group if it is at very high risk and threatened with extinction in the near future, but not yet in the CR group.
VU Vulnerable	Although they cannot be placed in CR and EN groups; taxa that are under high threat in the medium-term future in nature are placed in this group. In our country, some species known from more than one locality that are thought to be threatened in the medium term have been placed in this category. In addition, some species that are not currently threatened have been placed in this category in order to ensure their protection in the future.
LR Lower Risk (Less Threatened)	Plants with better populations that cannot be placed in any of the above groups are placed in this category. Plants with very good populations and known from at least 5 localities are placed in this category. There are 3 subcategories that can be ranked in terms of threat according to their future status: (cd), (nt) and (lc).
LR/(cd) Conservation Dependent	The taxon will be placed in one of the above categories within 5 years and requires a special conservation status for both species and habitat.
LR/ (nt) Near Threatened	Candidates that cannot be placed in the previous group but are close to being placed in the VU category.
LR/ (lc) Least Concern	Those that do not require any protection and are not threatened.
DD Data Deficient	A taxon is placed in this group if knowledge about its distribution and abundance is insufficient. Even if the biology of a taxon in this category is well known, information on its distribution and abundance is insufficient. Therefore, placing a taxon in the DD category indicates that more information needs to be gathered about it, rather than that it is threatened. Once the information is available, the taxon should be placed in another category appropriate to its status.
NE Not Evaluated	Those that cannot be assessed by any of the above criteria.

Explanatory Information on Some Criteria

Additional criteria accepted for placement in the **CR, EN** and **VU** categories are:

For **CR** Category - Plants that are in danger of disappearing in nature in a very short period of time can be decided according to the following criteria.

A. If the population is declining as a result of the following threats;

80% probability of disappearance in the population within 10 years for the following reasons

a-Change in habitat characteristics and decrease in the degree of closeness of the species;

b - Under the threat of actual and potential collection;

c-Threat of invasion by another taxon, hybridization, disease, seed failure, contamination, competition and parasites;

B. If the total distribution area of the plant is less than 100 km^2 and the single distribution area is less than 10 km^2, very fragmented or known from a single location.

For **EN** Category - At high risk of the above-mentioned threats; population is expected to decline by 50% in the last 10 years or in 3 generations; distribution area is up to 5000 km^2 or 500 km^2 in a single area; number of individuals is below 2500 or known from at most 5 locations.

For **VU** Category - Species whose population is expected to decrease by 20% in the last 10 years or 3 generations in the face of the threats mentioned above; whose distribution area is not more than 10 locations, whose distribution area is 20.000 km^2, the number of mature individuals is less than 10.000, or whose population is expected to decrease by 10% in 100 years during field studies.

c) Convention for the Conservation of Wildlife and Habitats in Europe (Bern)

The Bern Convention is a convention to protect wild flora and fauna and their habitats, to ensure that necessary measures are taken for endangered or endangered species, and to ensure the dissemination of wild flora and fauna education. Annex lists and explanations of the Bern Convention are given in Table 39.

Table 39 BERN Convention Annex Lists and Explanations

LIST OF ANNEXES	EXPLANATIONS
ANNEX I	Strictly protected flora species
ANNEX II	Strictly protected fauna species (SPFS- Strictly Protected Fauna Species)
ANNEX III	Protected fauna species (PFS- Protected Fauna Species)

d) Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The CITES Convention is a convention that binds the import, export, in short, international trade of wild animal and plant species between the countries that are parties to the convention to certain permits and documents. Appendix lists and explanations of the CITES Convention are given in Table 40.

Table 40 CITES Convention Appendix Lists and Explanations

LIST OF ANNEXES	EXPLANATIONS
ANNEX I	It covers all species threatened with extinction that are or may be affected by trade. Trade in specimens of these species must be subject to particularly stringent legislation and only permitted in exceptional circumstances to avoid further jeopardizing their continued extinction.

LIST OF ANNEXES	EXPLANATIONS
ANNEX II	(a) Species that are not currently in imminent danger of extinction but may become extinct unless trade in their specimens is subject to strict regulations to prevent uses incompatible with their continued extinction; and (b) other species that need to be subject to legislation in order to effectively control the trade in specimens of certain species referred to in subparagraph (a).
ANNEX III	It covers all species that any Party indicates are subject to regulation within its jurisdiction for the purpose of preventing or restricting their use and that it needs to cooperate with other Parties in controlling their trade.

Assessment of the Project Area in terms of Plant Geography (Phytogeography)

Due to its geographical location, our country is under the influence of various climates. As a matter of fact, oceanic climatic conditions prevail on the slopes of the North Anatolian and Yıldız (Istranca) Mountains facing north, especially the Black Sea; Mediterranean in the Marmara Sea, Aegean and Mediterranean regions; and continental climatic conditions prevail in Central, Eastern and Southeastern Anatolia. Thus, the north of Anatolia and Thrace is a country where humid temperate climates prevailing in the west of the continents to the east of the oceans, the Aegean and Mediterranean subtropical, and the central and eastern regions of Anatolia are a collection of continental climates prevailing in the interior of the continents. In the high mountainous areas, cold climatic conditions effective in more northern latitudes are observed. Therefore, the existence of different areas and phytogeographical regions in terms of vegetation in Türkiye (Figure 37) is a necessity of natural conditions.

As a general assessment, the north of Türkiye as a whole falls within the Euro-Siberian Flora Region. In the north, the Eastern Black Sea Region, starting from the east of Ordu, falls within the Colchic, while the western parts fall within the Euxine sub-flora or sections of the same flora realm. The northern coasts of the Marmara Sea and the Aegean and Mediterranean regions constitute the Eastern Mediterranean Flora. The Central and Eastern Anatolia regions fall within the Turanian-Eurasian or Irano-Turanian Flora Region, and the steppe areas of Southeastern Anatolia fall within the Irano-Turanian Flora Division. In short, Türkiye is a country where Euro-Siberian, Mediterranean and Iran-Turanian flora regions coexist.

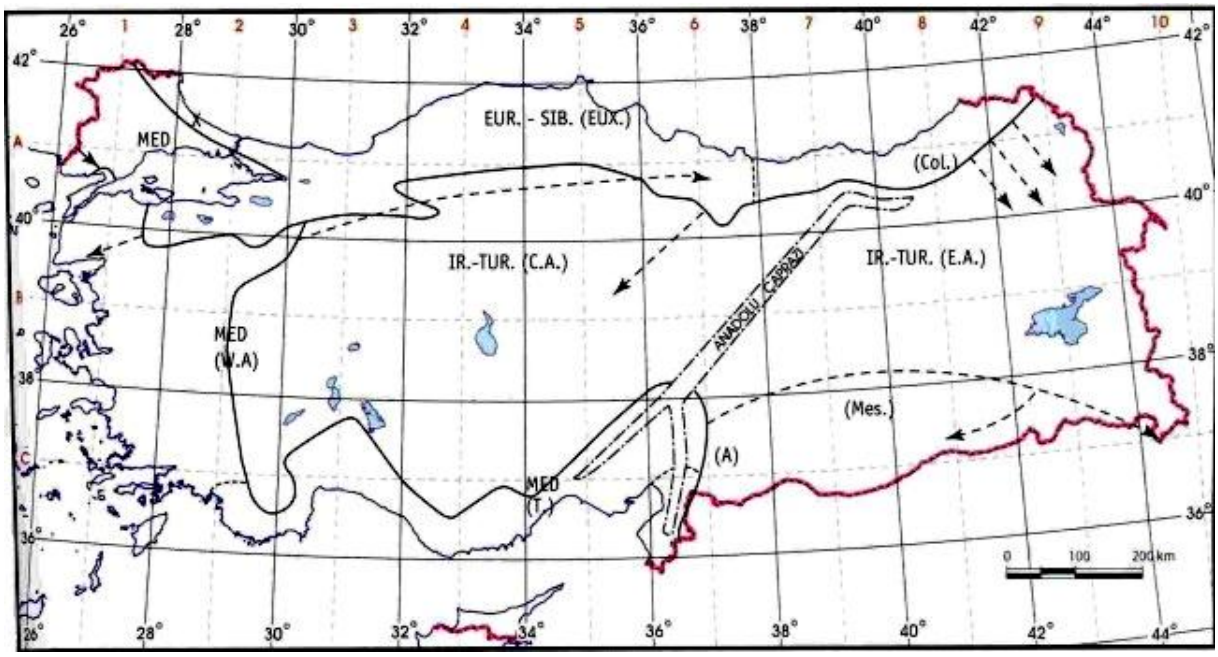


Figure 37 Phytogeographic Regions in Türkiye and the Anatolian Diagonal
(EUR.-SIB: European Siberian Plant Geographic Region, MED: Mediterranean Plant Geography Region, IR.-TUR: Iran Turan Plant Geography Region)

The Project area is located in square A2 according to the Grid Quadrature System (Figure 38).

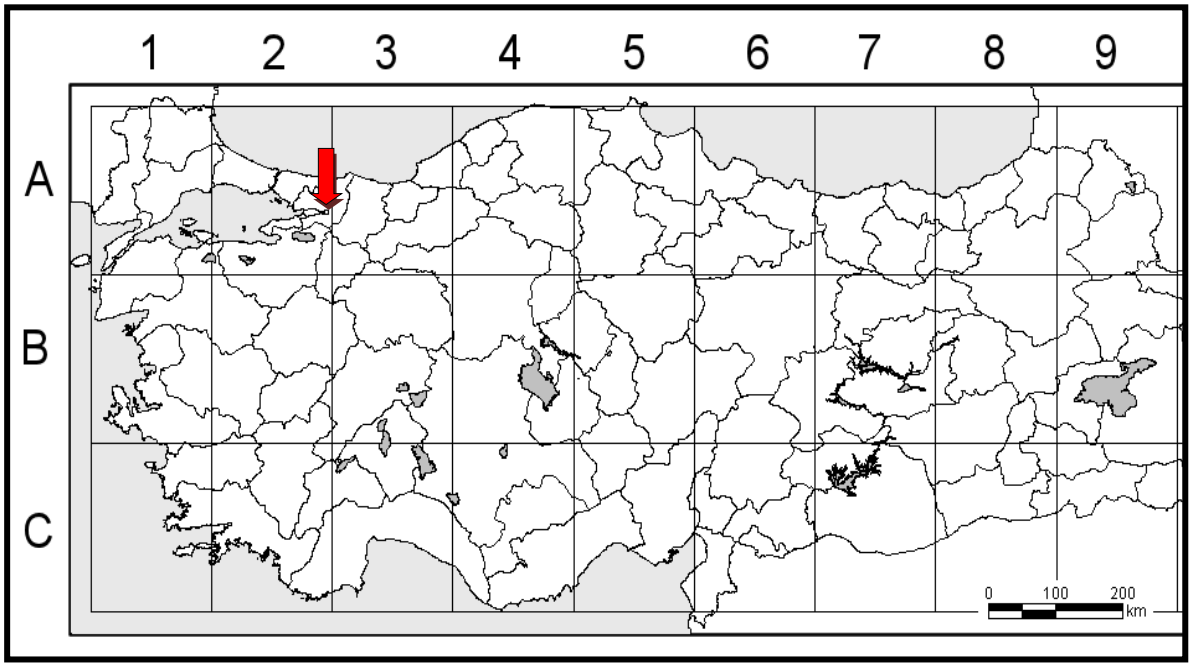


Figure 38 Location of the Project Area in Grid Quadrature System

Floristic Analysis

A total of 26 plant taxa belonging to 11 families have been identified in and around the Project area. There are no endemic species among the plant taxa found and likely to be found in and around the project area. According to the IUCN red list, 7 of the 53 plant taxa found and likely to be found in the area are in the "LC" and 19 are in the "NE" category. Among the plant taxa identified in the project area, there are no plant taxa included in the Annex Lists of the Bern and CITES Conventions. Information on these taxons is presented in Table 41.

Table 41 Plant Taxons found and likely to be found in the Project Area and its immediate surroundings and their Protection Status

Family	Scientific Name	Endemism	IUCN	CITES	BERN	Phytogeographic Region	Form of Detection
Amaranthaceae	*Amaranthus retroflexus*	-	NE	LD	LD	-	L
Apiaceae	*Bifora radians*	-	NE	LD	LD	-	L
Apiaceae	*Bunium ferulaceum*	-	NE	LD	LD	Mediterranean	L
Asteraceae	*Artemisia vulgaris*	-	LC	LD	LD	-	L
Asteraceae	*Cota altissima*	-	NE	LD	LD	-	L
Asteraceae	*Cota austriaca*	-	NE	LD	LD	-	L
Asteraceae	*Matricaria chamomilla*	-	LC	LD	LD	-	L
Brassicaceae	*Brassica nigra*	-	LC	LD	LD	-	L
Brassicaceae	*Calepina irregularis*	-	NE	LD	LD	-	L
Brassicaceae	*Capsella bursa-pastoris*	-	LC	LD	LD	-	L
Brassicaceae	*Descurainia sophia*	-	NE	LD	LD	-	L
Brassicaceae	*Diplotaxis viminea*	-	LC	LD	LD	-	L
Brassicaceae	*Myagrum perfoliatum*	-	NE	LD	LD	-	L
Brassicaceae	*Neslia paniculata subsp. thracica*	-	NE	LD	LD	-	L
Brassicaceae	*Rapistrum rugosum*	-	NE	LD	LD	-	L

Family	Scientific Name	Endemism	IUCN	CITES	BERN	Phytogeographic Region	Form of Detection
Brassicaceae	*Strigosella africana*	-	NE	LD	LD	-	L
Campanulaceae	*Legousia hybrida*	-	NE	LD	LD	Mediterranean	L
Caryophyllaceae	*Dianthus corymbosus*	-	NE	LD	LD	-	L
Caryophyllaceae	*Herniaria hirsuta*	-	NE	LD	LD	-	L
Convolvulaceae	*Convolvulus arvensis*	-	NE	LD	LD	-	L + F
Fabaceae	*Medicago polymorpha*	-	LC	LD	LD	-	L + F
Fabaceae	*Trifolium spumosum*	-	NE	LD	LD	Mediterranean	L
Fabaceae	*Vicia sativa*	-	NE	LD	LD	-	L + F
Papaveraceae	*Hypecoum procumbens*	-	NE	LD	LD	-	L
Poaceae	*Poa annua*	-	LC	LD	LD	-	L
Polygonaceae	*Polygonum arenastrum*	-	NE	LD	LD	-	L

Abbreviations LD: Unlisted, L: Literature, F: Field.

Fauna

Since fauna species show seasonal changes and it may take several years to determine the fauna inventory of an area, the species given in the fauna lists were prepared by taking into consideration the detailed literature study, observations and hearsay of local people, biotope characteristics of the region, current distribution areas and current biogeography rules.

In the field studies carried out within the scope of the identification of fauna elements (bivalves, reptiles, birds and mammals), areas close to the water source, under stones and rocks, rock crevices, tree hollows, etc. within the project area and impact area were checked. No traps were set in order not to harm the fauna. After the collected specimens were photographed, they were released back into the nature in order not to harm the ecological balance. Fauna data were collected by utilizing literature studies, especially articles and scientific reports on faunistic researches conducted in the areas close to these areas.

Endemic, Rare and Threatened Fauna Species and Threat Categories

a) Endemic, Rare or Endangered Fauna Species

Amphibian, reptile, bird and mammal species, which were determined to be distributed in the project area and impact area as a result of field, literature and survey studies, were evaluated in their own sections.

b) IUCN Threat Categories

The IUCN "Red List of Species in Danger of Extinction" ("IUCN Red List") is the most comprehensive Global Conservation status inventory of plant and animal species in the world. The IUCN Red List is maintained by the International Union for Conservation of Wildlife and Natural Resources.

The categories were classified into 9 groups (Table 42 and Figure 39). In this classification, extinction rate, population size, geographical distribution areas, population and distribution degree criteria were taken into consideration.

Table 42 IUCN Categories and their meanings

IUCN Categories	Meanings
Evaluated	Under evaluation
Not Evaluated (NE)	Not evaluated

IUCN Categories	Meanings
Adequate data	Sufficient data available
Data Deficient (DD)	Not enough data available (data missing)
Extinct (EX)	Completely extinct, extinct species
Extinct in the Wild (EW)	Extinct species in the wild
Critically Endangered (CR)	Species in significant danger of extinction
Endangered (EN)	Species in danger of extinction
Vulnerable (VU)	Species in danger of future extinction unless conservation measures are taken
Near Threatened (NT)	Almost threatened
Least Concern (LC)	Least worried species

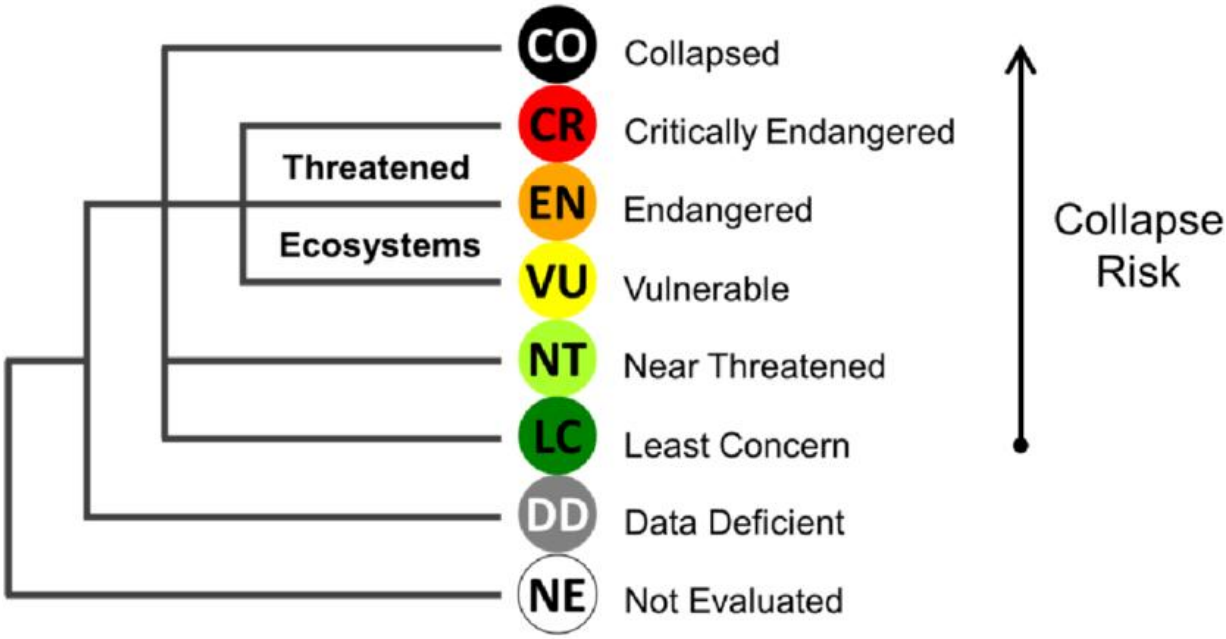


Figure 39 IUCN Risk Classes

c) Convention for the Conservation of Wildlife and Habitats in Europe (Bern)

The Bern Convention is a convention to protect wild flora and fauna and their habitats, to ensure that necessary measures are taken for endangered or endangered species, and to ensure the dissemination of wild flora and fauna education. Annex lists and explanations of the Bern Convention are given in Table 43.

Table 43 BERN Convention Annex Lists and Explanations

LIST OF ANNEXES	EXPLANATIONS
ANNEX I	Strictly protected flora species
ANNEX II	Strictly protected fauna species (SPFS- Strictly Protected Fauna Species)
ANNEX III	Protected fauna species (PFS- Protected Fauna Species)

d) Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The CITES Convention is a convention that binds the import, export, in short, international trade of wild animal and plant species between the countries that are parties to the convention to certain permits and documents. Appendix lists and explanations of the CITES Convention are given in Table 44.

Table 44 CITES Convention Appendix Lists and Explanations

LIST OF ANNEXES	EXPLANATIONS
ANNEX I	It covers all species threatened with extinction that are or may be affected by trade. Trade in specimens of these species must be subject to particularly stringent legislation and only permitted in exceptional circumstances to avoid further jeopardizing their continued extinction.
ANNEX II	(a) species that are not currently threatened with absolute extinction, but may become extinct unless trade in specimens is subject to strict regulations to prevent uses incompatible with their continued extinction; and (b) other species that need to be subject to legislation in order to effectively control trade in specimens of certain species referred to in subparagraph (a).
ANNEX III	It covers all species that any Party indicates are subject to regulation within its jurisdiction for the purpose of preventing or restricting their use and that it needs to cooperate with other Parties in controlling their trade.

e) 2023-2024 Central Hunting Commission Decision (MAKK)

In addition; "2023-2024 Central Hunting Commission Decisions" entered into force by the Republic of Türkiye Ministry of Agriculture and Forestry General Directorate of Nature Conservation and National Parks have been included in the relevant lists.

The Central Hunting Commission convenes every year within the framework of the authority it receives from the Land Hunting Law No. 4915 and determines the game animals to be protected throughout the country in that hunting period, the game animals to be allowed to be hunted and their hunting periods, times and days, hunting amounts, prohibited hunting tools and equipment, hunting areas to be prohibited, hunting principles and procedures for combat purposes *(*www.milliparklar.gov.tr). Central Hunting Commission Decisions and Explanations are given below (Table 45).

Table 45 Central Hunting Commission Decisions and Explanations

MAK LISTS	EXPLANATIONS
ANNEX 1	Game Animals Protected by the Central Hunting Commission
ANNEX 2	Game Animals Permitted to Hunt by the Central Hunting Commission for Specified Periods

f) Red Data Book Categories and Descriptions Used for Ornithofauna

The Red Data Book categories determined by Prof. Dr. İlhami Kiziroğlu for bird species are given below. The explanation of the symbols used for the conservation status and status of the bird species in the table is as follows.

A.1.0= Species that have disappeared beyond any doubt and are no longer seen in their natural habitat.

A.1.1= Domesticated, domesticated species whose natural populations are now extinct or have not been seen in their natural habitat for at least the last fifteen to twenty-five years, but continue to live in voles, cages and other artificial conditions.

A.1.2= Populations of these species are very low throughout Türkiye. They are represented by **1 individual - 10 pairs** (=1- 20 individuals) in the regions where they are monitored.

A.2= The numbers of these species range between **11-25 pairs** (22-50 individuals) in the areas where they are observed. They are significantly threatened with extinction.

A.3= Populations of these species in Türkiye generally range between (52- 500) individuals in the regions where they are observed. These species are also vulnerable to extinction and have a high risk of extinction in the wild.

A.3.1= Populations of these species are declining in the areas where they are observed. The population of these species also varies between **251- 500 pairs** (502- 1000 individuals).

A.4= The densities of these species according to IUCN and ATS criteria are not yet threatened with extinction in the regions where they are observed, but there is a local decrease in their populations and they are candidates to become threatened with extinction in time. Populations of these species range between **501- 5000 pairs** (=1002- 10 000 individuals) in the regions where they are observed.

A.5= The observed populations of these species are not yet threatened with decline or extinction.

A.6= Includes species that have not been adequately researched and for which there is no reliable data. Since they are based on one or at most two observations only as **"incidental species= RT", there** is currently no chance of a reliable assessment and they need to be researched

A.7= It is not possible to make an assessment of these species at this time because the records of these species in Türkiye are not complete and reliable. Species categorized as **NE: (not evaluated)** according to IUCN criteria are included in this group. These include species whose compliance with the above criteria has not been fully evaluated so far. they are marked with "*" in the relevant tables.

Species in group **"B"** are either winter visitors or transit migrants. These species are significantly threatened with extinction and will be subject to the same assessment as in group "A". Therefore, the criteria in steps B.1.0 - B.7 will also be used for the species in group "B":

B1.0= There are no examples of species in this status that were previously recorded as wintering in Türkiye but are now extinct.

B.1.1= These species use Türkiye as a wintering or transit area, but their populations are threatened with significant extinction. The natural populations of birds in their wintering grounds are now extinct: they are domesticated species that survive in voliers, cages and other artificial conditions. These species have no chance of surviving in the wild. If they are released into the wild, it is no longer possible for them to adapt to natural living conditions.

B.1.2= The populations of these species are very low throughout Türkiye and are represented by **1 individual - 10 pairs** (1- 20 individuals) in the regions where they are monitored. Since these species are under great threat of extinction, they must be protected throughout Türkiye.

B.2= The numbers of these species range from **11 to 25 pairs** (22 to 50 individuals) in the areas where they are observed. These species are significantly threatened with extinction.

B.3= Populations of these species in Türkiye generally range between **26-50 pairs** (52-500 individuals) in the regions where they are observed. Species in great danger of extinction in the wild. These species are also vulnerable to extinction and in great danger of extinction in the wild.

B.3.1= Populations of these species are declining in the areas where they are observed. Their population also ranges between **251- 500 pairs** (502- 1000 individuals). It includes species that tend to decline in the areas where they are observed, according to previous records.

B.4= Population densities of these species are not yet threatened with extinction in the areas where they are observed, but there is a localized decline in their populations. These species are candidates to be threatened with extinction in time. Populations of these species range between **501- 5000 pairs** (1002- 10 000 individuals) in the areas where they are observed.

B.5= The observed populations of these species are not yet in decline or threatened with extinction.

B.6= Includes under-researched and poorly recorded species. Since they are based on fewer than two observations as **"chance species= RT"** only, there is currently no chance for a reliable assessment and need to be investigated.

B.7= It is not possible to make an assessment of these species at this time because their records are few, uncertain and unreliable.

K: Winter visitors These species are mostly of western origin and come to spend the winter in warmer regions of Türkiye, mainly the Lake District and wetlands further south.

T: Transit migrants These species use Anatolia during their spring and fall migrations.

R: Random species These are characterized by irregular records and very low numbers of individuals.

N: Rare species are species that do not fall under the above statuses and for which there is no reliable, sufficient and healthy data.

Faunistic Analysis

a. Bivalves (Amphibia)

The name amphibians, or bivalves, means those with a double life. This is because many amphibian species spend their lives partly in water and partly on land. Amphibians have no scales, plates, bristles, etc. on their skin. In other words, their skin is bare and contains plenty of glands that keep it moist. They usually undergo metamorphosis and turn into a juvenile individual with an adult appearance. Adults are carnivorous. They generally cannot tolerate drought and salinity. There are 3 types of amphibians that are quite different from each other in terms of appearance; Tailless Frogs (Anura), Tailed Frogs (Salamanders) (Urodela) and Legless Frogs (Apoda), which look like snakes or worms at first glance.

It has been determined that 2 amphibian species are distributed in the project vicinity and in areas close to the project vicinity. There are no endemic species among these amphibian species and 1 species is in the "LC" and 1 species is in the "DD" category according to the IUCN red list. None of these species are included in the additional lists of the CITES Convention. According to the Bern Convention; 2 species distributed in and around the project area are included in the Annex-III list. According to the Central Hunting Commission Decisions (MAK); none of these species are included in the additional lists of the Central Hunting Commission Decisions. Information on the amphibian species found and likely to be found in the area after the studies carried out within the scope of the Project is given in Table 46.

Table 46 Species of Bivalves Found and Likely to be Found in the Project Area and its Near Environment and Their Conservation Status

Family	Scientific Name	Endemism	IUCN	CITES	BERN	MAKK	Form of Detection
Bufonidae	*Bufo bufo*	-	LC	U	ANNEX III	U	L
Bufonidae	*Bufotes variabilis*	-	DD	U	ANNEX III	U	L

Abbreviations U: Unlisted, L: Literature, F: Field.

b. Reptilia (Reptiles)

The class of reptiles (Reptilia) is composed of six groups, namely the calachians (Rhynchocephalia), turtles (Chelonia, Testudinata), crocodiles (Crocodilia), lizards (Sauria), blind lizards (Amphisbaenia) and snakes (Ophidia, Serpentes). Three of these, lizards, blind lizards and snakes, form the order Squamata. Reptiles are included in the Tetrapoda or "land vertebrates" group of vertebrates, but snakes and some lizards lack feet. Reptiles reproduce by laying eggs, although some are viviparous. Some lizards and snakes also reproduce parthenogenetically.

It has been determined that 9 reptile species are distributed in the project vicinity and in areas close to the project vicinity. According to the IUCN red list, 1 species is in the "NE", 1 species is in the "VU" and 7 species are in the "LC" category. According to the Bern Convention; 6 species distributed throughout

the province are listed in Annex-II and 3 species in Annex-III. There is 1 reptile species listed in Appendix-II of the CITES Convention. According to the Central Hunting Commission Decisions (MAK); 9 species are not included in the additional lists of the Central Hunting Commission Decisions. Information on the reptile species found and likely to be found in the area after the studies carried out within the scope of the Project is given in Table 47.

Table 47 Reptile Species Found and Likely to be Found in the Project Area and its Vicinity and Their Conservation Status

Family	Scientific Name	Endemism	IUCN	CITES	BERN	MAKK	Form of Detection
Agamidae	*Stellagama stellio*	-	LC	U	ANNEX II	U	L
Colubridae	*Eirenis modestus*	-	LC	U	ANNEX III	U	L
Colubridae	*Platyceps najadum*	-	LC	U	ANNEX III	U	L
Gekkonidae	*Hemidactylus turcicus*	-	LC	U	ANNEX III	U	L
Gekkonidae	*Mediodactylus kotschyi*	-	LC	U	ANNEX II	U	L
Lacertidae	*Lacerta trilineata*	-	LC	U	ANNEX II	U	L
Lacertidae	*Ophisops elegans*	-	NE	U	ANNEX II	U	L
Testudinidae	*Testudo graeca*	-	VU[13]	II	ANNEX II	U	L + F
Viperidae	*Montivipera xanthina*	-	LC	U	ANNEX II	U	L

Abbreviations U: Unlisted, L: Literature, F: Field.

c. Birds (Aves)

Birds belong to the class of vertebrates between reptiles and mammals. Their most characteristic feature is that their front limbs are transformed into wings for flight. They are also warm-blooded (constant temperature) and their bodies are covered with feathers. They have a light skeletal structure because their bones are hollow.

Although the number of bird species in our country varies according to different sources, it is 474 according to Kuşbank records and 484 according to the updated Türkiye's Anonymous Birds (Trakuş) 2015 October records. With the latest updates, this number has increased to 513 (Kiziroğlu, 2015).

It has been determined that 38 bird species belonging to 19 families are distributed in the project vicinity and in the areas close to the project vicinity. Of these species, 10 are winter visitors, 4 are summer visitors, 21 are native and 3 are transit. There are no endemic species among these bird species and according to the IUCN red list, 1 species is in the "NE" category and 37 species are in the "LC" category. According to the Bern Convention; 17 species distributed throughout the province are listed in Annex-II and 16 species in Annex-III. There are 4 bird species listed in Annex II of the CITES Convention. According to the Central Hunting Commission Decisions (MAK); 9 species are on the Annex-I list and 6 species are on the Annex-II list. Information on the bird species found and likely to be found in the area after the studies carried out within the scope of the project is given in Table 48.

Table 48 Bird Species Found and Likely to be Found in the Project Area and its Vicinity and Their Protection Status

Family Name	Scientific Name	Endemism	IUCN	CITES	BERN	MAKK	Status	RDB	Form of Detection
Accipitridae	*Buteo buteo*	-	LC	II	ANNEX III	U	S	A.3	L
Accipitridae	*Buteo rufinus*	-	LC	II	ANNEX III	U	S	A.3	L
Accipitridae	*Circus aeruginosus*	-	LC	II	ANNEX III	U	S	A.3	L
Alaudidae	*Alauda arvensis*	-	LC	U	ANNEX III	ANNEX I	WV	A.4	L

[13] Even though tortoise (Testudo graece) categorized as 'VU' according to IUCN, it is a widely spread reptile species found in every region except the Eastern Black Sea region in Türkiye. It is generally found in dry, stony and sandy terrains.

Family Name	Scientific Name	Endemism	IUCN	CITES	BERN	MAKK	Status	RDB	Form of Detection
Alaudidae	*Galerida cristata*	-	LC	U	ANNEX III	ANNEX I	S	A.3	L
Apodidae	*Apus apus*	-	LC	U	ANNEX III	U	T	A.3.1	L
Ciconiidae	*Ciconia ciconia*	-	LC	U	ANNEX II	U	SV	A.3.1	L
Ciconiidae	*Ciconia nigra*	-	LC	II	ANNEX II	U	T	A.3	L
Columbidae	*Columba livia*	-	LC	U	ANNEX III	ANNEX II	S	A.5	L
Columbidae	*Columba palumbus*	-	LC	U	U	ANNEX II	WV	A.4	L
Columbidae	*Spilopelia senegalensis*	-	LC	U	ANNEX III	ANNEX I	S	A.4	L
Columbidae	*Streptopelia decaocto*	-	LC	U	ANNEX III	ANNEX I	S	A.5	L
Corvidae	*Corvus corax*	-	LC	U	ANNEX III	ANNEX I	S	A.5	L
Corvidae	*Corvus cornix*	-	NE	U	ANNEX III	U	S	A.5	L
Corvidae	*Corvus monedula*	-	LC	U	U	ANNEX II	S	A.5	L
Corvidae	*Pica pica*	-	LC	U	U	ANNEX II	S	A.5	L
Emberizidae	*Emberiza cirlus*	-	LC	U	ANNEX II	U	S	A.2	L
Fringillidae	*Carduelis carduelis*	-	LC	U	ANNEX II	U	S	A.3.1	L
Fringillidae	*Chloris chloris*	-	LC	U	ANNEX II	U	S	A.3	L
Fringillidae	*Fringilla coelebs*	-	LC	U	ANNEX III	ANNEX I	S	A.4	L
Hirundinidae	*Delichon urbicum*	-	LC	U	ANNEX II	U	SV	A.3	L
Hirundinidae	*Hirundo rustica*	-	LC	U	ANNEX II	U	SV	A.5	L+F
Laridae	*Larus cachinnans*	-	LC	U	ANNEX III	ANNEX I	WV	A.4	L
Laridae	*Larus ridibundus*	-	LC	U	ANNEX III	ANNEX I	WV	A.5	L
Motacillidae	*Motacilla alba*	-	LC	U	ANNEX II	U	S	A.3.1	L
Muscicapidae	*Erithacus rubecula*	-	LC	U	ANNEX II	U	WV	A.3	L
Muscicapidae	*Muscicapa striata*	-	LC	U	ANNEX II	U	T	A.3	L
Muscicapidae	*Saxicola torquatus*	-	LC	U	ANNEX II	U	WV	A.3	L
Paridae	*Parus major*	-	LC	U	ANNEX II	U	S	A.3.1	L
Paridae	*Poecile lugubris*	-	LC	U	ANNEX II	U	S	A.2	L
Passeridae	*Passer domesticus*	-	LC	U	U	ANNEX II	S	A.5	L+F
Phalacrocoracidae	*Phalacrocorax carbo*	-	LC	U	ANNEX III	ANNEX II	WV	A.3	L
Podicipedidae	*Podiceps cristatus*	-	LC	U	ANNEX III	U	S	A.5	L
Sittidae	*Sitta europaea*	-	LC	U	ANNEX II	U	S	A.3	L
Sturnidae	*Sturnus vulgaris*	-	LC	U	U	ANNEX I	WV	A.5	L
Sylviidae	*Sylvia atricapilla*	-	LC	U	ANNEX II	U	SV	A.2	L
Sylviidae	*Sylvia cantillans*	-	LC	U	ANNEX II	U	SV	A.2	L
Sylviidae	*Sylvia melanocephala*	-	LC	U	ANNEX II	U	WV	A.3	L

Abbreviations U: Unlisted, L: Literature, F: Field, T: Transit, SV: Summer Visitor, WV: Winter Visitor, N: Native.

g. Mammals (Mammalia)

It has been determined that 9 mammal species are distributed in the Project vicinity and in areas close to the Project vicinity. There are no endemic species among these mammal species and all of them are in the "LC" category according to the IUCN red list. According to the Bern Convention, 2 species are listed in Annex-II and 1 species in Annex-III. There is 1 mammal species included in the Appendix lists of the CITES Convention. According to the Central Hunting Commission Decisions (MAK), 2 species are on the Annex-II list. Information on the mammal species found and likely to be found in the area after the studies carried out within the scope of the Project is given in Table 49.

Table 49 Mammal Species Found and Likely to be Found in the Project Area and its Vicinity and Their Conservation Status

Family	Scientific Name	Endemism	IUCN	CITES	BERN	MAKK	Form of Detection
Canidae	*Vulpes vulpes*	-	LC	III/NC	U	ANNEX II	L
Cricetidae	*Microtus guentheri*	-	LC	U	U	U	L
Erinaceidae	*Erinaceus concolor*	-	LC	U	U	U	L
Muridae	*Mus macedonicus*	-	LC	U	U	U	L
Muridae	*Rattus rattus*	-	LC	U	U	U	L

Family	Scientific Name	Endemism	IUCN	CITES	BERN	MAKK	Form of Detection
Rhinolophidae	*Rhinolophus ferrumequinum*	-	LC	U	ANNEX II	U	L
Suidae	*Sus scrofa*	-	LC	U	U	ANNEX II	L
Vespertilionidae	*Myotis blythii*	-	LC	U	ANNEX II	U	L
Vespertilionidae	*Pipistrellus pipistrellus*	-	LC	U	ANNEX III	U	L

Abbreviations LD: Unlisted, L: Literature, F: Field.

Protected Areas

Nationally Protected Areas

Desktop studies and literature research were conducted utilizing databases from relevant institutions within the scope of the Project to locate and evaluate protected places within the Project Area and its near vicinity.

The Project Area contains no national parks, nature parks, nature monuments, or nature reserve areas as specified in Articles 2 and 3 of the National Parks Law. The Land Hunting Law in the Project Area does not establish Wildlife Protection Areas, Wildlife Development Areas, or Wild Animal Nestling Areas. The nearest protected areas to the Project area are Uzuntarla Nature Park and Izmit Gulf Wetland. Uzuntarla Nature Park and Izmit Gulf Wetland Buffer Zone Boundary are 11.5 km and 3.5 km away from the Project Area, respectively.

Within the area of influence of the Project, there is no sensitive water body determined in accordance with the provisions of the Regulation on the Determination of Sensitive Water Bodies and Areas Affecting These Water Bodies (Official Gazette dated 23.12.2016 and numbered 29927).

Internationally Recognized Areas

Internationally recognized areas exclusively defined according to WB ESS6 (2012) are UNESCO World Heritage Natural Sites, Biosphere Reserves, Ramsar Wetlands of International Importance, Key Biodiversity Areas (KBA), Important Bird Areas, and Alliance for Zero Extinction Sites.

The Project areas will not be located within any internationally recognized areas of high biodiversity value (such as World Heritage Natural Sites, Biosphere Reserves, Ramsar Wetlands of International Importance, Key Biodiversity Areas, Important Bird Areas, and Alliance for Zero Extinction Sites. The nearest internationally recognized area is Sapanca Lake, 11 kilometres away.

The protected areas map showing the Project area, and its immediate surroundings is given in Figure 40.

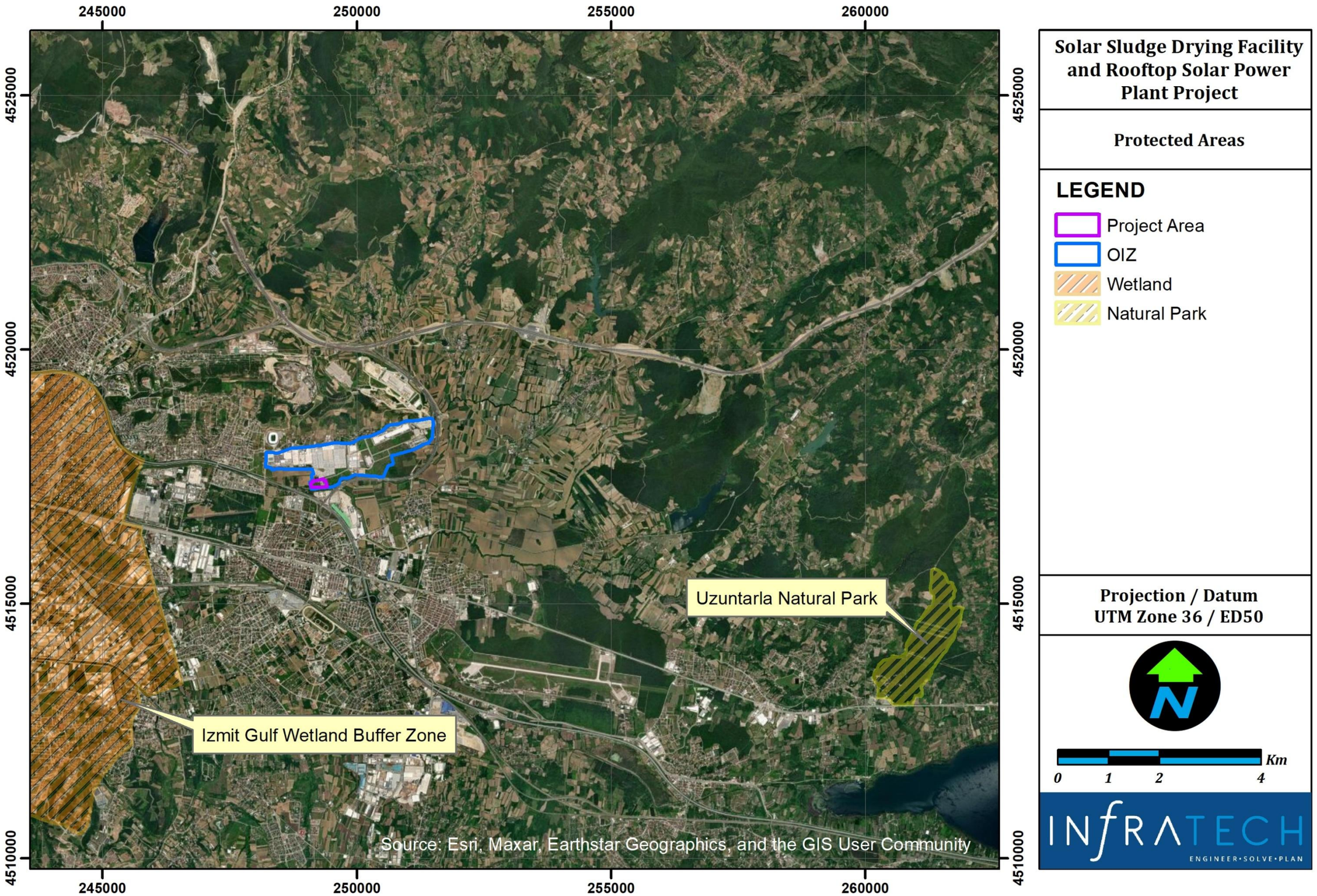


Figure 40 Internationally Recognized Areas around the Project Area

ANNEX-7: AIR QUALITY IMPACT CALCULATIONS

Pre-Construction Phase

In the pre-construction phase of the Project, topsoil stripping will be carried out during the land preparation process. There is no data on the amount of soil to be stripped in the feasibility report of the project. In a total area of 40,395 m^2, the solar sludge drying plant will cover 5,000 m^2, the solar power plant will cover 1,217 m^2 roof area. It is estimated that a minimum of 30 cm of topsoil stripping will be carried out in the 5,000 m^2 area where the sludge drying plant is planned. Table 50 showing the dust emission factors is given below to calculate the dust emissions resulting from the topsoil stripping process.

Table 50 Dust Emission Factor

Sources	Emission Factors		Unit
	Uncontrolled	Controlled	
Dismantling/Excavation	0.025	0.0125	kg/ton
Loading	0.010	0.0050	
Unloading	0.010	0.0050	
Storage	5.800	2.9000	
Transportation (total distance of round trip)	0.700	0.3500	kg/km- vehicle

Source: Industrial Air Pollution Control Regulation, Appendix 12.

- Volume of topsoil to be stripped = Area x Height = Volume
- Selected average depth of topsoil stripped is 0.3 m
  = 5,000 m^2 (area determined based on desk studies) x 0.30 m = 1,500 m^3
- Density of topsoil: 1.6 ton/m^3 (based on desk studies)
- Amount of topsoil to be stripped: 1,500 m^3 x 1.6 ton/m^3 = 2,400 ton
- Duration of pre-construction phase of Project = 30 days
- Daily amount of topsoil to be stripped: 2,400 ton/5 days[14] = 480.0 ton/day
- One working day = 8 hours;
- Hourly amount of topsoil to be stripped: 480 ton/day x 1 day/8 hours = 60 ton/hour
- The maximum distance to be transported within the parcel is 200 metres round trip
- The capacity of one vehicle was taken 30 tonnes
- Storage area = Area = Volume / Height
  = 1,500 m^3 / 1 m (assumed average storage height) = 0.15 ha

Uncontrolled emissions:

Uncontrolled emissions amount of dismantling/excavation works is calculated by multiplying the related dismantling/excavation factor (see Table 50) with working time of topsoil stripping and daily amount of topsoil stripped. Similarly, uncontrolled emissions amount sourced by excavation storage is calculated by multiplying related factor given in Table 50 with the storage area of the excavated material. Storage area is calculated in the previous paragraph by dividing volume of excavated soil (also given in previous paragraph) with assumed average height of the stored excavation (1 m).

Amount of PM_{10} emissions (dismantling/excavation):
Dismantling/Excavation emission factor (uncontrolled): 0.025 kg/ton (see Table 50)
Amount of PM_{10} emissions = Hourly excavated material amount x Related factor
= 60 ton/hour * 0.025 kg/ton = **1.5 kg/hour**

[14] It is assumed that all topsoil will be stripped within 5 days and the emission flow rate is ensured to be high for the worst case scenario.

Amount of PM_{10} emissions (loading):
Loading emission factor (uncontrolled): 0.010 kg/ton (see Table 50)
Amount of PM_{10} emissions = Hourly excavated material amount x Related factor
= 60 ton/hour * 0.010 kg/ton = **0.6 kg/hour**

Amount of PM_{10} emissions (Transportation):
Transportation emission factor (uncontrolled): 0.700 kg/km-vehicle (see Table 50)
Amount of PM_{10} emissions = Hourly excavated material amount x Related factor x Round trip x Capacity of Vehicle
= (60 ton/hour * 0.700 kg/km-vehicle * 0,2 km) / 30 ton/vehicle= **0.28 kg/hour**

Amount of PM_{10} emissions (unloading to storage area):
Unloading emission factor (uncontrolled): 0.010 kg/ton (see Table 50)
Amount of PM_{10} emissions = Hourly excavated material amount x Related factor
= 60 ton/hour * 0.010 kg/ton = **0.6 kg/hour**

Amount of PM_{10} emissions (storage):
Storage emission factor (uncontrolled): 5.8 kg/ha (see Table 50)
Average storage time = 1 day (assumption)
Amount of PM_{10} emissions = Storage area x Related factor x Average storage time
= 0.15 ha x 5.8 kg/ha x 1 day x 1/24 day/hour = **0.036 kg/hour**

As a result of the calculation using uncontrolled emission factors, the emission flow rate from topsoil stripping is **3.016 kg/h**.

Controlled emissions:

Controlled emissions amount of dismantling/excavation works is calculated by multiplying the related dismantling/excavation factor (see Table 50) with working time of topsoil stripping and daily amount of topsoil stripped. Similarly, controlled emissions amount sourced by excavation storage is calculated by multiplying related factors given in (see Table 50) with the storage area of the excavated material. Size of the storage area is same with uncontrolled emissions calculations.

Amount of PM_{10} emissions (dismantling/excavation):
Dismantling/Excavation emission factor (controlled): 0.0125 kg/ton (see Table 50)
Amount of PM_{10} emissions: Hourly excavated material amount x Related factor
= 60 ton/hour * 0.0125 kg/ton = **0.75 kg/hour**

Amount of PM_{10} emissions (loading):
Loading emission factor (controlled): 0.005 kg/ton (see Table 50)
Amount of PM_{10} emissions = Hourly excavated material amount x Related factor
= 60 ton/hour * 0.005 kg/ton = **0.30 kg/hour**

Amount of PM_{10} emissions (Transportation):
Transportation emission factor (controlled): 0.350 kg/km-vehicle (see Table 50)
Amount of PM_{10} emissions = Hourly excavated material amount x Related factor x Round trip x Capacity of Vehicle
= (60 ton/hour * 0.350 kg/km-vehicle * 0,2 km) / 30 ton/vehicle= **0.14 kg/hour**

Amount of PM_{10} emissions (unloading to storage area):
Unloading emission factor (controlled): 0.005 kg/ton (see Table 50)
Amount of PM_{10} emissions = Hourly excavated material amount x Related factor
= 60 ton/hour * 0.005 kg/ton = **0.3 kg/hour**

Amount of PM_{10} emissions (storage):
Storage emission factor (controlled): 2.9 kg/ha (see Table 50)
Average storage time = 1 day (assumption)
Amount of PM_{10} emissions = Storage area x Related factor x Average storage time
= 0.15 ha x 2.9 kg/ha x 1 day x 1/24 hours = **0.018 kg/hour**

As a result of the calculation using controlled emission factors, the emission flow rate from topsoil stripping is **1.508 kg/h**.

Exhaust Emissions

In addition to the dust emissions, there will be exhaust emissions of heavy construction machinery. Primary emissions from exhaust gases of vehicles are CO, SO_2, NO_x, PM_{10} and $PM_{2.5}$. Emission characteristics depend on parameters such as; age of the vehicle, engine speed, working temperature, ambient temperature and pressure, type and quality of fuel. The equipment to be used during pre-construction phase is given in Table 51.

Table 51 Equipment List to be Used During Pre-construction Phase

Construction Machinery/Equipment	Number
Truck	1
Loader	1

Dust and gas emission from vehicles are calculated as below. The emission factors for CO, SO_2, NO_x, PM_{10} and $PM_{2.5}$are given in Table 52. The U.S. Environmental Protection Agency (EPA) does not provide a fixed $PM_{2.5}/PM_{10}$ ratio because it can vary depending on location, sources of pollution, and weather conditions[15]. Most studies report that the ratio of $PM_{2.5}$ to PM_{10} varies between 0.5 and 0.7 in urban areas. To stay on the safe side, the $PM_{2.5}$ emission factor is taken to be 70% of PM_{10}.

Table 52 Emission Factors for 1 L Diesel Consumption

Pollutant	Emission Factor (g/L)
CO	0.49
SO_2	0.01
NOx	3.0
PM_{10}	0.12
$PM_{2.5}$	0,084

Source: Environmental Protection Agency (EPA), 2023.

The diesel consumption by each construction vehicle is assumed as 25 L/hour. Total diesel consumption for 2 construction vehicles given in Table 51 is 50 L/hour. The results of calculation by using emission factors and diesel consumption of construction vehicles are as:

CO : 50 L/h x 0.49 g/L = **0.0245 kg/h**
SO_2 : 50 L/h x 0.01 g/L = **0.0005 kg/h**
NO_x : 50 L/h x 3.0 g/L = **0.15 kg/h**
PM_{10} : 50 L/h x 0.12 g/L = **0.006 kg/h**
$PM_{2.5}$: 50 L/h x 0.084 g/L = **0.0042 kg/h**

[15] PM10 and PM10-2.5 Air Quality Analyses, Schmidt and Jenkins Memo - July 22, 2010, Particulate Matter (PM) Air Quality Standards - Documents from Review Completed in 2012, EPA. The EPA has a lot of work on this issue, but has never given a clear ratio.

Construction Phase

During the construction phase of the Project, the drying plant will be constructed on a concrete floor. No excavation activities will be carried out on the ground and side concrete walls will be installed for the installation of mixing equipment. The entire sludge drying plant will be constructed using Polycarbonate Sheet and Steel Construction. Therefore, there is an impact on air quality only due to exhaust gas from the machinery and equipment to be operated.

Primary emissions from exhaust gases of vehicles are CO, SO_2, NO_x, PM_{10} and $PM_{2.5}$. Emission characteristics depend on parameters such as; age of the vehicle, engine speed, working temperature, ambient temperature and pressure, type and quality of fuel. The construction machinery and equipment list are given in Table 53.

Table 53 Construction Machinery and Equipment List

Construction Machinery/Equipment	Number
Truck (concrete mixer)	2
Tower crane	1

Dust and gas emission from vehicles are calculated as below. In calculations, the emission factors for CO, SO_2, NO_x, PM_{10} and $PM_{2.5}$ given in Table 52 are used.

The diesel consumption by each construction vehicle is assumed as 25 L/hour. Total diesel consumption by 3 construction vehicles given in Table 53 equals to 75 L/hour. The results of calculation by using emission factors and diesel consumption of construction vehicles are as:

CO : 75 L/h x 0.49 g/L = **0.0368 kg/h**
SO_2 : 75 L/h x 0.01 g/L = **0.00075 kg/h**
NOx : 75 L/h x 3.0 g/L = **0.225 kg/h**
PM_{10} : 75 L/h x 0.12 g/L = **0.009 kg/h**
$PM_{2.5}$: 75 L/h x 0.084 g/L = **0.0063 kg/h**

ANNEX-8: NOISE LEVEL CALCULATIONS

The total equivalent noise level created by noise sources is calculated with the help of the formula given below.

$$L_{wT} = 10 \times \log \sum_{i=1}^{n} 10^{\frac{L_{wi}}{10}} \qquad (1)\ (METU, 2023).$$

Where;

N : Number of noise sources
Lwi : Noise level (dBA) of each source
LwT : Total equivalent noise level

The noise level originating from the machine/equipment and reaching a certain distance is calculated by the formula below.

$$L_p = L_{wT} + 10 \times \log \frac{Q}{4\pi r^2} \qquad (2)\ (SRL,1988).$$

Where;

Q: 1
r: Distance (m)
Lp: Noise level (dBA)

Pre-construction Phase

The equipment to be used in the pre-construction phase and their noise levels are given below.

Table 54 Noise Levels of Machinery/Equipment

Equipment	Number	Lwi
Excavator	1	104
Truck	1	108

Using the information given in Table 1 and the formula numbered 1, total equivalent noise level is calculated as 109.46 dBA.

In addition, using formula numbered 2, the noise levels depending on distance for pre-constrution phase are calculated and given in Table 2.

Table 55 Noise Levels of Depending on Distance

Distance (m)	Lp (dBA)	Project Standard (dBA)
15	74.94	55
50	64.49	55
100	58.47	55
200	52.44	55
300	48.92	55
400	46.42	55
500	44.49	55
600	42.90	55
700	41.56	55
800	40.40	55
900	39.38	55
1000	38.47	55
1500	34.94	55
2000	32.44	55
2500	30.51	55

Construction Phase

The equipment to be used in the pre-construction phase and their noise levels are given below.

Table 56 Noise Levels of Machinery/Equipment

Equipment	Number	Lwi
Truck (concrete mixer)	2	108
Tower crane	1	112

Using the information given in Table 3 and the formula numbered 1, total equivalent noise level is calculated as 111.8 dBA.

In addition, using formula numbered 2, the noise levels depending on distance for pre-constrution phase are calculated and given in Table 4.

Table 57 Noise Levels of Depending on Distance

Distance (m)	Lp (dBA)	Project Standard (dBA)
15	77.29	55
50	77.29	55
100	66.83	55
200	60.81	55
300	54.79	55
400	51.27	55
500	48.77	55
600	46.83	55
700	45.25	55
800	43.91	55
900	42.75	55
1000	41.72	55
1500	40.81	55
2000	37.29	55
2500	34.79	55

ANNEX-9: CHANCE FIND PROCEDURE

1. Introduction

Asım Kibar OIZ is responsible to avoid or mitigate any potential impacts of the Activities on the physical or cultural resources. It is anticipated that the project sites are selected such that there would not be any overlapping with archaeological and heritage sites/assets within the project impact area. However, there is still a possibility of encountering some unknown archaeological sites and cultural heritage assets as a Chance Find during project activities. A chance find means potential cultural heritage objects, features or sites that are identified outside of a formal site reconnaissance, normally as a result of construction monitoring. Thus, this document aims to outline the procedure and respective responsibilities in relation to the management of Chance Finds during construction works.

2. Roles and Responsibilities

Asım Kibar OIZ and all the contractors are responsible to comply with the procedure during the project construction activities. In this regard, Asım Kibar OIZ would be providing training to their and contractors' employees involved in supervision and construction works regarding the procedure. Mainly a chance find could be encountered during the pre-construction and ground disturbance (e.g., excavation and levelling) activities. Thus, the procedure has to be implemented day to day at this stage.

3. Chance Find Process and Procedure

The step by step process and procedure to be followed upon a chance find discovery is provided below. In the case of any chance find, as detailed below, the Contractor will give due consideration and follow the necessary steps.

Step 1 - After the discovery of a chance find:

- All work must cease at the location where discovery is made
- A temporary buffer zone around the chance find will be put in place
- Contractor contacts the Asım Kibar OIZ and the archaeological museum in the province is informed immediately
- Chance find location is secured through flagging, or no-entry signs, etc.
- Chance find should not be moved, removed or further disturbed

Step 2 – Recording

- Chance Find Form Part A is filled in by the contractor and sent to Asım Kibar OIZ and a copy is filed for records

Step 3 – Contact with local authority

- The contractor notifies the relevant Governmental Archaeological Museum in the Province for the chance find

Step 4 – Authority's decision

The relevant Museum decides on the following path of actions for chance find area:

Step 4.A - No significance to site or finding

- The museum declares that the site/finding is considered to be of no significance
- Contractor informs the Asım Kibar OIZ
- Contractor records the decision on Part B of Chance Find form and sends a copy to the Asım Kibar OIZ
- A copy of Chance Find form Part B is kept for records
- No further actions required
- This step closes out the chance find procedure
- Construction activities may resume

Step 4.B – Significance to site

- The museum declares that the site/finding is considered to be of significance
- Museum decides on further actions and informs the contractor and the contractor informs the Asım Kibar OIZ
- Contractor records the decision on Part B of Chance Find form
- Proceed to Step 5

Step 5 – Site investigation

Step 5.A - After field investigation Museum declares the site/finding has minor significance

- Contractor informs the Asım Kibar OIZ
- Contractor records the decision on Part C of Chance Find form and sends a copy to the Asım Kibar OIZ
- A copy of Chance Find form Part B is kept for records
- No further actions required
- This step closes out the chance find procedure
- Construction activities may resume

Step 5.B - After field investigation Museum declares the site/finding has moderate significance

- Further studies such as test pit/salvage excavations or remote sensing investigation are to be completed
- Museum provides instructions, and/or supervision for the studies
- Contractor informs the Asım Kibar OIZ
- Asım Kibar OIZ provides an archaeological work team of qualified archaeologist and workers to work under the supervision of the museum.
- After excavation is completed, team provides a report to the museum directorate
- The museum directorate reports the study outcomes to the relevant Regional Preservation Board of Cultural Assets.
- The relevant Regional Preservation Board of Cultural Assets officially confirms completion of recovery and informs the Asım Kibar OIZ
- Contractor records the decision on Part C of Chance Find form and sends a copy to the Asım Kibar OIZ
- A copy of Chance Find form Part B is kept for records
- No further actions required
- This step closes out the chance find procedure

- Construction activities may resume

Step 5.C - After field investigation Museum declares the site/finding has major significance

- Salvage excavation is to be completed
- Site is to be treated according to Law on the Protection of Cultural and Natural Assets Law (No. 2863 dated 21.07.1983)
- Museum provides instructions, and/or supervision for test pit/salvage archaeological excavation
- Contractor informs the Asım Kibar OIZ
- Asım Kibar OIZ provides an archaeological work team of qualified archaeologist and workers to work under the supervision of the museum
- Once the excavation is completed, salvage excavation team provides a report to museum directorate
- The relevant Regional Preservation Board of Cultural Assets officially confirms completion of recovery and informs Asım Kibar OIZ
- Site will be officially recorded and protected according to Turkish regulations
- Contractor records the decision on Part C of Chance Find form and sends a copy to the municipality
- A copy of Chance Find form Part B is kept for records
- No further actions required
- This step closes out the chance find procedure
- Construction activities may resume or further actions need to be taken

It is important to note that in case human remains are found, all project team and the local authorities will be immediately notified.

4. Monitoring and Reporting

The contractor will monitor all construction or other ground disturbance activities for evidence of presence of cultural heritage items. Chance Finds will be recorded on the Chance Find Report form (see Annex-9.1). All Chance Find Report forms will be kept in hard copy at the site and will also be scanned and saved electronically. Any Chance Find will be recorded in the Chance Find Register (see Annex-9.2).

Annex 9.1 Chance Find Report Form

PART A			
Project Location (Province):	District: Neighborhood:	Date:	Form No:
Name of person reporting chance find:			
Was work stopped in the immediate vicinity of the chance find? ☐ Yes ☐ No			
Was a buffer zone created to protect the chance find? ☐ Yes ☐ No			
NOTIFICATION			
Municipality contacted ☐ Yes ☐ No			
CHANCE FIND DETAILS			
GPS coordinates	Photo record ☐ Yes ☐ No If not, explain why: Other records ☐ Yes ☐ No Specify (drawings, videos, etc.):		
Description of chance find:			
Description of site/finding and other specifications of site/finding (e.g. surface sediment type, ground surface visibility, etc.):			

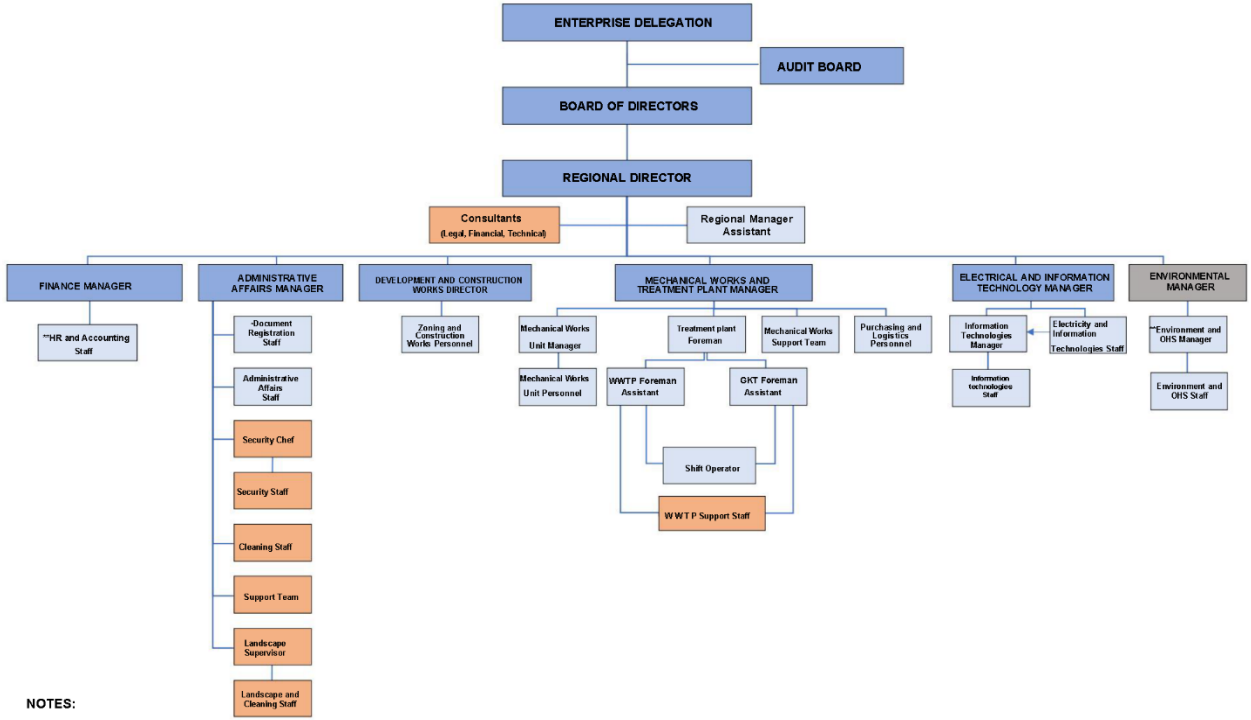
PART B		
NOTIFICATION OF MUSEUM DIRECTORATE		
Contractor contacted museum directorate ☐ Yes ☐ No Date of notification: Name of museum directorate and Name of contact: Contact number of museum directorate representative:		
DECISION OF MUSEUM DIRECTORATE		
Date of site visit:		
☐ Site/Finding of no significance - Construction to proceed with no further action – End of chance find procedure Date of notice to resume work:	☐ Site/Finding of significance - Further actions required Please Fill out Part C	
Name of museum directorate representative/archeologist: Contact information:		
Municipality contacted ☐ Yes ☐ No		
PART C		
FURTHER FIELD INVESTIGATION		
☐ Site/Finding of minor significance	☐ Site/Finding of moderate significance	☐ Site/Finding of major significance
Describe additional work to be conducted:		
Date started:	Date completed:	
Date of notice to resume construction works:		
Name of museum directorate representative/archaeologist: Contact information:		
Municipality contacted ☐ Yes ☐ No		

Annex 9.2 Chance Find Register

Date of Find	Summary of Chance Find	Name of Authority Notified	Action Taken	Chance Find Form Completed	Status Open or Closed	Remarks

ANNEX-10: ORGANISATION CHART OF ASIM KIBAR OIZ

ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ	ASIM KİBAR ORGANIZED INDUSTRIAL ZONE ORGANIZATION CHART	DOCUMENT NUMBER	AKOSB.LST.007
		RELEASEDATE	30.01.2023
		REVISION NO	2



NOTES:

1) * These are the works to be done as a special duty.

2) ** Positions in the Quality Team

3) Outsourced services

4) Positions without permanent appointment - by proxy

5) Positions in the KVKK team; It is stated in AKOSB.LST.016 KVKK Project Board List

ANNEX-11: ISO 9001 AND ISO 14001 CERTIFICATES

This is to Certify that

BVCS
BRITISH VERITAS CERTIFICATION SERVICES

ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ YÖNETİMİ

Asım Kibar Organize Sanayi Bölgesi 1. Cd. No:3 İzmit, TÜRKİYE

Conforms to the Requirements of

ISO 9001:2015

Kalite Yönetim Sistemi
Quality Management System

IN ACCORDANCE WITH THE LAW AND IMPLEMENTATION REGULATIONS ON ORGANIZED INDUSTRIAL ZONES SERVICES AND ACTIVITIES

ORGANİZE SANAYİ BÖLGELERİ KANUNU VE UYGULAMA YÖNETMELİĞİ DOĞRULTUSUNDA YAPILAN HİZMET VE FAALİYETLER

Certificate Number: Q.024.0296.TR Rev.2
Certification Period: 1 Yıl – 11.04.2022

Expiry Date : 10.04.2025
Certified Date: 11.04.2024

Approving Officer:

NAC

Verify the validity with the QR Code

BRITISH VERITAS CERTIFICATION SERVICES
BVCS
CERTIVICATION
www.bvcscert.com

HMI Certification Training Ltd.
492 Bearwood Rd, Smethwick B66 4HB, Birmingham / West Midland - England
This certificate remains the property of HMI it is validity is subject to arrangement between the certificated client and HMI. For further details go to
www.bvcscert.com

This is to Certify that

BVCS
BRITISH VERITAS CERTIFICATION SERVICES

ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ YÖNETİMİ

Asım Kibar Organize Sanayi Bölgesi 1. Cd. No:3 İzmit, TÜRKİYE

Conforms to the Requirements of

ISO 14001:2015

Çevre Yönetim Sistemi
Environmental Management System

IN ACCORDANCE WITH THE LAW AND IMPLEMENTATION REGULATIONS ON ORGANIZED INDUSTRIAL ZONES SERVICES AND ACTIVITIES

ORGANİZE SANAYİ BÖLGELERİ KANUNU VE UYGULAMA YÖNETMELİĞİ DOĞRULTUSUNDA YAPILAN HİZMET VE FAALİYETLER

Certificate Number: E.024.0296.TR Rev.2
Certification Period: 1 Yıl – 11.04.2022

Expiry Date : 10.04.2025
Certified Date: 11.04.2024

NAC

Approving Officer:

Verify the validity with the QR Code

BRITISH VERITAS CERTIFICATION SERVICES
BVCS
CERTIVICATION
www.bvcscert.com

HMI Certification Training Ltd.
492 Bearwood Rd, Smethwick B66 4HB, Birmingham / West Midland - England
This certificate remains the property of HMI it is valitidy is subject to arrangement between the certificated client and HMI. For further details go to
www.bvcscert.com

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

INFRATECH
ENGINEER•SOLVE•PLAN

ANNEX-12: GROUNDWATER UTILISATION CERTIFICATION

DSİ Genel Müdürlüğü
1. Bölge Müdürlüğü Bursa

Form No: 2.7.4
Belge No: 01.4100.036.K.317547
Belge Tarihi: 05.06.2017

YERALTISUYU KULLANMA BELGESİ

1. Belge Sahibi : **HYUNDAİ-ASSAN OTOMOTİV SAN. VE TİC. A.Ş.**
T.C. Kimlik Numarası (910006485)
Adresi ATATÜRK MAH.VATAN CAD.41305 ALİKAHYA/KOCAELİ
2. Teknik Sorumlu :
a) Adı Soyadı : NİYAZİ TEMİZKAN
b) Mesleği : (JEOLOJİ YÜKSEK MÜHENDİSİ)
c) Diploma-Oda Sicil No : 6964
d) Adresi :
3. Sondör Kuyucu Galerici :
a) Adı Soyadı : ALİ SAKLANMAZ
b) Mesleği : Sondör
c) Diploma-Oda Sicil No : 4730
d) Adresi :
4. Kuyu/Galeri Yeri :
İli : İzmit
İlçesi : Izmit
Beldesi, Mahallesi veya Köyü : ORHANİYE
Kuyu'nun DSİ No'su : KL.01.387
Koordinatı : 248470 - 4517393
Havza Adı : 2- Marmara Havzası
Ova Adı :
5. Kuyu/Galeri Verimi :
Pompajla : 4 lt/sn
Artezyen : lt/sn
Statik Seviye : 1 m
Dinamik Seviye (pompajda) : 61 m
Çekilecek Su Miktarı : 150,00 Ton/gün - 45.000,00 Ton/yıl
Çekilecek suyu temine yetecek enerji miktarı : 20000 kWh
Sayaç Numarası : 52121433
Kullanma Amacı : **SANAYİ SUYU**

YAS İŞLETME SAHASI İÇİNDEDİR

05.06.2017 tarihli dilekçe ile yukarıda belirtilen ***Derin Kuyu*** kullanmak istediğini belirten **HYUNDAİ-ASSAN OTOMOTİV SAN. VE TİC. A.Ş.**

müracaatı üzerine yapılan inceleme sonucu, isteğin kanun, tüzük ve hükümlerine uygun olduğu anlaşıldığından, suyun yalnız ***SANAYİ SUYU*** amacıyla kullanılması şartıyla bu kullanma belgesi verilmiştir.

DSİ 1. Bölge Md.

Fehmi KÖSE
Bölge Müdür Yardımcısı

Eki:
1) Kuyu kütüğü (3 adet)
2) Pompaj programı (3 adet)
3) Analiz raporu (3 adet)
(kullanma amacına uygun)
4) Kuyu açılan arazinin onaylı tapu fotokopisi

T. C.
DSİ GENEL MÜDÜRLÜĞÜ
.....1...... Bölge Müdürlüğü

Mescit yanı

(3) Nolu

Form No. : 2.7.4.
Belge No. K1.01.293
Belge Tarihi 20.5.1996

YERALTISUYU KULLANMA BELGESİ

1. Belge Sahibi : ASSAN A.Ş.
TERSANE CAD.ASLAN HAN Kat:4 KARAKÖY/İSTANBUL
2. Kuyu/Galeri Yeri :
İ l i : KOCAELİ
İlçesi : İZMİT
Bucağı : KÖSEKÖY
Mahallesi veya Köyü : ALİKAHYA-DURHASAN
Kuyunun DSİ No.'su :
3. Kuyu/Galeri Verimi :
Pompajla : 2 lt/sn.
Artezyen : - lt/sn.
Statik Seviye : 3 m.
Dinamik seviye (pompajda): 80 m.
Çekilecek su miktarı : 150 Ton/gün ~~54750~~ 45000 Ton/yıl
Kullanma amacı : Sanayi

15.3.1996.... tarihli dilekçe ile yukarıda yeri belirtilen Derinkuyuyu .... kullanmak istediğini bildiren .... 'ın müracaatı üzerine yapılan inceleme sonucu, isteğin kanun, tüzük ve yönetmelik hükümlerine uygun olduğu anlaşıldığından, suyun yalnız .sanayi......... .... amacıyla kullanılması şartıyla bu kullanma belgesi verilmiştir.

Ek : 1 adet onaylı kuyu kütüğü
1 adet pompaj programı

DSİ
.........1.......... Bölge Müdürü a.
MÜMİN ÇÖÇMEN
Jeoteknik Hizmetler ve
Yeraltısuları Şube Müdürü

Taner AYDIN
YAS. Planlama Rezerv.
Kontrol Başmühendisi

DSİ Matbaası — II. 5/651 - 76
O-M/124.08.067/72

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP
INFRATECH
ENGINEER•SOLVE•PLAN

T. C.
DSİ GENEL MÜDÜRLÜĞÜ
1 Bölge Müdürlüğü

PDF Belgesi

(1) Nolu

Form No. : 2.7.4.
Belge No. : Kl.01.312
Belge Tarihi : 6.6.1997

YERALTISUYU KULLANMA BELGESİ

1. **Belge Sahibi** : ASSAN A.Ş.
Tersane Cad.Aslan Han Kat:4 KARAKÖY/İSTANBUL

2. **Kuyu/Galeri Yeri** :

İli : KOCAELİ

İlçesi : İZMİT

Bucağı : 1.BÖLGE

Mahallesi veya Köyü : DURHASAN

Kuyunun DSİ No.'su :

3. **Kuyu/Galeri Verimi** :

Pompajla : 2 lt/sn.

Artezyen : lt/sn.

Statik Seviye : 2 m.

Dinamik seviye (pompajda) : 44 m.

Çekilecek su miktarı : 150 Ton/gün 54 000 Ton/yıl

Kullanma amacı : Sanayi

24.5.1997... tarihli dilekçe ile yukarıda yeri belirtilen derinkuyuyu kullanmak istediğini bildiren ..... 'ın müracaatı üzerine yapılan inceleme sonucu, isteğin kanun, tüzük ve yönetmelik hükümlerine uygun olduğu anlaşıldığından, suyun yalnız sanayi ..... amacıyla kullanılması şartıyla bu kullanma belgesi verilmiştir.

Eki : 1 adet onaylı kuyu kütüğü
1 adet pompaj programı

DSİ
1 Bölge Müdürü

MÜMİN GÖÇMEN
Jeoteknik Hizmetler ve
Yeraltısuları Şube Müdürü

ASLI GİBİDİR.

Taner AYDIN
YAS. Planlama Rezerv.
Kontrol Başmühendisi

DSİ Matbaası — II. 5/651 - 76

O-M/124.08.067/72

ANNEX-13- INDUSTRIAL WASTE MANAGEMENT PLAN

T.C.
KOCAELİ VALİLİĞİ
Çevre, Şehircilik ve İklim Değişikliği İl Müdürlüğü

Sayı : E-13251696-145.01-7238994
Konu : Endüstriyel Atık Yönetim Planı

ASIM KİBAR ORGANİZE SANAYİ BÖLGESİNE
Asım Kibar OSB 1. Cadde No:3 İzmit/KOCAELİ

İlgi : Asım Kibar Organize Sanayi Bölgesi'nin 23.08.2023 tarihli ve 7239292/belgenet evrak kayıt sayılı yazısı.

İlgi yazınızda; yazı ekinde gönderilen Endüstriyel Atık Yönetim Planınızın "Atık Yönetimi Yönetmeliği" kapsamında incelenmesi talep edilmiştir.

İl Müdürlüğümüzce yapılan inceleme neticesinde; planda olabilecek değişikliklerin Müdürlüğümüze bildirilmesi ve adı geçen yönetmelik hükümlerine uyulması kaydıyla Endüstriyel Atık Yönetim Planınız Müdürlüğümüzce uygun bulunmuştur. Firmanıza verilen Atık Yönetim Planı onay yazısı, yazımız tarihi itibariyle 3(üç) yıl geçerli olup, geçerlilik süresi bitimine 3(üç) ay kala yenilenerek Müdürlüğümüze sunulması gerekmektedir.

Bilgilerinizi ve gereğini rica ederim.

Ahmet KIRILMAZ
Çevre, Şehircilik ve İklim Değişikliği İl Müdürü

Bu belge, güvenli elektronik imza ile imzalanmıştır.
Doğrulama Kodu: FF54C351-8BA8-4C2C-8817-38C30699A91F Doğrulama Adresi: https://www.turkiye.gov.tr

Adres: Ovacık Mahallesi, Hasat Sokak, No:1 Başiskele/KOCAELİ
Tel.No: 0 262 312 11 41 Faks: 0 262 325 31 87 E-posta:
kocaeli@csb.gov.tr
KEP Adresi : kocaelicevrevesehircilik@hs01.kep.tr
Bilgi için:Harun ARAS
Çevre Mühendisi

ASIM KİBAR
ORGANİZE SANAYİ BÖLGESİ

ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ

ENDÜSTRİYEL (TEHLİKELİ VE TEHLİKESİZ) ATIK YÖNETİM PLANI

AĞUSTOS – 2023

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

INFRATECH
ENGINEER•SOLVE•PLAN

ENDÜSTRİYEL(TEHLİKELİ VE TEHLİKESİZ) ATIK YÖNETİM PLANI

ATIK ÜRETİCİSİ SANAYİ TESİSİNE AİT BİLGİLER

1. Tesis İletişim Bilgileri

Firma Adı:	Asım Kibar Organize Sanayi Bölgesi
İletişim Bilgileri **Adres:** **Telefon:** **Faks:**	 Asım Kibar OSB 1.Cadde No: 3 İzmit/KOCAELİ +90 262 324 80 62 +90 262 324 79 03
Vergi Kimlik Numarası:	565 049 3220
Tesis Sahibi (Yetkilisi):	Sadiye DİŞBUDAK
İletişim Bilgileri **Telefon:** **E-posta:**	 +90 262 324 80 62 Sadiye.disbudak@akosb.com

2. Firmada Atık Yönetiminden Sorumlu Kişiye Ait İletişim Bilgileri

Adı Soyadı:	Seda ÇAPA EROĞLU
İletişim Bilgileri **Adres:** **Telefon:** **Faks:** **E-posta:**	 Asım Kibar OSB 1.Cadde No: 3 İzmit/KOCAELİ +90 262 324 80 62 +90 262 324 79 03 seda.capa@akosb.com

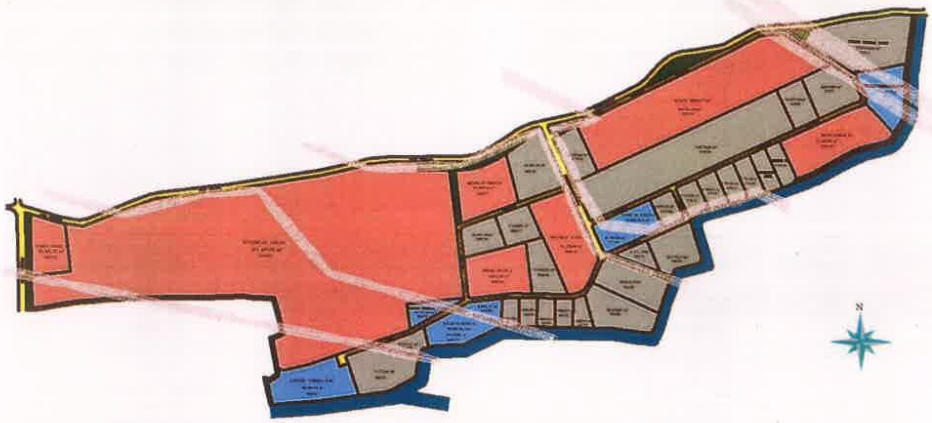
3. Atıkların Oluştuğu Proses ve Faaliyete İlişkin Bilgi

3.1. Atık türlerine göre atık kaynaklarının da gösterildiği iş akım şeması, prosesin ve atık oluşumunun anlatıldığı teknik olmayan özeti

3.1.1. Genel Vaziyet Planı

Şekil 1. Asım Kibar Organize Sanayi Bölgesi (Google Earth Görüntüsü)

ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ

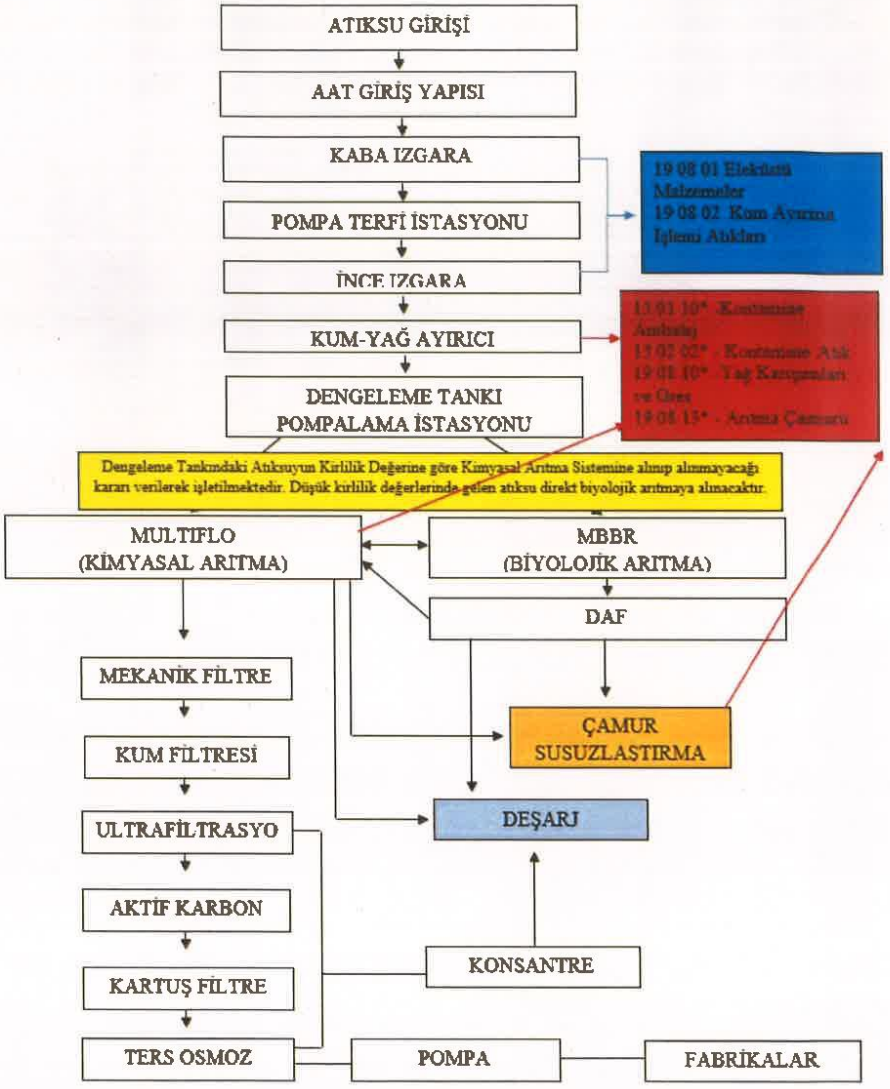


Şekil 2. Asım Kibar Organize Sanayi Bölgesi Parselizasyon Planı

Şekil 3. Asım Kibar Organize Sanayi Bölgesi Atıksu Arıtma Tesisi

3.1.2. İş Akım Şeması ile Atık Oluşum Noktaları

Şema 1. Asım Kibar Organize Sanayi Bölgesi Genel İş Akım Şeması



Şema 2. Merkezi ATT İş Akım Şeması

İş Akım Şeması Açıklaması

Organize Sanayi Bölgesi Genel İş Akım Şeması Açıklanması

Organize Sanayi Bölgesinde yönetim faaliyetleri ve altyapı ve üst yapı çalışmaları yapılmaktadır.

Ruhsatlandırma (İmar-GSMR)
OSB kapsamında üretime geçecek olan işletmelerin Yapı Ruhsatı, Yapı Kullanma İzin Belgesi ve işletme aşamsında tesislere İşyeri Açma ve Çalışma Ruhsatları Asım Kibar OSB tarafından düzenlenmektedir.

Altyapı Çalışmaları
OSB katılımcı firmalarına su, elektrişk ve doğalgaz, iletişim konularında hizmet sağlamaktadır. OSB tamamında oluşan yağmursuyu ve atıksu şebekelerinin işletmesi de OSB tarafından yapılmaktadır.

Çevre Düzeni
OSB' de bulunan yollar, yeşil alanların temizlik ve bakımı OSB tarafından yapılmaktadır. Katılımcı firmaların evsel ve evsel nitelikteki endüstriyel atıkları da OSB tarafından organizasyon kapsamında toplanmakta ve İzaydaş tarafından işletilmekte olan çöp deponi sahasına gönderilmektedir.

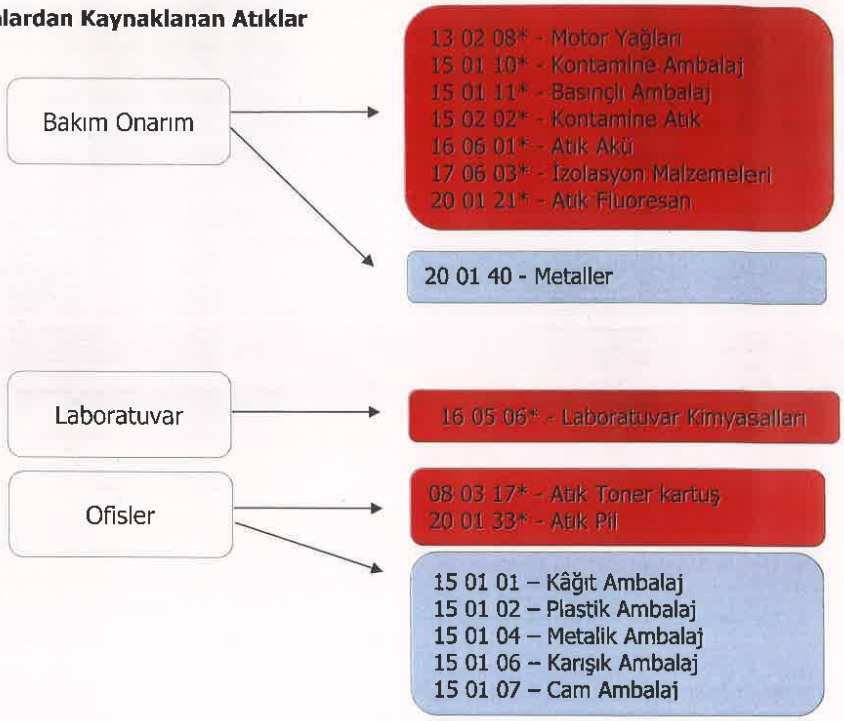
Güvenlik
OSBgeneli güvenlik hizmeti anlaşmalı kuruluşu tarafından sağlanmaktadır.

Merkezi Atıksu Arıtma Tesisi İşletilmesi Genel İş Akım Şeması Açıklanması

- Giriş haznesi
- Kaba ızgaralar
- Pompa istasyonu
- İnce ızgara üniteleri
- Kum ve yağ tutucu üniteleri
- Dengeleme tankı
- Ara pompa istasyonu
- MBBR (Hareketli Yataklı Biyofilm Reaktör)
- DAF (Çözünmüş Hava Flotasyonu)
- Çamur Arıtımı
- Multiflo (koagülasyon, temas, flokülasyon ve çöktürme tankları
- Mekanik Filtre
- Kum Filtresi
- Ultrafiltrasyon
- Aktif Karbon
- Kartuş Flitre
- Ters Osmoz

AKOSB'un kendi personelleri tarafından işletmesi gerçekleştirilen arıtma tesisinde, evsel ve endüstriyel atıksular, fiziksel, biyolojik ve kimyasal arıtmalardan geçerek Atıksu Geri Kazanım tesisine iletilmektedir. Atıksu Geri Kazanım tesisine gelen arıtılmış atık sular, ileri arıtma yöntemleri ile tekrar arıtıldıktan sonra, fabrikalara proses suyu olarak iletilmektedir. İleri arıtmadan kaynaklı, konsantre atık su da, SKKY Tablo 19 (özel tablo) standartlarına göre arıtma tesisinin güney sınırında yer alan YİRİM deresine deşarj edilmektedir.

Diğer Aşamalardan Kaynaklanan Atıklar



- Tesisimizde yemek hizmeti dışarıdan alınmakta olup tesis bünyemizde bitkisel atık yağ oluşmamaktadır. Yemek firmasına ilişkin belgeler ekte verilmiştir.
- OSB Müdürlüğünde çalışan sayısı 30 kişidir ve yapılan faaliyet tehlikesiz ve az tehlikeli olarak geçtiği için herhangi bir tıbbi atık oluşumu söz konusu değildir.

4. Atık Miktarları ve Planlanan Yönetimleri

BİRİNCİ YIL
Tarih Aralığı: 01/09/2023 – 01/09/2024

Atık Kodu	Atık Kodu Tanımı	Toplam Atık Miktarı (kg/yıl)	Atığın Gönderileceği Tesis
08 03 17*	Tehlikeli maddeler içeren atık baskı tonerleri	30	124791-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-KOCAELİ ŞUBESİ
13 02 08*	Diğer motor, şanzıman ve yağlama yağları	100	65008 - PETDER - PETROL SANAYİ DERNEĞİ İKTİSADİ İŞLETMESİ (YETKİLENDİRİLMİŞ KURULUŞ) (ÇKN: 224893424)
15 01 01	Kâğıt Ambalaj	2000	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)
15 01 02	Plastik Ambalaj	1000	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)
15 01 04	Metalik Ambalaj	200	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)
15 01 07	Cam Ambalaj	200	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)
15 01 10*	Tehlikeli maddelerin kalıntılarını içeren ya da tehlikeli maddelerle kontamine olmuş ambalajlar	750	19460 - ALTUN AMBALAJ TİC. LTD. ŞTİ. (ÇKN: 222901916)
15 01 11*	Boş basınçlı konteynerler dahil olmak üzere tehlikeli gözenekli katı yapı (örneğin asbest) içeren metalik ambalajlar	20	76235-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-TUZLA ŞUBESİ
15 02 02*	Tehlikeli maddelerle kirlenmiş emiciler, filtre malzemeleri (başka şekilde tanımlanmamış ise yağ filtreleri), temizleme bezleri, koruyucu giysiler	750	124791-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-KOCAELİ ŞUBESİ
16 05 06*	Laboratuvar kimyasalları karışımları dâhil tehlikeli maddelerden oluşan ya da tehlikeli maddeler içeren laboratuvar kimyasalları	100	76235-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-TUZLA ŞUBESİ
16 06 01*	Kurşunlu Piller ve Akümülatörler	30	18101- ANEL DOĞA ENTEGRE GERİ DÖNÜŞÜM ENDÜSTRİ A.Ş
17 06 03*	Tehlikeli Maddelerden oluşan yada tehlikeli maddeler içeren diğer yalıtım malzemeleri	500	124791-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-KOCAELİ ŞUBESİ
19 08 01	Elek üstü maddeler	2.750	10514 - İZAYDAŞ İZMİT ATIK VE ARTIKLARI ARITMA YAKMA VE DEĞERLENDİRME ANONİM ŞİRKETİ (ÇKN: 222591124)
19 08 02	Kum ayırma işleminden kaynaklanan atıklar	1.500	10514 - İZAYDAŞ İZMİT ATIK VE ARTIKLARI ARITMA YAKMA VE DEĞERLENDİRME ANONİM ŞİRKETİ (ÇKN: 222591124)
19 08 10*	19 08 09 dışındaki yağ ve su ayrışmasından çıkan yağ karışımları ve gres	200	124791-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-KOCAELİ ŞUBESİ
19 08 13*	Endüstriyel atıksuyun diğer yöntemlerle arıtılmasından kaynaklanan tehlikeli maddeler içeren çamurlar	700.000	166252 - BURSA ENTEGRE ENERJİ SANAYİ VE TİCARET ANONİM ŞİRKETİ (ÇKN: 231171050)
20 01 21*	Flüoresan lambalar ve diğer cıva içeren atıklar	30	76235-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-TUZLA ŞUBESİ
20 01 33*	16 06 01, 16 06 02 veya 16 06 03'un altında geçen pil ve akümülatörler ve bu pilleri içeren sınıflandırılmamış karışık pil ve akümülatörler	5	65009 - TAP - TAŞINABİLİR PİL ÜRETİCİLERİ VE İTHALATÇILARI DERNEĞİ (ÇKN: -)
20 01 35*	20 01 21 ve 20 01 23 dışındaki tehlikeli parçalar içeren ve iskartaya çıkmış elektrikli ve elektronik ekipmanlar	50	76235-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-TUZLA ŞUBESİ
20 01 40	Metaller	2.000	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)

İKİNCİ YIL
Tarih Aralığı: 01/09/2024 – 01/09/2025

Atık Kodu	Atık Kodu Tanımı	Toplam Atık Miktarı (kg/yıl)	Atığın Gönderileceği Tesis
08 03 17*	Tehlikeli maddeler içeren atık baskı tonerleri	30	124791-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-KOCAELİ ŞUBESİ
13 02 08*	Diğer motor, şanzıman ve yağlama yağları	100	65008 - PETDER - PETROL SANAYİ DERNEĞİ İKTİSADİ İŞLETMESİ (YETKİLENDİRİLMİŞ KURULUŞ) (ÇKN: 224893424)
15 01 01	Kâğıt Ambalaj	2000	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)
15 01 02	Plastik Ambalaj	1000	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)
15 01 04	Metalik Ambalaj	200	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)

15 01 07	Cam Ambalaj	200	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)
15 01 10*	Tehlikeli maddelerin kalıntılarını içeren ya da tehlikeli maddelerle kontamine olmuş ambalajlar	750	19460 - ALTUN AMBALAJ TİC. LTD. ŞTİ. (ÇKN: 222901916)
15 01 11*	Boş basınçlı konteynerler dahil olmak üzere tehlikeli gözenekli katı yapı (örneğin asbest) içeren metalik ambalajlar	20	76235-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-TUZLA ŞUBESİ
15 02 02*	Tehlikeli maddelerle kirlenmiş emiciler, filtre malzemeleri (başka şekilde tanımlanmamış ise yağ filtreleri), temizleme bezleri, koruyucu giysiler	750	124791-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-KOCAELİ ŞUBESİ
16 05 06*	Laboratuvar kimyasalları karışımları dâhil tehlikeli maddelerden oluşan ya da tehlikeli maddeler içeren laboratuvar kimyasalları	100	76235-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-TUZLA ŞUBESİ
16 06 01*	Kurşunlu Piller ve Akümülatörler	30	18101- ANEL DOĞA ENTEGRE GERİ DÖNÜŞÜM ENDÜSTRİ A.Ş
17 06 03*	Tehlikeli Maddelerden oluşan yada tehlikeli maddeler içeren diğer yalıtım malzemeleri	500	124791-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-KOCAELİ ŞUBESİ
19 08 01	Elek üstü maddeler	2.750	10514 - İZAYDAŞ İZMİT ATIK VE ARTIKLARI ARITMA YAKMA VE DEĞERLENDİRME ANONİM ŞİRKETİ (ÇKN: 222591124)
19 08 02	Kum ayırma işleminden kaynaklanan atıklar	1.500	10514 - İZAYDAŞ İZMİT ATIK VE ARTIKLARI ARITMA YAKMA VE DEĞERLENDİRME ANONİM ŞİRKETİ (ÇKN: 222591124)
19 08 10*	19 08 09 dışındaki yağ ve su ayrışmasından çıkan yağ karışımları ve gres	200	124791-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-KOCAELİ ŞUBESİ
19 08 13*	Endüstriyel atıksuyun diğer yöntemlerle arıtılmasından kaynaklanan tehlikeli maddeler içeren çamurlar	700.000	166252 - BURSA ENTEGRE ENERJİ SANAYİ VE TİCARET ANONİM ŞİRKETİ (ÇKN: 231171050)
20 01 21*	Flüoresan lambalar ve diğer cıva içeren atıklar	30	76235-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-TUZLA ŞUBESİ
20 01 33*	16 06 01, 16 06 02 veya 16 06 03'un altında geçen pil ve akümülatörler ve bu pilleri içeren sınıflandırılmamış karışık pil ve akümülatörler	5	65009 - TAP - TAŞINABİLİR PİL ÜRETİCİLERİ VE İTHALATÇILARI DERNEĞİ (ÇKN: -)
20 01 35*	20 01 21 ve 20 01 23 dışındaki tehlikeli parçalar içeren ve ıskartaya çıkmış elektrikli ve elektronik ekipmanlar	50	76235-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-TUZLA ŞUBESİ
20 01 40	Metaller	2.000	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)

ÜÇÜNCÜ YIL
Tarih Aralığı: 01/09/2025 – 01/09/2026

Atık Kodu	Atık Kodu Tanımı	Toplam Atık Miktarı (kg/yıl)	Atığın Gönderileceği Tesis
08 03 17*	Tehlikeli maddeler içeren atık baskı tonerleri	30	124791-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-KOCAELİ ŞUBESİ
13 02 08*	Diğer motor, şanzıman ve yağlama yağları	100	65008 - PETDER - PETROL SANAYİ DERNEĞİ İKTİSADİ İŞLETMESİ (YETKİLENDİRİLMİŞ KURULUŞ) (ÇKN: 224893424)
15 01 01	Kâğıt Ambalaj	2000	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)
15 01 02	Plastik Ambalaj	1000	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)
15 01 04	Metalik Ambalaj	200	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)
15 01 07	Cam Ambalaj	200	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)
15 01 10*	Tehlikeli maddelerin kalıntılarını içeren ya da tehlikeli maddelerle kontamine olmuş ambalajlar	750	19460 - ALTUN AMBALAJ TİC. LTD. ŞTİ. (ÇKN: 222901916)
15 01 11*	Boş basınçlı konteynerler dahil olmak üzere tehlikeli gözenekli katı yapı (örneğin asbest) içeren metalik ambalajlar	20	76235-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-TUZLA ŞUBESİ
15 02 02*	Tehlikeli maddelerle kirlenmiş emiciler, filtre malzemeleri (başka şekilde tanımlanmamış ise yağ filtreleri), temizleme bezleri, koruyucu giysiler	750	124791-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-KOCAELİ ŞUBESİ
16 05 06*	Laboratuvar kimyasalları karışımları dâhil tehlikeli maddelerden oluşan ya da tehlikeli maddeler içeren laboratuvar kimyasalları	100	76235-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-TUZLA ŞUBESİ
16 06 01*	Kurşunlu Piller ve Akümülatörler	30	18101- ANEL DOĞA ENTEGRE GERİ DÖNÜŞÜM ENDÜSTRİ A.Ş

19 08 02 kodlu Kum Ayırma İşlemi Atıkları kaynağında ayrı şekilde toplanarak düzenli aralıklarla bakanlıkça lisanslı tesislere gönderilmektedir.

9. İl Müdürlüğünce Gerekli Görülen Diğer Bilgi ve Belgeler

- Bir Önceki Yıla Ait Tehlikeli Tehlikesiz Atık Beyanı
- Tehlikeli Atık Mali Sorumluluk Sigortası
- Kapasite Raporu Muafiyet Yazısı/ÇED Görüşleri
- MoTAT görüntüleri
- Tehlikesiz Atık İrsaliyeleri
- Tehlikeli ve Tehlikesiz Atık Firmalarının Lisanslıları

17 06 03*	Tehlikeli Maddelerden oluşan yada tehlikeli maddeler içeren diğer yalıtım malzemeleri	500	124791-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-KOCAELİ ŞUBESİ
19 08 01	Elek üstü maddeler	2.750	10514 - İZAYDAŞ İZMİT ATIK VE ARTIKLARI ARITMA YAKMA VE DEĞERLENDİRME ANONİM ŞİRKETİ (ÇKN: 222591124)
19 08 02	Kum ayırma işleminden kaynaklanan atıklar	1.500	10514 - İZAYDAŞ İZMİT ATIK VE ARTIKLARI ARITMA YAKMA VE DEĞERLENDİRME ANONİM ŞİRKETİ (ÇKN: 222591124)
19 08 10*	19 08 09 dışındaki yağ ve su ayrışmasından çıkan yağ karışımları ve gres	200	124791-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-KOCAELİ ŞUBESİ
19 08 13*	Endüstriyel atıksuyun diğer yöntemlerle arıtılmasından kaynaklanan tehlikeli maddeler içeren çamurlar	700.000	166252 - BURSA ENTEGRE ENERJİ SANAYİ VE TİCARET ANONİM ŞİRKETİ (ÇKN: 231171050)
20 01 21*	Flüoresan lambalar ve diğer cıva içeren atıklar	30	76235-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-TUZLA ŞUBESİ
20 01 33*	16 06 01, 16 06 02 veya 16 06 03'un altında geçen pil ve akümülatörler ve bu pilleri içeren sınıflandırılmamış karışık pil ve akümülatörler	5	65009 - TAP - TAŞINABİLİR PİL ÜRETİCİLERİ VE İTHALATÇILARI DERNEĞİ (ÇKN: -)
20 01 35*	20 01 21 ve 20 01 23 dışındaki tehlikeli parçalar içeren ve ıskartaya çıkmış elektrikli ve elektronik ekipmanlar	50	76235-AKADEMİ ÇEVRE ENTEGRE ATIK YÖNETİM ENDÜSTRİ A.Ş.-TUZLA ŞUBESİ
20 01 40	Metaller	2.000	1051663 - ERSEM PLASTİK VE GRANÜL SANAYİ DIŞ TİC. LTD. ŞTİ. KULLAR ŞUBESİ (ÇKN: 290176032)

5. Tesis İçi Geri Kazanım/Bertaraf

Tesiste herhangi bir geri kazanım/bertaraf işlemi gerçekleştirilmemektedir.

6. Atık Önleme ve Azaltım Bilgileri

Atık azaltılması amacıyla çalışan tüm personele Çevre ve Atık Yönetimi konusunda düzenli aralıklarla eğitim verilmektedir. Prosesler detaylı bir şekilde incelenerek mevcut proseslerde atık minimizasyonu konusunda çalışma yapılacaktır. Tesis politikası olarak, oluşabilecek atık miktarının minimum düzeyde tutulması hedeflenmektedir.

Tesiste ve OSB genelinde Sıfır Atık Yönetim Sistemi ve 14001 Çevre Yönetim Sistemi uygulamaktadır. Bu kapsamda bertaraf giden atık miktarının minimum seviyede tutulması hedeflenmektedir.

7. Atıkların Bertarafa Gönderilme Gerekçesi

Atık Yönetimi Yönetmeliği Ek-4'e istinaden 20 01 33* kodlu atık piller bertarafa gönderilmektedir.

20 01 33* kodlu atık piller bünyelerinde çeşitli metalleri içermektedirler ve çinko-karbon, alkali-manganez, vs. gibi pillerin atıklarının ekonomik getirisi daha düşüktür ve geri dönüşüm işlemleri, toplama miktarları fazla değilse, maliyetlidir. Bu nedenle bu tür pillerin atıkları bertaraf işlemine tabi tutulur. Ülkemizde henüz taşınabilir türdeki pil atıklarını geri dönüştüren bir tesis yoktur. Bu nedenle oluşan atık piller bertarafa gönderilmektedir.

8. Geçici Depolama Alanı Bilgileri

- **Atık Sahası Zemini Hakkında Bilgi:**
  Atık sahasının zemini tamamen beton olup, geçirimsizlik sağlanmıştır.
- **Alınan Çevresel Tedbirler:**
  Sızma/Dökülme: Sızıntının önlenmesi için tehlikeli atık sahasının iç kısmında bulunan kanal ile toplanmakta ve kör rögarda biriktirilmektedir. Ayrıca atıkların sızması ihtimaline karşı atık sahası içerisinde atık kutuları bulunmaktadır.
  Toz/Koku: Tehlikeli ve Tehlikesiz Atık Sahasına konulan atıklar uygun ambalaj içerisinde ve türlerine göre ayrı olarak biriktirilerek oluşturulabilecek toz ve kokunun önlenmesi sağlanmıştır. Ayrıca atık sahası içerisinde oluşabilecek toz ve koku tehlikeli atık sahası havalandırma sistemi ile giderilmektedir.

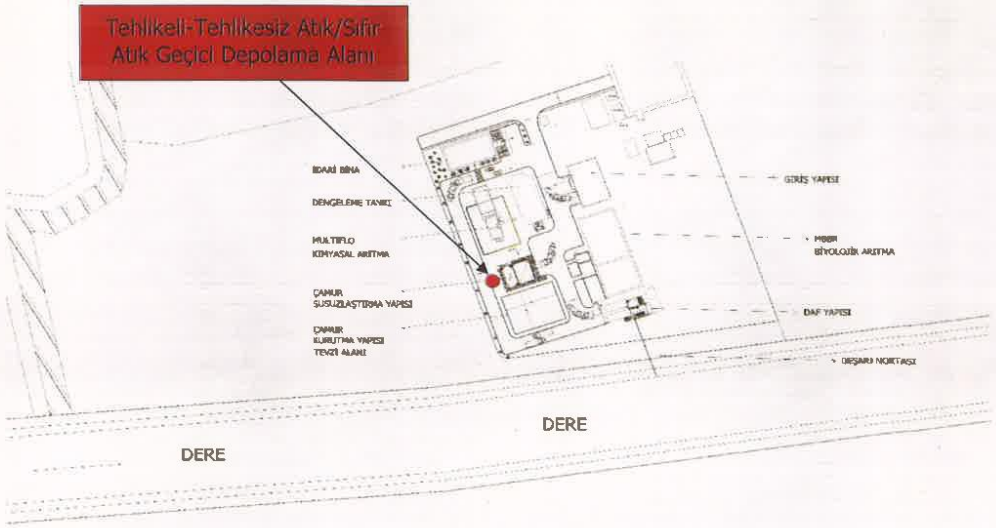
- **Yangın Güvenliği:**
  Tehlikeli Atık Sahasında oluşabilecek her hangi bir yangına müdahale için atık sahası içinde ve yakınlarında yangın tüpü bulunmaktadır.

ATIK SAHASI KOORDİNAT BİLGİLERİ
(TEHLİKELİ / TEHLİKESİZ – SIFIR ATIK)

ATIK SAHASI NOKTA NO	DOĞU YÖNÜ	KUZEY YÖNÜ
1 no'lu nokta	30⁰ 01′ 45.53″ D	40⁰ 46′ 02.15″ K
2 no'lu nokta	30⁰ 01′ 45.79″ D	40⁰ 46′ 01.81″ K
3 no'lu nokta	30⁰ 01′ 45.65″ D	40⁰ 46′ 01.79″ K
4 no'lu nokta	30⁰ 01′ 45.40″ D	40⁰ 46′ 02.14″ K

ASIM KİBAR
ORGANİZE SANAYİ BÖLGESİ

ENDÜSTRİYEL ATIK YÖNETİM PLANI



- **Tehlikeli ve Tehlikesiz Atık Sahası Görüntüleri:**

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

INFRATECH
ENGINEER•SOLVE•PLAN

Zemin beton ile kaplanmıştır. Atıklar kapısı kilitli şekilde muhafaza edilmektedir.

Saha içerisinde meydana gelebilecek herhangi bir kimyasal sızıntısına karşı önlem olarak belirtilen hat boyunca kör kanal yapılmıştır. Herhangi bir kimyasal sızıntısında sızıntının burada tutularak absorban malzeme tarafından emilmesi, absorban malzemenin ise kontamine atık olarak bakanlıkça lisanslı tesislere gönderilmi sağlanacaktır.

Atık sahasında oluşabilecek herhangi bir yangın ihtimaline karşı yangın tüpü, herhangi bir kimyasal sızıntısı ihtimaline karşı ise absorban malzeme

Atık sahasından sorumlu personel tanımlanmış olup gerekli uyarı levhaları alanda yer almaktadır.

ASIM KİBAR
ORGANİZE SANAYİ BÖLGESİ

TEHLİKELİ ATIK SAHASI

ASIM KİBAR
ORGANİZE SANAYİ BÖLGESİ

TEHLİKELİ-TEHLİKESİZ ATIK SAHASI SORUMLU PERSONEL LİSTESİ

Adı Soyadı	Görevi	Tel. No
Seda ÇAPA	Çevre ve İSG Yöneticisi	0530 555 74 00
Soner ŞAHİN	Tesis Formeni	0539 495 76 42
Yunus AKTOP	Destek Personeli	0542 258 78 20

TEHLİKELİ ATIK ASIM KİBAR

YAĞ, BOYA KİMYASAL VB. KUTULARI

Tehlikeli maddelerin kalıntılarını içeren ya da tehlikeli maddelerle kontamine olmuş ambalajlar

15 01 10*

TEHLİKELİ ATIK ASIM KİBAR

BOŞ BASINÇLI KONTEYNERLER DAHİL OLMAK ÜZERE TEHLİKELİ GÖZENEKLİ KATI YAPI İÇEREN METALİ AMBALAJLAR

Basınçlı Ambalaj

15 01 11*

Tehlikeli ve tehlikesiz atıklar atık sahasında birbirlerinden ayrı, atık kodlarının bulunduğu bölmelerde depolanmaktadır.

TEHLİKELİ ATIK	
ATIK MOTOR ŞANZIMAN VE YAĞLAMA YAĞLARI	
Diğer motor, şanzıman ve yağlama yağları	13 02 08*

TEHLİKELİ ATIK	
YAĞ KARIŞIMLARI, GRES	
19 08 09 dışındaki yağ ve su ayrışmasından çıkan yağ karışımları ve gres	19 08 10*

TEHLİKELİ ATIK	
YAĞLI, BOYALI KİMYASALLARA BULANMIŞ ELDİVENLER, BEZLER, KIYAFETLER, KAĞITLAR VE STREÇLER	
Tehlikeli maddelerle kirlenmiş emiciler, filtre malzemeleri (başka şekilde tanımlanmamış ise yağ filtreleri), temizleme bezleri, koruyucu giysiler	15 02 02*

Atıklar atık sahası içerisinde ayrıca plastik geçirimsiz kovalar içerisinde biriktirilmektedir.

19 08 13* kodlu Arıtma Çamurları konyetnırda depolanarak düzenli aralıklarla bakanlıkça lisanslı tesislere gönderilmektedir.

19 08 01 kodlu Elek Üstü Atıklar kaynağında ayrı şekilde toplanarak düzenli aralıklarla bakanlıkça lisanslı tesislere gönderilmektedir.

ATİK BEYAN FORMU

Revize edilen - güncel

YIL 2023 (7950855)

TESİS ADI ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ

TESİS ADRESİ KOCAELİ,ATATÜRK (OSB) Mahallesi, 4. CADDE, No: 21 /1-1, İZMİT,Türkiye

TESİS SORUMLUSU SEDA ÇAPA EROĞLU

BEYAN KONTROL NO	ATIK KODU	ATIK ADI	ATIK YAĞ KATEGO.	MİKTAR	ÖLÇÜ BİRİMİ	İŞLEMİN NEREDE YAPILDIĞI	ATIK İŞLEME YÖNTEMİ	ATIK İŞLEME TESİSİ / TIBBİ ATIK ALAN BELEDİYE / İHRACATÇI
8264211	080317	Tehlikeli maddeler içeren atık baskı tonerleri		10.000000	Kilogram	Tesis Dışı	R12	124791
8697515	080317	Tehlikeli maddeler içeren atık baskı tonerleri		10.000000	Kilogram	Tesis Dışı	R13	104705
8264241	130208	Diğer motor, şanzıman ve yağlama yağları	II. Kategori	60.000000	Kilogram	Tesis Dışı	R9	1015501
8264343	150101	Kağıt ve karton ambalaj		415.000000	Kilogram	Tesis Dışı	R12	1051663
8264348	150102	Plastik ambalaj		515.000000	Kilogram	Tesis Dışı	R12	1051663
8264354	150104	Metalik ambalaj		95.000000	Kilogram	Tesis Dışı	R12	1051663
8264361	150107	Cam ambalaj		75.000000	Kilogram	Tesis Dışı	R12	1051663
8264246	150110	Tehlikeli maddelerin kalıntılarını içeren ya da tehlikeli maddelerle kontamine olmuş ambalajlar		10.000000	Kilogram	Tesis Dışı	R12	124791
8264256	150110	Tehlikeli maddelerin kalıntılarını içeren ya da tehlikeli maddelerle kontamine olmuş ambalajlar		60.000000	Kilogram	Tesis Dışı	R12	32069
8264251	150110	Tehlikeli maddelerin kalıntılarını içeren ya da tehlikeli maddelerle kontamine olmuş ambalajlar		460.000000	Kilogram	Tesis Dışı	R12	19460
8264263	150111	Boş basınçlı konteynerler dahil olmak üzere tehlikeli gözenekli katı yapı (örneğin asbest) içeren metalik ambalajlar		30.000000	Kilogram	Tesis Dışı	R12	76235
8697527	150111	Boş basınçlı konteynerler dahil olmak üzere tehlikeli gözenekli katı yapı (örneğin asbest) içeren metalik ambalajlar		10.000000	Kilogram	Tesis Dışı	R13	104705
8264271	150202	Tehlikeli maddelerle kirlenmiş emiciler, filtre malzemeleri (başka şekilde tanımlanmamış ise yağ filtreleri), temizleme bezleri, koruyucu giysiler		150.000000	Kilogram	Tesis Dışı	R12	76235
8264264	150202	Tehlikeli maddelerle kirlenmiş emiciler, filtre malzemeleri (başka şekilde tanımlanmamış ise yağ filtreleri), temizleme bezleri, koruyucu giysiler		200.000000	Kilogram	Tesis Dışı	R12	32069

28.03.2024 08:58:00

Sayfa 1 / 3

ATIK BEYAN FORMU

YIL 2023 (7950855)

TESİS ADI ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ

TESİS ADRESİ KOCAELİ,ATATÜRK (OSB) Mahallesi, 4. CADDE, No: 21 /1-1, İZMİT,Türkiye

TESİS SORUMLUSU SEDA ÇAPA EROĞLU

BEYAN KONTROL NO	ATIK KODU	ATIK ADI	ATIK YAĞ KATEGO.	MİKTAR	ÖLÇÜ BİRİMİ	İŞLEMİN NEREDE YAPILDIĞI	ATIK İŞLEME YÖNTEMİ	ATIK İŞLEME TESİSİ / TIBBİ ATIK ALAN BELEDİYE / İHRACATÇI
8697542	160506	Laboratuvar kimyasalları karışımları dahil tehlikeli maddelerden oluşan ya da tehlikeli maddeler içeren laboratuvar kimyasalları		20.000000	Kilogram	Tesis Dışı	R13	104705
8264288	160506	Laboratuvar kimyasalları karışımları dahil tehlikeli maddelerden oluşan ya da tehlikeli maddeler içeren laboratuvar kimyasalları		10.000000	Kilogram	Tesis Dışı	R13	76235
8264276	160601	Kurşunlu piller ve akümülatörler		500.000000	Kilogram	Tesis Dışı	R13	18101
8264322	170603	Tehlikeli maddelerden oluşan ya da tehlikeli maddeler içeren diğer yalıtım malzemeleri		50.000000	Kilogram	Tesis Dışı	R12	76235
8264331	190801	Elek üstü maddeler		720.000000	Kilogram	Tesis Dışı	D10	10514
8264337	190802	Kum ayırma işleminden kaynaklanan atıkları		3020.000000	Kilogram	Tesis Dışı	R13	10514
8264281	190810	19 08 09 dışındaki yağ ve su ayrışmasından çıkan yağ karışımları ve gres		80.000000	Kilogram	Tesis Dışı	R12	32069
8264297	190810	19 08 09 dışındaki yağ ve su ayrışmasından çıkan yağ karışımları ve gres		30.000000	Kilogram	Tesis Dışı	R13	76235
8264304	190813	Endüstriyel atıksuyun diğer yöntemlerle arıtılmasından kaynaklanan tehlikeli maddeler içeren çamurlar		38340.000000	Kilogram	Tesis Dışı	R12	27126
8264309	190813	Endüstriyel atıksuyun diğer yöntemlerle arıtılmasından kaynaklanan tehlikeli maddeler içeren çamurlar		329680.000000	Kilogram	Tesis Dışı	R12	166252
8697557	190813	Endüstriyel atıksuyun diğer yöntemlerle arıtılmasından kaynaklanan tehlikeli maddeler içeren çamurlar		169720.000000	Kilogram	Tesis Dışı	R13	104705
8264310	200121	Flüoresan lambalar ve diğer cıva içeren atıklar		10.000000	Kilogram	Tesis Dışı	R12	76235
8264314	200133	16 06 01, 16 06 02 veya 16 06 03?un altında geçen pil ve akümülatörler ve bu pilleri içeren sınıflandırılmamış karışık pil ve akümülatörler		13.000000	Kilogram	Tesis Dışı	D5	65009
8264318	200135	20 01 21 ve 20 01 23 dışındaki tehlikeli parçalar içeren ve ıskartaya çıkmış elektrikli ve elektronik ekipmanlar		20.000000	Kilogram	Tesis Dışı	R12	76235

Nace Bilgisi

NACE KODU	NACE ADI	KAPASİTE	BİRİM
68.32.02	Bir ücret veya sözleşmeye dayalı olarak yapılan gayrimenkul yönetimi faaliyetleri (site yöneticiliği, mobil ev alanlarının, müşterek mülkiyetli konutların, devre mülklerin, ikamet amaçlı olmayan mülklerin, vb. yönetimi)	777584000	litre/yıl

ANNEX-15- ZERO WASTE CERTIFICATE

T.C.
KOCAELİ VALİLİĞİ
Çevre ve Şehircilik İl Müdürlüğü

Belge No: TS/41/B2 /8/1

Tarih: 12/06/2020

SIFIR ATIK BELGESİ
(Temel Seviye)

Adı : **ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ**
Adresi : **KOCAELİ,ATATÜRK (OSB) Mahallesi, 4. CADDE, No: 21 /1-1, İZMİT,Türkiye**
Vergi No : **5650493220**

12/07/2019 tarihli ve 30829 sayılı Resmi Gazete'de yayımlanarak yürürlüğe giren Sıfır Atık Yönetmeliği'nce Sıfır Atık Yönetim Sistemi'ni kurarak **Sıfır Atık Belgesi**'ni almaya hak kazanmıştır.

e-imzalıdır
Ahmet KIRILMAZ
Çevre ve Şehircilik İl Müdürü

Belge Son Geçerlilik Tarihi: 12/06/2025

Not: 5070 sayılı Elektronik İmza Kanunu gereği bu belge elektronik imza ile imzalanmıştır.
Evrak Doğrulama Kodu : BEKHEXDL Evrak Takip Adresi: https://www.turkiye.gov.tr/cevre-ve-sehircilik-bakanligi

	Başlama itiş Ta 1./2023.. 09/1	:

TÜZEL KİŞİNİN

			6220922832 6

NETİM BUL ARI: Tes

Denetim amaçlı ... tutanak ... noolu ... 0 tarihli ... ek

	Çevre İzin ve Denetim Şb. Md.

Tesis Yetkilis Seda ÇAPA ERDOĞU

Düzenleyenlerin

			Sayısı
	K İ D M Çev Müh		
Aslıhan İĞİT			

işbu tutanak ..... ve ..... sayfa düzenlenmiştir.

ANNEX-16- STANDARD AMENDMENT LETTER FOR SO4 PARAMETER RELATED TO WASTEWATER DISCHARGE

T.C.
ÇEVRE VE ŞEHİRCİLİK
BAKANLIĞI

ÇEVRE YÖNETİMİ GENEL MÜDÜRLÜĞÜ - SANAYİ ATIKSU KİRLİLİĞİ ÖNLEME VE KONTROLÜ ŞUBE MÜDÜRLÜĞÜ
19/10/2016 18:52 - 41203884-110.03.02-E.12382
08525131

T.C.
ÇEVRE VE ŞEHİRCİLİK BAKANLIĞI
Çevre Yönetimi Genel Müdürlüğü

Sayı : 41203884-110.03.02-
Konu : Atıksu Geri Kazanımı Hk.

ASIM KİBAR ORGANİZE SANAYİ BÖLGE MÜDÜRLÜĞÜNE
(Asım Kibar OSB 1. Cd. No:3 41310 Alikahya-İzmit/KOCAELİ)

İlgi : 10.08.2016 tarihli ve 2016/157 sayılı yazı.

İlgi yazıda, Kocaeli İli'nde yer alan ve Asım Kibar Organize Sanayi Bölgesi olarak bölgede faaliyet gösteren sanayi kuruluşlarının evsel ve endüstiyel atıksularının OSB'ye ait 05.01.2016 tarihinde çevre izni alınmış olan atıksu arıtma tesisinde Su Kirliliği Kontrolü Yönetmeliği (SKKY) Tablo 19'da yer alan alıcı ortam deşarj standartlarını sağlayacak şekilde arıtılarak, Yirim Deresine deşarj edildiği belirtilmektedir.

Diğer taraftan, 2014 yılında bölgenin kullanılabilir su kaynakları olan barajlardaki su oranının düşmesi ile su sıkıntısının ortaya çıkmasının ardından, atıksu geri kazanımının gündeme geldiği ve atıksu geri kazanımı amacıyla, faaliyette bulunan mevcut atıksu arıtma tesisine (AAT) pilot tesis kurulduğu, atıksu karakterizasyonu karşısında geri kazanım için nasıl bir proses yapılması gerektiği ve bu proses sonucunda konsantre atıksuyun hangi değerlere sahip olacağı hususlarının yer aldığı "Proses Raporu"nun hazırlandığı ifade edilerek, proje onay dosyasında kullanılmak üzere, atıksu geri kazanımı sonrasında oluşacak konsantre atıksuyun alıcı ortama deşarjında hangi parametrelere tabi olunacağının ilgi yazı ekinde sunulan proses raporunun da göz önünde bulundurularak belirlenmesi talep edilmektedir.

Bu bağlamda, ilgi yazı ve ekinde yer alan atıksu geri kazanım proses raporu incelenmiş olup, OSB'ye ait AAT'den çıkan sular ile kesikli laboratuvar çalışmalarının gerçekleştirildiği, AAT'den çıkan suyun önce Ultrafiltrasyon prosesinden geçirildiği, ardından farklı basınç değerlerinin uygulandığı 3 farklı Ters Osmoz membranı kullanarak geri kazanım oranlarının değerlendirildiği anlaşılmıştır. Ayrıca, kirlilik konsantrasyonu ve geri kazanım oranlarına istinaden TP, SO_4 ve TKN parametreleri açısından geri kazanım oranının % 20'nin üzerine çıkmasının mümkün olmadığı, mevcutta kullanımda olan AAT'de yapılacak birkaç revizyon ile TP ve TKN değerinin geri kazanım tesisi girişine daha düşük değerle giriş yapabileceği ancak SO_4'ün indirgenmesinin mevcut AAT ile mümkün olmadığı, geri kazanım seviyesinin % 58 seviyelerinde kalacağı, bununla birlikte SKKY Tablo 19'da 1500 mg/L olan SO_4 değerinin SKKY Tablo 20.7'deki 2500 mg/L'ye çekilmesi durumunda ise %75' e çıkabileceği raporda belirtilmektedir.

Bilindiği üzere, membranlar, parçacık boyutlarına göre fiziksel ayırma yapan sistemler olup, ihtiyaca göre tek tek veya birkaç membranın bir araya gelmesiyle kombine şekilde de kullanılabilmektedir. Özellikle ters osmoz sistemi ile molekül boyutunda ayrım

Mustafa Kemal Mahallesi Eskişehir Devlet Yolu (Dumlupınar Bulvarı) 9. km. (Tepe Prime Yanı) No: 278 Çankaya / Ankara
Telefon No: 0312 5863269 Faks:
E-Posta: ayse.ozyer@csb.gov.tr İnternet Adresi: www.csb.gov.tr

Bilgi için:Ayşe ÖZYER
Çevre Mühendisi

yapılabilmekte ve arzu edilmeyen kirleticilerin geçişi engellenerek kirleticilerin ayrı bir sıvı fazda konsantre kalması sağlanmaktadır. Bu konsantre sular içindeki kirleticiler, membran besleme suyunda mevcut olan kirleticilerle aynı olmakla birlikte daha küçük hacim içerisinde olduklarından besleme suyundakine nazaran konsantrasyonları geri kazanım oranına bağlı olarak birkaç kat daha fazla olabilmektedir. Söz konusu OSB'den kaynaklanan atıksuda olması muhtemel kirleticiler SKKY Tablo 19'da verilmiştir. Bununla birlikte, özellikle atıksuların geri kazanımı sonucu oluşan ve daha küçük hacimde olmasına rağmen kirletici konsantrasyonu daha yoğun olan bu tip konsantrelerin alıcı ortama doğrudan verilmesi özellikle ağır metaller açısından alıcı ortamda olumsuz sonuçlara neden olabilmektedir.

Diğer taraftan, SO_4'ün özellikle endüstriyel atıksuların taşındığı kanallarda anaerobik koşullarda korozyona neden olduğu ve içme suyunda yüksek oranda bulunmasının insan sağlığı üzerinde olumsuz etkilerinin olduğu bilinmektedir.

Bununla birlikte, gelişen sanayi, artan nüfus ve su talebi, yükselen su fiyatları ve gelişen geri kazanım teknolojileri dikkate alındığında doğal kaynakların ekonomik kullanımını sağlamak için atıksuların yeniden kullanımı Bakanlığımız tarafından desteklenmektedir. OSB'den kaynaklanan arıtılmış suların geri kazanımı sonucu oluşacak konsantre suların Marmara Denizine boşalan Yirim Deresine deşarj edileceği ve arıtılan atıksuların doğrudan veya geri kazanım uygulaması sonrasında konsantre olarak deşarj edilmesi durumlarında alıcı ortama verilecek kirlilik yükünün değişmeyeceği dikkate alındığında, konsantre akımın alıcı ortama deşarjında SO_4 parametresi için 2500 mg/L değerine müsaade edilebilecektir. Ancak, diğer parametreler açısından SKKY Tablo 19'da yer alan sınır değerleri aşmayacak şekilde geri kazanım oranlarının ayarlanması gerekmektedir.

Ayrıca, bahse konu OSB'ye ait Bakanlığımızca onaylı fiziksel+kimyasal+biyolojik AAT'de herhangi bir değişiklik yapılmadan, geri kazanım amacıyla ilave olarak eklenecek ileri arıtma üniteleri için tesisin proje onay revizyonunun gerekli olup olmayacağı hususu, ileri arıtma üniteleri eklenerek işletmeye geçildikten sonra ekte verilen özel tablo çerçevesinde 1 ay içerisinde 2 adedi İl Müdürlüğü gözetiminde alınmak şartıyla toplam 5 adet 2 saatlik kompozit çıkış suyu numunesinde, Bakanlığımızca yetkilendirilmiş bir laboratuvarda yapılacak analiz sonuçlarının tarafımıza sunulmasından sonra değerlendirilecektir.

Bilgilerinizi ve gereğini rica ederim.

Muhammet ECEL
Bakan a.
Genel Müdür

Ek: Özel Tablo

Mustafa Kemal Mahallesi Eskişehir Devlet Yolu (Dumlupınar Bulvarı) 9. km. (Tepe Prime Yanı) No: 278 Çankaya / Ankara
Telefon No: 0312 5863269 Faks:
E-Posta: ayse.ozyer@csb.gov.tr İnternet Adresi: www.csb.gov.tr

Bilgi için:Ayşe ÖZYER
Çevre Mühendisi

ASIM KİBAR OSB ATIKSULARIN ALICI ORTAMA DEŞARJ STANDARTLARI TABLOSU

PARAMETRE	BİRİM	KOMPOZİT NUMUNE 2 SAATLİK	KOMPOZİT NUMUNE 24 SAATLİK
KİMYASAL OKSİJEN İHTİYACI (KOİ)	(mg/L)	400	300
ASKIDA KATI MADDE (AKM)	(mg/L)	200	100
YAĞ VE GRES	(mg/L)	20	10
TOPLAM FOSFOR	(mg/L)	2	1
TOPLAM KROM	(mg/L)	2	1
KROM (Cr^{+6})	(mg/L)	0.5	0.5
KURŞUN (Pb)	(mg/L)	2	1
TOPLAM SİYANÜR (CN^-)	(mg/L)	1	0.5
KADMİYUM (Cd)	(mg/L)	0.1	-
DEMİR (Fe)	(mg/L)	10	-
FLORÜR (F^-)	(mg/L)	15	-
BAKIR (Cu)	(mg/L)	3	-
ÇİNKO (Zn)	(mg/L)	5	-
CİVA (Hg)	(mg/L)	-	0.05
SÜLFAT (SO_4)	(mg/L)	2500	2500
TOPLAM KJELDAHL-AZOTU (*)	(mg/L)	20	15
BALIK BİYODENEYİ (ZSF)	-	10	10
pH	-	6-9	6-9
(Ek satır:RG-24/4/2011-27914) Renk	(Pt-Co)	280	260

ANNEX-17- STAKEHOLDER CONSULTATION MEETING DOCUMENTS

ANNEX-17.1: Stakeholder Engagement and Information Meeting Announcements

ASIM KİBAR
ORGANİZE SANAYİ BÖLGESİ

ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ
DUYURU

Asım Kibar Organize Sanayi Bölgesinin yararlanıcısı olduğu; T.C. Sanayi ve Teknoloji Bakanlığı koordinasyonunda ve Dünya Bankası finansmanlı Türkiye Organize Sanayi Bölgeleri projeleri kapsamında "**SOLAR ÇAMUR KURUTMA TESİSİ VE ÇATI ÜSTÜ GÜNEŞ ENERJİSİ SANTRALİ**" projesi hayata geçirilmesi planlanmaktadır.

Söz konusu proje ve faaliyetleri hakkında başta Proje Alanı çevresindeki sakinler olmak üzere Proje paydaşlarının Proje hakkında bilgilendirilmesi, görüş ve önerilerinin alınabilmesi adına, aşağıda belirtilen yer, gün ve saatte "**Paydaş Katılım ve Bilgilendirme Toplantısı**" düzenlenecektir.

Halkımıza saygıyla duyurulur.

Toplantı Tarihi, Saati ve Yeri

Yer: Alikahya Kültür Merkezi
Adres: Alikahya Atatürk Mahallesi, Bağımsızlık Cd. No:11, 41310 İzmit / Kocaeli
Tarih: 5 Şubat 2025
Saat: 11:00

KONUM

www.akosb.com.tr

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

INFRATECH
ENGINEER•SOLVE•PLAN

İletişim: +90 (262) 324 80 62 E-Mail : info@akosb.com.tr Kep : asimkibarosb@hs01.kep.tr

Login BİZE ULAŞIN →

Anasayfa Hakkımızda Hizmetler Firmalar Duyurular İletişim

PAYDAŞ KATILIM VE BİLGİLENDİRME TOPLANTISI

EV > DUYURULAR > UNCATEGORİZED > PAYDAŞ KATILIM VE BİLGİLENDİRME TOPLANTISI

ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ

DUYURU

ASIM KİBAR ORGANİZE SANAYİ BÖLGESİ

SOLAR ÇAMUR KURUTMA TESİSİ VE ÇATI ÜSTÜ GÜNEŞ ENERJİSİ SANTRALİ PAYDAŞ KATILIM VE BİLGİLENDİRME TOPLANTISI

PAYDAŞ KATILIM VE BİLGİLENDİRME TOPLANTISI

ADMİN | 0 YORUMLAR

Asım Kibar Organize Sanayi Bölgesinin yararlanıcısı olduğu; T.C. Sanayi ve Teknoloji Bakanlığı koordinasyonunda ve Dünya Bankası finansmanlı Türkiye Organize Sanayi Bölgeleri projeleri kapsamında "**SOLAR ÇAMUR KURUTMA TESİSİ VE ÇATI ÜSTÜ GÜNEŞ ENERJİSİ SANTRALİ**" projesi hayata geçirilmesi planlanmaktadır.

Söz konusu proje ve faaliyetleri hakkında başta Proje Alanı çevresindeki sakinler olmak üzere Proje paydaşlarının Proje hakkında bilgilendirilmesi, görüş ve önerilerinin alınabilmesi adına, aşağıda belirtilen yer, gün ve saatte "**Paydaş Katılım ve Bilgilendirme Toplantısı**" düzenlenecektir.

Halkımıza saygıyla duyurulur.

Toplantı Tarihi, Saati ve Yeri

Yer: Alikahya Kültür Merkezi
Adres: Alikahya Atatürk Mahallesi, Bağımsızlık Cd. No:11, 41310 İzmit / Kocaeli
Tarih: 5 Şubat 2025
Saat: 11:00

Projeler ile ilgili belge ve dokümanlara aşağıdaki bağlantılardan ulaşabilirsiniz.

[TR] Solar Çamur Kurutma Tesisi ve Çatı Üstü Güneş Enerjisi Santrali (0,12 MW) Projesi

[EN] Solar Sludge Drying Facility and Rooftop Solar Power Plant (0.12 MW) Project

Arama...

Son Yazılar

PAYDAŞ KATILIM VE BİLGİLENDİRME TOPLANTISI GERÇEKLEŞTİ

PAYDAŞ KATILIM VE BİLGİLENDİRME TOPLANTISI

2024 YILININ SON MÜTEŞEBBİS HEYET TOPLANTISI GERÇEKLEŞTİ

Twitter – OSBÜK

@Osbuk_org adlı kullanıcının gönderileri

Organize Sanayi Bö @Osbuk · 10 Şub 2023

81 İl'deki tüm OSB'lerimizle deprem bölgemiz için seferberiz...

Yaralarımızı devlet-millet el ele, birlikte saracağız.

14 266

Organize Sanayi Bö @Osbuk · 21 Şub 2023

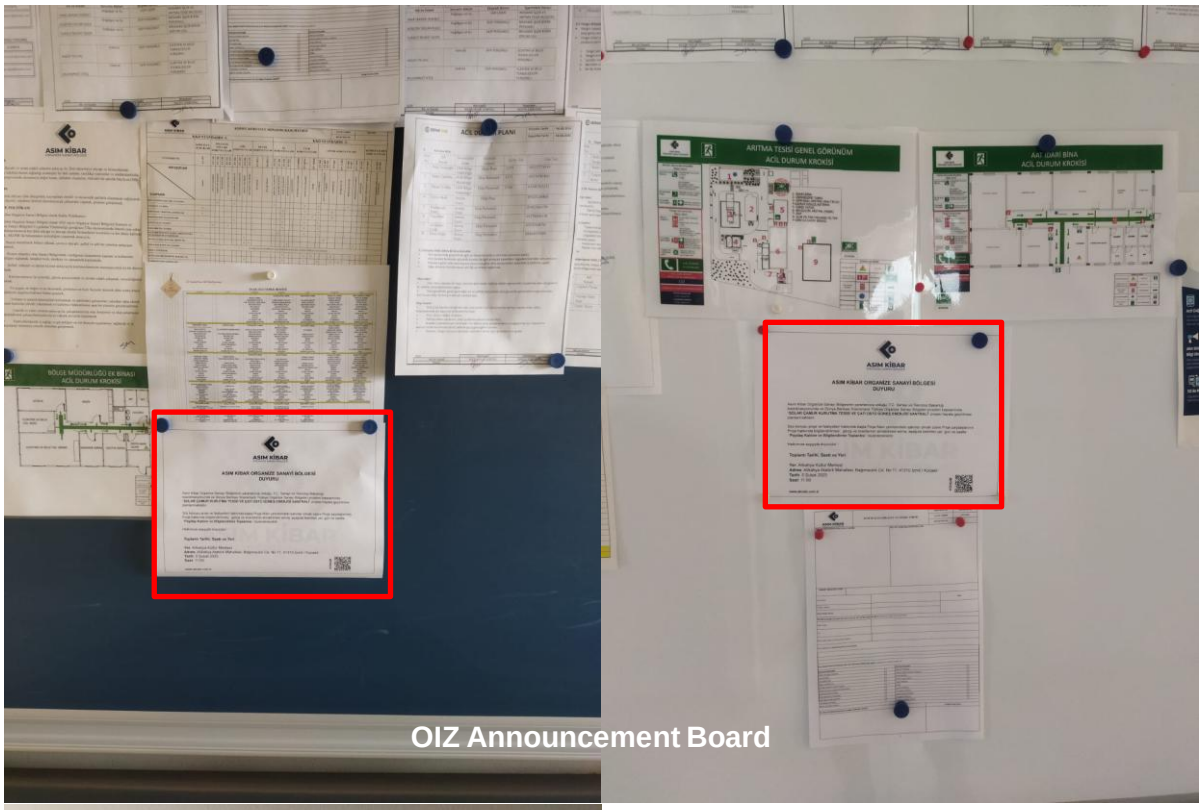
Yaraları birlikte sarmak için #EvimYuvanOlsun seferberliğine siz de katılın.

Kullanmadığınız eviniz depremzedelere yuva olsun.

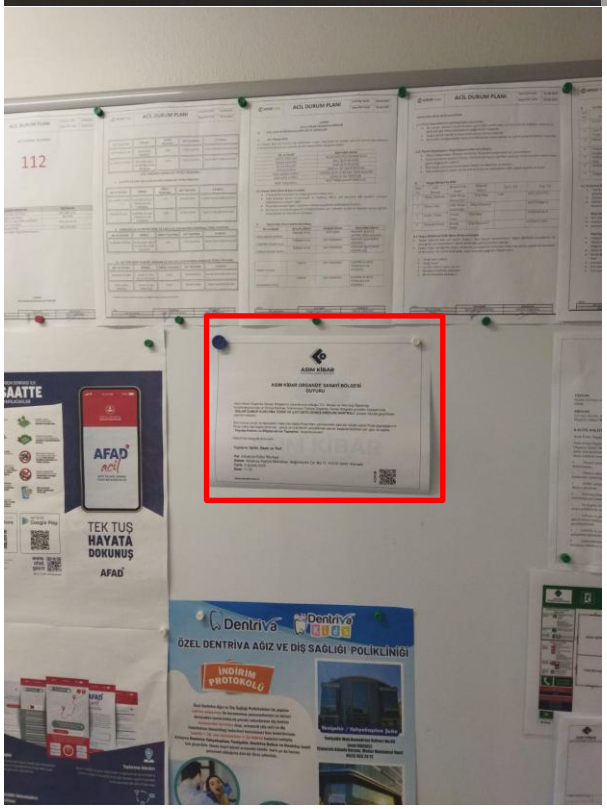
- Bedelsiz tahsis edebilirsiniz.

THE WORLD BANK
IBRD • IDA | WORLD BANK GROUP

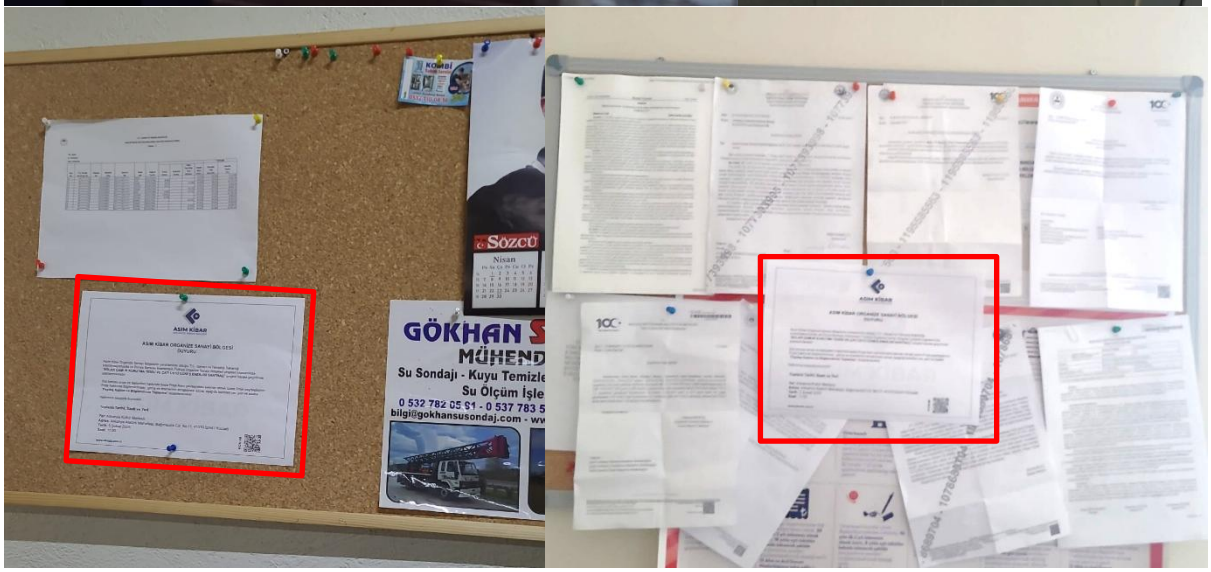
INFRATECH
ENGINEER • SOLVE • PLAN

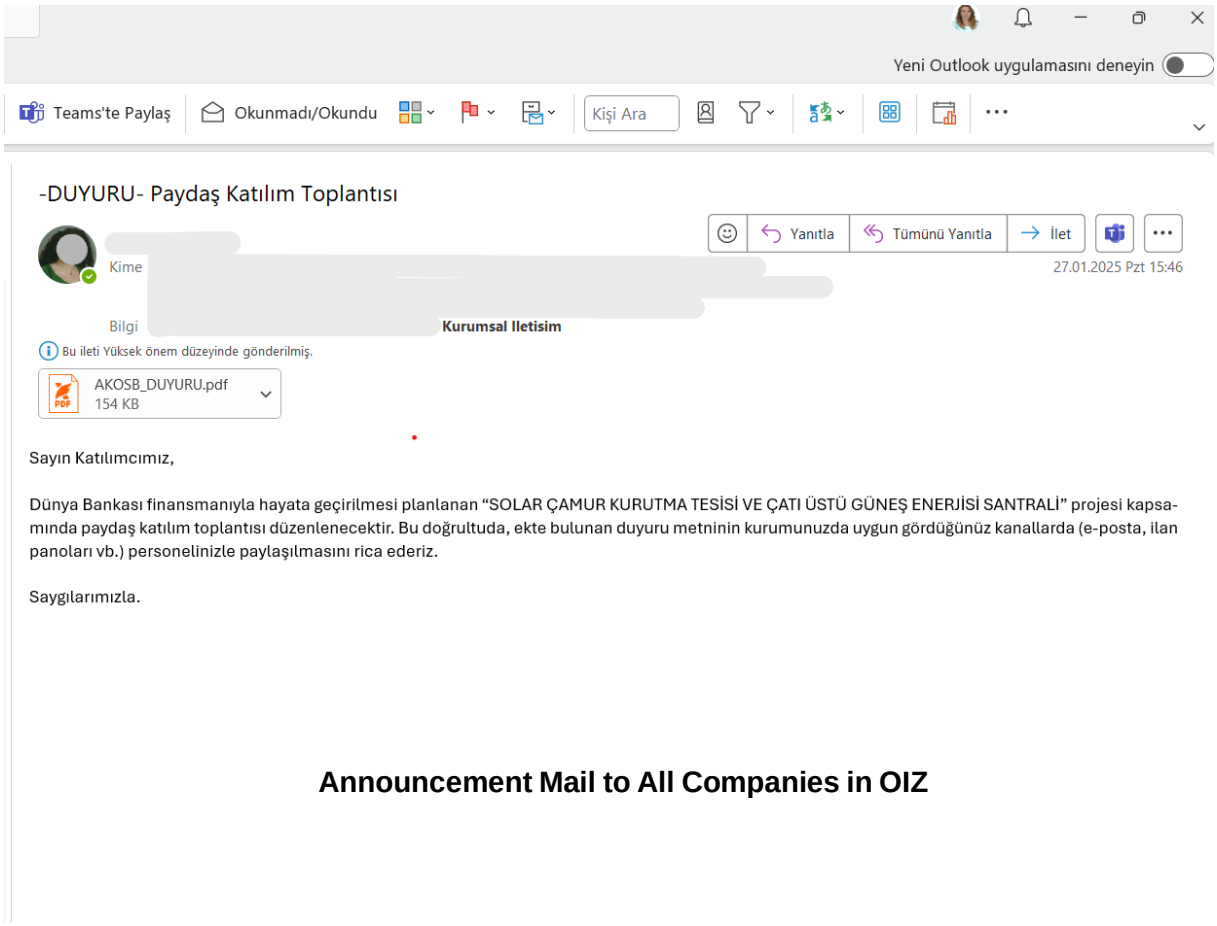


OIZ Announcement Board



Muhtars' Offices in the AoI of the Project





Announcement Mail to All Companies in OIZ

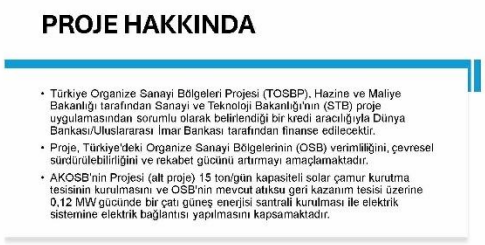
ANNEX-17.2: Local Newspaper Announcement

January 27, 2025, Özgur Kocaeli Newspaper, Page 3

ANNEX-17.3: SCM presentation prepared by Infratech

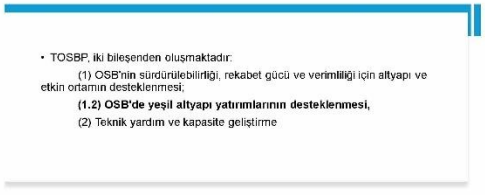
1

2

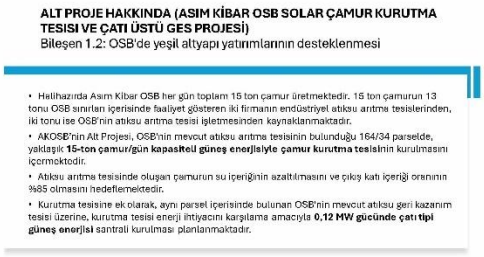


3

4



5



6

ALT PROJE HAKKINDA (ASIM KİBAR OSB SOLAR ÇAMUR KURUTMA TESISI VE ÇATI ÜSTÜ GES PROJESİ)
Bileşen 1.2: OSB'de yeşil altyapı yatırımlarının desteklenmesi

PROJENİN YERLEŞİM PLANI

7

ALT PROJE HAKKINDA (ASIM KİBAR OSB SOLAR ÇAMUR KURUTMA TESISI VE ÇATI ÜSTÜ GES PROJESİ)
Bileşen 1.2: OSB'de yeşil altyapı yatırımlarının desteklenmesi

8

PROJE AŞAMALARI

- İnşaat Öncesi Aşama (Arazi Hazırlık)
- İnşaat Aşaması (Montaj, Kurulum)
- İşletme Aşaması

9

PROJE AŞAMALARI
İnşaat Öncesi Aşama (Arazi Hazırlık) ve İnşaat Aşaması (Montaj)

Solar Çamur Kurutma Tesisi için

- Bitkisel toprağın sıyrılması,
- Geçirimsiz beton zeminin inşa edilmesi,
- Korozyona dayanıklı çelik bir köprü ve köprüye bağlı yüksekliği ayarlanabilir karıştırma ekipmanlarının montajı,
- Polikarbonat levhalı çelik konstrüksiyon yapının kurulumu,
- Otomatik çamur deşarj sistemi ve koku giderme ünitelerinin tesise dahil edilmesi.

10

PROJE AŞAMALARI
İnşaat Öncesi Aşama (Arazi Hazırlık) ve İnşaat Aşaması (Montaj)

Çatı GES Tesisi için

- PV modül taşıyan alüminyum bağlantı aparatları monte edilecek
- Enerji hatları döşenecek
- İnverter ve Trafo bağlantıları yapılacak

İnşaat öncesi aşamada 4 personel inşaat aşamasında ise 25 personel istihdam edilecek

11

PROJE AŞAMALARI
İşletme Aşaması

- Çamur Kurutma Tesisinde bakım onarım çalışmaları yapılacak,
- Belirli periyotlarla çatı GES'te panel temizliği yapılacak,
- 1 personel istihdam edilecek,
- Çamur miktarı 1/3 oranında düşecek,
- Çamur taşıma faaliyetlerinin azalması sonucu sera gazı emisyonları da azalacak.

12

PROJE AŞAMALARI
Çamur Kurutma Tesisi Örnek Görünümleri

13

PROJENİN ÇEVRE VE İSG YÖNETİMİ

14

ÇEVRE YÖNETİMİ

Atıklar	• Evsel Katı Atıklar, Tehlikeli ve Tehlikesiz Atıklar, Sıvı Atıklar,…
Hava Kalitesi	• Makinelerden ve inşaat işlerinden kaynaklanan toz oluşumu ve egzoz emisyonları
Gürültü	• Makinelerden ve inşaat işlerinden kaynaklanan gürültü seviyelerinde artış
Kaynak Kullanımı	• Su, yakıt, elektrik, vb. doğal kaynak kullanımı
Su Kaynakları	• Yeraltı ve yüzey sularına olası etkiler
Toprak	• Kimyasal sızıntılar veya dökülmelerden kaynaklanan olası toprak kirliliği etkileri

15

ÇEVRE YÖNETİMİ
Atık Yönetimi

- Atık yönetimi hiyerarşi,
- Atıklar ayrıştırılacak ve belirlenmiş geçici depolama alanlarında depolanacak,
- Geri dönüşümü, taşınması ve bertarafı lisanslı firmalar ve/veya ilgili Kocaeli Büyükşehir Belediyesi araçları ile gerçekleştirilecek,
- Oluşan atıklar kayıt altına alınacak ve kayıtlar idari binada muhafaza edilecektir.

16

ÇEVRE YÖNETİMİ
Hava Kalitesi

- Toz bastırma yöntemleri uygulanacak,
- Rüzgarlı hava koşulları (rüzgar hızı 30 km/saat'in üzerinde) olduğunda kazı yapılmayacak,
- Asfalt yollar mümkün olduğunca çok kullanılacak,
- Şikayet alınması durumunda toz ölçümleri yapılacak
- Toz bastırma faaliyetleri artırılacak, gerekli görülmesi halinde hızın/trafiğin daha da azaltılması gibi hafifletici önlemler geliştirilecek,

17

ÇEVRE YÖNETİMİ
Gürültü

- İnşaat çalışmaları 07:00 - 19:00 saatleri arasında gerçekleştirilecek, geceleri hiçbir inşaat faaliyeti yapılmayacak,
- Gece operasyonlarının gerekli görülmesi durumunda, inşaat faaliyetlerinin zamanı hakkında halk 1 hafta önceden bilgilendirilecek,
- Şikâyet durumunda gürültü ölçümleri yapılacak,
- Gürültü bariyerlerinin kullanılması gibi hafifletici önlemler artırılacak.

18

ÇEVRE YÖNETİMİ
Kaynak Verimliliği ve Kirlilik Önleme

- Temiz üretim seçeneklerini değerlendirerek en uygun hammadde ve kaynakların seçilmesi için inşaat yüklenicisini denetlenecek,
- Dökülmelerin ve kimyasal sızıntıların önlenmesi için yeterli önlemlerin alınmasıyla yeraltı suyu kalitesinin etkilenmemesi sağlanacak,
- Makine ve ekipmanlar yağ ve yakıt sızıntısı açısından düzenli olarak kontrol edilecek,
- Atıkların sahada herhangi bir şekilde yakılmasına veya gömülmesine ve/veya atıkların yakındaki yollara veya su kaynaklarına dökülmesine izin verilmeyecek.

19

ÇEVRE YÖNETİMİ
Su ve Atıksu Yönetimi

- Personele sağlanacak içme suyunun kalitesi, İTASHY, WHO ve DBG gibi uluslararası kabul görmüş standartlara uygun olacak,
- Hiçbir kirli madde, katı atık, zehirli veya tehlikeli madde seyreltme veya bertaraf amacıyla su kaynakları yakınında depolanmayacak, dökülmeyecek veya bertaraf edilmeyecek,
- İnşaat ve işletme aşamalarında AAT'de çalışan mevcut işçilerin kullandığı tuvaletler kullanılacak,
- İşletme aşamasında, GES paneli temizlik faaliyetlerinde kullanılan su buharlaşacak; dolayısıyla atık su oluşmayacak.

20

PROJENİN ÇEVRE VE İSG YÖNETİMİ
ÇEVRESEL VE SOSYAL YÖNETİM PLANI (ÇSYP)

Konu	Potansiyel Etki	Etki Azaltma Öncesi Etki Önemi	Etki Azaltıcı Önlem	Etki Azaltma Sonrası Etki Önemi	Azaltım Maliyeti	Sorumlu Taraf/ Taraflar
Fiziksel Çevre						
Hava Kalitesi: Toz Emisyonları	Proje Alanı çevresindeki hava kalitesinin düşürülmesi. Yakındaki yollarda ve otoyollarda görüş mesafesini geçici olarak azaltılı. Proje Alanındaki yüksek toz emisyonlarına uzun süre maruz kalınması nedeniyle olası sağlık tehlikeleri. Kuvvetli rüzgarlarda erozyon olasılığı	Düşük	•Proje Alanında rüzgarlı hava koşulları (rüzgar hızı 30 km/saat'in üzerinde) olduğunda, kazı yapılmayacak veya toz dağılımını önlemek için rüzgar kalkanları/bariyerleri yerleştirilmesi gibi ek önlemler alınacaktır; •Yükleme ve boşaltma işlemleri [illegible] yapılacaktır.	İhmal Edilebilir/ Yok	İnşaat öncesi maliyete dahildir	Yüklenici (uygulama) Asım Kibar OSB (performans denetimi ve yönetimi)

21

İş Sağlığı ve Güvenliği Yönetimi

Yüklenici/Müteahhit tarafından;

- İSG sorumluları belirlenecek,
- Tehlikeler tespit edilecek ve risk analizleri gerçekleştirilecek,
- İSG ile ilgili önlem ve tedbirler değerlendirilecek ve uygulanacak,
- Tüm çalışanlara temel düzey İSG eğitimleri verilecek,
- İnşaat sahası ilgili sorumlular tarafından düzenli olarak denetlenecek,
- Denetleme sırasında tespit edilen uygunsuzluklar rapor edilerek en kısa sürede gerekli aksiyonlar alınacaktır.

22

İş Sağlığı ve Güvenliği Yönetimi
Acil Durum Hazırlık ve Müdahale

Yüklenici/Müteahhit tarafından;

- Acil Durum Müdahale Planı hazırlanacak,
- Acil Durum Ekipleri belirlenecek ve görevleri ile ilgili eğitimler verilecek,
- Acil Toplanma Alanları belirlenecek ve işaretlenecek,
- Acil Durum müdahale ekipmanlarının tam ve eksiksiz şekilde sahada olacak,
- Tatbikatlar gerçekleştirilecek,

23

İş Sağlığı ve Güvenliği Yönetimi
Acil Durum Ekipleri

24

4

Toplum Sağlığı ve Güvenliği Yönetimi

- İnşaat alanına erişim bariyerlerle ve güvenlik personeli ile kısıtlanacak.
- Trafik güvenliği önlemleri alınacak, saha çevresinde hız limitleri uygulanacak,
- Makine ve araçların bakımları düzenli olarak yapılacak, (hava kalitesi ve gürültü etkileri için)
- Toplum Sağlığı ve Güvenliği ile ilgili konularda Şikayet Mekanizması etkin bir şekilde uygulanacak.

25

PROJENİN SOSYAL YÖNETİMİ

26

Paydaşlar

Proje faaliyetlerinden etkilenen ya da etkilenme ihtimali olan gerçek ya da tüzel kişiler.

- Kredi veren kuruluşlar
- Proje sahibi, proje yürütücüsü..
- Ulusal ve yerel devlet kurum ve kuruluşları
- Proje alanına yakın yerleşimler
- Proje kapsamında arazisi edinilen PEKler.. (Projeden Etkilenen Kişiler)
- Dezavantajlı ya da hassas olabilecek PEKler (Örneğin, yaşlılar, engelliler, vb.)
- Sivil Toplum Kuruluşları
- Medya
- Üniversiteler, vakıflar, kooperatifler, yerel iş kuruluşları, iş dernekleri, ticaret odaları vs..
- Yüklenici ve ona bağlı çalışanlar.

27

Neden Paydaş Katılım Toplantıları Düzenlenir?

- Paydaş katılımı, ilgili proje boyunca gerçekleştirilen kapsayıcı ve süreklilik arz eden bir süreçtir. Doğru şekilde tasarlanıp uygulandığında, projenin çevresel ve sosyal etki ve risklerinin başarılı bir şekilde yönetilmesini ve paydaşlarla sağlam iletişim ve ilişkilerin kurulmasına olanak sağlar.
- Proje sürecinde paydaşlar arasında kurulan erken, sık ve açık iletişim ile olası çatışmalar ve proje gecikmelerinin önüne geçilecektir.

28

Şikayet Mekanizması

- Projeyi etkileyen sorunların tanımlanmasına ve tarafsız, zamanında ve etkili bir şekilde çözülmesine izin vermek,
- Projeden etkilenen paydaşlar da dahil olmak üzere yararlanıcıların hesap verebilirliğinin güçlendirilmesi,
- Paydaşların geri bildirimde bulunmaları ve endişelerini dile getirmeleri için kanallar sağlamak.

29

Şikayet Mekanizması (ÇSYP 11. bölüm)

- Ulusal Düzeyde (CİMER)
- Yabancılar İletişim Merkezi (YİMER)
- Sanayi ve Teknoloji Bakanlığı
- Proje Düzeyinde (Asım Kibar OSB)

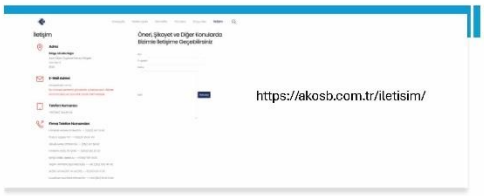
30

Şikayet Mekanizması (ÇSYP 11. bölüm)

	CİMER	YİMER	STB
Web sayfası:	www.cimer.gov.tr/ www.turkiye.gov.tr/	www.yimer.gov.tr	www.sanayi.gov.tr
E-posta:		yimer@cpc.gov.tr	info@sanayi.gov.tr dbonan@sanayi.gov.tr
Çağrı Merkezi (yardım hattı):	150	157	
Telefon numarası:	+90 312 590 20 00	+90 312 515 11 22	444 6 100
Faks numarası:	+90 0312 473 64 94	+90 312 320 06 09	+90 (312) 201 53 23
Resmi Mektup/Dilekçe:	Türkiye Cumhuriyeti, İletişim Başkanlığı T.C. Cumhurbaşkanlığı Külliyesi 06560 Beştepe/Ankara	Türkiye Cumhuriyeti Göç İdaresi Genel Müdürlüğü, Çamlıca Mahallesi 122. Sok. Sokak No: 4 Yenimahalle/Ankara	Mustafa Kemal Mahallesi Dumlupınar Bulvarı (Eskişehir Yolu 7.Km) 2151. Cadde No:154/A 06530 Çankaya/ANKARA
Bireysel Başvuru:	Valilikler, bakanlıklar ve kaymakamlıklardaki herkla ilişkiler mesleği.	Türkiye Cumhuriyeti Göç İdaresi Genel Müdürlüğü	

31

Şikayet Mekanizması (ÇSYP 11. bölüm)



32

Şikayet Mekanizması (ÇSYP 11. bölüm)

- Şikayetler telefon, e-posta, mektup, yukarıdaki kanallardan herhangi biri aracılığıyla doldurulan şikayet yoluyla iletilebilir veya OSB'ye gelenler şikayetlerini öneri kutusuna atabilir.
- Şikayetler Proje Yönetim Birimine (PYB)'ye iletilir, Şikayet Günlüğüne kaydedilir ve Seviye 1, Seviye 2 veya Seviye 3 şikayetler olarak kategorize edilir. Eğer kapsam dışındaysa, ilgili kişi bilgilendirilir ve alternatif bir çözüm önerilir.
  - **1. Seviye Şikâyet:** Münferit veya 'tek seferlik' ve esasen yerel olan bir şikayet.
  - **2 Seviye Şikâyet:** Yaygın ve tekrarlanan bir şikayet.
  - **3. Seviye Şikâyet:**
    - Bir defaya mahsus veya yaygın ya da tekrarlanan,
    - Proje standartlarının ciddi bir şekilde ihlal edilmesine neden olan,
    - Uluslararası medyanın olumsuz ilgisine yol açan, medyadan ya da diğer kilit paydaşlardan olumsuz yorum alma potansiyeline olan.

33

Şikayet Mekanizması (ÇSYP 11. bölüm)

- Şikayetin alındığı, PYB/Sosyal Uzmanı tarafından 2 iş günü içinde şahsen görüşme, telefon görüşmesi veya mektup yoluyla teyit edilir.
- Şikayetin soruşturulması Proje Müdürü tarafından yürütülür.
- PYB, uygun şekilde, şikayetle kimin ilgilenmesi gerektiğine karar vermede Proje Müdürü destekler ve yanıt için ek desteğin gerekli olup olmadığını belirler.
- Yetkilendirilmiş ekip tarafından 15 gün içinde bir yanıt geliştirilir. Yanıt, şikayete uygun bir çözüm belirler ve bir durumu açıklığa kavuşturmak için daha fazla bilgi verilmesini, sorunları hafifletmek için önlemler alınmasını veya Proje faaliyetleri sırasında meydana gelen zararların mali tazminat yoluyla telafi edilmesini içerir.

34

ÇALIŞANLAR İÇİN ŞİKAYET ÇÖZÜM MEKANİZMASI

35

İşgücü Yönetim Prosedürü

- İYP, projenin inşaat öncesi, inşaat ve işletme aşamalarında geçerli olan, işgücü ve çalışma koşullarına ilişkin gerekliliklerı açıklayan bir dokümandır.
- Tüm çalışanlara adil muamele yapılarak eşit fırsatların tanınması ve ayrımcılık yapılmaması için gereken uygulamaları teşvik eder ve uygulamaya koyulmasını sağlar.
- Proje çalışanlarının kendilerinin ve haklarının korunması ve işgücü ile ilgili risklerin yönetilmesi için gerekli altyapının sağlanmasını hedefler.
- İYP, işgücü ve çalışma koşullarına uygunluk, raporlama, roller ve sorumluluklar, izleme ve eğitim açısından gereksinimleri ve beklentileri açıklar.

36

PROJENİN ÇEVRESEL VE SOSYAL TÜM DOKUMANLARINA NEREDEN ULAŞILABİLİR?

- https://yesilosb.sanayi.gov.tr/
- OSB'nin Resmi Web Sitesi: https://akosb.com.tr/
- OSB Müdürlüğü (Proje Yönetim Birimi)

37

Soru ve Görüşleriniz Bizim İçin Değerlidir...

38

ANNEX-17.4: Minutes of the Q&A session

There was no question received after Infratech's presentation on the Project's Environmental and Social Management Plan.

ANNEX-17.5: Meeting Photos

ANNEX-18- CONTRIBUTORS

Name-Surname	Profession
Münire Selcen Ak	Environmental Engineer
Özdemir Uğural	Environmental Engineer
Bülent Taş	Geological Engineer
Tunca Ataoğlu	Civil Engineer, PEng, MSc, PMP
Sinem Otlu	Business Development, Analytics and Planing
Banu Ergin	Civil Engineer
Göze Doğu	Sociologist, Ph.D.