Environmental and Social Impact Assessment (ESIA) Report

Konya Wastewater Treatment Plant Rehabilitation and II. Stage Construction Project

8 August 2025

Project Information

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Abbreviations

AoI	Area of Influence
AQAMR	Air Quality Assessment and Management Regulation
AQMS	Air Quality Monitoring Stations
DSİ	State Hydraulic Works
E&S	Environmental and Social
EHS	Environment Health and Safety
EIA	Environmental Impact Assessment
ESF	Environmental and Social Framework
ESHS	Environmental, Social and Health and Safety
ESIA	Environmental and Impact Assessment
ESMF	Environmental and Social Management Framework
ESMS	Environmental and Social Management System
ESS	Environmental and Social Standards
GHG	Greenhouse Gas
GIIP	Good International Industry Practice
IAPCR	Industrial Air Pollution Control Regulation
IFC	International Finance Corporation
İLBANK	İller Bankası A.Ş
ILO	International Labour Organization
IUCN	International Union for Conservation of Nature
KBA	Key Biodiversity Areas
KMM	Konya Metropolitan Municipality
KOSKİ	Directorate General of Konya Water and Sewerage Administration
KWWTP	Konya Wastewater Treatment Plant
MoEUCC	Ministry of Environment, Urbanization and Climate Change
NGO	Non-governmental organisations
NT	Nearly Threatened
SEP	Stakeholder Engagement Plan
SGK	Social Security Institution
SME	Small and Medium-Sized Enterprises
the Project	Konya Wastewater Treatment Plant Rehabilitation and II. Stage Construction Project
TUBIVES	TÜBİTAK's Turkish Plants Database
TurkStat	Turkish Statistical Institute

UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UWTR	Urban Wastewater Treatment Regulation
VU	Vulnerable
WB	World Bank
WCEIP	Türkiye: Water Circularity and Efficiency Improvement Project
WPCR	Water Pollution Control Regulation
WWTP	Wastewater Treatment Plant

1 EXECUTIVE SUMMARY

İller Bankası A.Ş. (ILBANK) is implementing the Water Circularity and Efficiency Improvement Project (WCEIP) with support from the World Bank (WB). The objectives of the Water Circularity and Efficiency Improvement Project are: (a) to improve wastewater services and reuse; (b) to increase irrigation services and efficiency; and (c) to strengthen institutional capacity and coordination for managing water circularity and point source pollution reduction in selected water-stressed areas in Turkiye. The Konya Wastewater Treatment Plant (KWWTP) Rehabilitation and II. Stage Construction Project (the Project) will be financed under WCEIP.

ILBANK is the Borrower of the loan, serving as a financial intermediary (FI) to Konya Water and Sewerage Administration (KOSKİ). KOSKİ will be responsible for the implementation of the Project.

KKWWTP originally designed to cater to lesser demands, will undergo significant rehabilitation and expansion. This initiative will include upgrading old systems and installing new technologies to enhance treatment processes and operational efficiency. With the realization of the project KOSKİ is planning to increase its capacity to 2040 year, 400,000 m^3/day, 2.409.592 person to improve the efficiency of the existing plant and to ensure its ability to handle the higher inflow rate due to population increase as the capacity of the existing plant has come to an end.

The Project falls under the list given in the Annex-1 of the Environmental Impact Assessment (EIA) Regulation as "*15- wastewater treatment plants with a capacity over 50,000 m³/day*". Therefore, a full-scale EIA is required and completed with the receipt of the "EIA Positive Certificate" dated 20.04.2021 and numbered 6265 for the Project. This EIA Decision covers only the block no 0 and parcel no 852 (0/852). However, some time after the EIA Approval decision was taken, a part of the ventilation pool no. 8, seen on the Layout given in the Final EIA report, which formed the basis of the said decision, had to be forced to enter to block no 0 and parcel no 938 (0/938), due to the necessity arised during the detailed project studies. The owner of parcel number 938 is also KOSKİ. Consequently, an opinion was obtained from the General Directorate of Environmental Impact Assessment, Permitting and Inspection of the Ministry of Environment, Urbanization and Climate Change on 27.12.2024 regarding the validity of the EIA Positive Decision in case the mentioned block no 0 and parcel no 938 (0/938) is used.

The requirement for the preparation of this Environmental and Social Impact Assessment (ESIA) study arises from the World Bank's Environmental and Social Framework (ESF) definition of risk categories for candidate projects to be financed by the World Bank. According to the ESF, projects are classified into one of four categories: high risk, substantial risk, moderate risk or low risk taking into account relevant potential risks and impacts, such as the type, location, sensitivity and scale of the project; the nature and magnitude of the potential environmental and social risks and impacts; the capacity and commitment of the Borrower; and other areas of risks that may be relevant to the delivery of environmental and social mitigation measures and outcomes. The environmental and social management risks, impacts and mitigation measures are assessed comprehensively in Section 5 and Section 6 of for both construction and operation phases of the Project. As detailed in Section 3.5, the overall risk of the WCEIP is evaluated by İLBANK WCEIP ESMF in terms of Environmental and Social Risk Classifications and accordingly overall risk assessment is rated as "Substantial", since both environmental and social risk ratings are both "Substantial".

This ESIA, prepared by Poseidon Çevre Sosyal Danışmanlık Mühendislik Ticaret Ltd. Şti. (POSEİDON), is developed in accordance with the WB ESF and national legislation to identify potential adverse environmental and social impacts / risks, establish baseline conditions, and establish mitigation, monitoring and measure to be taken during construction and operation phases of the Project.

The need for the project arises from increasing urbanization and population growth in Konya, which have placed a strain on the current wastewater treatment facilities.

KWWTP is the 1st stage of the KWWTP was commissioned in 2009 and is designed for the treatment of Konya Centrum's wastewater with a wastewater treatment process that removes carbon (C) and parital nitrogen (N). The existing capacity of 1st stage KWWTP is 200,000 m^3/day and with the realization of the project proposed in this ESIA it will reach 400,000 m^3/day. In the design of KWWTP Rehabilitation and II. Stage Construction Project (the Project proposed in this ESIA and referred as "the Project" in the ESIA report) a process revision (C, N and P removal complying with regulations) and capacity increase is considered. The reason behind the extension is to provide a higher level of treatment with greater capacity and thus to enable the reuse of the effluent for agricultural irrigation purposes, as in line with the objectives of the greater WCEIP. Units to be rehabilitated and units to be constructed in the scope of the project is given in Section 2 of the ESIA.

Within the scope of the planned capacity increase, new units will be constructed and rehabilitation work will be carried out on the units in the existing plant as shown below:

Units to be Rehabiliteted	New Units to be Constructed (2nd Stage Units)
Stormwater lifting station	Water recovery building
Wastewater Pumping Station	Inlet pumping station-2
Stormwater connection channel	Coarse and fine screen building
Stormwater screen channels	Aerated grit and grease removal units 5, 6, 7 and 8
Preliminary grit removal unit	Grit classifiers and rotary sieve building
Inlet and overflow structure	Primary sedimentation tank distribution chamber -2
Coarse screen channel- 1	Primary sedimentation tanks 5, 6, 7 and 8
Inlet pumping station-1	Primary sedimentation scum tank-1, 2, 3 and 4
Aerated grit and grease removal unit 1, 2 and 3	Primary sludge pumping station-3 and 4
Grit chamber blower building	Primary sedimentation tank outlet collection menholes -3 and 4
Inlet wastewater analysis unit	Distribution chambers for biological treatment-3 and 4
Primary sedimentation tank distribution chamber -1	Biological phosphorus removal tanks-1, 2, 3 and 4
Primary sedimentation tanks 1, 2, 3 & 4	Aeration basins1, 4, 5, 6, 7 and 8
Primary sludge pumping station-1 & 2	Biological treatment blower building-1

Primary sedimentation tank outlet collection menholes 1 & 2	Secondary sedimentation tanks and return sludge pumping stations
Distribution chambers for biological treatment 1& 2	Return sludge flow measurement structure-1 and 2
Aeration basins 2& 3	Secondary sedimentation scum tanks-1 and 2
Biological treatment blower building-2	Secondary sedimentation scum tank-3, 4, 9,10,11 and 12
Secondary sedimentation tanks and return sludge pumping stations	Secondary sedimentation tank distribution chamber-3
Secondary sedimentation tank-1, 2, 3, 4, 5, 6, 7 and 8	Return sludge pumping station-3
Secondary sedimentation tank distribution chamber-1 and 2	Return sludge flow measurement structure-3
Return sludge pumping station-1	Secondary sedimentation scum tank-5 and 6
Service water booster station	Secondary sedimentation tank-13, 14, 15 and 16
Primary sludge thickeners distribution chamber	Secondary sedimentation tank distribution chamber-4
Primary sludge thickeners-1, 2, 3 and 4	Return sludge pumping station-4
Thickened sludge pumping station	Secondary sedimentation scum tank-7 and 8
Sludge mixing tanks 1	Sludge screen building
Weighbridge	Excess sludge thickening building
Anaerobic sludge digester-1, 2, 3 and 4	Sludge mixing tanks
Heating center and energy recovery building	Sludge dewatering building
Digester building-1	Odour removal unit-1 and 2
Desulphurisation units	Anaerobic sludge digester-5, 6,7,8,9,10,11 and 12
Gas storage tank	Heating center and energy recovery building
Biogas blowers	Digester buildings-2 and 3
Gas flares	Desulphurisation units
Old heating recovery building	Gas flares
Tr-0 , 1, 2 and 3 transformer buildings	Tr-7, 8and 9 transformer building
Tr- 0 and 4 main transformer buildings	Tr-2.ag panel building
Guardhouse	Administration building
Administration building	Storage building

Workshop garage building	New security building
Water recovery building	Main+coarse screen waste storage plate
	Fine screen waste storage plate
	Grit+grease+foam waste storage plate
	Sludge screen waste storage plate

The treatment sludge to be generated during the operational phase of the project will be used for agricultural purposes, as is currently practiced. In line with this, a permit renewal application was submitted by KOSKİ to the Provincial Directorate of Environment, Urbanization and Climate Change with the letter dated 13/01/2025 and numbered E-20824400-220.04.02-92632. In response, the Konya Provincial Directorate issued a letter numbered E-684495568-110.03.01-11756064 (see Annex N), establishing a commission and requesting that soil and treatment sludge samples be collected by authorized laboratory personnel under the supervision of the Directorate and submitted along with the analysis results. These sampling and analysis activities were conducted by an accredited laboratory, and the permit process has been successfully completed.

In line with permit requirements, in accordance with Article 8, paragraph 2, subparagraphs (c) and (ç) of the relevant regulation, for agricultural lands permitted for sludge application (i.e., where the concentration of heavy metals in the soil exceeds 50% of the limit values stated in Annex I-A), soil sampling and analysis will be carried out every twelve months. In addition, sludge samples will be collected every six months and analyzed for the parameters specified in Annexes II-A and II-B of the regulation. The results of these analyses will be submitted to the Provincial Directorate of Environment, Urbanization and Climate Change. A new 20,000 m² temporary sludge storage area has been designated within the existing boundaries of the KWWTP (see Figure 2.12 and Figure 2.13) and will be used for storage during the operational phase of the project.

In case the sludge is not deemed suitable for agricultural use based on laboratory analysis or regulatory requirements, or the sludge is not demanded by farmers for agricultural use, dewatered sludge will be stored temporarily and further dried in the temporary sludge disposal area (see Figure 2 11, Figure 2 12 and Figure 2 13), and it will be transported by licensed transportation vehicles for final disposal to the Konya Sanitary Landfill when it reaches 50% dryness rate (see Annex O for official acceptance document). If dewatering of the sludge would not be achieved in the desired amount, the sludge will be transported by licensed transportation vehicles for final disposal to the existing incineration facility within the Konya Sanitary Landfill. The protocol regarding incineration, which has a capacity covering the amount of sludge to be generated from the 1st and 2nd stage facility and whose validity date is the end of 2059, is included in Annex P.

A comprehensive Sludge Management Plan will be prepared prior to the commissioning of the treatment plant. This plan will define the sustainable procedures for sludge management and final disposal.

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The project will be established in the administrative boundaries of Konya Province, Karatay District, Tatlıcak Neighbourhood comprising block no 0 and parcel no 852 (0/852) and block no 0 and parcel no 938 (0/938) Parcels. Block no 0 and parcel no 852 (0/852); is the area of the existing KWWTP area and has been registered as WWTP land and owned by Konya

Metropolitan Municipality (KMM) Water and Sewerage Administration (KOSKİ) since 2009. The owner of block no 0 and parcel no 938 (0/938) is also KOSKİ.

Since both parcels are owned by KOSKİ, KOSKİ applied to MoEUCC and asked for an opinion on the validity of the EIA Positive decision taken for this project and MoEUCC gave a positive opinion regarding the EIA positive decision in question to include block no 0 and parcel no 938 (0/938). Therefore, the project does not require expropriation of any private land and will be established and operated in block no 0 and parcel no 852 (0/852) and block no 0 and parcel no 938 (0/938) owned by KOSKİ and no land has been or will be acquired for the project.

Although is it not decided yet, KOSKİ estimates that around 300 people will be employed by the project's construction contractor. For the operation phase, KOSKİ will employ 58 more personnel in addition to its 43 employees working currently for the O&M activities of the existing KWWTP. Thus, the total workforce will reach to 101 during the operation phase.

The activities will start with the design review to be performed by KOSKİ's own workforce and resources. The scope of this task is limited with the final review of design and relevant specifications. This stage is expected to take three months. Following that, construction tender process will be initiated, which is expected to take eight months. In the meantime, selection process for the construction supervision consultant will start. After the finalization of the processes defined above, the construction contractor will start construction activities. The construction activities will last for 24 months, and following the commissioning of the plant, the Defect Liability Period (DLP) will start for 12 months.

The commencement of the project is expected to happen in 35 months after the day zero. Details about the Project are provided in Section 2.

Following Section 2,, the assessment continues with Institutional and Legal Framework in Section 3,, including National Legislation, international Legislation and conventions and World Bank's Environmental and social Framework.

Environmental and social baseline conditions of the project area are described in Section 4 comprising land use, soil and geology, air quality, Noise, water and wastewater, biodiversity and socio-economic baseline conditions.

The environmental and social risks / impacts and relevant assessments associated with the project are presented in Section 5,, referring to the area of influence and methodology used in the evaluations in th scope of this ESIA. Section 6 of ESIA Report presents Environmental and social mitigation measures.

Proposed environmental and social impacts / risks of the project to be discussed in this ESIA are:

- Impacts / risks on physical environment:
  The potential anticipated impacts / risks on the physical environment to be discussed in this ESIA are; topography, soil and land use, air pollution, odor, climate change noise pollution and vibration, water and wastewater pollution, wastes, visual impacts and landscape.
- Impacts / risks on biological environment:
  The wildlife would be most affected by habitat reduction within the Project site. Wildlife within surrounding habitats might also be affected if the construction activity (and associated noise) disturbs normal behaviors, such as feeding and reproduction. Since the existing wastewater treatment area will be used for the project, the project area is poor in terms of biodiversity, and the anthropogenic effect in the project area is high. Therefore, any significant impact on biological environment is not expected. The project

has a positive impact on receiving environment due to the avoidance od untreated wastewater discharge.

- Impacts / risks on social environment:
  Positive impacts of the project on both socio-economy (procurement opportunities and local employment) and community health and safety since the Project will improve wastewater problems of the beneficiarfies.
  Negative social impacts / risks anticipated from the project are damage risks on infrastructure and services, possible impacts on livelihood in terms of agricultural activities, impacts on labor and working conditions of the workers in terms od occupational health and safety and impacts on the community health and safety (such as unauthorized entry into construction site and shutdown of WWTP during operation) and assessed in Section 5 comprehensively.

As seen in every wastewater treatment plant project, another expected impact of the project due to its specific feature is sludge management. Sludge formation due to project activities and proposed management techniques are described in Section 4.1.1,, 5.3.5 and Section 6 comprehensively.

KWWTP operation phase would possibly create odour nuisance in the close vicinity of the plant. Several levels of measures are recommended in the Chapter 7 of this report. It is recommended to KOSKİ to plant trees to the WWTP borders to minimize impacts related with odour, noise, and dust generation, and aesthetics.

Project alternatives are given in Section 7,, comprising no-project alternative and process, site and layout akternatives of the project and Section 8 presents project design measures such as, basis for selection, integration of EHSGs, pollution prevention and abatement measures and references to GIIP.

Finally key measures and actions for the Environmental and Social Action Plan (ESAP) are given in Section 7.

The project incorporates various mitigation strategies to address the identified environmental and social risks. These include:

- Environmental and Social Management Plan (ESMP): Outlines specific measures to manage construction impacts such as noise, dust, and waste.
- Stakeholder Engagement Plan (SEP): Focuses on addressing social impacts, including labor management and community safety.

The potential environmental and social impacts and mitigation measures having impact significance medium and above and monitoring activities address in this ESIA and ESMP are provided in Table 1-1.

Table 1-1 Summary of The Impacts and Mitigation Measures

Environmental and Social Attributes	Description	Impacts / Mitigation Measures	Impact Significance (Without ESIA)
CONSTRUCTIONCONSTRUCTION PHASE			
Soil Quality	Contamination of soil	Section 5.2.1 & Section 7	Medium

	Loss of topsoil		
Noise and Vibration	Increase in noise level	Section 5.2.3 & Section 7	
Water Quality	Change in the surface water and groundwater quality Accidental spills/leaks can affect water resources.	Section 5.2.4 & Section 7	Medium
Socio-economic Environment	Impact on demographic structure and social cohesion	Section 5.4.3 & Section 7	Medium
	Impacts on disadvantaged/vulnerable groups		
Labor and Working Conditions	Child labor and forced labor risks	Section 5.4.5 & Section 7	Medium
	Informal employement		
	Sexual exploitation, abuse, and harassment risks		
Community Health and Safety and Security		Section 5.4.6 & Section 7	Medium
OPERATINAL PHASEPHASE			
Air Quality	Odorous gas emissions and nuisance in the close vicinity of the KWWTP	Section 5.2.2 & Section 7	Medium
Noise and Vibration	Increase in noise level	Section 5.2.3 & Section 7	Medium
Waste and Resources	Improper handling of excess sludge	Section 5.2.5 & Section 7	Medium
Labor and Working Conditions	Workers' exposure to work related occupational health and safety risks	Section 5.4.5 & Section 7	Medium
	Hazards of Maintenance and Repair Activities		Medium
Community Health, Safety and Security	Failure of operation	Section 5.4.6 & Section 7	Medium

For for mitigation of impacts and proper implementation of the above-mentioned mitigation measures, it is recommended that prior to construction, an Environmental and Social

Management System (ESMS) should be established comprising site specific Sub - Environmental and Social Management Plans and implemented successfully:

Table 1-2 List of Recommended Management Plans and Procedures

Construction Phase Management Plans	Operation Phase Management Plans
Environmental and Social Management Plan	Environmental and Social Management Plan
Soil Management Plan	Air Quality Management Plan
Spill Response Procedure	Waste Management Plan
Waste Management Plan	Spill Response Procedure
Air Quality Management Plan	Water Resources Management Plan
Noise and Vibration Management Plan	Noise Management Plan
Water Resources Management Plan	Sludge Management Plan
Emergency Preparedness and Response Plan	Emergency Preparedness and Response Plan
Traffic Management Plan	Occupational Health and Safety Management Plan
Occupational Health and Safety Management Plan	Community Health and Safety and Security Management Plan
Community Health and Safety and Security Management Plan	Stakeholder Engagement Plan comprising Grievance Mechanism Procedure
Stakeholder Engagement Plan comprising Grievance Mechanism Procedure	Traffic Management Plan
Contractor Management Plan	Labor Management Plan
Chance Finds Procedure	
Labor Management Plan	

Construction Phase Management Plans should be prepared by construction contractor and submitted to KOSKİ for approval and to ILBANK for information before initiation of the construction acitivites. For the operational phase of the project, proposed sub-management plans should be prepared by KOSKİ and submitted ILBANK for approval before operation starts.

For full transparency, an ESIA Disclosure Package is made available, comprising the ESIA Report, ESMP, SEP, and a Non-Technical Summary.

The Konya Wastewater Treatment Plant Rehabilitation and II. Stage Construction Project represents a critical step towards enhancing the water management infrastructure in Konya. Through careful planning, rigorous environmental and social safeguards, and active stakeholder engagement, the project aims to deliver substantial long-term benefits for the region's population and ecological health, aligning with national and international sustainability goals.

2 PROJECT DESCRIPTION

2.1 Project Background and Overview

The WCEIP is designed to improve the circularity and efficiency of irrigation and wastewater services in selected water stressed areas, and to strengthen institutional capacity and coordination for resilient service delivery and wastewater reuse in selected basins in Türkiye. The project aims to support the Government of Türkiye's efforts to address climate change induced water scarcity and pollution in selected water stressed basins in Türkiye, particularly in view of the increasing demand for water for irrigation and other uses, inadequate wastewater treatment prior to discharge, and the need to strengthen institutional capacity and coordination to address these issues in Türkiye.

The project in question, the Konya Wastewater Treatment Plant (KWWTP) Rehabilitation and II. Stage Construction Project (the Project)), is therefore consideredunder the WCEIP as it supports the various objectives of the WCEIP, given the threat of water scarcity in the Konya Basin, the increased demand for irrigation water in the region and the inadequate treatment capacity of the existing Konya Wastewater Treatment Plant (KWWTP).

KWWTP with a total capacity of 200,000 m^3/day is located within the administrative borders of Konya Province, Karatay District, Tatlıcak Neighbourhood, Saadet Street No:42 (block no 0 and parcel no 852 (0/852) and block no 0 and parcel no 938 (0/938))).KWWTP has been operated by Konya Metropolitan Municipality (KMM) Water and Sewerage Administration (KOSKİ) since 2009. The satellite image of the KWWTP is presented in Figure 2-1.

Access to KWWTP from other cities can be made through D300, D330, D696 and D715 state roads. The main state roads and the transportation routes within the city are given in Figure 2-2. The road conditions (paved/unpaved) within KWWTP are show in Figure 2-3.

The distance of the closest residential buildings to KWWTP is presented in Table 2-1 and the satellite image is given in Figure 2-4.

Table 2-1 Closest houses to the project components

Settlements	Nearest Settlements
Tatlıcak Neighborhood	0.14 km
Fevziçakmak Neighborhood	2.15 km

KWWTP receives the urban wastewater generated in Karatay, Meram and Selcuklu districts and discharges the treated effluent through State Hydraulic Work (DSİ) Keçili Discharge Channel. The discharge channel passes through an agricultural plain and eventually connects to Salt Lake (tr. Tuz Gölü). The discharge point[1] is shown in Figure 2-5 together with general overview of the KWWTP. Industrial discharges are controlled by the "Regulation on the Discharge of Wastewater into the Sewer System". Organized Industrial Zones have their own wastewater treatment plants.

KOSKİ is planning to increase its capacity to 2040 year, 400,000 m^3/day, 2.409.592 person to improve the efficiency of the existing plant and to ensure its ability to handle the higher inflow rate due to population increase as the capacity of the existing plant has come to an end. The capacity increase project planned by KOSKİ in 2021 constitutes of rehabilitation of the existing units and construction of new units. The main objective of the project is to provide a higher level of treatment with greater capacity and thus to enable the reuse of the effluent for agricultural irrigation purposes. Therefore, KOSKİ seeks finance for thethe Konya Wastewater

1 Coordinates of the discharge point: E: 37.888898, N: 32.582242, Y: 4635259, X: 4193740

Treatment Plant Rehabilitation and II. Stage Construction Project (“the project”) through the *Water Circularity and Efficiency Improvement Project (WCEIP) Component A. Wastewater Collection, Treatment and Reuse for Irrigation and Other Beneficial Purposes.*

The details of the project isis provided in the following sections.

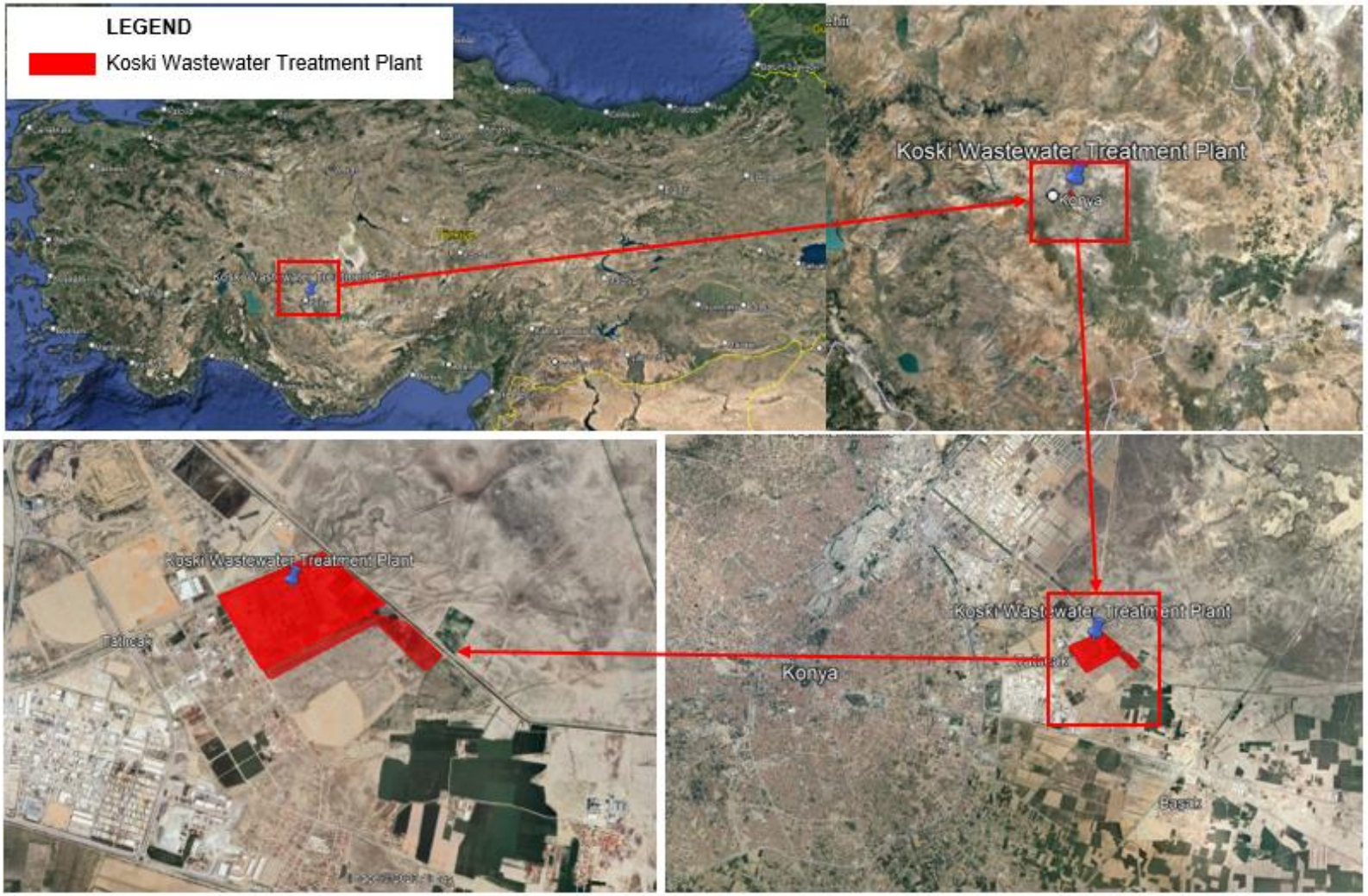

Figure 2-1. Location of the project

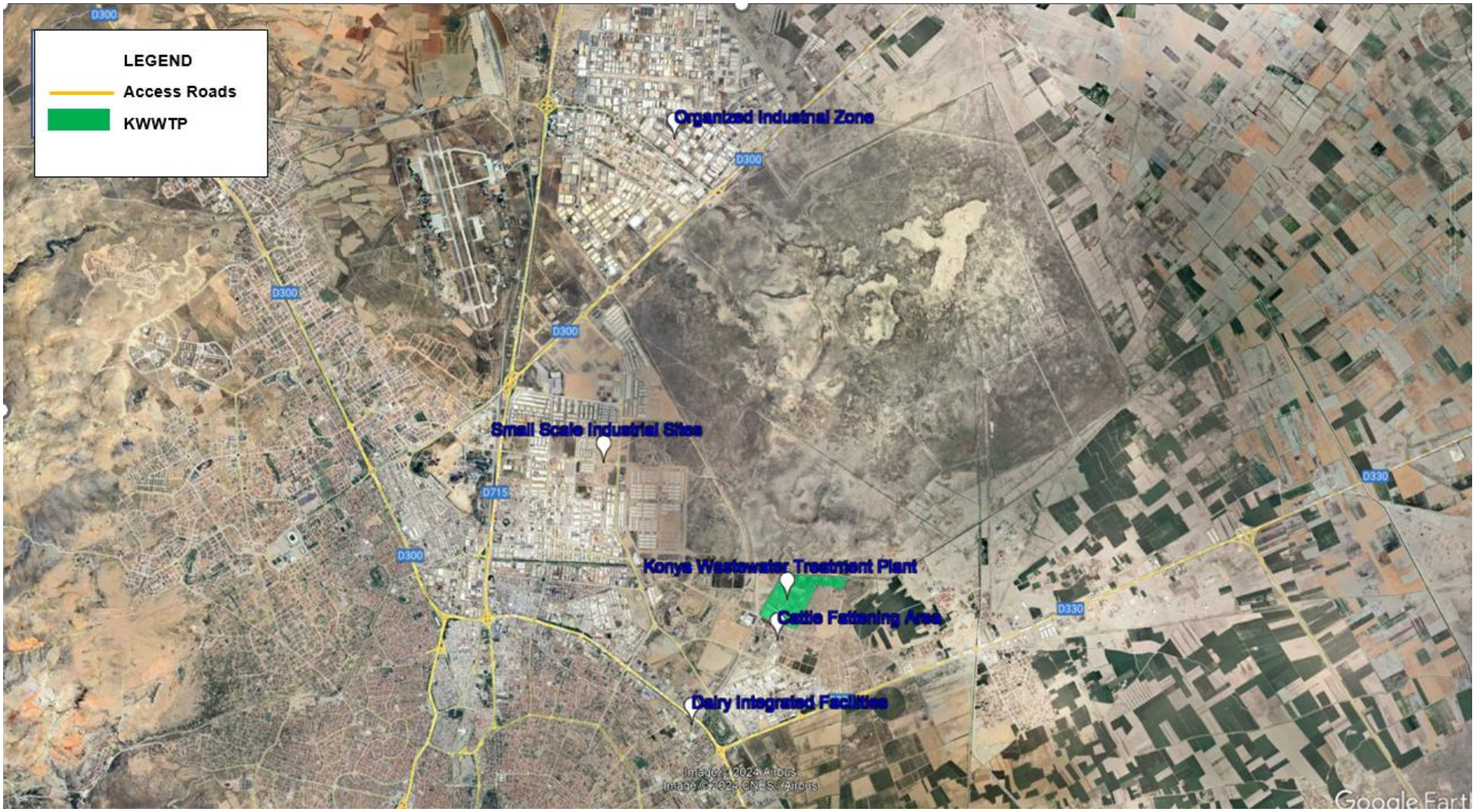

Figure 2-2. Roads to KWWTP

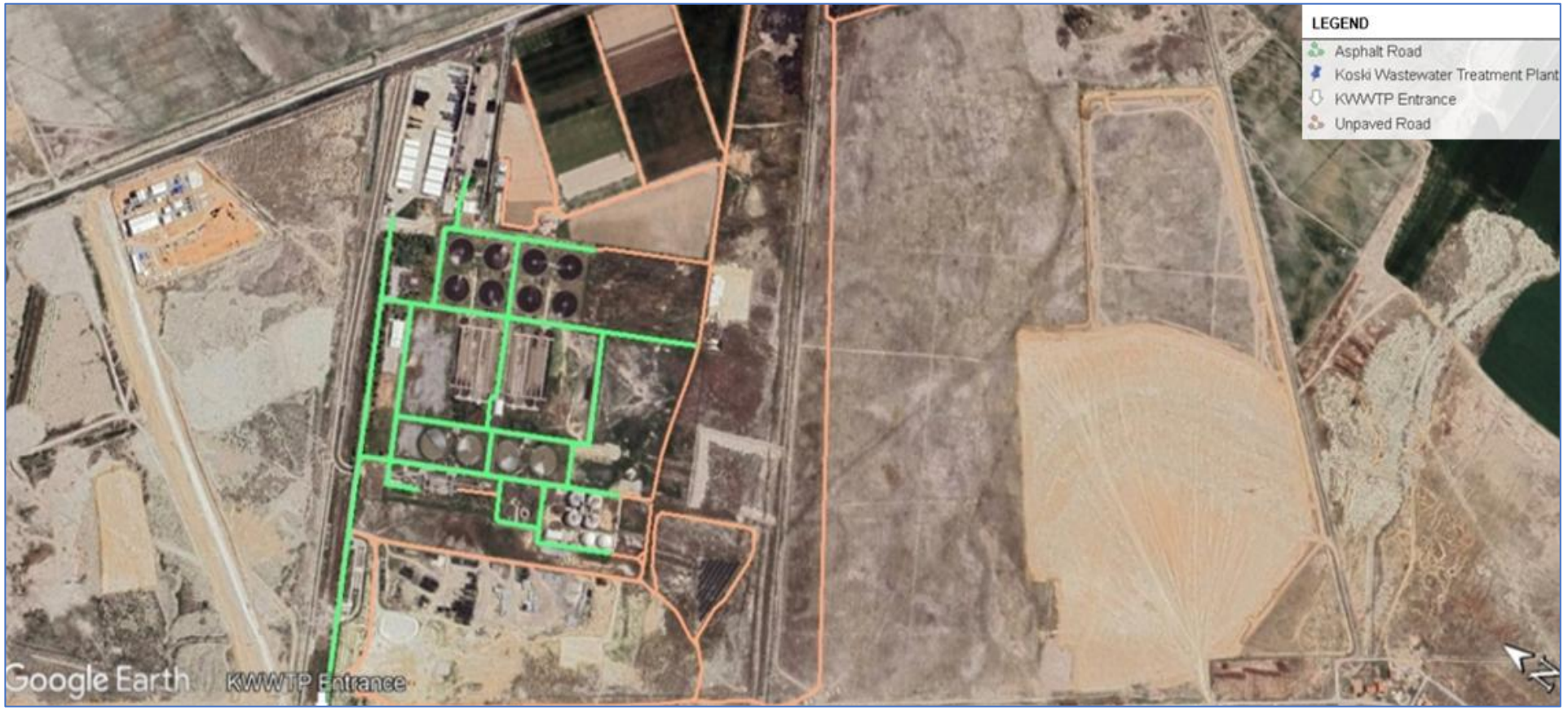

Figure 2-3. Transportation Roads within the KWWTP

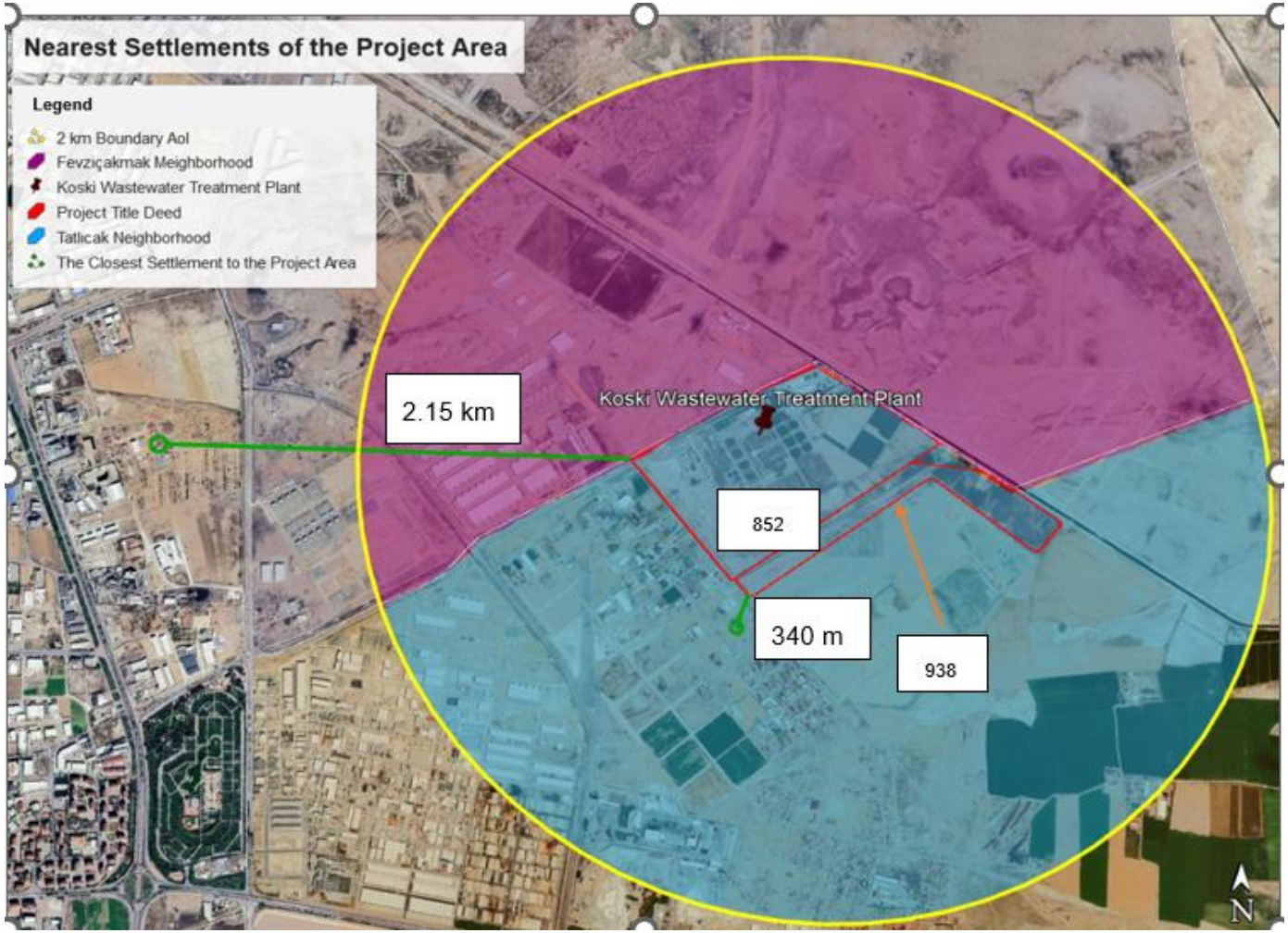

Figure 2-4. Satellite Image of Nearest Settlements

Figure 2-5. Keçili Discharge Channel

Figure 2-6. Industrial and Production Facilities in the project Area and Its Surroundings

2.2 Characteristics of Existing KWWTP

The existing plant, which is called as the "1st stage", was designed in accordance with ATV 131 E standards with the aim of C and partial N-P removal. While the main units of the plant are listed below, the flow diagram of KWWTP is presented in Figure 2-7 and the aeral view of the existing plant is provided in Figure 2-8. The schematic representation of the plant is given in Figure 2-9.

- Inlet structure
- Screening – six coarse and six fine screens for the removal of solids greater than 6 mm
- Areated grit chamber – four tanks
- Primary sedimentation tank – four tanks
- Aeration tanks – eight tanks for the biological removal of C and N
- Final sedimentation tanks – eight tanks
- Sludge thickener
- Anaerobic sludge digester
- Sludge dewatering (four decanters) and landfill areas
- Effluent storage tank
- Anaerobic Sludge Digesters – four tanks
- Gas engines – 834 kW three engines
- Irrigation water sand filters.

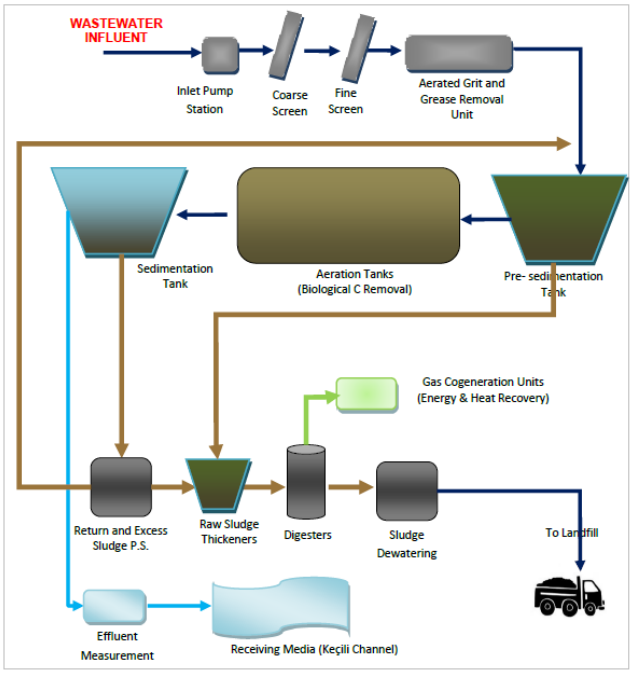

Figure 2-7 KWWTP Flowchart

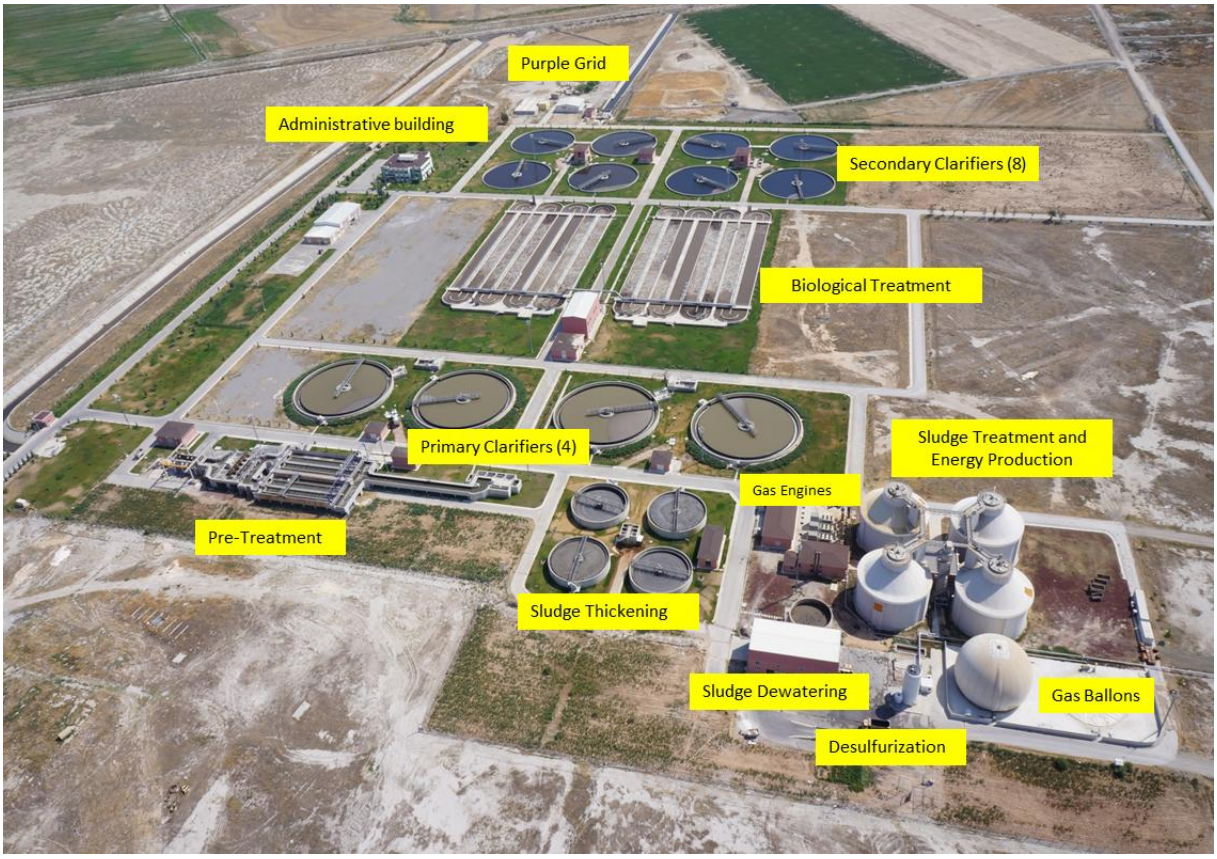

Figure 2-8. Aereal view of the existing KWWTP

The treatment sludge to be generated during the operational phase of the project will be used for agricultural purposes, as is currently practiced. In line with this, a permit renewal application was submitted by KOSKİ to the Provincial Directorate of Environment, Urbanization and Climate Change with the letter dated 13/01/2025 and numbered E-20824400-220.04.02-92632. In response, the Konya Provincial Directorate issued a letter numbered E-684495568-110.03.01-11756064 (see Annex N), establishing a commission and requesting that soil and treatment sludge samples be collected by authorized laboratory personnel under the supervision of the Directorate and submitted along with the analysis results. These sampling and analysis activities were conducted by an accredited laboratory, and the permit process has been successfully completed.

In line with permit requirements, in accordance with Article 8, paragraph 2, subparagraphs (c) and (ç) of the relevant regulation, for agricultural lands permitted for sludge application (i.e., where the concentration of heavy metals in the soil exceeds 50% of the limit values stated in Annex I-A), soil sampling and analysis will be carried out every twelve months. In addition, sludge samples will be collected every six months and analyzed for the parameters specified in Annexes II-A and II-B of the regulation. The results of these analyses will be submitted to the Provincial Directorate of Environment, Urbanization and Climate Change. A new 20,000 m² temporary sludge storage area has been designated within the existing boundaries of the KWWTP (see Figure 2.12 and Figure 2.13) and will be used for storage during the operational phase of the project.

In case the sludge is not deemed suitable for agricultural use based on laboratory analysis or regulatory requirements, or the sludge is not demanded by farmers for agricultural use, dewatered sludge will be stored temporarily and further dried in the temporary sludge disposal area (see Figure 2 11, Figure 2 12 and Figure 2 13), and it will be transported by licensed transportation vehicles for final disposal to the Konya Sanitary Landfill when it reaches 50%

dryness rate (see Annex O for official acceptance document). If dewatering of the sludge would not be achieved in the desired amount, the sludge will be transported by licensed transportation vehicles for final disposal to the existing incineration facility within the Konya Sanitary Landfill. The protocol regarding incineration, which has a capacity covering the amount of sludge to be generated from the 1st and 2nd stage facility and whose validity date is the end of 2059, is included in Annex P.

A comprehensive Sludge Management Plan will be prepared prior to the commissioning of the treatment plant. This plan will define the sustainable procedures for sludge management and final disposal.

The discharge point for both the existing and planned project is Keçili Channel.

Influent and effluent water quality, together with the treatment performance of the existing KWWTP has been continuously monitored by KOSKİ. The summary showing the average treatment performance over the years for different parameters is given in Table 2-2. The detailed registers are provided in Annex B.

Table 2-2 Monthly Average Treatment Performance of KWWTP

Year	Month	Average Monthly Treatment Performance				
		TSS	COD	BOD	TN	TP
2020*	Jan	93%	93%	97%	45%	84%
	Feb	92%	90%	97%	39%	89%
	Mar	90%	91%	98%	45%	91%
	Apr	94%	92%	98%	53%	91%
2021	Jan	91%	93%	97%	42%	87%
	Feb	90%	90%	97%	33%	91%
	Mar	86%	90%	97%	54%	92%
	Apr	91%	91%	97%	49%	88%
	May	93%	92%	96%	48%	86%
	Jun	97%	93%	95%	61%	93%
	Jul	94%	94%	96%	85%	94%
	Aug	95%	94%	96%	59%	92%
	Sep	97%	93%	-	60%	91%
	Oct	95%	94%	-	59%	91%
	Nov	97%	94%	98%	53%	94%
	Dec	96%	93%	98%	44%	90%
2022	Jan	95%	92%	97%	46%	93%

Year	Month	Average Monthly Treatment Performance				
		TSS	COD	BOD	TN	TP
	Feb	96%	92%	98%	54%	93%
	Mar	96%	93%	98%	54%	92%
	Apr	95%	93%	98%	37%	95%
	May	96%	93%	97%	55%	93%
	Jun	97%	91%	94%	57%	93%
	Jul	96%	90%	88%	53%	94%
	Aug	96%	94%	91%	45%	90%
	Sep	97%	95%	-	60%	90%
	Oct	97%	95%	-	58%	91%
	Nov	98%	95%	97%	49%	93%
	Dec	94%	94%	93%	59%	88%
2023	Jan	96%	93%	97%	52%	81%
	Feb	95%	93%	99%	41%	89%
	Mar	92%	86%	-	22%	84%
	Apr	84%	91%	97%	25%	86%
	May	92%	89%	98%	38%	81%
	Jun	94%	92%	-	45%	100%
	Jul	95%	92%	96%	25%	90%
	Aug	98%	95%	96%	65%	88%
	Sep	98%	95%	96%	70%	93%
	Oct	98%	95%	96%	76%	95%
	Nov	97%	95%	95%	66%	91%
	Dec	93%	92%	96%	62%	82%
2024	Jan	87%	89%	92%	59%	79%
	Feb	90%	89%	96%	27%	82%
	Mar	91%	90%	96%	31%	88%
	Apr	87%	88%	98%	13%	79%

Year	Month	Average Monthly Treatment Performance				
		TSS	COD	BOD	TN	TP
	May	91%	90%	97%	36%	80%
	Jun	92%	90%	96%	42%	98%
	Jul	94%	91%	97%	23%	92%
	Aug	96%	94%	96%	64%	90%

*No analysis between May-Dec 2020 due to COVID-19 restrictions.

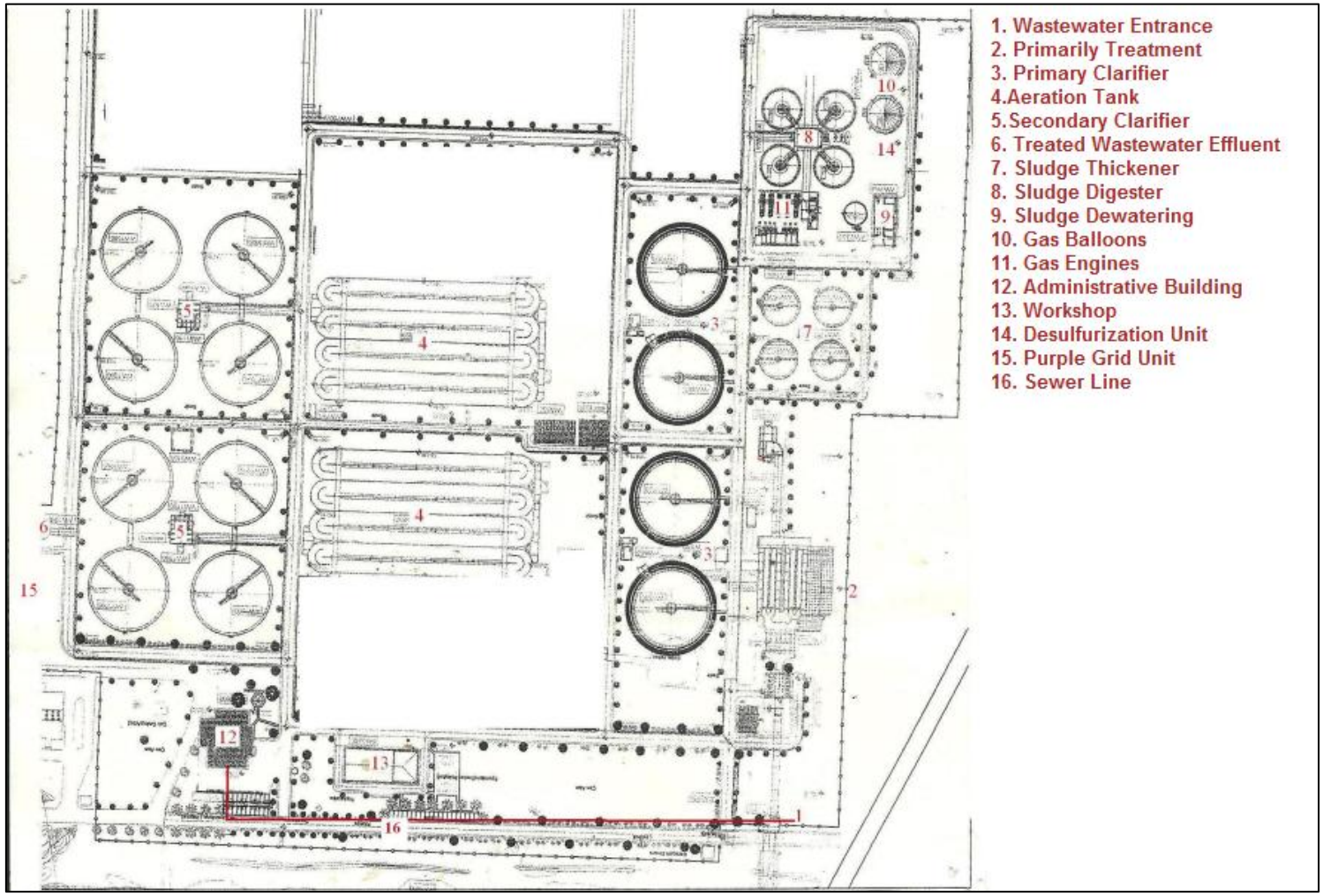

Figure 2-9. Layout of the Existing Wastewater Treatment Plant

2.3 Project

As described previously, the rationale behind the extension is to provide a higher level of treatment with greater capacity and thus to enable the reuse of the effluent for agricultural irrigation purposes, as in line with the objectives of the greater WCEIP. In this section, the details of the project are summarized by majorly relying on the information given in Konya (Centrum) Wastewater Treatment Plant Rehabilitation and 2. Stage Construction Project – Project Identification Report – R07 (6 November 2023). Units to be Rehabilitated and Units to be Constructed is given in Figure 2-10. Rehabilitation work of different sizes will be carried out in all units constructed in the first stage, and the first stage units also represent the units to be rehabilitated. For General Layout Plan details, please see Appendix-Z.

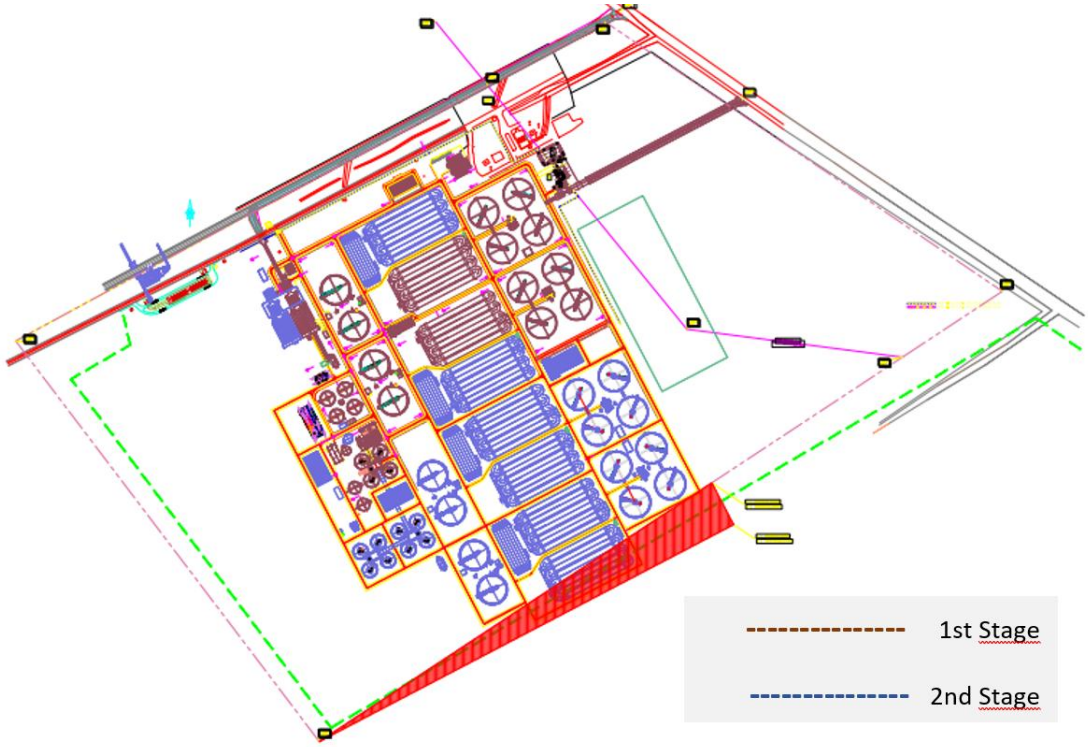

Figure 2-10 Units to be Rehabilitated and Units to be Constructed

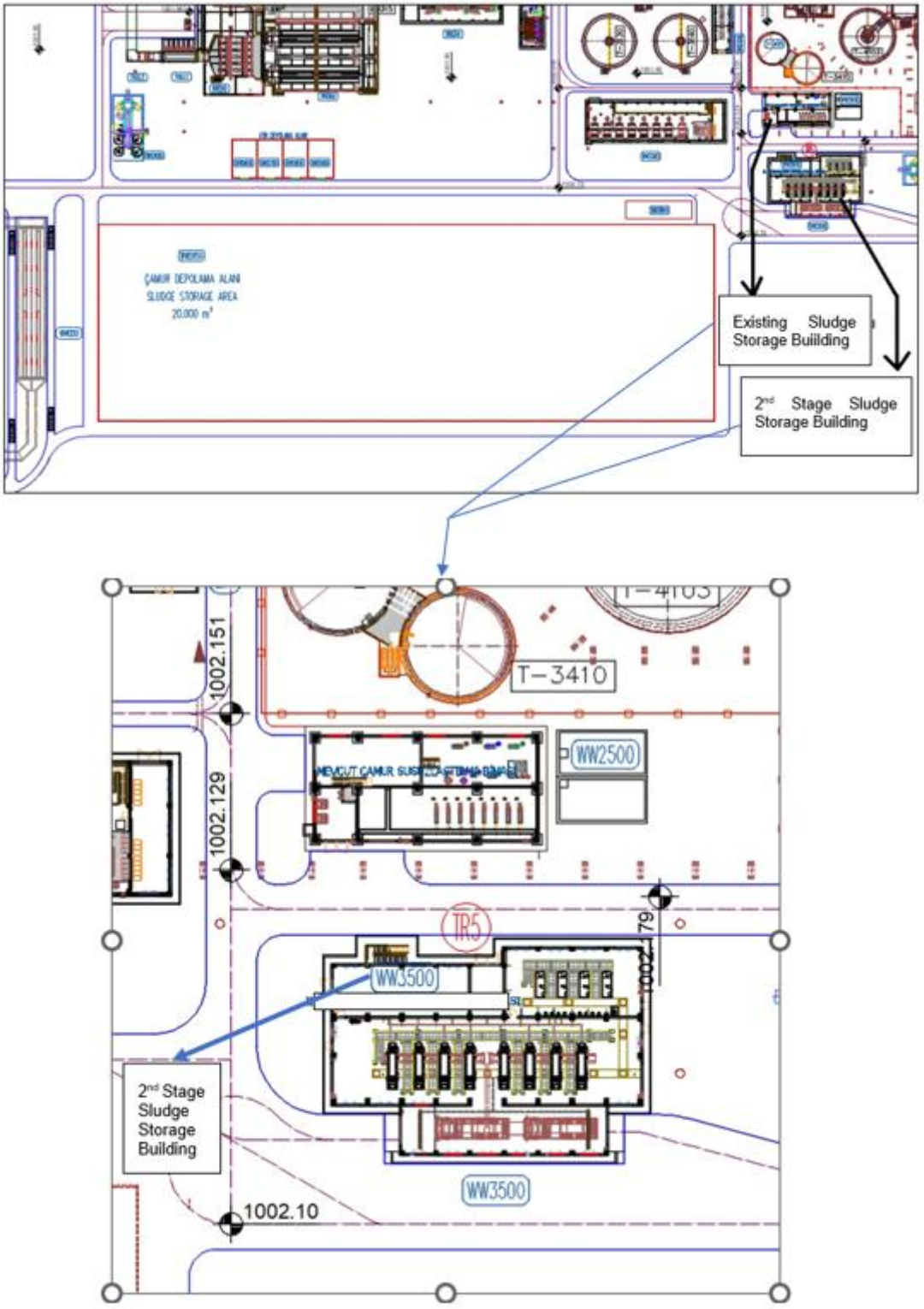

Figure 2-11 Sludge Storage Area and Existing and 2nd Stage Sludge Dewatering Buildings

2.3.1 Wastewater Generation Rate, Characteristics and Pollution Loads

The wastewater generation rate and wastewater characterization studies were conducted by the design consultant of the project. The detailed calculations can be found in PID. The

wastewater influent flowrate, its anticipated characteristics, and pollution loads used in the design are provided in Annex AB. The PID consultant performed verification calculation by comparing the actual characteristics of wastewater received by the existing KWWTP, and the literature and specifications such as WWTP Technical Procedures Communique, and it is seen that there is a big difference between these. As a result, the PID consultant recommended that actual data including influent quality parameters should be reassessed during design review period.

Industrial Wastewater (excluding Organized Industrial Zones) is accepted to Konya Wastewater Treatment Plant according to the conditions specified in the KOSKİ Wastewater Discharge to Sewerage System Regulation. Inspection and discharge permit processes are carried out by OSKİKOSKİ. Different conditions are arranged according to many different industries and wastewater flow rates. For detailed information, the link below[2] from Directorate General of KOSKİ can be examined.

In Türkiye, Urban Wastewater Treatment Regulation must be complied for effluent discharges. The regulation was adapted from EU Legislation Urban Wastewater Directive (91/27/EEC). The project's design studies conducted by following the stipulations of the regulation. The discharge standards of the project is provided in Annex AA.

2.3.2 Project Units

After the determination of design year population, wastewater characterization and influent flowrate, the design consultant selected the units required for the project. As the project consists of rehabilitation of the existing KWWTP and construction of new units to resolve capacity problems and to ensure effluent quality, the following units will be installed/constructed within the scope of the project (as defined in the project and other documents):

- Screening
  - Mechanical coarse screens – Twelve coarse screens and a conveyor.
  - Mechanical fine screens – Twelve fine screens, one conveyor and three screenings press.
- Grit chamber – four tanks will be added to the existing four tanks.
- Pre-sedimentation tanks – four pre-sedimentation tanks will be added to the existing four tanks.
- Anaerobic tanks – 12 tanks will be added to the system for biological phosphorus removal.
- Aeration tanks – 24 tanks will be added to the existing eight tanks
- Final sedimentation tanks – eight tanks will be added to the existing eight tanks.
- Primary sludge gravity thickener – the existing tanks will continue to be used; no new tanks will be introduced but the number of thickened sludge pumps will be increased from 6 to 14.
- Excess sludge mechanical thickener – eight thickeners.

[2] https://www.koski.gov.tr/uploads/sayfalar_v/dosya/sayfalar-122-atiksularin-kanalizasyon-sistemine-desarj-yonetmeligi-2022-12-09-15-06-31-Zb.docx

- Anaerobic sludge digestion – eight tanks will be added to existing four tanks. The existing four digester tanks will be retrofitted. Five gas engines will replace existing 3 gas engines (834 kWe).
- Sludge dewatering – eight decanters.
- A new 20,000 m² temporary sludge storage area has been designated within the existing boundaries of the KWWTP (see Figure 2.12 and Figure 2.13) and will be used for storage during the operational phase of the project.

  Existing and planned temporary sludge storage areas of the projectis given in Figure 2-12 and Figure 2-13 respectively.

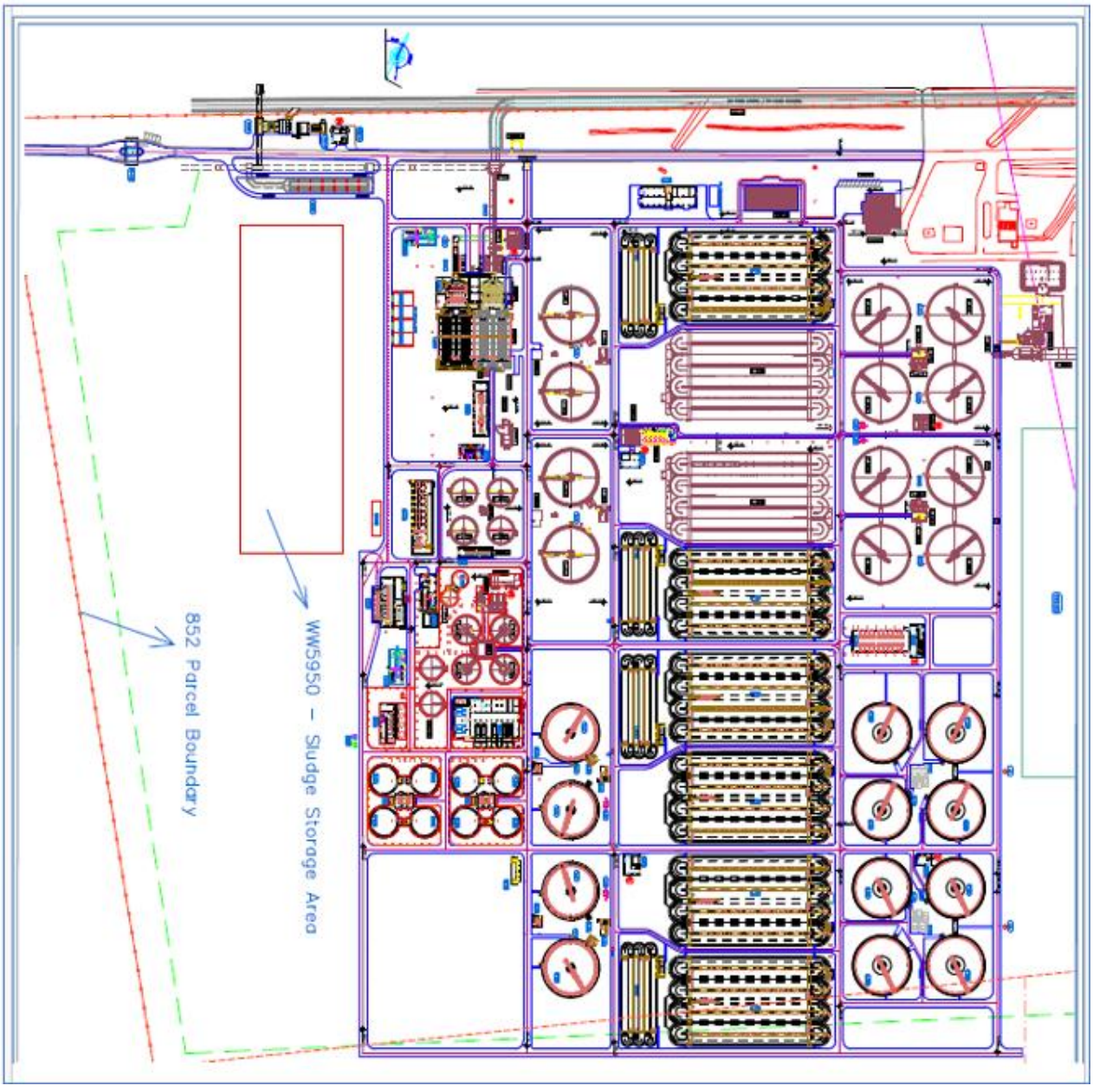

Figure 2-12 Planned Temporary Sludge Storage Area (20,000 m2)

Figure 2-13 Existing and Planned Sludge Storage Areas

Within the scope of the planned capacity increase, new units will be constructed and rehabilitation work will be carried out on the units in the existing plant. These units to be constructed and rehabilitated is given in Table 2-3.

Table 2-3 Units to be rehabilitated and constructed

UNIT NO	1st STAGE UNITS (REHABILITATED UNITS)	UNIT NO	2nd STAGE UNITS
WW000	Stormwater lifting station	**T-102.2**	Coarse screen channel- 2
WW010	Wastewater Pumping Station	**T-103.2**	Inlet pumping station-2
T-001	Stormwater connection channel	**WW200**	Coarse and fine screen building
T-002	Stormwater screen channels	**WW300**	Aerated grit and grease removal unit
T-003	Stormwater lifting station	**T-305**	Aerated grit and grease removal unit-5
WW050	Preliminary grit removal unit	**T-306**	Aerated grit and grease removal unit-6
WW100	Inlet and overflow structure	**T-307**	Aerated grit and grease removal unit-7
T-101	Overflow structure	**T-308**	Aerated grit and grease removal unit-8
T-102.1	Coarse screen channel- 1	**WW330**	Grit classifiers and rotary sieve building
T-103.1	Inlet pumping station-1	**WW450**	Primary sedimentation tank distribution chamber -2
WW300	Aerated grit and grease removal unit	**WW500**	Primary sedimentation tanks
T-301	Aerated grit and grease removal unit-1	**T-505**	Primary sedimentation tank-5
T-302	Aerated grit and grease removal unit-2	**T-506**	Primary sedimentation tank-6

UNIT NO	1st STAGE UNITS (REHABILITATED UNITS)	UNIT NO	2nd STAGE UNITS
T-303	Aerated grit and grease removal unit-3	**T-507**	Primary sedimentation tank-7
T-304	Aerated grit and grease removal unit-4	**T-508**	Primary sedimentation tank-8
WW350	Grit chamber blower building	**T-510**	Primary sedimentation scum tank-1
WW400	Inlet wastewater analysis unit	**T-520**	Primary sedimentation scum tank-2
WW410	Primary sedimentation tank distribution chamber -1	**T-530**	Primary sedimentation scum tank-3
WW500	Primary sedimentation tanks	**T-540**	Primary sedimentation scum tank-4
T-501	Primary sedimentation tank-1	**WW570**	Primary sludge pumping station-3
T-502	Primary sedimentation tank-2	**WW580**	Primary sludge pumping station-4
T-503	Primary sedimentation tank-3	**WW600**	Primary sedimentation tank outlet collection menholes
T-504	Primary sedimentation tank-4	**WW630**	Primary sedimentation tank outlet collection menhole-3
WW550	Primary sludge pumping station-1	**WW640**	Primary sedimentation tank outlet collection menhole-4
WW560	Primary sludge pumping station-2	**WW700**	Distribution chambers for biological treatment
WW600	Primary sedimentation tank outlet collection menholes	**T-730**	Distribution chamber for biological treatment-3
WW610	Primary sedimentation tank outlet collection menhole-1	**T-740**	Distribution chamber for biological treatment-4
WW620	Primary sedimentation tank outlet collection menhole-2	**WW800**	Biological phosphorus removal tanks
WW700	Distribution chambers for biological treatment	**T-810**	Biological phosphorus removal tank-1
T-710	Distribution chamber for biological treatment-1	**T-820**	Biological phosphorus removal tank-2
T-720	Distribution chamber for biological treatment-2	**T-830**	Biological phosphorus removal tank-3
WW1000	Aeration basins	**T-840**	Biological phosphorus removal tank-4
T-1200	Aeration basin-2	**WW1000**	Aeration basins
T-1300	Aeration basin-3	**T-1100**	Aeration basin-1
WW1990	Biological treatment blower building-2	**T-1400**	Aeration basin-4
WW2000	Secondary sedimentation tanks and return sludge pumping stations	**T-1500**	Aeration basin-5
T-2101	Secondary sedimentation tank-1	**T-1600**	Aeration basin-6
T-2102	Secondary sedimentation tank-2	**T-1700**	Aeration basin-7
T-2103	Secondary sedimentation tank-3	**T-1800**	Aeration basin-8

UNIT NO	1st STAGE UNITS (REHABILITATED UNITS)	UNIT NO	2nd STAGE UNITS
T-2104	Secondary sedimentation tank-4	**WW1900**	Biological treatment blower building-1
T-2010	Secondary sedimentation tank distribution chamber-1	**WW2000**	Secondary sedimentation tanks and return sludge pumping stations
T-2110	Return sludge pumping station-1	**V-2111**	Return sludge flow measurement structure-1
T-2201	Secondary sedimentation tank-5	**T-2120**	Secondary sedimentation scum tank-1
T-2202	Secondary sedimentation tank-6	**T-2130**	Secondary sedimentation scum tank-2
T-2203	Secondary sedimentation tank-7	**V-2211**	Return sludge flow measurement structure-2
T-2204	Secondary sedimentation tank-8	**T-2220**	Secondary sedimentation scum tank-3
T-2020	Secondary sedimentation tank distribution chamber-2	**T-2230**	Secondary sedimentation scum tank-4
T-2210	Return sludge pumping station-2	**T-2301**	Secondary sedimentation tank-9
WW2500	Service water booster station	**T-2302**	Secondary sedimentation tank-10
WW3050	Primary sludge thickeners distribution chamber	**T-2303**	Secondary sedimentation tank-11
WW3100	Primary sludge thickeners	**T-2304**	Secondary sedimentation tank-12
T-3110	Primary sludge thickener-1	**T-2030**	Secondary sedimentation tank distribution chamber-3
T-3120	Primary sludge thickener-2	**T-2310**	Return sludge pumping station-3
T-3130	Primary sludge thickener-3	**V-2311**	Return sludge flow measurement structure-3
T-3140	Primary sludge thickener-4	**T-2320**	Secondary sedimentation scum tank-5
WW3200	Thickened sludge pumping station	**T-2330**	Secondary sedimentation scum tank-6
WW3400	Sludge mixing tanks	**T-2401**	Secondary sedimentation tank-13
T-3410	Sludge mixing tank-1	**T-2402**	Secondary sedimentation tank-14
WW3800	Weighbridge	**T-2403**	Secondary sedimentation tank-15
T-4101	Anaerobic sludge digester-1	**T-2404**	Secondary sedimentation tank-16
T-4102	Anaerobic sludge digester-2	**T-2040**	Secondary sedimentation tank distribution chamber-4
T-4103	Anaerobic sludge digester-3	**T-2410**	Return sludge pumping station-4
T-4104	Anaerobic sludge digester-4	**V-2411**	Return sludge flow measurement structure-4
WW4000	Heating center and energy recovery building	**T-2420**	Secondary sedimentation scum tank-7
WW4100	Digester building-1	**T-2430**	Secondary sedimentation scum tank-8
WW-4600	Desulphurisation units	**WW3000**	Sludge screen building

UNIT NO	1st STAGE UNITS (REHABILITATED UNITS)
WW-4700	Gas storage tank
WW-4800	Biogas blowers
WW-4900	Gas flares
WW5100	Old heating recovery building
WW5110	Tr-1 transformer building
WW5120	Tr-2 transformer building
WW5130	Tr-3 transformer building
WW5170	Tr-0 transformer building
WW5190	Tr-4 main transformer building
WW-5200	Guardhouse
WW-5300	Administration building
WW-5400	Workshop garage building
WW-5500	Water recovery building

UNIT NO	2nd STAGE UNITS
WW3300	Excess sludge thickening building
WW3400	Sludge mixing tanks
T-3420	Sludge mixing tank-2
WW3500	Sludge dewatering building
WW3600	Odour removal unit-1
WW3700	Odour removal unit-2
T-4201	Anaerobic sludge digester-5
T-4202	Anaerobic sludge digester-6
T-4203	Anaerobic sludge digester-7
T-4204	Anaerobic sludge digester-8
T-4301	Anaerobic sludge digester-9
T-4302	Anaerobic sludge digester-10
T-4303	Anaerobic sludge digester-11
T-4304	Anaerobic sludge digester-12
WW4000	Heating center and energy recovery building
WW4200	Digester building-2
WW4300	Digester building-3
WW-4600	Desulphurisation units
WW-4900	Gas flares
WW5140	Tr-9 transformer building
WW5150	Tr-8 transformer building
WW5160	Tr-7 transformer building
WW5180	Tr-2.ag panel building
WW-5300	Administration building
WW-5410	Storage building
WW-5420	New security building
WW-5600	Main+coarse screen waste storage plate
WW-5700	Fine screen waste storage plate
WW-5800	Grit+grease+foam waste storage plate

UNIT NO	1st STAGE UNITS (REHABILITATED UNITS)	UNIT NO	2nd STAGE UNITS
		WW-5900	Sludge screen waste storage plate

Flow Diagram of the KWWTP after the Project is given in Figure 2-14

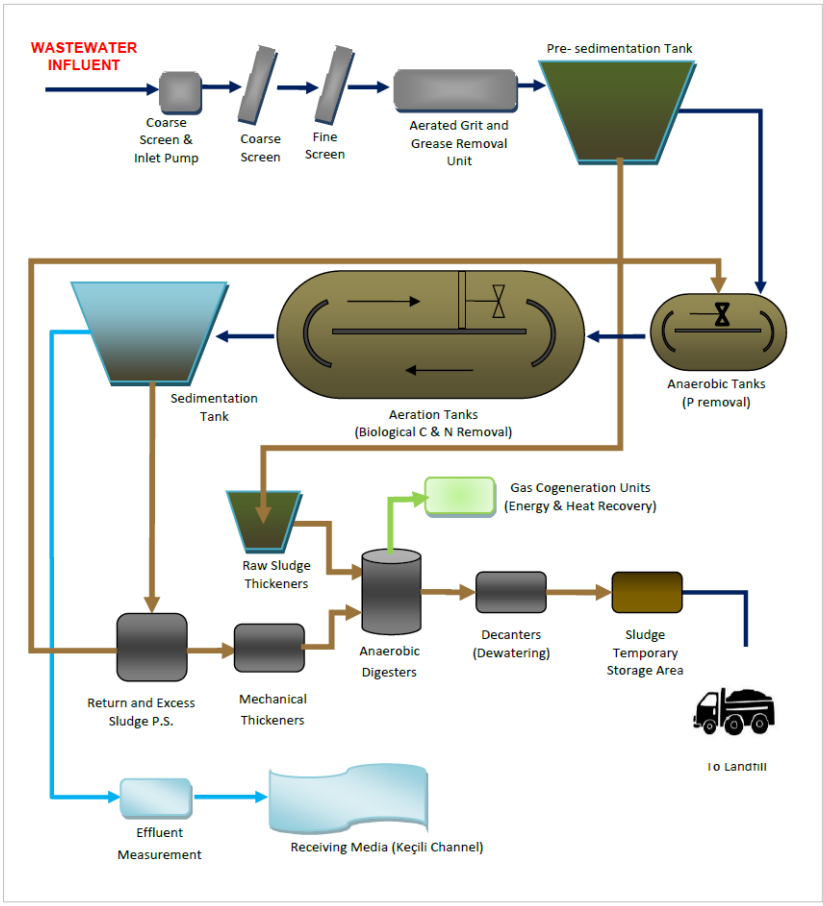

Figure 2-14 Flow Diagram of the KWWTP after the Project realiziation

2.3.3 Associated Facilities

The primary associated facility for the Project involves constructing a new irrigation system, which will utilize treated effluent from the KWWTP. The State Hydraulic Works (DSİ) will oversee the planning, design, and construction of this irrigation infrastructure. The current plan includes adding an additional disinfection unit at the KWWTP to enhance the effluent quality to a level suitable for irrigation reuse. It is considered that the operation of the facility can be carried out by OSKİKOSKİ after a protocol is signed with DSI, with the costs covered by DSI. KOSKİ can handle the operation and maintenance of the entire system after signing this protocol.

The information currently available is briefly summarized below:

- Within the scope of WCEIP, feasibility studies and designs for tertiary disinfection units will be financed.

- DSİ will be responsible for the procurement of relevant consultancy services for this activity.
- The disinfection units comprise discrete infrastructure component of KWWTP that will treat the wastewater to meet the quality standards required for reuse for irrigation. Goods and works related to the construction and installation of relevant investments may be financed through future financing that may be requested by DSİ should the feasibility studies for such investments be approved.
- In such case, KOSKİ will be responsible for O&M of the entire wastewater treatment plant systems, including the disinfection units, to ensure a smooth transition between the main treatment plant, disinfection units, and the irrigation schemes that will use the treated wastewater, with the costs covered by DSI, but DSİ will own the disinfection unit.
- A protocol will be signed between DSİ and KOSKİ to allow for clarification of aspects associated with the O&M of the disinfection unit.
- Within the scope of WCEIP, feasibility studies and designs for the irrigation network that will convey the treated wastewater for irrigation to farms will be financed.
- These activities, again, will be implemented by DSİ, which will be responsible for the procurement of relevant consultancy services.
- The irrigation network will be owned by DSİ. Goods and works related to the construction and installation of relevant investments may be financed through future financing that may be requested by DSİ should the feasibility studies for such investments be approved.

Although at this stage, it does not seem possible to provide detailed information before the studies carried out by DSI reach their final state, iin line with the project it prepared in 2021, KOSKİ will be able to construct the following advanced tertiary treatment units in accordance with a protocol that can be carried out with the cost covered by DSI for the use of treated water for agricultural purposes in the scope of WCEİP::

- Quick and slow mixing units
- Sedimentation tank
- Clarifier
- Quick sand filter
- Ultra and nanofiltration units
- UV Unit
- Backwash unit

Given the existence of the KWWTP, there is no need for other associated facilities such as new energy transmission lines or access roads

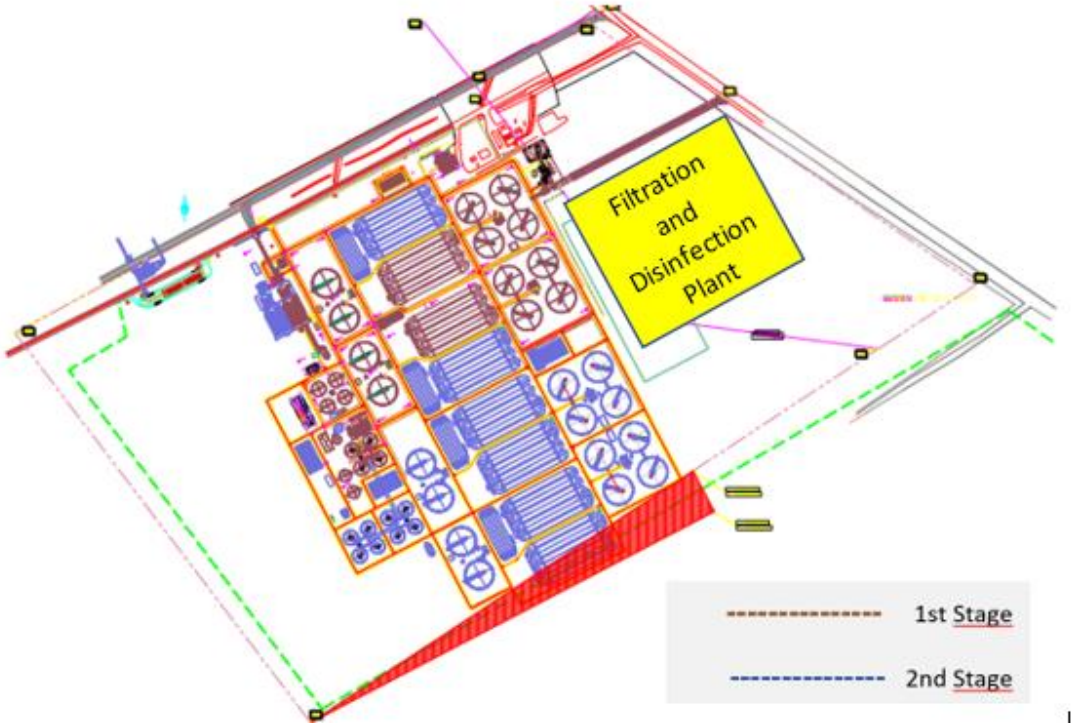

Figure 2-15 Filtration and Disinfection Plant Location Required for Wastewater Recovery

2.3.4 Cost and Schedule of the PProject

The scope and the yearly breakdown cost of the project is presented in Table 2-4. For further information on financial analysis, please refer to the PID.

Table 2-4 Cost Estimate of the project

#	Component	Before construction	1st Year (€)	2nd Year (€)	3rd Year (€)	4th Year (€)	TOTAL (€)
1	Konya (Centrum) Wastewater Treatment Plant Rehabilitation and 2. Stage Construction Project	-	30,602,914	36,723,496	6,120,583	-	73,446,993
2	Consultancy services / technical assistance	70,759	591,346	672,214	144,045	12,636	1,491,000
GRAND TOTAL (€)		70,759	31,194,259	37,395,710	6,264,628	12,636	74,937,993

The activities will start with the design review to be performed by KOSKİ's own workforce and resources. The suitability of the process was re-evaluated by 2 consultant academicians from 2 different universities and its suitability was confirmed in line with the simulation program

outputs. *Prof. Dr. H. Güçlü İNSEL & Prof. Dr. Bilgehan NAS & Res. Assist Dr. Gökşin ÖZYILDIZ Process Simulation Report for Konya Wastewater Treatment Plant Upgrade (August 2024).* The scope of this task is limited with the final review of design and relevant specifications. KOSKİ will not require an external consultancy for the task. This stage is expected to take three months. Following that, construction tender process will be initiated, which is expected to take eight months. In the meantime, selection process for the construction supervision consultant will start.

After the finalization of the processes defined above, the construction contractor will start construction activities. The construction activities will last for 24 months, and following the commissioning of the plant, the Defect Liability Period (DLP) will start for 12 months.

The commencement of the project is expected to happen in 35 months after the day zero.

The schedule of the project is presented in Table 2-5.

Table 2-5P Project Schedule

Project Activity	1st Year												2nd Year												3rd Year												4th Year												5th Year						
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7
Preparation construction tender documents (by KOSKİ)																																																							
Tender evaluation																																																						
Selection of construction supervision consultant																																																						
Construction phase																																																						
DLP																																																						

2.3.5 Construction Activities

The activities to be performed during the land preparation and construction phase can be summarized as follows:

- Site preparation
- Topsoil stripping and excavation activities for the units to be added
- Construction of reinforced concrete structures
- Transportation of unit components (necessary machinery and tools)
- On site assembly of the units
- Laying the underground pipes
- Electrical works and installation of the control system
- Connection to the system
- Testing and commissioning
- Landscaping.

The construction phase of the project is planned to be completed within two years, including commissioning period required.

The construction activities of the project comprise of rather straightforward construction methodologies and techniques, such as excavation for foundations and underground piping, concrete pouring and finishing, rebar works, backfilling, compaction, and finally landscaping.

After laying the reinforced concrete foundations, the electromechanical works will speed up such as installation of equipments, pipes, and cables required for the relevant units. In the end, all equipment will be connected to the KWWTP's existing SCADA system that enables the operator to remotely monitor and control the entire Plant.

The final stage of the construction works is the test and commissioning phase. In this stage, all installed equipment, both electronical and mechanical, will be tested and commissioned to identify whether any defects. All identified defects will be recorded and reported to the relevant contractor as they will continue to be accountable during the defect liability period (DLP). If the test and commissioning activities confirm that all key units and equipment work properly, there will be no obstacle to operate the plant. It should be noted that the KWWTP's new units would be commissioned as well with minor defects recorded and the relevant contractor instructed for resolution.

With the completion of construction phase, the facility is expected to be in operation until the design year 2040.

The operation and maintenance (O&M) activities will be carried out by the KWWTP employees. The existing workforce is experienced on the day-to-day O&M of a wastewater treatment plant. In any case, due to the new units to be added to the existing plant and new employees to be recruited due to the capacity increase, a set of training will be taken from third parties by all staff for capacity development purposes.

2.3.6 Access to the PProject Site

The access to the project site will be the same as the existing KWWTP. Under the Project, no new roads will be constructed and existing roads within the site will continue to be used.These are shown Figure 2-16.

Figure 2-16. Access Roads to be Used within the project Site

2.3.7 Machinery and Equipment Requirement

Machinery and equipment planned to be used during the land preparation and construction phase are given in Table 2-6 below. It should be noted that the numbers given in the table might change after KOSKİ's design evaluation study.

Table 2-6. Machinery and Equipment Requirement

Machinery/Equipment	Number
Dump Truck	2
Excavator	1
Loader	1
Mobile Crane	1
Truck Mixer	2

2.3.8 Workforce Requirements

KOSKİ estimates that around 300 people will be employed by the project's construction contractor.

For the operation phase, KOSKİ will employ 58 more personnel in addition to its 43 employees working currently for the O&M activities of the existing KWWTP. Thus, the total workforce will reach to 101 during the operation phase.

The construction camp area (please see Figure 2-17) and construction offices will be established in the WWTP area. Within the WWTP area, landscape areas and areas adjacent to internal service roads will be used for this purpose. Therefore, there is no need for land allocation for the construction camp area and construction office. All temporary auxiliary facilities related to the construction will be established within the WWTP area in order to avoid further land-based impacts in accordance with the DB's impact mitigation hierarchy. There is a single point of entry into the facility, and armed private security guards serve at the security point. In addition, security is provided by a camera system along the facility borders. The current application will continue during construction work.

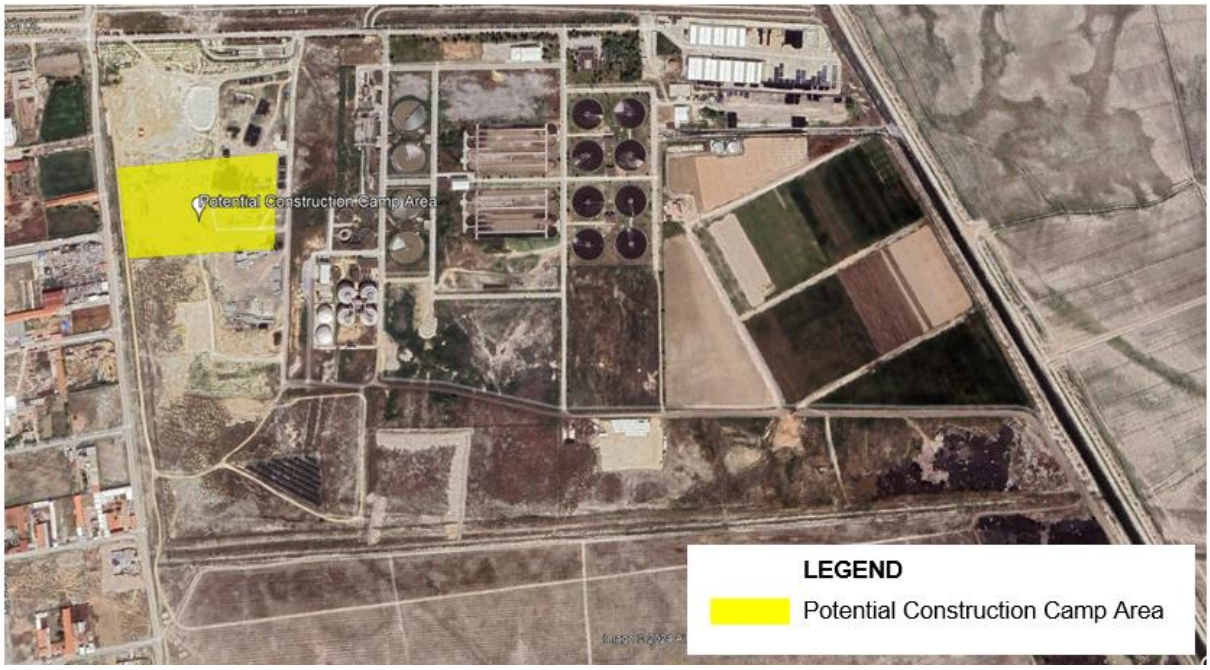

Figure 2-17. Potential Construction Camp Area

2.3.9 Land Requirement

The project will be established in the administrative boundaries of Konya Province, Karatay District, Tatlıcak Neighbourhood comprising block no 0 and parcel no 852 (0/852) and block no 0 and parcel no 938 (0/938). Block no 0 and parcel no 852 (0/852); is the area of the existing KWWTP area and has been registered as WWTP land and owned by Konya Metropolitan Municipality (KMM) Water and Sewerage Administration (KOSKİ) since 2009.

Since both parcels are owned by KOSKİ, the project will be established and operated in block no 0 and parcel no 852 (0/852) and block no 0 and parcel no 938 (0/938) and no landland has been or will be acquired for the project. .Ttitle deed registers the project area (block no 0 and parcel no 852 (0/852) and block no 0 and parcel no 938 (0/938) parcel are provided in Annex C.

3 INSTITUTIONAL AND LEGAL FRAMEWORK

This chapter briefly summarizes the institutional and legal framework, national and international standards and guidelines including EU legislation applicable to the Project. For further information please refer to Annex R.

3.1 Institutional Framework

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/settlements) according to geographic and economic conditions, and the need for public services.

Ministries are the units of central administration. Local branches of ministries area composed of provincial organizations attached to governors and district organizations attached to the district governors.

At the local level, municipality mayors and the headmen of the villages/neighbourhoods (muhtar) are the representatives of the administrative structure.

KOSKİ, the final beneficiary of this project, provides water and wastewater services across the entire Konya province, not just the city center, due to its status as a metropolitan municipality. Operating with an independent budget, KOSKİ functions as a public legal entity under KMM. The KOSKİ Board of Management is led by the Mayor of KMM and includes the General Manager and Deputy Manager with the longest tenure, as well as three members nominated by the mayor and approved by the MoEUCC. The general assembly of KOSKİ meets at least biannually to review the financial results and activities of the previous fiscal year, and to make decisions on the annual budget, investment programs, and tariffs for the upcoming year.

3.2 Applicable Turkish Legislation

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

Pursuant to Article 9 of the By-Law of Environmental Permit and License published in the Official Gazette dated 10.09.2014 and numbered 29115, the Environmental Permit Certificate on Air Emission, Noise Control and Wastewater Discharge numbered 224573890.0.1 with a start date of 30.07.2019 was obtained to be valid until 30.07.2024 has been presented in Annex D. Pursuant to Article 11 of the same By-Law, the process for renewal of the Environmental Permit and License Certificate is ongoing. While this process is ongoing, a Provisional Operating Certificate has been received and is presented in Annex-Y.

During the project design phase, the Project Approval of Wastewater Treatment Plant, which must be obtained from the Ministry of Environment, Urbanization and Climate Change in accordance with current legislation, has also been received and is presented in Annex-U.Complementary to the Environmental Law and its regulations, the laws listed below also govern the protection and conservation of the environment, prevention and control of pollution, implementation of measures for the prevention of pollution, health and safety, and labor issues:

- Electricity Market Law (No: 6446)
- Energy Efficiency Law (No: 5627)
- Expropriation Law (No: 2942)

- Forestry Law (No:6831)
- Groundwater Law (No: 167)
- Labour Law (No:4857)
- Law on the Conservation of Cultural and Natural Assets (No:2863)
- Law on Improvement of Olive Cultivation and Budding of Wild Species (No:3573)
- Law on Soil Protection and Land Use (No:5403)
- Mining Law (No:3213)
- Municipality Law (No: 5393)
- National Parks Law (No: 2873)
- Pasture Law (No:4342)
- Public Health Law (No: 1593)
- Resettlement Law (No: 5543)
- Traffic Law (No: 2918)
- Occupational Health and Safety Law (No: 6331)
- Expropriation Law (No: 2942)

Several key legislations for the project are the Water Pollution Control Regulation (WPCR) and Urban Wastewater Treatment Regulation (UWTR). The criteria to be followed by the Project is Class-2 discharge standards. The limits are provided in Table 3-1 and Table 3-2.

Table 3-1 Discharge limits for secondary treatment from urban wastewater treatment plants* (UWTR Table 1)

Parameter	Concentration (mg/l)	Minimum treatment efficiency (%)
Biochemical oxygen demand without nitrification 3(BOD5 at 20ºC)	25	70-90 40 Article 8(c)
Chemical oxygen demand (COD)	125	75
Total suspended solids (TSS)	35 **35 Article 8 (c)** **(more than 10000 E.P.)**	904 **90 Article 8 (c)** **(more than 10000 E.P.)**

3 If a correlation can be established between BOD_5 and the replacement parameter, this parameter can be replaced by another parameter: total organic carbon (TOC) or total oxygen demand (TOI).

4 This requirement depends on the size of the settlement.

Parameter	Concentration (mg/l)	Minimum treatment efficiency (%)
	60 Article 8 (c) (2000-10000E.P.)	70 Article 8 (c) (2000-10000 E.P.)

* Concentration values or treatment efficiencies will be applied.

Table 3-2 Discharge limits for advanced treatment from urban wastewater treatment plants (UWTR Table 2)

Parameter	Concentration (mg/l)	Minimum treatment efficiency (%)
Total phosphorus	2 mg/l P (10000-100000 E.P.) **1 mg/l P** **(more than 100 000 E.P.)**	80
Total nitrogen	15 mg/l N (10000-100000 E.P) **10 mg/l N** **(more than 100 000 E.P.)**	70-80

3.3 International Conventions

A list of relevant conventions ratified by Türkiye that are relevant for the environmental and social aspects is presented in the Annex R of the report.

3.4 EIA Process under Turkish EIA Regulation

Article 10 of Environmental Law forms the main framework of the Environmental Impact Assessment (EIA) Regulation published in the Official Gazette No. 31907 dated 29.07.2022. As per the EIA Regulation, EIA applications are carried out for identifying the positive and negative impacts of the projects planned to be implemented, for assessing the precautions to be taken to prevent negative impacts or minimize them in a way that will not harm the environment by determining the location and the alternative technologies and for monitoring and checking the implementation of the projects.

The EIA process defines the process that includes the application, and the preconstruction, construction, operation, and post-operation works for performing the environmental impact assessment of the planned project. EIA is the process that starts with the presentation of the reports in which all the specified aspects of the projects are expressed and ends with the decision of the MoEUCC.

Unless the decision that “EIA is Positive” or “EIA is not Required” is made for projects subject to the EIA Regulation, incentive, approval, permit, building license and use permit for such projects cannot be granted, and no investment can be started or tendered for the project. However, this does not preclude applying for the processing of such incentives, approvals, permits, and licenses. As part of the European Union membership process, Türkiye has carried out a variety of organizational and legislative reforms. With these reforms, environmental legislation and environmental protection instruments have been harmonized with international standards. The activities and liabilities to be carried out within the scope of the Project must adhere to the provisions of the relevant Turkish legislation.

The Project falls under the list given in the Annex-1 of the EIA Regulation as "*15- wastewater treatment plants with a capacity over 50,000 m³/day*". Therefore, a full-scale EIA is required for the Project. Therefore, a full-scale EIA is required and completed with the receipt of the "EIA Positive Certificate" dated 20.04.2021 and numbered 6265 for the Project. This EIA Decision covers only the block no 0 and parcel no 852 (0/852). However, some time after the EIA Approval decision was taken, a part of the ventilation pool no. 8, seen on the Layout given in the Final EIA report, which formed the basis of the said decision, had to be forced to enter to block no 0 and parcel no 938 (0/938), due to the necessity arised during the detailed project studies. The owner of block no 0 and parcel no 938 (0/938) is also KOSKİ. Consequently, an opinion was obtained from the General Directorate of Environmental Impact Assessment, Permitting and Inspection of the Ministry of Environment, Urbanization and Climate Change on 27.12.2024 regarding the validity of the EIA Positive Decision in case the mentioned block no 0 and parcel no 938 (0/938) is used. noThe authority's opinion that the EIA Positive Decision also covers the block no 0 and parcel no 938 (0/938) is presentedpresented in Annex-R.

3.5 Project Categorization

According to the World Bank's ESF, projects are classified into one of four classifications as High Risk, Substantial Risk, Moderate Risk or Low Risk taking into account relevant potential risks and impacts, such as the type, location, sensitivity and scale of the project; the nature and magnitude of the potential environmental and social risks and impacts; the capacity and commitment of the Borrower; and other areas of risks that may be relevant to the delivery of environmental and social mitigation measures and outcomes.

The overall risk of the WCEIP is evaluated by İLBANK WCEIP ESMF in terms of Environmental and Social Risk Classifications and accordingly overall risk assessment is rated as "Substantial", since both environmental and social risk ratings are both "Substantial". The relevant evaluation criterias are presented below.

As per the evaluation of the environmental risks of the project the following isssues were taken into consideration. The project's environmental risk is mainly attributed to the type and sclae of the project activities (wastewater collection, treatment and reuse for agriculture, construction of new irrigation schemes and modernization/rehabilitation of existing schemes), and their wide geograpghic coverage of different basis. The long-term environmental impacts of the project activities are expected to be positive as they will result in improved wastewater treatment system and irrigation services. However, potential adverse environmental risks and impacts are also expected and are mainly associaieted with the civil works for the construction of wastewater collection and WWTP's and the construction and modernization of irrigation schemes, installation of smart water meters to the piped irrigation systems, as well as their operation and mainatenance.

As per the evaluation of the social risks of the project the following isssues were taken into consideration. The project will have a positive impact over the medium and long term in ensuring more efficient and suitable use of water sources. Howeveri during construction and operation stages, the investment carries substational social risk: Social tension and resistance regarding the siting of WWTP due to lack of adequate stakeholder engagement, adverse impacts to disadvantaged / vulnerable communities depending on the siting choises, labor and working conditions risks during construction, community health and safety risks during construction and operation, SEA/SH risks during construction depending on the size and sourcing of the workforce and risks relating to inadequate stakeholder engagement and grievance management. On the other hand, rehabilitation and modernisation of the existing project can pose the following risks; labor and working conditions risks during construction, community health and safety risks during construction and operation, SEA/SH risks during construction based on workers travelling to remote / rural areas, risk regarding ability to pay

based on installation of new water meters, risk regarding willingness of farmerd to use reclaimed wastewater, and risks relating to inadequate stakeholder engagement and grievance management.

While the activities within the scope of WCEIP are expected to enhance the environmental and social conditions in their impact area, they also carry potential risks and impacts. These include issues related to waste generation, indirect effects on ecosystems and habitats, noise, vibration, and other risks detailed in other sections of this ESIA study. This study has been conducted in alignment with the risk categorization provided by the ESMF.

TheThe Project is categorized as “Substantial” according to WB ESF. Therefore, this ESIA study has been prepared in line with national legislation and WB ESSs.

3.6 International Standards, Legislation and Guidelines

The project will need to adhere to the following standards (collectively referred to as the “Relevant Standards”):

- The World Bank (WB) Environmental and Social Framework (ESF)
- WB Environmental and Social Standards (ESSs)
- EU Environmental, Social and OHS Directives
- Conventions and treaties ratified by Türkiye
- International Standards (ISO 14001, ISO 45001, etc.)
- Good International Industry Practices (GIIPs)
- WB Group General and Sectoral Environmental, Health and Safety (EHS) Guidelines
    - WGB General EHS Guidelines
    - WBG EHS Guidelines for Water and Sanitation
    - WBG IFC/EBRD Guidance on Workers’ Accommodation (applicable if accommodation will be provided by the construction contractor)
- ILBANK Environmental and Social Management System (ESMS).

3.6.1 World Bank Environmental and Social Standards

The WB Environmental and Social Standards (ESSs) set the requirements to be met by Borrowers with respect to the identification, evaluation and mitigation of social and environmental risks and impacts associated with projects supported by the Bank through Investment Project Financing. Nine out of the ten ESSs establish the standards that the Borrower and the project will meet through the project life cycle, as follows:

- ESS1: Assessment and Management of Environmental and Social Risks and Impacts
- ESS2: Labor and Working Conditions
- ESS3: Resource Efficiency and Pollution Prevention and Management
- ESS4: Community Health and Safety
- ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement

- ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities
- ESS8: Cultural Heritage
- ESS9: Financial Intermediaries
- ESS10: Stakeholder Engagement and Information Disclosure

ESS7 “Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities” and ESS9 “Financial Intermediaries” are not assessed within the scope of this study as there are no indigenous groups in Türkiye that meet the definition provided in ESS7, and the requirements of ESS9 will be followed by İLBANK while KOSKİ will only provide assistance to İLBANK on its implementation.

The details on World Bank ESF and ESSs can be found in Annex R.

3.6.2 İLBANK WCEIP Environmental and Social Framework and Environmental and Social Management System

The other key framework followed in this ESIA Report and to be followed by KOSKİ is the WCEIP’s Environmental and Social Management Framework (ESMF), Labour Management Plan (LMP) and Stakeholder Engagement Plan (SEP). The details can be found in Annex R.

ILBANK has established an Environmental and Social Management System (ESMS) effective on 24th of Dec 2023. The ESMS is aimed at ensuring systematic identification, assessment, management, monitoring, and reporting of the environmental and social (E&S) risks and impacts of the projects and subprojects financed by the International Finance Institutions (IFIs). Since Sub-loan Agreement signed after the effective date, this process will be implemented on an ongoing basis after signature with the Contractor in line with the requirements of the national legislation, international agreements and conventions ratified by Türkiye and E&S standards of lending IFIs (World Bank for the WCEIP). As a critical element of the ESMS, ILBANK has adopted and published (*https://www.ilbank.gov.tr/sayfa/ilbank-environmental-and-social-policy*) an E&S Policy applicable to all ILBANK projects and subprojects financed through IFIs. ILBANK ESMS Project Cycle will not be fully applied to the project, but ILBANK ESMS will be applied for Supervision, Monitoring and Reporting Procedure. Environmental and Social Supervision, Monitoring and Reporting Procedure will be followed through E&S Performance Periodic Monitoring Reports, E&S Incident Notification Form and E&S Incident Investigation Form. Since Project is classified as a Substantial Risk Project, E&S Performance Periodic Monitoring Report will be presented quarterly during construction and semi-annually in the first 2 years and annually afterwards (Subject to approval by ILBANK based on the monitoring outcomes of the first 2 years) during operation (Post final acceptance, throughout the sub-loan duration). E&S Performance Periodic Monitoring Report will be presented after finalization of bidding process.

**https://www.ilbank.gov.tr/sayfa/ilbank-environmental-and-social-policy*

The information to be provided as part of reporting for the respective monitoring period will include the following:

- Up-to-date information on the project and progress with project implementation (e.g. status of construction, project timeline, etc.),
- Status of compliance with legal requirements (e.g. project permitting status, status and outcomes of audits done by national authorities, fines imposed by national authorities if any, etc.)
- Details of how the requirements of the IFI standards (e.g. WB ESSs) are being met on the basis of compliance with the project level Environmental and Social Management Plan,
- Incident and accident reports and statistics,
- Current project level E&S organization and capacity (including information on capacity building and training),
- Progress with project level stakeholder engagement activities and management of grievances, and
- Records on E&S non-conformities identified and general status of Corrective Action Plan implementation at project level (in case of non-conformities).

Sub-borrower will notify the ILBANK RD – E&S Teams of any significant E&S incident or accident within maximum 24 hours of the accident/incident through E&S Incident Notification Form. For significant accidents or incidents, a detailed E&S Incident Investigation Form will be submitted to ILBANK within 30 calendar days of the accident/incident date. The investigation will be supplemented by a Root Cause Analysis (RCA) to be conducted pursuant to good international industry practices (GIIPs). Templates of E&S Incident Notification Form and E&S Incident Investigation Form are presented in Annex T and Annex V, respectively.

The notification will include the following information:

- A description of the E&S incident or accident in sufficient details including any fatalities or serious injuries such as lost time incidents, etc. with any supporting visual material (photographs, sketches, etc.)
- Parties involved in and affected by the E&S incident or accident
- Status of immediate actions and measures required to be taken by the sub-borrower and/or contractors (including regulatory requirements such as notification of related authorities)
- Actions and measures to be taken within a defined timeframe to prevent any recurrence in the respective project or other projects of the sub-borrower financed by ILBANK through IFIs (if any)
- Documentation/records related to E&S management aspects to the extent they are relevant to the E&S incident/accident (e.g. relevant management plans and procedures in place, training records of involved project personnel, OHS certifications of the involved personnel, visual materials related to the immediate actions taken, etc.)

3.7 Project Standards:

ESIA studies of the Project will be carried out in accordance with relevant TürkiyeTürkiye and international legislation as well as relevant environmental and social standards and guidelines and more stringent project standard will be selected as project standard.

4 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS

4.1 Land Use, Soil, Geoloogy, and Natural Hazards

To determine baseline conditions of land use and geology of the project area, the following data sources have been used:

- The land cover database of the Coordination of Information on the Environment (CORINE, 2018)
- Preliminary geological and geotechnical surveys provided in the Project national EIA Report
- Public governmental databases and literature review
- General Directorate of Mineral Research and Exploration (MTA, Geoscience Portal)
- Disaster and Emergency Management Presidency of Türkiye (Earthquake Research Department database)
- Disaster and Emergency Management Presidency of Türkiye (Natural Disaster Databank of Türkiye)

4.1.1 Land Use

The project area is located at Konya Province, Karatay District, Tatlıcak District, Saadet Caddesi No: 42 block no 0 and parcel no 852 (0/852) and block no 0 and parcel no 938 (0/938))) and there are agricultural lands starting from the parcel boundaries. In the scope of the Project, parcel no 852 (0/852) will be used for the locations of theunitsthe units to be rehabilitated and fortfor the planned sludge storage area (see Figure 2-13).). On the other hand, parcel no 938 (0/938) will be used for hethe temporary sludge storage till realization of the new 20,000 m2 temporary storage area which is located in the existing KWWTP area boundaries .

As mentioned in *Section 2.3.9,, f*or most of the project units will be established in the existing KWWTP area located in block no 0 and parcel no 852 (0/852). Additionally, for the aeration pool number 8 and temporary sludge storage araea block no 0 and parcel no 938 (0/938) will be used. The owner of both parcels in block no 0 and parcel no 852 (0/852) and block no 0 and parcel no 938 (0/938) is KOSKİ. For this reason, KOSKİ applied to MoEUCC and asked for an opinion on the validity of the “EIA is Positive” decision taken for the project with the entering of a part of the aeration pool no. 8 to block no 0 and parcel no 938 (0/938) and obtained a positive opinion regarding with the “EIA is Positive” decision in question to include block no 0 and parcel no 938 (0/938) (Pls. see annex E).

The treatment sludge to be generated during the operational phase of the project will be used for agricultural purposes, as is currently practiced. In line with this, a permit renewal application was submitted by KOSKİ to the Provincial Directorate of Environment, Urbanization and Climate Change with the letter dated 13/01/2025 and numbered E-20824400-220.04.02-92632. In response, the Konya Provincial Directorate issued a letter numbered E-684495568-110.03.01-11756064 (see Annex N), establishing a commission and requesting that soil and treatment sludge samples be collected by authorized laboratory personnel under the supervision of the Directorate and submitted along with the analysis results. These sampling and analysis activities were conducted by an accredited laboratory, and the permit process has been successfully completed.

In line with permit requirements, in accordance with Article 8, paragraph 2, subparagraphs (c) and (ç) of the relevant regulation, for agricultural lands permitted for sludge application (i.e.,

where the concentration of heavy metals in the soil exceeds 50% of the limit values stated in Annex I-A), soil sampling and analysis will be carried out every twelve months. In addition, sludge samples will be collected every six months and analyzed for the parameters specified in Annexes II-A and II-B of the regulation. The results of these analyses will be submitted to the Provincial Directorate of Environment, Urbanization and Climate Change. A new 20,000 m² temporary sludge storage area has been designated within the existing boundaries of the KWWTP (see Figure 2.12 and Figure 2.13) and will be used for storage during the operational phase of the project.

In case the sludge is not deemed suitable for agricultural use based on laboratory analysis or regulatory requirements, or the sludge is not demanded by farmers for agricultural use, dewatered sludge will be stored temporarily and further dried in the temporary sludge disposal area (see Figure 2 11, Figure 2 12 and Figure 2 13), and it will be transported by licensed transportation vehicles for final disposal to the Konya Sanitary Landfill when it reaches 50% dryness rate (see Annex O for official acceptance document). If dewatering of the sludge would not be achieved in the desired amount, the sludge will be transported by licensed transportation vehicles for final disposal to the existing incineration facility within the Konya Sanitary Landfill. The protocol regarding incineration, which has a capacity covering the amount of sludge to be generated from the 1st and 2nd stage facility and whose validity date is the end of 2059, is included in Annex P.

A comprehensive Sludge Management Plan will be prepared prior to the commissioning of the treatment plant. This plan will define the sustainable procedures for sludge management and final disposal. It is also known that the project area used to be a swamp. There is no vegetative soil on it. Relevant maps (Topographical Map with scale of 1/25,000 and Territorial Plan with Scale of 1/100,000) are given in Annex F and Annex G. The ppoject area is seen within the boundaries of "partly Urban and Regional Social Infrastructure Area, partly Third Degree Road, partly Military Prohibition and Security Zone" in the 1/100,000 scale Territorial Plan. The project area is located in the "Urban and Regional Social Infrastructure" area.

The project area has no interaction with the protected areas defined in the legislation:

- Sensitive Regions
- National Parks
- Natural Parks
- Wetlands
- Natural Monuments
- Nature Conservation Areas
- Wildlife Protection Areas
- Wild Animal Habitation Areas
- Cultural Heritage
- Natural Assets
- Areas Protected under to the Bosphorus Law
- Biogenetic Reserve Areas
- Biosphere Reserves
- Special Environmental Protection Areas

- Special Protection Areas
- Protected Areas Related to Drinking and Domestic Water Resources, Tourism Areas and Centers
- Protected Areas - Other Areas.

4.1.2 Soil

The soil composition in Konya Province comprises various soil groups, each with different percentages of coverage. Alluvial soils account for 13%, followed by hydromorphic alluvial soils at 1.9%, and colluvial soils at 5.8%. Other soil types include saline sodic soils (0.4%), organic soils (0.01%), brown forest soils (5.2%), lime-free brown forest soils (5.4%), chestnut soils (0.7%), red chestnut soils (6.3%), red Mediterranean soils (0.9%), red brown Mediterranean soils (9.8%), brown soils (19.6%), red brown soils (16.8%), lime-free brown soils (1.2%), cyerosome soils (0.9%), and regosol soils (2.6%).

The project area is characterized by hydromorphic saline alluvial soil, presenting low suitability for agriculture, a gentle slope of 0-1%, a topsoil thickness of 20-30 cm, and predominantly clayey calcareous, brownish gray, and pale olive soil. The area is marked by the presence of salt crystals, with the lower soil layer exhibiting various colors from light gray to olive between calcareous clay loam and clay. The main soil component is alluvium, ranging from sandy to clayey, often calcareous. The soil depth, crucial for root development, is substantial, but the excessive bottom water limits plant root expansion and subsequently reduces yields. The large soil groups map of Karatay district, including the project site is presented in Figure 4-1.

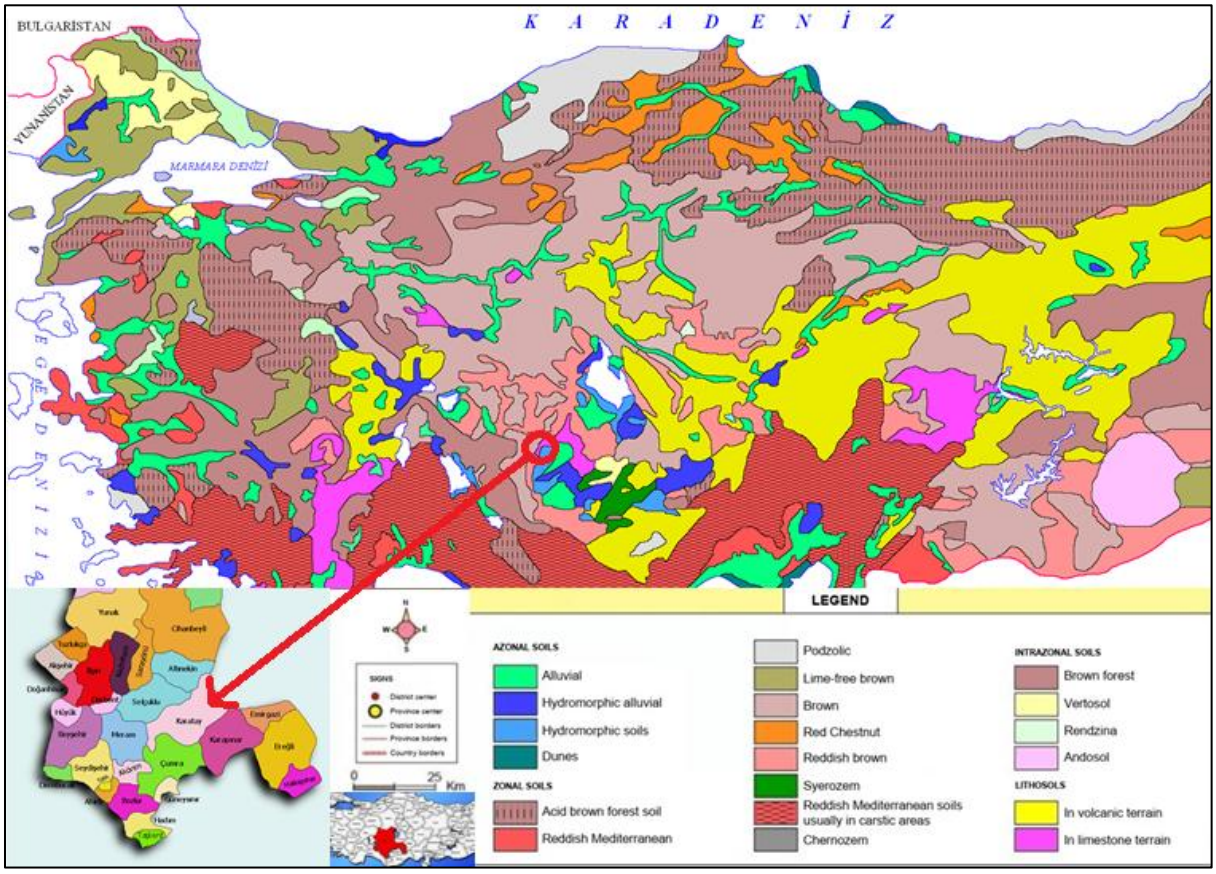

Figure 4-1 Large Soil Groups of Karatay District

The project area is seen as brown land according to the former Ministry of Agriculture, Forestry and Rural Affairs General Directorate of Rural Services (currently MoEUCC), Konya Province Land Existence and the Map of Land Availability for Agricultural Use, and its agricultural use status has been determined as Class IV.

The Class IV land is the land class that is especially suitable for permanent allocation to pasture. Occasional field crops may also be grown. Excessive slope, erosion, bad soil characteristics and climate are the limiting factors for agriculture on this class of soil. Slightly sloped soils with poor drainage are also imported into the fourth class. They are not subject to erosion, but they are not suitable for growing many crops as they dry out suddenly in the spring and their productivity is low. In semi-arid regions, it is generally not possible to implement rotation systems containing legumes on fourth class lands due to climate.

On the Project footprint, the historical contamination status of the site is unknown to the ESIA consultant as of the reporting date. Therefore, relevant measures are developed and presented in ESMP and Chapter 9.

4.1.3 Geology

This section presents the geological characteristics of the project site and its surroundings. The brief information presented here is obtained from the Project's national EIA Report and geological investigations carried out by General Directorate of Mineral Research and Exploration (MTA) of Türkiye.

Konya province is a part of the Main Tectonic Units of Türkiye and the central section of the Taurus Union. This union is composed of masses that were superimposed due to compression forces, which formed during the late Cretaceous Paleocene.

Within the boundaries of Konya, significant masses like Bozkır, Geyikdağı, and Aladağ are observed. Paleozoic (first era) aged rock units are the oldest rocks in the region, found in the Bozkır, Hadim, Seydişehir, Akören, Ahirli, Beyşehir, Doğanhisar, and Kadınhanı regions, both within the Taurus belt and the Central Anatolian Union. Mesozoic (second era) aged rocks, often an extension of Paleozoic aged units, are prevalent in Ereğli, Bozkır, Seydişehir, and extend to Ahirli, Akören, Altınekin, Kadınhanı, Beyşehir, Akşehir, Ilgın, and Doğanhisar regions.

During the Tertiary era, the sea and lagoon sediments were concealed by widespread volcanic activities, along with older units. Marine sediments can be observed around Ereğli and Çumra. The region, including Konya and its surroundings, started to experience collapsing due to block faults during the Late Miocene (10 million years ago) Pliocene. This collapse led to the formation of a substantial lake, the remnants of which we see today as Akgöl and Hotamış Lake. Over time, this lake was filled with terrestrial sediments, shaping the landscape as we know it today.

The plains of Ereğli, Karapınar, Cihanbeyli, Kulu, Sarayönü, Kadınhanı, Konya center, and surrounding districts, as well as Çumra Plains, emerged from debris carried by floods originating from the Taurus Mountains' foothills in the south. The topographic slope increases from north to south, and the flood-borne debris is approximately 15 meters thick. Groundwater can be found between 20-100 meters in various parts of the region, sometimes even making artesian appearances. The Ereğli Plain, running northeast to southwest, is covered with Quaternary-aged alluviums, which overlay the underlying aged formations with angled dissonance. The alluvium is mainly composed of clay, sand, gravel, and silt, with varying dominance across different regions. For instance, clay is dominant in the central and western parts, while sand and gravel dominate the eastern part.

The thickness of the alluvium does not exceed several meters and reaches a maximum of 10 meters. In the north, the alluvial thickness decreases, and the region's geological composition comprises various formations, each with distinct characteristics and ages. The stratigraphy of the area is delineated by formations such as Lorasdagi Formation, Emirhan Formation, Kızılkuyu Formation, Beşyüzevler Formation, Aslımyayla Formation, Migration Formation, and Shakyatan Formation, each contributing to the geological richness of the region.

TheThe Geological Map (1/25.000 Scale) of the project Area is given in Figure 4-2 Geological Map of the project Area.

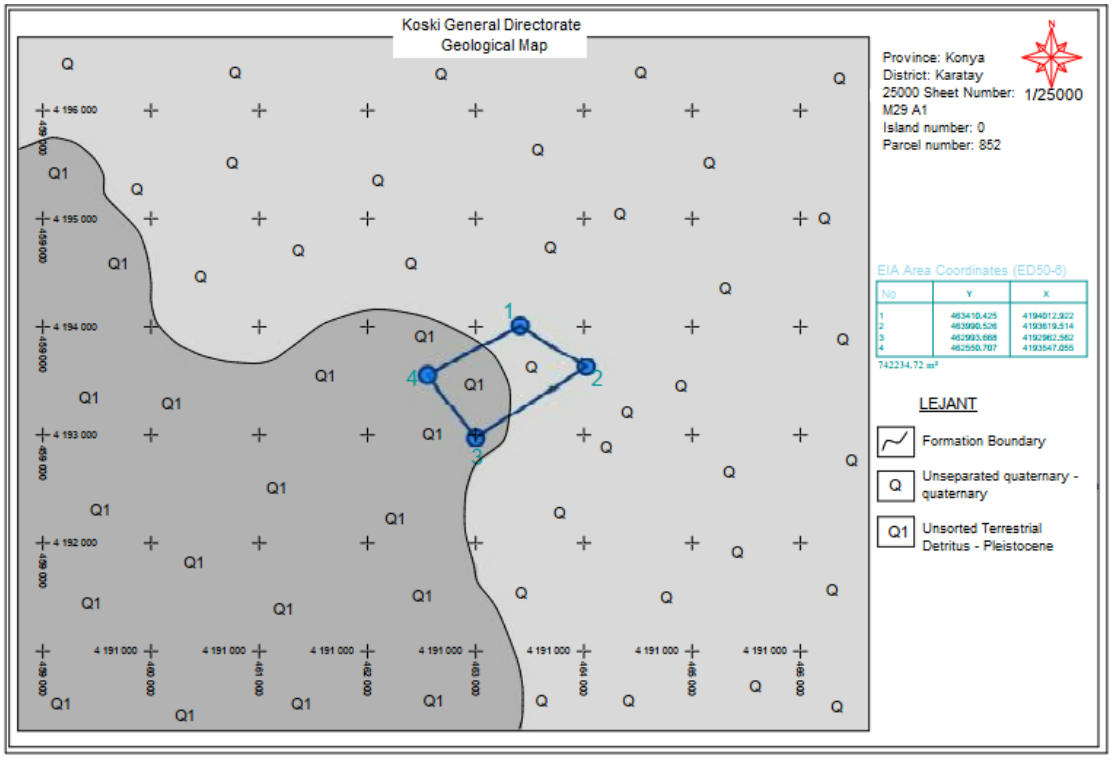

Figure 4-2 Geological Map of the project Area

Project Area Geological Investigation

Mesozoic and tertiary aged units outcropping in and around the study area are briefly mentioned below:

Konya Formation (QK): Consists mainly yellowish-brown, little attached siltstone, sandstone and conglomerate. Although siltstones form the main rock type, they contain sandstone interlayers and towards the west, in front of the elevation formed by thr units older than Quaternary, comglomerates gradually dominate.

Topraklı Formation (TQt): Observed in less rough flat areas in the region. The formation lithologies consist of brown colored conglomerate, gravel, sand muddy levels. Caliche formation is obderved in some areas.

Erenlerdağı Vulcanite (Tsu): Consists of pinkish dacite, grey greenish andesite and black colored gaseous basalts. It is in the form of andesite with vitrophyric-porphyric texture, andesite

with hypo crystalline texture with pyroxene and basalt with hypo crystalline texture with pyroxene.

Küçükmuhsine Formation (Tk): Neogene sequence in the form of grey, white cream and pinkish colred tuff, tuffite, volcanic breccia, volcanic sandstone alternation in the study area was defind as Küçük muhsine formation. The tuffites in the study area show very rare bedding and are generally massive and have formed morphological shapes resembling fairy chimneys due to their different resistance to abrasion.

Ulumuhsine Formation (Tu): Consits of grey-beige cream colored limestone, marl, and oncolite limestones, was studied within the “Dilekçi Formation” and named as Ulumuhsine limestone member. The rocks of the formation are limestone and oncolytic limestones. In addition marl, clayey limestone and mudstones are observed. The dominant lithologies of Ulumuhsine formation are composed of cream-colored limestones.

Hatip Ophiolite Mixture (Mzh): Consists of matrix of mostly serpentinized ophiolitic rozks, pelagic limestones, radiolarites, basalt and spilite pyroclastics, flysch deposits, and mappable limestone bloacks in the matrix.

İkisivritepe Olistolite (Mzhi): Of the lithologies found in the Hatip ophiolite complex, only the limestone blocks are mappable. The bloacks outcrop in the north and south of the study area. Limestone blocks can be observed almost everywhere in the melange and these blocks are floating in the mixed.

Besides, a site investigation study has been performed for the in the scope of the Project Identification Report in January -February 2020 to understand the ground conditions of areas where treatment plant units shall be constructed.

4.1.4 Natural Hazards

Seismicity

The official Türkiye Earthquake Hazard Map is given Figure 4-3. The project area is at the ground acceleration limit of 0.0 - 0.1 (g) and is in the low hazard risk class.

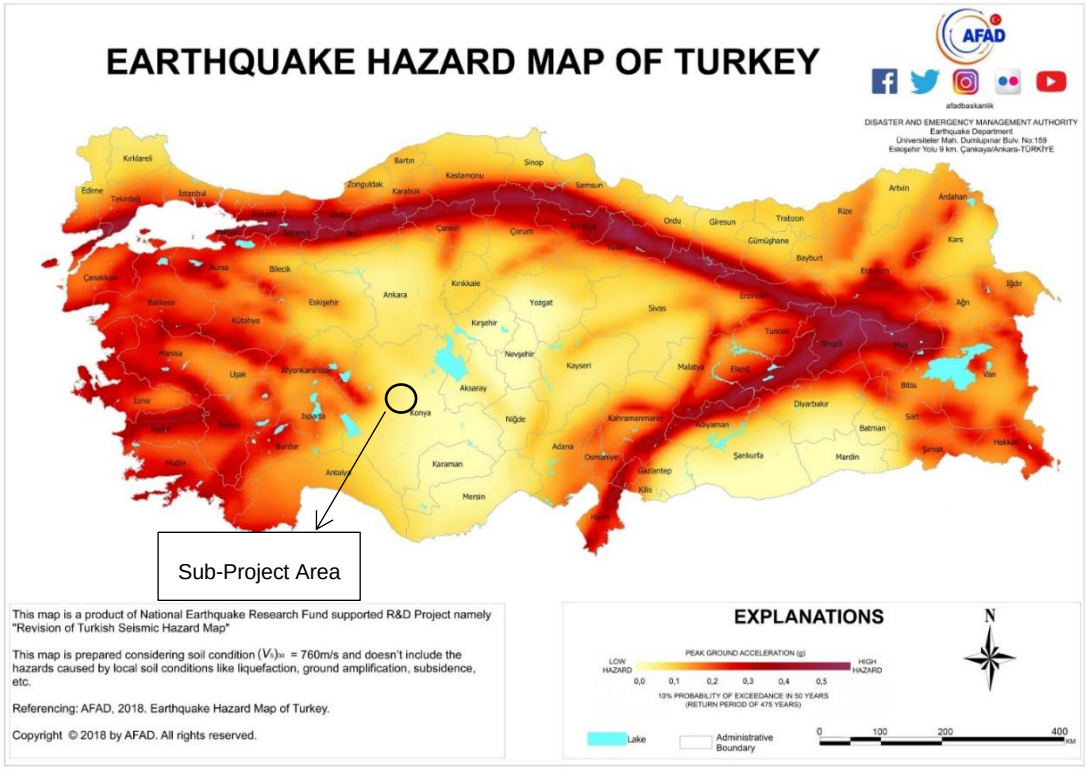

Figure 4-3. Earthquake Hazard Map of Türkiye

According to the data obtained from Disaster and Emergency Management Authority (AFAD), Türkiye Earthquake Hazard Maps Interactive Web Application, the closest fault line to the project area is located at 8 km north (*see* Figure 4-4).

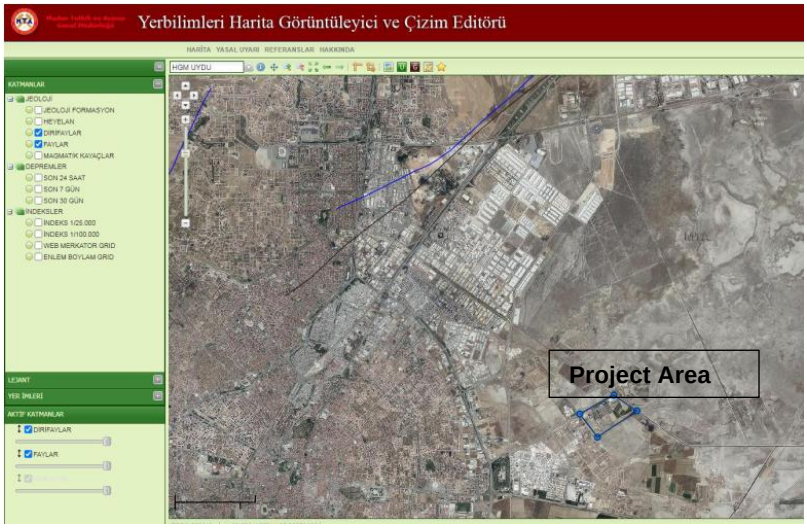

Figure 4-4. Distance of the PrProject Area to Fault Lines

Landslide

The facility has a flat surface, there is no risk of landslides around the facility.

Avalanche

There is no recorded avalanche in the region.

Hail

When historical catastrophic events in the region are examined, the hail events were occurred various times and there were minimal damage to vegetable and grain cultivated areas.

Storm

When historical storm events were examined in the region, storms were occurred varios times and destroyed some chimneys of houses, blew away some tiles, and broke some trees.

Fog

There are no recorded extreme fog events in the region.

Flooding – Flash Flood

There are no recorded flooding/flash flood events in the region.

Sinkhole

During the Ground Survey studies, no sinkhole formation was observed as a result of 15 Seismic Refraction with 57.5 meters opening, 5 Microtremor and 13 Electrical Resistivity Tomography (ERT) measurements.

4.2 Air Quality

4.2.1 Baseline Air Quality

Air quality measurements are performed instantly by means of air quality monitoring stations that are located different regions all over the country. National Air Quality Monitoring Stations (AQMSs) automatically record air pollution data, and the data[5] is presented though the national air monitoring network of the MoEUCC.

There are ten (10) AQMSs in Konya Province. The locations of the AQMSs close to the project area isis given in Figure 4-5. Of these 10 AQMS, only the data of the stations close to the project area are presented in this section. The average concentrations of parameters monitored by AQMSs for the last 5 years is given in Table 4-1.

5 http://sim.csb.gov.tr/SERVICES/airquality

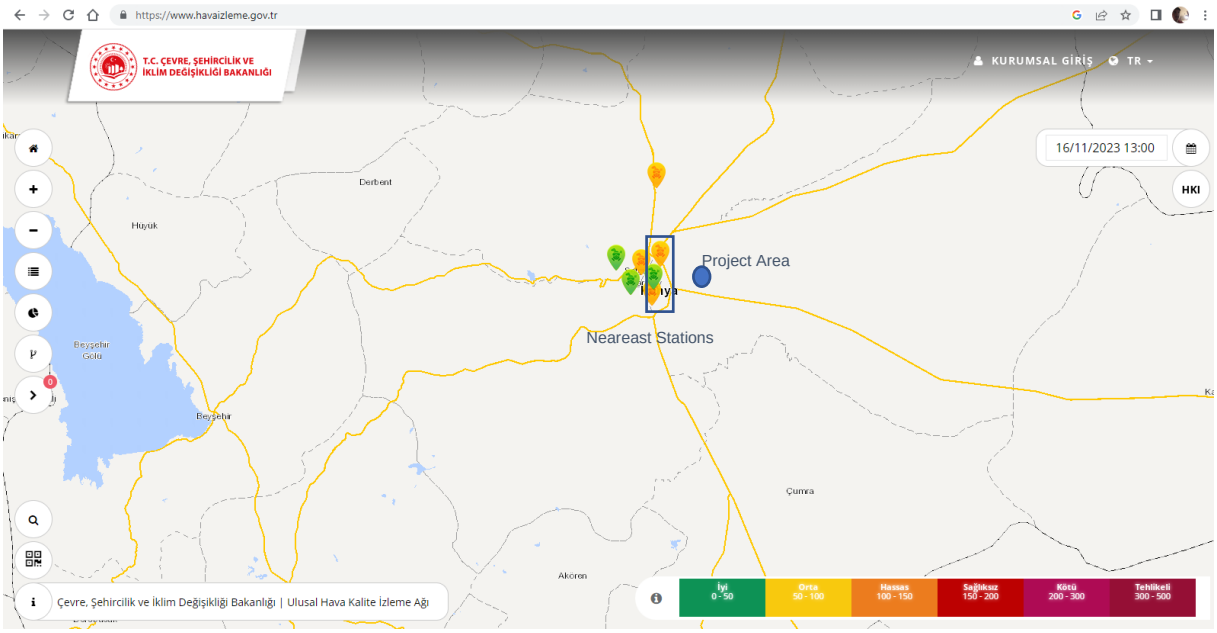

Figure 4-5. Locations of the AQMSs around the PProject area

Table 4-1. Average Concentrations for Last 5 Years (2018-2023)

AQMS	Average concentration of last 5 years (µg/m^3)						
	PM_{10}	$PM_{2.5}$	SO_2	NO_2	Nox	NO	O_3
Karkent	62.83	32.80	7.90	-	82.73	43.36	28.53
Karatay 1	67.91	-	19.27	41.73	64.67	22.25	32.87
Karatay 2	-	-	9.97	29.34	48.40	20.24	19.62
Limit Values							
Turkish AQAMR	50	-	125	40	30	-	120
WBG Guideline	50	25	20	40	-	-	100

In addition to the data recorded by AQMSs, $PM_{2.5}$ and PM_{10} background measurements have been conducted between 27.10.2023 and 28.10.2023 by Çınar Laboratory. Measurement points were determined at 3 points within the circle with a radius of 2 kilometers determined as the project's area of influence. Measurements were made for each point and for a total of 24 hours. The locations of the determined measurement points are as follows:

- 1st Measurement Point: KWWTP Entrance (Security)
- 2nd Measurement Point: Konya Metropolitan Municipality Support Services building
- 3rd Measurement Point: Konya Pumping Center-1 (TM-1) point

According to the Konya Metropolitan Municipality 1/1000 Zoning Plan, the area around the project site is divided into industrial areas. Measurement Points are shown in yellow in Figure 4-6. The coordinates of the measurement points are provided in Table 4-2.

Figure 4-6. Measurement Points

Table 4-2 Ambient Air Quality Measurement Points

Measurement Point	Coordinates	
	East	North
MP – 1	462517	4193358
MP – 2	462261	4191588
MP – 3	465195	4192526

PM2.5 and PM10 measurement results are given in Table 4-3Moreover, the report belonging to background measurement is given in Annex H.

Table 4-3. $PM_{2.5}$ and PM_{10} Measurement Results

Measurement Point	Measurement Date	Measurement Results		Limit Values	
		$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}
MP-1	27.10.2023	5068.38	7380.30	-	50
MP-2	27.10.2023	5071.68	5566.05		
MP-3	27.10.2023	447.24	768.22		

When the measurement results were examined, it was seen that the results were much higher than the limit values. Therefore, Çınar Laboratory, which made the measurements and calculations, was contacted and although the measurement results were requested to be recalculated, Çınar Laboratory renewed that there was no error in the measurement results.

One of the biggest reasons for the high background dust measurement results is that the construction works of the industrial areas immediately surrounding the existing treatment facility have started and continue. At the 1st and 2nd measurement points, background dust measurements were high due to the high instantaneous measurements as a result of the transport of excavation by trucks every day and the entry and exit to the construction areas. In addition, there is an Asphalt Construction Site to the right of the existing plant and an Excavation dumping site to the left. Due to the operations of these two facilities and the fact that the roads of both facilities are not asphalted, background dust measurements were high.

It is understood that it is high due to the agricultural lands around the 3rd measurement point and because the period coincides with the preparation of agricultural lands before the winter season.

It has been observed that the existing treatment facility has no effect on the high measurement results and is due to the industrial constructions and agricultural lands around it. Even though it is known that the measurement results do not originate from KOSKİ activities, $PM_{2.5}$ and PM_{10} measurements should be carried out in the borders of KWWTP once each during the construction and operation periods of the project in order to take precautions.

In the air quality measurements made by the TÜBİTAK Marmara Research Center with the passive sampling method in the Koski General Directorate Konya Urban Wastewater Treatment Plant impact area, it was determined that the ammonia concentration was not Konya Wastewater Treatment Plant and the hydrogen sulfide parameter was below the limit values at all points (Annex AC).

Between March and May 2023, passive sampling of NH_3 and H_2S were conducted at 12 locations. The results are provided in Table 4-4. The laboratory report prepared by The Scientific and Technological Research Council of Türkiye - Marmara Research Center is provided in Annex AC.

Table 4-4 NH_3 and H_2S Monitoring Results

No.	Monitoring Location	NH_3 Measurement Results ($\mu g/m^3$)		H_2S Measurement Results ($\mu g/m^3$)	
		April 2023	May 2023	April 2023	May 2023
1	KWWTP Entrance	61.94	21.50	0.70	0.82
2	KWWTP South	42.76	43.38	0.42	1.65
3	Adliye (Court house)	35.26	18.02	0.28	0.96
4	Büyük Soylu Oto (Automotive shop)	24.90	9.46	<0.14	0.55
5	Ayça Süt (Dairy)	34.41	15.13	<0.14	0.55
6	Karatay KOMEK (Vocational Course Center)	44.96	38.68	<0.14	0.41
7	Osman Gazi Konutları (Residential building)	25.74	<0.23	<0.14	<0.27
8	Pala Bıyıklar Plaza (Business Center)	32.16	12.42	<0.14	0.41
9	Eski Deponi (Old dumpsite)	35.54	12.49	<0.14	0.41
10	Şehir Hastanesi (City Hospital)	18.14	12.23	<0.14	0.55
11	Akkonak Evleri (Residential complex)	24.43	85.29	<0.14	<0.27
12	Sehavet Sokak (street)	24.10	10.49	<0.14	0.55

As there is no legislative limit value for NH_3, the results are compared with the literature value. The lowest odour threshold concentration value for ammonia is given as 26.6 $\mu g/m^3$ by Ruth (1986). Ammonia odour in outdoor air can be felt if its concentration exceeds this value. The

measured concentrations at several monitoring locations where these are higher than the threshold are not originated from the KWWTP due to the predominant wind directions, as stated in the laboratory report. For H_2S, Industrial Air Pollution Control Regulation Annex 2 Table 2.2 defines 20 µg/m^3 limit value. All results are lower than this limit value.

4.2.2 Climate and Meteorology

Konya experiences a continental climate characterized by dry, hot summers and cold, snowy winters. Despite its position in the southernmost part of Central Anatolia, it maintains cooler temperatures compared to other cities in the region. This is primarily due to the central Taurus Mountains, which effectively block any maritime influence. Additionally, a distinctive aspect of Konya's climate is the delayed onset of summer and the prolonged duration of winter. The temperature values in Konya between 2019 and 2022 are presented in Table 4-5.

Average Temperature: According to Konya Meteorology Station's observation records, annual average temperature is 11.7 °C.

Maximum Temperature: According to Konya Meteorology Station's observation records, monthly maximum temperature which is 30.2 °C was measured in July and August.

Minimum Temperature: According to Konya Meteorology Station's observation records, monthly minimum temperature which is -4.2 °C was measured in January.

Table 4-5. Konya Meteorology Station's Temperature Values (2019-2022)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly Avg. Temp. (°C)	-0.2	1.5	5.5	11.1	15.9	20.1	23.5	23.3	18.8	12.8	6.5	1.8	11.7
Monthly Max. Temp (°C)	4.6	7.0	11.7	17.5	22.4	26.7	30.2	30.2	26.0	20.0	13.1	6.6	18.0
Monthly Min. Temp (°C)	-4.2	-3.3	-0.2	4.3	8.6	12.7	15.9	15.7	11.0	6.0	0.8	-2.3	5.4

According to the observation records of Konya Meteorology Station, the annual average total precipitation is 331.8 mm. On the other hand, the annual average number of rainy days is 82.8 days. Relevant precipitation data is given in Table 4-6.

Table 4-6. Precipitation Values of Konya Meteorology Station

	Jan	Feb	Mar	Apr	May	Jun	Jul	Au	Sep	Oct	Nov	Dec	Annual
Average Number of Rainy Days	9.96	8.39	8.91	8.90	10.3	6.78	2.18	1.48	3.17	6.07	6.57	10.1	82.8
Monthly Maximum precipitation (mm)	38.4	28.8	29.4	31.7	43.0	25.9	7.5	6.3	13.5	29.6	32.0	45.7	331.8

4.3 Noise

Noise background measurements have been conducted between 27.10.2023 and 28.10.2023 by Çınar Laboratory. Measurement points were determined for 24 hours at 3 sensitive locations within the circle with a radius of 2 kilometers of the project site. The measurement locations are as follows:

- 1st Measurement Point: KWWTP Entrance (Security),
- 2nd Measurement Point: Konya Metropolitan Municipality Support Services building,
- 3rd Measurement Point: Konya Pumping Center-1 (TM-1) point.

Measurements were made in accordance with TS ISO 1996-1 and TS ISO 1996-2 standards and principles specified in Environmental Noise Assessment and Management Regulation.

The locations of the baseline measurement points are given in Table 4-7 and Figure 4-7. The measurement results are briefly summarized in Table 4-8 (for national time period definition), in Table 4-9 (for WBG time period definition), and the laboratory report is given in Annex AD.

Table 4-7. Coordinates of Measurement Points

Measuring Point	Coordinates	
	X	Y
MP-1	462517	4193358
MP-2	462261	4191588
MP-3	465195	4192526

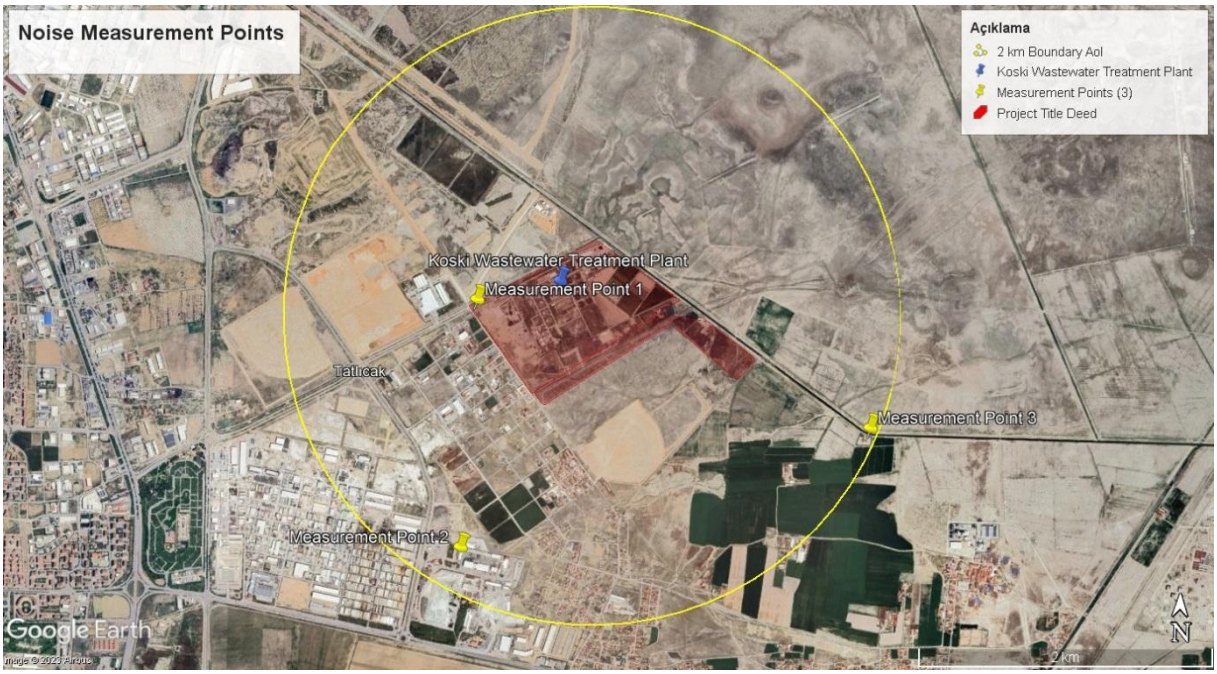

Figure 4-7. Locations of Noise Measurement Points

Table 4-8. Background Noise Measurement Results (National)

Measurement Point	Date	Time Period*	Measurement Results (dBA)	National Limit Values (dBA)
MP-1	27.10.2023	Leq-day	57.1	$L_{eq\text{-}day}$: 65 $L_{eq\text{-}evening}$:60 $L_{eq\text{-}night}$:55
		Leq-evening	57.9	
		Leq-night	54.5	
	28.10.2023	Leq-day	53.6	
		Leq-evening	-	
		Leq-night	-	

Measurement Point	Date	Time Period*	Measurement Results (dBA)	National Limit Values (dBA)
MP-2	27.10.2023	Leq-day	64.6	
		Leq-evening	59.6	
		Leq-night	54.8	
	28.10.2023	Leq-day	55.9	
		Leq-evening	-	
		Leq-night	-	
MP-3	27.10.2023	Leq-day	47.4	
		Leq-evening	44.9	
		Leq-night	47.2	
	28.10.2023	Leq-day	49.3	
		Leq-evening	-	
		Leq-night	-	

* Day: 07:00-19:00, Evening: 19:00-23:00, Night: 23:00-07:00

Table 4-9. Background Noise Measurement Results (WBG)

Measurement Point	Date	Time Period*	Measurement Results (dBA)	WBG Limit Values
MP-1	27.10.2023	Leq-day	**56.7**	
		Leq-night	**56.1**	
	28.10.2023	Leq-day	53.6	
		Leq-night	-	
MP-2	27.10.2023	Leq-day	**63.6**	
		Leq-night	**55.1**	
	28.10.2023	Leq-day	55.9	
		Leq-night	-	
MP-3	27.10.2023	Leq-day	46.7	
		Leq-night	**47.1**	
	28.10.2023	Leq-day	49.3	
		Leq-night	-	

$L_{eq\text{-}day}$:55
$L_{eq\text{-}night}$:45

* Day: 07:00-22:00, Night: 22:00-07:00

Since there is an industrial zone near the 1st and 2nd measurement points, there are some construction activities in the region. For this reason, working activities with construction equipment and the use of heavy tonnage vehicles occur quite frequently in the region 24 hours a day, especially during daylight hours. Ongoing construction activities are expected to create high baseline noise levels at the 1st and 2nd measurement points. Since the 3rd measurement point is far from construction activities, the measurement results are expected to be slightly lower than the other points.

In order to be able to reduce the noise level at a reasonable value in complient with the project standards some mitigating measures will be applied such as adding silencerssilencers or barriers to noise-generating equipment, restriction of constructionconstruction activities during nighttime hours etc.etc. The detailed mitigation measures are presented in Section 7..

4.4 Water and Wastewater

In this section, baseline condition regarding the water resources of the pproject Area and its vicinity is presented. The following data sources has been used to identify characteristics of the water resources:

- Konya Wastewater Treatment Plant Rehabilitation and II. Stage Construction Project EIA Report,
- Konya Provincial Environmental Status Report for 2022, and
- Governmental databases on water resources such as Geodata Portal.

4.4.1 Surface Water Resources

There are no wells or notable water sources near the project area. Roughly 300 meters northeast of the project area lies the Keçili Discharge Channel.

1/25.000 Scale Hydrology Map depicting the project area and its surroundings does not indicate any wells, springs, boreholes, or flowing streams near the project area (see Annex J). A dry stream is situated approximately 370 meters southeast of the project area.

Given the absence of surface water sources near the project area and the reliance on the General Directorate of KOSKİ's network for water supply, information about surface waters in the Konya Closed Basin is provided in Table 4-10 and Table 4-11 This includes details about lakes, ponds, dams, and streams in the region.

Water supply is already provided to the project site (i.e. the existing KWWTP) via municipal water distribution system.

Table 4-10. Konya Province Water Resources Potential

Name	Average Flowrate (hm^3/year)
Uludere	143.2
Beysehir Lake	446.0
Çavuş Creek	37.4
Suberte Stream	117.9
Çarşamba Stream	164.8
Zapana Creek	233.6
Mayıs Creek	53.6
Meram Tea	51,.0
Sille Creek	2.0
Insuyu Creek	14.7
Goksu Creek	818.7
Yunak Gokpinar Creek	223.2
Ilgın Creek	124.0
Bakirpinari, Zengi, Besgoz Resources	36.4
Others	472.5

Table 4-11. Natural Lakes

Name	Surface area(ha)
Salt Lake	78.536
Beysehir Lake	58.000
Hotamis Lake	22.600
Eregli Akgol	8.504

4.4.2 Groundwater

Groundwater flows from all directions towards the city center of Konya due to the substantial extraction of groundwater in the city center, creating a flow of groundwater towards this area. Rich groundwater resources, typically reaching depths of 20 to 100 meters, are found in the plains of Çumra, Ereğli, Cihanbeyli, Akşehir, and Yunak within Konya Province. In some locations, this groundwater exhibits artesian properties. Additionally, numerous ordinary wells and boreholes have been established, predominantly for agricultural purposes. The water-bearing formations consist of paleozoic marbles, mesozoic limestones, neogene limestones, and alluviums in and around Konya. The Konya Plain extends approximately 80 km in the north-south direction and 50 km in the west-east direction. It encompasses several sub-plains, including the Hotamış Plain, Karapınar Plain, Karaman Plain, and Ereğli Plain. The Konya Closed Basin, the largest closed basin in Türkiye, covers approximately 62,000 km² in the Anatolian peninsula. It spans Konya, Karaman, Niğde, and Aksaray Provinces. The water resources feeding the basin are primarily from streams and groundwater sourced from the Taurus Mountains. The basin accounts for 10% of Türkiye's annual withdrawable groundwater reserve, and 80% of this is allocated for agricultural irrigation through DSİ facilities. Despite the basin's substantial water potential, groundwater levels have been declining due to insufficient rainfall, excessive use, and unauthorized drilling. According to DSİ data, there are nearly 95,000 groundwater production wells in the Konya Closed Basin, with a significant portion being unlicensed. Although there isis no production wells located around the project site, the presence of unlicensed wells is possible, but unknown to the consultant.

4.4.3 Wastewater

99% of Konya’s population is connected to the city’s sewerage system operated by KOSKİ. There are 44 wastewater treatment plants throughout Konya Province.

The sewerage system is connected to several wastewater treatment plants where the details of the plants are provided in Table 4-12 Table 4-12and Table 4-13.. The kmz file of Active Wastewater Treatment Plants given in Table 4-12, Table 4-13 and Table 4-14 is presented in Annex AA.

Table 4-12. Koski Biological Wastewater Treatment Plants

Biological							
1	Konya	8	Hüyük	15	Çamlık	22	Üzümlü
2	Kulu	9	Derbent	16	Bozkır	23	Beyşehir
3	Akşehir	10	Cihanbeyli	17	Gökpınar	24	Taraşcı
4	Karapınar	11	Ömeranlı	18	Tuzlukçu	25	Zengen
5	Seydişehir	12	Suğla	19	Gölyazı	26	Kayasu
6	Sarayönü	13	Başarakavak	20	Tuzyaka		
7	Yunak	14	Tepekent	21	Huğlu		

Table 4-13 WetlandSytems. Koski WetlandWastewater Treatment Sytems

Natural							
1	Kadınhanı	6	Altınekin	11	Gökçehüyük	16	Meydanlı
2	Akören	7	Avdan	12	Günyüzü	17	Zincirlikuyu
3	Güneysınır	8	Bulcuk	13	Kapaklı	18	Çobankaya
4	Ereğli	9	Büyükoba	14	Kökez		
5	Yükselen	10	Çavdar	15	Kuran		

Table 4-14. Koski Under Construction Phase Biological Wastewater Treatment Plants

Under Construction - Biological									
1	Çumra	2	Ilgın	3	Doğanhisar	4	Derebucak	5	Taşkent

Table 4-15 List of WWTPs in Konya (2023)[6]

No.	District	Name of the WWTP	Level of Treatment	Capacity (m^3/day)	Amount of Effluent Dischage (m^3/year)	Discharge Location	Population Served	Amount of Generated Sludge (ton/year)
1	Akören	Akören	Biological	624	201,115	Boyalık Creek	2,820	-
2	Akören	Kayasu Package WWTP	Biological	400	61,238	May Lake	1,393	-
3	Akşehir	Akşehir	Advanced	15,102	4.860.137	Akşehir Lake	70,477	1,675
4	Altınekin	Altınekin		250	92.345	DSİ Channel	3,038	-
5	Beyşehir	Beyşehir		11,143	2.506.818	Çarşamba River	45,888	2,186
6	Bozkır	Bozkır		3,307	944.592	Çarşamba River	8,488	1,023
7	Cihanbeyli	Günyüzü	Biological	200	48.545	Tersakan	1,762	-
8	Cihanbeyli	Gölyazı	Advanced	400	79.211	DSİ Channel	2,063	3
9	Cihanbeyli	Cihanbeyli	Advanced	4,500	863.894	DSİ Channel	17,798	-
10	Çeltik	Gökpınar	Biological	1,000	115.197	Gökpınar River	2,933	19
11	Derbent	Derbent	Advanced	400	197.830	Riverbed	2,117	101

[6] *Konya Environmental Status Report 2023, PDoEUCC, page 50-51*

No.	District	Name of the WWTP	Level of Treatment	Capacity (m^3/day)	Amount of Effluent Dischage (m^3/year)	Discharge Location	Population Served	Amount of Generated Sludge (ton/year)
12	Derebucak	Çamlık	Advanced	300	119.041	Bakaran River	973	-
13	Ereğli	Ereğli	Biological	30,590	8.004.085	DSİ Channel	112,179	-
14	Ereğli	Zengen	Biological	400	140.421	Lagoon	1,769	-
15	Güneysınır	Güneysınır	Biological	2,096	743.140	Lagoon	5,956	-
16	Hüyük	Hüyük	Advanced	1,000	208.716	Riverbed	4,151	138
17	Ilgın	Avdan	Biological	75	20.075	Riverbed	245	-
18	Ilgın	Bulcuk	Biological	75	25.915	Riverbed	362	-
19	Ilgın	Büyükoba	Biological	75	24.090	Riverbed	335	-
20	Ilgın	Çobankaya	Biological	75	7.300	Riverbed	195	-
21	Ilgın	Kapaklı	Biological	150	51.100	Dereyatağı	276	-
22	Kadınhanı	Çavdar	Biological	18	5.475	Dereyatağı	159	-
23	Kadınhanı	Kadınhanı	Biological	4,009	914.325	Dereyatağı	14,812	-
24	Kadınhanı	Kökez	Biological	66	17.520	Dereyatağı	404	-
25	Kadınhanı	Meydanlı	Biological	150	48.910	-	402	-
26	Karapınar	Karapınar	Advanced	7,500	1. 653.846	DSİ Channel		3,561
27	Karatay	KWWTP	Advanced	200,000	67.308.152	Keçili	1,313,581	20,457
28	Kulu	Kulu	Advanced	15,000	2.323.813	Değirmenöz River	25,721	800
29	Kulu	Ömeranlı	Advanced	1,500	236.213	DSİ Channel	4,067	60
30	Kulu	Tuzyaka	Advanced	400	79.185	DSİ Channel	1,647	4
31	Kulu	Zincirlikuyu	Biological	210	71.905	-	1,925	-
32	Sarayönü	Sarayönü	Advanced	3,500	452.255	DSİ Channel	19,336	130
33	Selçuklu	Başarakavak	Advanced	300	66.430	Dolav River	1,190	27
34	Selçuklu	Tepekent	Advanced	300	79.570	Tepekent Anaçayı	4,165	32
35	Selçuklu	Yükselen	Physical	65	18.980	-	370	-
36	Seydişehir	Gökçehüyük	Biological	150	46.355	Riverbed	315	-

No.	District	Name of the WWTP	Level of Treatment	Capacity (m^3/day)	Amount of Effluent Dischage (m^3/year)	Discharge Location	Population Served	Amount of Generated Sludge (ton/year)
37	Seydişehir	Kuran	Biological	75	22.630	DSİ Channel	438	-
38	Seydişehir	Seydişehir	Advanced	5,952	2.159.238	DSİ Channel	46,047	429
39	Seydişehir	Suğla	Advanved	1,000	478.384	DSİ Channel	6,501	186
40	Seydişehir	Taraşçı	Biological	400	104.872	Riverbed	2,083	-
41	Tuzlukçu	Tuzlukçu	Biological	547	28.805	DSİ Channel	3,402	-
42	Yunak	Yunak	Biological	2,000	343.796	Lagoon	8,686	140
43	Beyşehir	Huğlu	Advanced	750	113.150	Riverbed	2.630	10
44	Beyşehir	Üzümlü	Advanced	1.100	235.425	Riverbed	4.893	50

4.5 Ecology and Biodiversity

This section has been developed in order to examine the status of the ecosystem and biodiversity in the Project area and its immediate surroundings, to reveal the flora and fauna inventory, to identify endemic, rare or endangered taxa, to determine the endangerment categories of the identified taxa according to WB ESS-6: Biodiversity Conservation and Sustainable Management of Living Natural Resources (WB ESS-6). WB ESS-6 defines natural habitat and critical habitat as follows: Natural habitats are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition. On the other hand, critical habitat is defined as areas with high biodiversity importance or value, including:

(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). WB ESS-6 aims to:

- 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 and,
- 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.

A field study was carried out on 17.08.2023 by Biologist Gözde YURTTAŞ in order to determine the migration movements and flight corridors of birds, especially with the ornithological structure, and to reveal the protection measures to be taken against the effects of the activity on flora and fauna.

The IUCN Red List Classes and Criteria are designed as an easily understood system for classifying species at high risk of global extinction. The purpose of this system is to establish a clear and objective method for classifying different species according to their risk of extinction. However, while the Red List draws attention to species at high risk of extinction, it is not the only way to prioritize conservation measures. Comprehensive consultations and tests during the development of the system have shown that the system yields solid results for most living things. Although the system consistently places species in threat classes, the criteria used do not consider the biological characteristics of each species.

Purposes of IUCN Red List Classes and Criteria;

- To provide a system that can be applied consistently by different people;
- To increase the objectivity of assessments with an easy-to-understand guide to the assessment of the various factors affecting burnout risk;
- To provide a system by which very different species can be compared;
- To enable users of threatened species lists to understand how each species is classified.

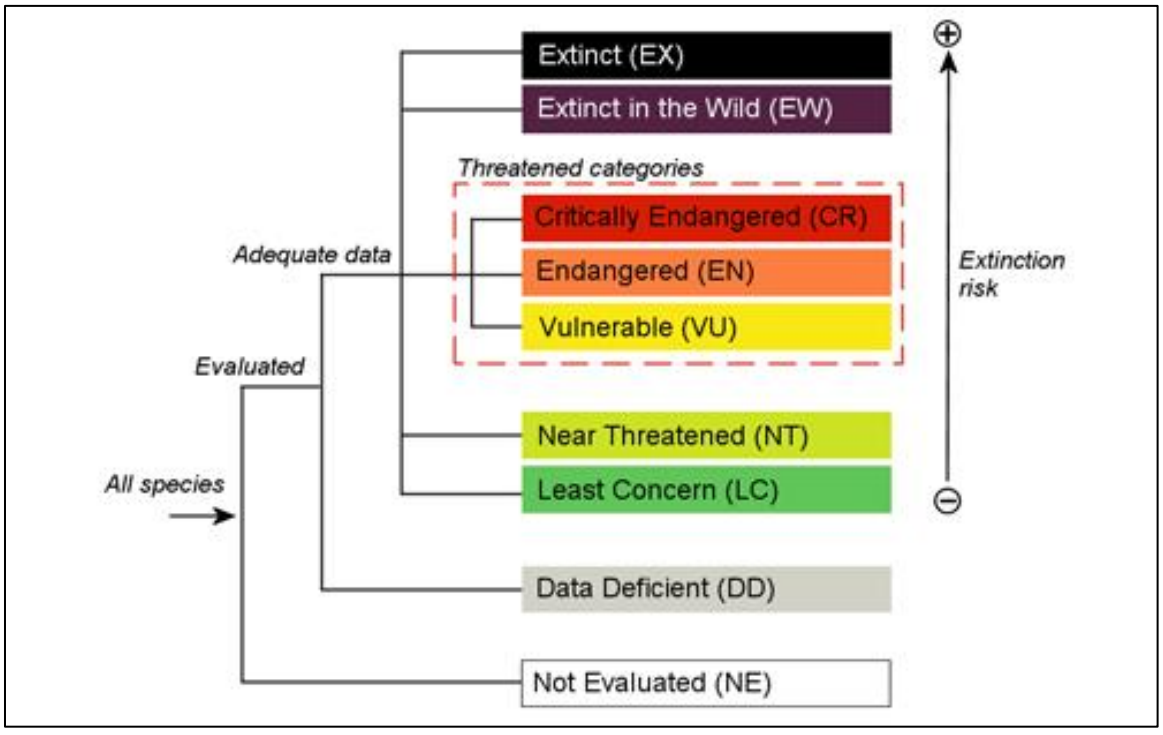

Figure 4-8 Structure of the Categories

The Convention on the Protection of European Wildlife and Habitats was signed in Bern on the 19th day of September 1979 and was published in the Official Gazette dated 20.02.1984 and numbered 18318.

The purpose of the Convention is to conserve wild flora and fauna and their habitats, especially to ensure the protection of those that require the cooperation of more than one state and to develop this cooperation.

- Appreciating that wild flora and fauna is a natural heritage of aesthetic, scientific, cultural, recreational, economic and original value, which must be preserved and passed on to future generations,
- Recognizing the fundamental role played by wild flora and fauna in the continuity of biological balance,
- Noting that many species of wild flora and fauna are seriously endangered, and some are in danger of extinction,
- Recognizing the need for international cooperation in the conservation of wild flora and fauna, to be considered by governments in their national goals and programs, and in particular in the conservation of migratory species, this convention was adopted.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES): The CITES Convention is a contract that binds the import and export of wild animal and plant species between the contracting countries, in short, international trade with certain permits and documents. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species in the wild, and it accords varying degrees of protection to more than 35,000 species of animals and plants. In order to ensure that the General Agreement on Tariffs and Trade (GATT) was not violated, the Secretariat of GATT was consulted during the drafting process.

Appendices lists and explanations of the CITES Convention are given in Table 4-16:

Table 4-16 Appendices lists and explanations of the CITES Convention

Appendices	Explanations
Appendix-I	It covers all species that are or may be affected by trade and are in danger of extinction. Trade in specimens of these species must be subject to particularly strict regulations and only be permitted in exceptional circumstances, in order not to expose their descendants to further endangerment.
Appendix-II	(a) Species that are not currently in absolute danger of extinction but may become extinct unless trade in specimens is subject to strict regulations to prevent use incompatible with their survival; and (b) other species which must be regulated so that Trade in specimens of certain species referred to in subparagraph (a) can be effectively controlled.
Appendix-III	About 170 species, are species that are listed after one member country has asked other CITES Parties for assistance in controlling trade in a species. The species are not necessarily threatened with extinction globally. In all member countries, trade in these species is only permitted with an appropriate export permit and a certificate of origin from the state of the member country who has listed the species.

Detailed information on flora and fauna inventories based on the field work carried out within the scope of the Project is given below.

4.5.1 Definition of the Study Area and Area of Influence

On August 17, 2023, the literature review was supplemented by fieldwork conducted in the project area. Species have been cataloged with their scientific authorship, local Turkish names

where applicable, phytogeographical region, endemic status, risk categories for endemic and rare species, and the altitudes at which they are found. The classification of endemic and non-endemic plants into danger categories was based on criteria from the IUCN 1994 and IUCN 2001, as outlined in the study by Ekim et al. (2000).

4.5.2 Methodology and Data Sources

The ecology assessment has considered relevant Turkish (national) legislation, applicable standards and guidelines for international finance, and international agreements.

Internationally accepted criteria are considered while determining study area together with the species characteristic and habitat needs. Potential critical habitats in the project Area were identified as well. This were done by overlaying the project Area with the distribution of species of conservation concern; with sites identified as globally important for migratory species (e.g. IBAs, Ramsar sites); with national parks and key biodiversity areas (KBAs).

International Agreements

In evaluating the threat/protection status of species; CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), Bern Convention, and IUCN (International Union for Conservation of Nature) Red List Database were used.

The Birds Directive (2009/147/EC)
Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (this is the codified version of Directive 79/409/EEC as amended). This Directive ensures far-reaching protection for all of Europe's wild birds, identifying 194 species and sub-species among them as particularly threatened and in need of special conservation measures.
The Habitats Directive (92/43/EEC)

The Habitats Directive 92/43/EEC was adopted in 1992. The main aim of this Directive is to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. While the Directive makes a contribution to the general objective of sustainable development; it ensures the conservation of a wide range of rare, threatened or endemic species, including around 450 animals and 500 plants. Some 200 rare and characteristic habitat types are also targeted for conservation in their own right (EC, 2014a).

Standards and Guidelines

Ecology and Biodiversity part of the Project is guided by the requirements of the ESS6. ESS6 covers areas of biodiversity conservation, ecosystem services and sustainable management of living resources, which are all fundamental to achieve sustainable development. The objectives of ESS6 are outlined 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.

The requirements of ESS6 are applied to projects: (i) located in modified, natural, and critical habitats; (ii) that potentially impact on or are dependent on ecosystem services over which the borrower has direct management control or significant influence; or (iii) that include the

production of living natural resources (e.g. agriculture, animal husbandry, fisheries and forestry) based on the risks and impacts identification process.

4.5.3 Ecological Research and Findings

Investigations of ecology and biodiversity conditions of the study area were conducted for both terrestrial and aquatic environment. In this scope necessary ecological research were conducted to determine the baseline conditions in the study area. These baseline data/information collections provide an overall picture of the conditions and sensitivities (if any) in the area that should be considered in assessment of potential impacts and development of relevant mitigation measures for design. The overall approach to determine the baseline conditions in the context and objectives provided above were include the following data collection and interpretation means:

- Review of pertinent literature and previous works,,
- Satellite image interpretation, as available,,
- Field works.

In the scope of this study, the importance/sensitivity of the habitats and species were given special attention in reporting and detailed data such as identified species list, their protection status and the extent of the areas were included.

4.5.3.1 Protected Areas and Designated Sites

The Project area is defined as "Urban and Regional Social Infrastructure" area by the Environmental Master Plan.

There are no Sensitive Regions, National Parks, Natural Parks, Wetlands, Natural Monuments, Nature Conservation Areas, Wildlife Protection Areas, Wild Animal Habitation Areas, Cultural Heritage, Natural Assets, Protected Areas and Protected Areas, Areas Protected According to the Bosphorus Law, Biogenetic Reserve Areas, Biosphere Reserves, Special Environmental Protection Areas, Special Protection Areas, Protected Areas Related to Drinking and Domestic Water Resources, Tourism Areas and Centers, and Protected Areas Other Areas.

The closest protected area is Akyokuş Nature Park, as shown in Figure 4-9

Figure 4-9 The distance between Akyokuş Nature Park to project Area

According to the approved zoning plan, there is no special area to be protected in the Project area and its immediate surroundings. Akyay Lake, which is currently used as a “Shooting Area” as shown in the zoning plan, has lost its feature.

Moreover, the Project area is also examined regarding the internationally recognized KBAs. It has been determined that the project area is located within an internationally recognized Akyay Plain KBA. The map showing the KBAs is given in Figure 4-10.

Akyay Plain KBA includes Akyay Lake, a shallow and salty wetland, and the extensive lowland steppe and salt marshes around the plain.

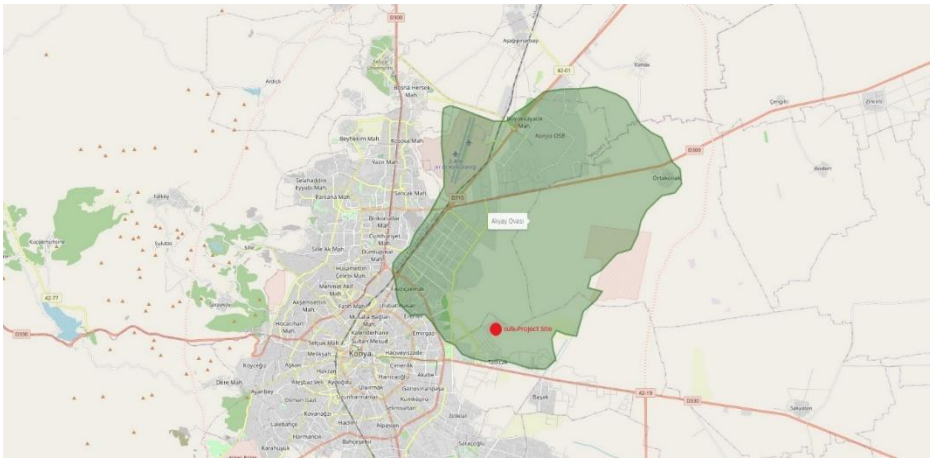

Figure 4-10 Akyay KBAKBA and P ProjectLocation

Due to the presence of *Himantopus himantopus*, a bird species breeding here and the "trigger species" for the IBA criteria, the Akyay Plain is also defined as IBA.

The flora of Akyay Plain has only been partly studied, but is known to include eight Globally Threatened taxa, including no fewer than seven listed on Appendix I of the Bern Convention, namely *Allium vuralii*, *Asparagus lycaonicus*, *Ferula halophila*, *Microcnemum coralloides ssp. anatolicum*, *Onosma halophilum*, *Silene salsuginea* and *Sphaerophysa kotschiana*. Therefore, Akyay Plain is designated as IPA. The IPA receives no formal protection, but may receive some level of protection by lying in part within a military artillery range in remains under considerable threat particularly due to its close proximity to Konya. Threats include the drainage of wetlands, but construction of a large industrial park over part of the site, the threat of large-scale afforestation, and the continued effects of heavy grazing and the conversion of drier steppic grassland to arable production.

Konya Organized Industrial Zone is located at the northwestern sideside of project the area. The western parts host Small Scale Industrial Sites.

In addition, intensive agricultural activities are carried out in and around the plain. Cereal products and sugar beets are planted in the area. Sugar beet production negatively affects the natural water regime due to the large amount of water consumption ESS6 recognised legally protected areas that meet the IUCN definition: "clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values."

In Turkey, Ministry of Agriculture and Forestry is the main official body responsible for development and implementation of national biodiversity conservation policies, action plans, designation of conservation areas, and many other related tasks conducted by its central and local directorates within the Ministry's organizational structure.

IUCN Protected Area Management Categories are adopted to the Turkish Protected Area System in 2006 through the Biodiversity and Natural Resource Management Project. Accordingly, legally protected areas in Turkey, were re-classified under the 6 protected area management categories in line with IUCN Guidelines:

I. **Strict protection [Ia) Strict nature reserve and Ib) Wilderness area]**
II. Ecosystem conservation and protection (i.e. National park)
III. Conservation of natural features (i.e. Natural monument)
IV. Conservation through active management (i.e. Habitat/species management area)
V. Landscape/seascape conservation and recreation (i.e. Protected landscape(seascape)
VI. Sustainable use of natural resources (i.e. Managed resource protected area).

It should be noted that Salt Lake Special Environmental Protection Area, 105 km away from project area and Bozdağ Wildlife Development Area are not included in the AoI due to their considerable distance to the project Site, as presented in Figure 4-11.

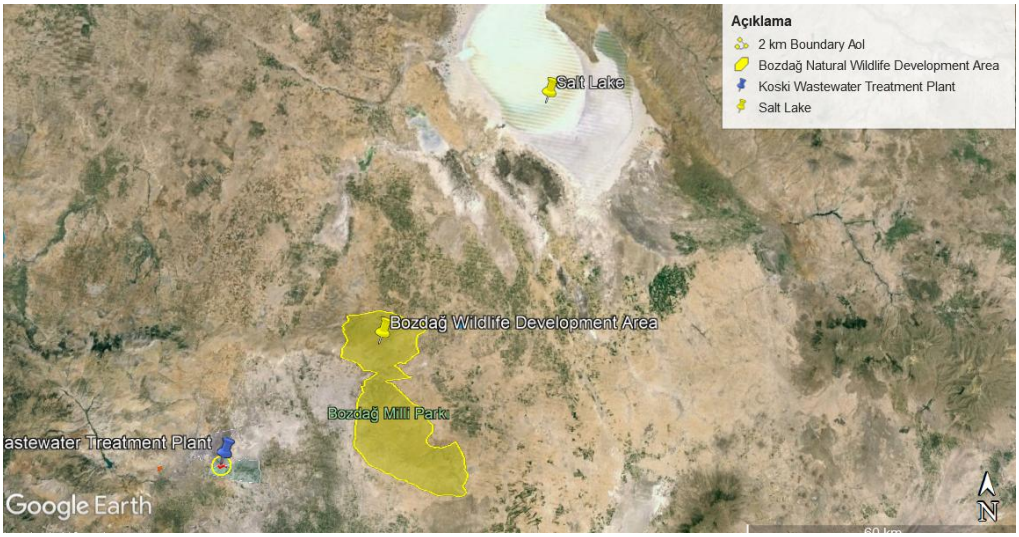

Figure 4-11 Protected Areas Close to the project Area

As mentioned in Section 2.1, KWWTP receives the urban wastewater generated in Karatay, Meram and Selcuklu districts and discharges the treated effluent through Keçili Discharge Channel. The discharge channel passes through an agricultural plain and eventually connects to Salt Lake (tr. Tuz Gölü).

Salt Lake is very poor in terms of rivers as they receive the least rainfall in Turkey. Important rivers are Peçenek River passing through Şereflikoçhisar in the east, SHW Konya drainage channel in the southwest, İnsuyu coming from Cihanbeyli in the west and Uluırmak coming from Aksaray in the southeast. However, some of these waters dry up in summer and cannot reach the Lake, and almost all the Lake dries up with the effect of excessive evaporation. A salt layer of up to 30 cm is formed in the dry areas. Salt Lake is one of the saltiest lakes not only in Turkey but also in the world. There are no aquatic plants in the lake due to the high salt concentration. Around the lake, there is a very weak saline flora in a large area and salt-resistant, sparse vegetation in the areas under the influence of rivers[7]

4.5.3.2 Flora and Vegetation

Konya Province is characterized by continental climate conditions due to its geographical features. However, altitude significantly influences climate elements like temperature and precipitation, leading to diverse vegetation across plain floors and mountainous regions. At lower altitudes, steppes dominate the landscape, while higher elevations host forests. Salty and barren soils around saline and brackish water lakes are home to halophytes due to the area's geological structure. The vast steppe is the predominant vegetation within Konya Province, with climate, soil, and geomorphological characteristics shaping the plain's flora.

Human activities have transformed forest areas into Anthropogenic Steppes over time, with bush formations interspersed among them. Cultivated plants, including grains, legumes, and sugar beets, cover extensive areas, accounting for 64% of the land and making Konya one of Türkiye's leading agricultural provinces. However, Konya is sparse in forest coverage, with only 12% of its surface area forested, transitioning from bush formations to forests at the plains' edges.

While carrying out the research, Davis's 'Flora of Türkiye', Prof. Dr. Ertan Tuzlacı's 'Dictionary of Turkish Plants', and Prof. Dr. Osman Ketenoğlu's 'Environmental Impact Assessment' and

[7] Aksaray Governorship Provincial Directorate of Environment, Urbanization and Climate Change, Retrieved from https://aksaray.csb.gov.tr/tuz-golu-ockb-i-100497

'Red Data Book of Turkish Plants' publications were used. In addition, a search was made in TÜBİTAK's Turkish Plants Database ("TUBIVES"). The flora table was arranged according to these data.

Endemism basically refers to a taxon, i.e., a particular specie, a genus or a group of plants and/or animals, restricted to a particular geographical area of the world. Such taxon is called as 'endemic' to that area. Endemism may occur on a variety of spatial scales, from small areas such as islands or mountain tops to areas as large as continents8 (Morrone, 2008).

All flora members in the study area are in the LC class according to the IUCN category. No endemic or endangered species according to IUCN, and annexes of CITES and BERN have been found in the project Area or its immediate surroundings.

4.5.3.3 Fauna

All information obtained in this section was taken from the EIA report prepared for the Project and site findings. The information in the EIA report is formed by considering the inputs of the local people and also the information obtained from detailed literature studies. In the literature studies, the following sources were taken as references: Prof. Dr. Ali Demirsoy's "Mammals-1996", "Vertebrates/ Amniota-1992", "General Zoogeography and Türkiye Zoogeography-2002". The works named "Birds of Türkiye -1989" by İlhami Kiniroglu and "Turkish Vertebrate Species List -1996", which is the products of the Türkiye fauna database project supported by DPT and TÜBİTAK, were used. The List of Amphibia (Amphibia), Reptilia (Reptiles), Mammalia (Mammals), and Aves (birds) that are present in the project area and its surroundings, according to the literature studies, are given in the sections below.

Amphibians and Reptiles

When the Amphibian species given in the EIA report were evaluated, it was seen that there are three species belonging to the Bufonidae family. These 3 species are listed in LC according to the IUCN and BERN classifications. On the other hand, there are eight reptile species belonging to six families. When these species were evaluated according to the BERN classification, six of them were evaluated as Nearly Threatened ("NT"), one of them was LC and one was Vulnerable ("VU"). Since the pproject is surrounded by fences, these species are not expected to be seen in the roject area. The list of reptile species given in in Annex AB.

Avians

When the bird species given in the EIA report were evaluated, it was seen that there were 20 species belonging to 15 families.

Mammals

No endemic fauna species were found in the field studies and literature research conducted for the pproject area and impact area.

A detailed explanation of the biodiversity section is shared in Annex AB.

4.5.3.4 Natural Habitat

ESS6 definitions are used in habitat and species assessments. These definitions are explained step-by-step as follow:

"Natural habitats are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition. If natural habitats are identified as part of the assessment, the Project owner will seek to avoid adverse impacts on them in accordance with the mitigation hierarchy."

"Critical habitat is defined as areas with high biodiversity importance or value, including:

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;

e) ecological functions or characteristics that are needed to maintain the viability of the biodiversity values described above in (a) to (d)."

"Modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition. Modified habitats may include, for example, areas managed for agriculture, forest plantations, reclaimed coastal zones, and reclaimed wetlands."

Based on these criteria, sensitivity of ecological components within the scope of the project have been determined as given in Table 4-17 Significance of Impacts on Resource/Receptor.

Table 4-17 Significance of Impacts on Resource/Receptor

Ecosystem Component	Significance of Impact		
	Major	Moderate	Minor
Designed Areas	Internationally Recognized Areas (e.g. UNESCO Natural World Heritage Sites, UNESCO Man and the Biosphere Reserves, Key Biodiversity Areas, and wetlands designated under the Convention on Wetlands of International Importance (the Ramsar Convention).	Nationally designated areas.	N/A

Ecosystem Component	Significance of Impact		
	Major	Moderate	Minor
Habitats	Habitats is natural or critical natural habitat under the ESS6 definitions and or Habitats that trigger critical habitat under the following ESS6 Criteria: Criterion 4: Highly threatened and/or unique; and/or ecosystems Criterion 5: Key evolutionary processes 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 Moderate 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 following ESS6 Criteria: • Criterion 1: Critically Endangered (CR) and/or Endangered (EN) species; • Criterion 2: Endemic and/or restricted-range species; and/or • Criterion 3: Migratory	Nationally/regionally important concentrations of Vulnerable (VU) species, or locally important concentrations of Critically Endangered (CR) and/or Endangered (EN) species. Locally important populations of endemic / range restricted species. Populations of migratory species	Locally important populations of Near Threatened (NT) or Vulnerable (VU) species, or locally important populations of species listed on Annexes to the Bern Convention.

4.6 Socio-Economic Baseline Conditions

The purpose of the Social Baseline Study is to collect key primary and secondary data that can be used as reference points for describing the current social and economic situation in the project Area of Influence, as well as provide the base information for the determination of social impacts associated with the project.

Primary Data

Primary data is comprised of information collected on the site during national EIA process and site visit in the scope of ESIA through the following items:

- Community level surveys
- Key informant interviews

In the scope of the ESIA studies performed by the E&S consultant, on August 17, an interview was held with the mukhtar of Tatlıcak neighborhood. Due to the unavailability of other stakeholders, telephone interviews were conducted on 2023 year 28 August, 4 September, and 18 September.

The views and expectations expressed in the interviews with the residents of the neighborhood regarding the construction process, its effects and the aftermath of the facility are listed below.

The expectation of being able to work as a manual worker during the construction process has been recorded as a general demand. Koski plans to conduct a special study on this issue with the construction contractor in order to realize this expectation. Increasing the employment of the residents of the neighborhood in jobs that do not require expertise as much as possible will also contribute to the social transformation of the neighborhood.

There is a general expectation that the increase in the number of employees during both the construction and operation periods will increase the frequency of public transportation trips to the neighborhood. It is also evaluated that the ongoing construction of many small-scale industrial sites in the immediate vicinity of the facility area will be effective in meeting this expectation.

It has been expressed that despite the density of industrial sites, this area will generally constitute a valuable place for existing settlements due to the fact that it contains structures at ground level.

There is an expectation that the presence of a municipality-owned facility/building in the area will keep the public authority's interest in the neighborhood alive. There is also an expectation that high-level visits to be carried out during the construction process will have a positive impact on the neighborhood.

It is seen that there is a general negative expectation that an odour problem will arise with the increase in the facility capacity. It has been observed that the information that odor removal units will be built within the scope of the project has significantly reduced this concern.

There were concerns that there would be an increase in the number of birds due to the presence of water in the plant and that this could have a negative impact on agricultural activities. It was reminded that similar concerns arose during the construction of the first stage of the facility, but this did not happen, and efforts were made to alleviate these concerns. However, it was stated that in the event of such a situation, bird repellent systems could be integrated into the facility and actions would be taken to solve the problem. In addition, it was reminded that the population mobility and noise generation potential of the presence of small-scale industrial sites would reduce this risk.

Questions were asked about the use of water treated in the facility for agricultural purposes. It was asked about its effect on plants, whether it would be delivered to them through pressurized lines, whether the fee would be lower or higher than well water, and it was stated that the issue was being studied by DSI. It was reminded that even if the treated wastewater was given at the same cost as well water due to the nutrients it contains, it would be advantageous, and that water prices in general irrigation programs were lower than well water costs.

Secondary Data

Secondary data comprise of statistical information such as population and economic indicators. Such data was obtained from the national institutions, ministries, research institutes, universities, national and local censuses, web-based published reports, assessment reports of local and national NGOs.

The following sections provide insights into the social infrastructure, including education, health services, transportation, vulnerable groups, and land ownership status, in Fevzi Çakmak and Tatlıcak neighborhoods.

4.6.1 Population and Demography

Population

Project is located in Konya Province, celebrated as Türkiye's agricultural heartland, benefits from vast agricultural lands, varied agro-ecological zones, extensive irrigation systems, and a strategic location. It's a powerhouse in the production of a wide array of field crops like wheat, barley, sugar beet, beans, potatoes, sunflowers, poppy, cumin, and safflower, alongside a variety of fruits and vegetables. Covering an area of 38,873 km², agriculture constitutes 67.7% of Konya's territory. (Konya AFAD Konya II IRAP).

Province Level

As of 31 December 2023, the population of Konya has increased by 23.894 compared to the previous year, reaching a total of 2.320.241 This figure comprises 1.152.384 men and 1,167.857 women, accounting for 49.67 % and 50.33% of the population, respectively. The land area of Konya covers 38,873 km², resulting in a population density of 56 people per km². The population trend of Konya province over the last five years, along with the latest figures released by TurkStat, is depicted in Table 4-18.. Gender-Based Population of Konya Province over the last five years* (nvi.gov.tr).

Table 4-18.. Gender-Based Population of Konya Province over the last five years*

Year	Male Population	Female Population	Total Population
2018	2,205,609	1,094,441	1,111,168
2019	2,232,374	1,108,968	1,123,406
2020	2,250,020	1,118,850	1,131,170
2021	2,277,017	1,131,923	1,145,094
2022	2,296,347	1,141,206	1,155,141
2023	2.320.241	1.167.857	1.152.384

*(nvi.gov.tr)

District Level

Karatay District is adjacent to Konya's 1st, 2nd and 3rd Organized Industrial Zones, and many businesses operate in these industrial zones. In the district, a total of 8,271 workplaces operate in 46 industrial and SME sites. Konya Commodity Exchange and Grain Exchange are also located in the district. In addition, the vast majority of small-scale industrial sites currently under construction are affiliated with this district. Some of these industrial sites are within walking distance of Tatlıcak Neighborhood.

Industrial businesses based on agriculture in Konya, especially milk and flour industry, are concentrated in the district. The application of stabilized treatment sludge in soil, which was initiated by KOSKİ in 2014, is a first in Türkiye. This application, in addition to being low-cost and environmentally friendly, provides a permanent nutritious effect in agriculture. While it was used free of charge on lands with permits in the early years, it is now provided for a fee of 100 TL/m3 on lands with permits due to high demand.

Neighborhood Level

The population of Tatlıcak Neighborhood is approximately 4,200 and this population remains stable. There are 32 households in the neighborhood, mainly Syrian refugees. The average age of the population in the neighborhood is 45. Fevziçakmak Neighborhood is home to approximately 8,400 people. There is no unemployment in the neighborhood and mostly middle-aged individuals work. The majority of the workforce works in the public sector or as workers in industrial zones.

The livelihoods of Fevziçakmak Neighborhood include working in jobs in the industrial zone, working in the public sector, and income from small-scale local businesses. Although there is no unemployment in the neighborhood, the majority of the workforce is employed in the industrial and public sectors. In addition, there are some unregistered sources of income in the neighborhood.

In Tatlıcak Neighborhood, cattle breeding is the most important activity, accounting for 50% of the neighborhood's economy, while the agricultural sector has a share of 20%. In addition, 10% work as daily workers in the construction sector.

In the discrict and neighbourhood level, the most updated data retrieved from TurkStat is given in Table 4-19. **District and Neighbourhood Level Gender-Based Populations***

Table 4-19. District and Neighbourhood Level Gender-Based Populations*

Settlements	Male Population	Female Population	Total Population
Karatay Municipality	**188.180**	**187.379**	**375.919**
Fevziçakmak Neighboorhood	8546	4209	4337
Tatlıcak Neighboorhood	2035	2155	4190

*(nvi.gov.tr)

The population change of Tatlıcak and Fevziçakmak neighborhoods, where the Project is located at, over the last five years is shown in Table 4-20. Population changes of Tatlıcak Neighborhood over the last five years*

Table 4-20. Population changes of Tatlıcak Neighborhood over the last five years*

Year	Tatlıcak Neighborhood	Fevziçakmak Neighborhood
2018	4,139	8546
2019	4,154	8495
2020	4,205	8446
2021	4,100	8432
2022	4,025	8567
2023	4.190	8559

**(nvi.gov.tr)*

The Mukhtar of Tatlıcak stated that the neighborhood's population is approximately 4,200, with a total of 800 households. The population remains stable throughout the year, without any seasonal fluctuations. There are 32 households within the neighborhood that are home to refugees, mostly Syrian. The average age of residents in the neighborhood is 45.

The Mukhtar of Fevziçakmak neighborhood stated that the population of the neighborhood is approximately 8400, the main source of income is regular salaried jobs and the population remains stable throughout the year. There is no unemployment in the neighborhood, and the community primarily consists of middle-aged (45-54) working individuals.

4.6.1.1 Socio-Economic Features

Konya Province, celebrated as Türkiye's agricultural heartland, benefits from vast agricultural lands, varied agro-ecological zones, extensive irrigation systems, and a strategic location. It's a powerhouse in the production of a wide array of field crops like wheat, barley, sugar beet, beans, potatoes, sunflowers, poppy, cumin, and safflower, alongside a variety of fruits and

vegetables. Covering an area of 38,873 km², agriculture constitutes 67.7% of Konya's territory. (Konya AFAD Konya II IRAP)

If we summarize the industrial information within the borders of Karatay district; Konya 1, 2 and 3. Organized Industrial Zones are adjacent to the district borders but are not within the provincial borders of Karatay. However, a portion of the population residing within the district borders works in the enterprises in these organized industrial zones. A total of 8,271 workplaces continues their activities in 46 industrial and SME sites within the district borders. Other SME-type, generally agricultural-based industrial enterprises (such as milk, flour) operate in different parts of the district. However, it can be said that the majority of these types of enterprises in Konya are concentrated within the district borders. Konya Commodity Exchange and Grain Exchange are also within the district borders. The vast majority of the small-scale industrial sites currently under construction are within the district borders. A large portion of them are within walking distance to Tatlıcak neighborhood.

The use of stabilized treatment sludge in soil was initiated by KOSKİ in 2014 after obtaining the necessary permits. This practise is the first implementation in Türkiye. In the first years, it was given free of charge to be used on lands where permission was obtained, but due to the high number of request, it is given for a fee of 100 TL/m^3 to lands where permission was obtained.

This practise has high individual and social benefits, as it has a longer-lasting nutritional effect compared to chemical fertilizers, is low in cost and contributes to the circular economy.

According to the Mukhtar, cattle breeding and daily wage labor are significant income sources, underpinning the neighborhood's economic fabric.

To provide a more detailed understanding of the local socio-economic dynamics, the economic profiles of Fevzi Çakmak and Tatlıcak Neighborhoods are summarized below, highlighting key livelihood activities and workforce distribution.

Fevzi Çakmak Neighborhood:

Fevzi Çakmak Neighborhood has a population of about 9,000. According to information from the mukhtar, 70% of the residents work in the public sector or as laborers in the industrial zone. It was stated that there is no unemployment in the neighborhood. Most people earn their income from jobs in the industrial zone or the public sector. The majority of the workforce is middle-aged, which is the largest age group in the neighborhood. Some informal income sources exist, mostly through small-scale businesses in the neighborhood.

Tatlıcak Neighborhood:

In Tatlıcak Neighborhood, cattle breeding is the most important economic activity, accounting for 50% of livelihoods. The agricultural sector is the second-largest source of income, contributing 20%. Additionally, 10% of the residents work as daily laborers in the construction sector. These sectors form the foundation of the neighborhood's economy.

The following properties are included in the UNESCO World Heritage Tentative List in Konya Province, and detailed information can be accessed from the official website of the UNESCO World Heritage Center: http://whc.unesco.org/en/tentativelists/state=tr.http://whc.unesco.org/en/tentativelists/state=tr.

Konya is on the UNESCO World Heritage Tentative List with the following assets:

- Konya Seljuk Capital (2000),
- Seljuk Caravanserais Denizli-Doğubeyazıt Route (2000),

- Eflatunpınar: Hittite Water Monument (2014),
- Anatolian Seljuk Madrasahs (Erzurum, Sivas, Kayseri, Konya and Kırşehir) (2014),
- İvriz Cultural Landscape (2017).

For the Project footprint level, official opinion of the relevant authority, Konya Regional Board for Cultural Asset Preservation, requested by KOSKİ on this matter. The response letter, as given in Annex K, stated that the project area does not overlap with any registered cultural heritage.

4.6.1.2 Population Projection

The population projection for the project is performed by using three methods: unified interest method, İLBANK method, and exponential method. First, the design consultant performed the projection calculations in 2020 as the project design was executed that year, then in 2023, the Project Identification Report (PID) consultant performed verification calculations by using the actual population data for 2020, 2021, and 2022. The control study by the PID consultant showed that the design consultant's population forecast for 2040, the design horizon, was reasonable, even on the safe side. The comparison of population projections made by design consultant and the PID consultant is given in Table 4-21 Comparison of Population Projections

Table 4-21 Comparison of Population Projections

	Population According to Years						
	2019	2020	2022	2025	2030	2035	2040*
Pop. projection according to design consultant	1,346,330	1,515,692	1,587,611	1,701,939	1,911,072	2,145,904	2,409,592
Pop. projection according to PID consultant			1,550,911	1,640,573	1,801,676	1,978,599	2,172,896

* 5% added to the original projections considering the daily visitors and tourist population.

4.6.2 Vulnerable and Disadvantaged Groups

Vulnerable and disadvantaged groups in the Fevzi Çakmak and Tatlıcak neighborhoods have been identified, along with their potential challenges in accessing stakeholder engagement activities and their relevance to the project.

Fevzi Çakmak Neighborhood

- Persons with Disabilities: There are 30 individuals with disabilities in the neighborhood. These individuals may face physical challenges in participating in stakeholder engagement activities unless accessible facilities and transportation are provided.
- Households Living in Poverty: The neighborhood includes 20 households classified as impoverished. Limited financial resources may restrict their ability to access engagement meetings, particularly if transportation or time away from income-generating activities is required.

- Employment Status: There is no unemployment in the neighborhood, and the community primarily consists of middle-aged working individuals. This reduces the likelihood of economic vulnerability hindering engagement with the project.

Tatlıcak Neighborhood

- Persons with Disabilities: The neighborhood has 15 individuals with disabilities, who may encounter difficulties attending project-related activities if appropriate accommodations, such as ramps or sign language interpretation, are not available.
- Unemployment: The muhtar estimates that nearly half of the neighborhood's young population is unemployed, indicating significant economic vulnerability. This group may have limited financial or emotional capacity to engage with the project due to their focus on securing livelihoods.
- Households Living in Poverty: Approximately 600 households in the neighborhood are impoverished. Financial constraints and other socioeconomic barriers may hinder their participation in project activities, particularly if transportation or childcare costs are involved.
- Elderly Population: There are 50 households consisting of individuals aged 70 and above living alone. These individuals may face mobility or communication challenges, limiting their ability to engage in project activities without specific support measures.
- Refugee Households: According to information received from the muhtar, there are a total of 32 refugee households (Afghan and Syrian). These individuals may have difficulties in conveying grievances or participating in stakeholder engagement activities due to language barriers.
- People with Chronic Diseases: In line with the information received from the muhtar, there are 6 individuals with chronic diseases.

The identified vulnerable groups may face challenges in accessing stakeholder engagement activities due to mobility, financial, or social barriers. To mitigate these issues, the project team should:

- Provide accessible venues for meetings, ensuring they are barrier-free for individuals with physical disabilities.
- Use diverse communication methods (e.g., written materials, visual aids, and oral presentations) to accommodate different needs.
- Offer transportation or reimbursements to ensure the participation of economically disadvantaged individuals.
- Schedule meetings at convenient times to avoid conflicts with work or caregiving responsibilities.
- Engage local muhtars to encourage participation and disseminate information effectively.

4.6.3 Education and Health Services

Education

There are two primary schools and two secondary schools in Tatlıcak Neighborhood.

The list of schools in the neighborhood is given below.

- Karatay Nermin - Agah - Erdinç Topak Middle School

- Nermin Agah Erdinç Topak Elementary School
- Karatay İbrahim Sulhiye Kamanlı Middle School
- İbrahim Sulhiye Kamanlı Elementary School

The closest school to the project area is İbrahim Sulhiye Kamanlı Elementary School, which is 1.90 km away.

There are two kindergartens, one primary school, two secondary schools and two high schools in Fevziçakmak Neighborhood.

The list of schools in the neighborhood is given below.

- Karatay Fevzi Çakmak Kindergarten
- Rota Kindergarten
- Karkent Primary School
- İsacan Bezircimam Hatip Middle School
- İsacan Bezirci Middle School
- Karatay Aykent Vocational and Technical Anatolian High School
- Karatay Süleyman Demirel National Lottery Anatolian High School

The closest school to the project area is Karatay Fevzi Çakmak Kindergarten, 3.95 km away.

Health Services

Tatlıcak Neighborhood: There is no health center in Tatlıcak Neighborhood. The nearest health service to the neighborhood is Konya City Hospital with a distance of 1.5 km and Karatay Fetih Family Health Center No. 72 with a distance of 4.7 km. According to the information received from the mukhtar, transportation to health services is easily provided.

Fevziçakmak Neighborhood: According to the information received from the mukhtar, Karatay Büsan Family Health Center No. 79 in the neighborhood meets the health services needs of the neighborhood. Konya City Hospital is 5 km away. According to the information received from the mukhtar, transportation to health services is easily provided. It was stated that there are no problems such as chronic diseases or access to health services in the neighborhood.

For the nearest health services and schools satellite image, see Figure 4-12.

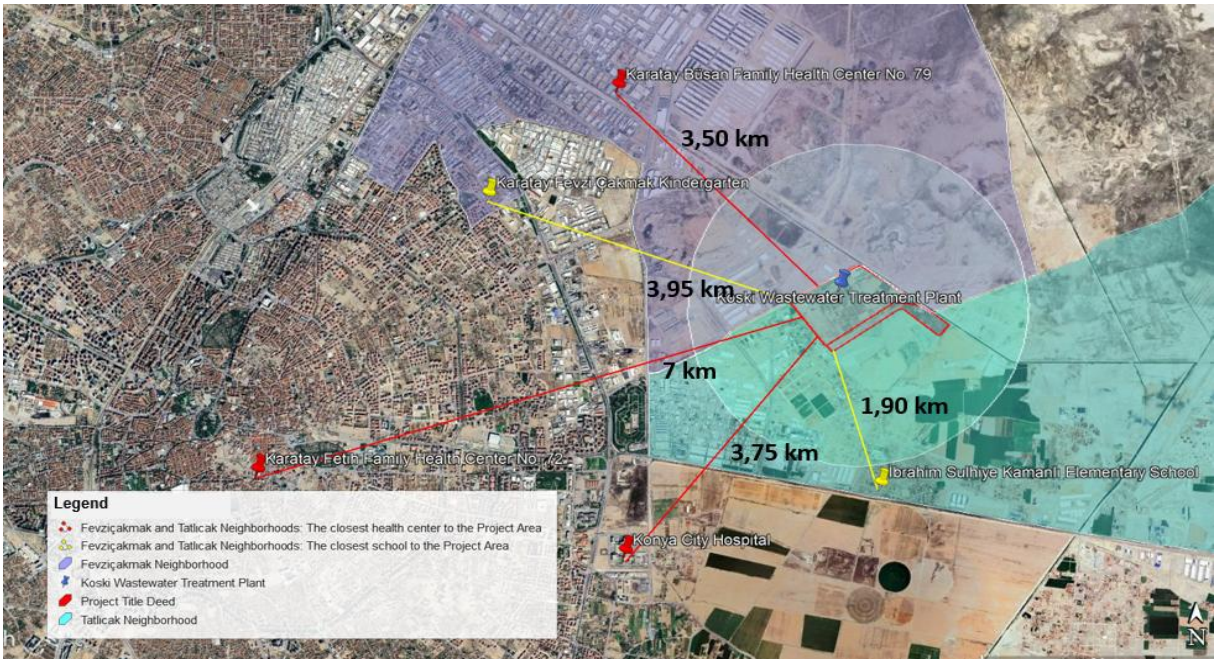

Figure 4-12 Nearest health services and schools satellite image

4.6.4 Infrastructure

Infrastructure Access and Deficiencies:

According to information from the mukhtars, both neighborhoods have access to water supply, waste management, and electricity services. The KOSKI General Directorate is working on improving sewer infrastructure and water supply.

4.6.5 Traffic

Transportation Infrastructure: Fevzi Çakmak Neighborhood has easy access to main roads and transport networks due to its location near the city center of Konya. Tatlıcak Neighborhood, being farther from the city center, may face difficulties in accessing main roads and transport networks. However, public transport lines and bus stops provide connections to the city.

Traffic Density: Traffic density increases in both neighborhoods, especially during morning and evening hours.

4.6.6 Cultural Heritage

The following properties are included in the UNESCO World Heritage Tentative List in Konya Province, and detailed information can be accessed from the official website of the UNESCO World Heritage Center: *http://whc.unesco.org/en/tentativelists/state=trhttp://whc.unesco.org/en/tentativelists/state=tr** .

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- Anatolian Seljuk Madrasahs (Erzurum, Sivas, Kayseri, Konya and Kırşehir) (2014),

- İvriz Cultural Landscape (2017).

For the Project footprint level, official opinion of the relevant authority, Konya Regional Board for Cultural Asset Preservation, requested by KOSKİ on this matter. The response letter, as given in Annex K, stated that the project area does not overlap with any registered cultural heritage.

The nearest registered cultural heritage site to the project area is Anatolian Seljuk Madrasahs: Karatay Madrasah, which is located 7.20 km away from the project area (see Figure 4-13).

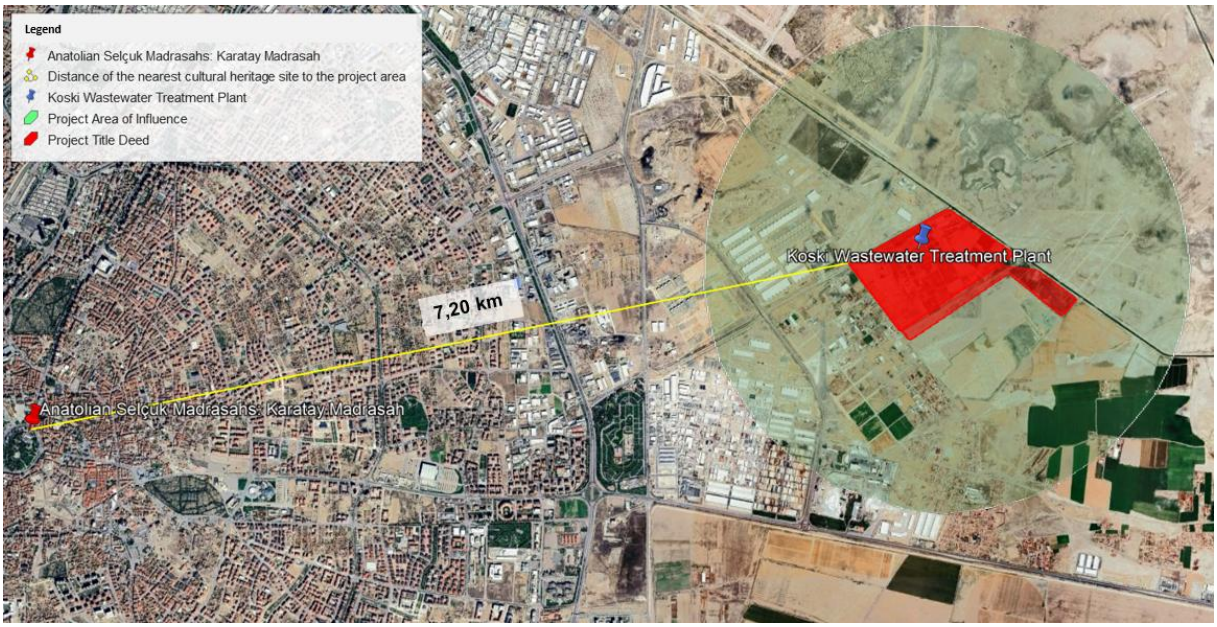

Figure 4-13 The nearest cultural heritage site to the project area

5 ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS

5.1 Area of Influence

According to WB ESSs, “where the project involves specifically identified physical elements, matters and facilities that are likely to create impacts, environmental and social risks and impacts shall be identified in the context of the project's Area of influence (“AoI”)”. Thus, AoI of the Project Thus, AoI of the Project is considered in two different aspects as environmental AoI and social EoI.

The area of influence (AoI) to be assessed may vary depending on the component itself and the characteristics of potentially affected receptors. In all cases, all areas where significant impacts are likely to occur are included in the AoI, and also project components are considered when identifying the AoI.

These areas where significant impacts are likely to occur are defined as follows:

- The Project footprint,
- Temporary Facilities,
- Associated facilities.

Environmental Area of Influence

With regard to the main physical component; soil, hydrology, hydrogeology, air and noise, the AoI of the project is defined in Table 5-1 Physical Area of Influence, and presented in Figure 5-1.

There are many pollutant sources around Konya WWTP such as fattening house, small industrial facilities, construction material suppliers industrial site, Metropolitan Municipality Facilities, Dairy Industry Facilities. Construction activities are still ongoing at many points. In order to avoid being included in the impact area of many pollutant sources listed here, a 2 km diameter area where the main source is considered as Konya WWTP has been determined as the impact area.

Table 5-1 Physical Area of Influence

ESIA Component	AoI
Soil and Subsoil	AoI includes the project footprint and temporary and associated facilities
Hydrology and Surface Water Quality	AoI includes the project footprint and temporary and associated facilities
Hydrogeology and Groundwater Quality	AoI includes the project footprint and temporary and associated facilities
Air Quality	AoI includes an area having boundaries 2 km. away from the project site, temporary and associated facilities

ESIA Component	AoI
Noise and Vibration	AoI includes an area having boundaries 2 km away from the project site, temporary and associated facilities

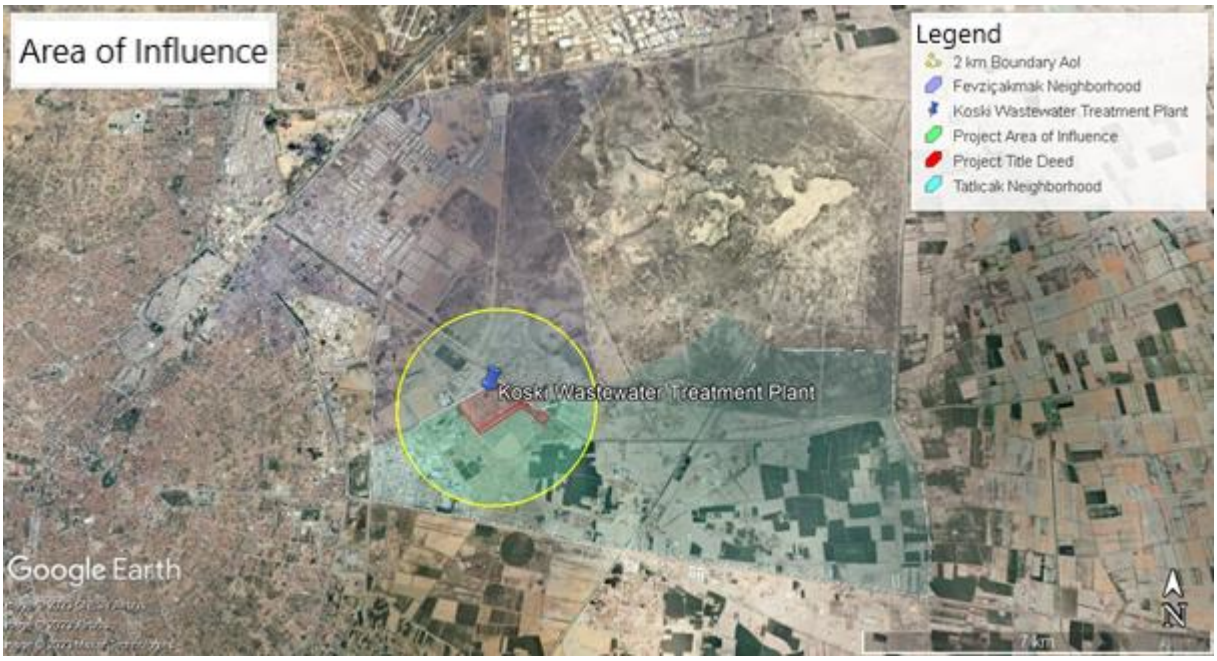

Figure 5-1 Area of Influence (AoI)

Social area of Influence

The AoI is the zone that may be influenced by the project. Understanding the AoI is an essential requirement for a social impact assessment (SIA), the social baseline must focus on the AoI, although the baseline may have a broader focus, depending on the nature and impact of the project.

In short, the AoI should include all project related structures and associated facilities (owned or managed) by the client and subcontractors and the associated activities strongly dependent on the Project. In addition, areas and communities directly impacted upon by the Project and associated facilities form part of the AoI. Cumulative impacts and potential unintended, but predictable, project consequences should also be considered in the delineation of the AoI.

From a social viewpoint, the AoI perspective is also influenced by direct and induced socio-economic influences (including resettlement, economic displacement, livelihood, health, and safety aspects), spatial implications, intrusion impacts and stakeholder typology.

Based on the considerations indicated in above section, a map presenting the zoning plan, the area around the Konya Wastewater Treatment Plant is reserved for small-scale industrial facilities.

Since there are many other construction, small industry and dairy industry facilities around the Project area, many other impact sources are included in the assestment area as the facility moves away from the construction area. Therefore, it is not possible to say that any possible impact on residential areas is only due to the Konya Wastewater Treatment Plant. The distance shown as 2 km is determined hypothetically, taking into account the current density of residential areas. The identified SAoI is given in Figure 5-2.

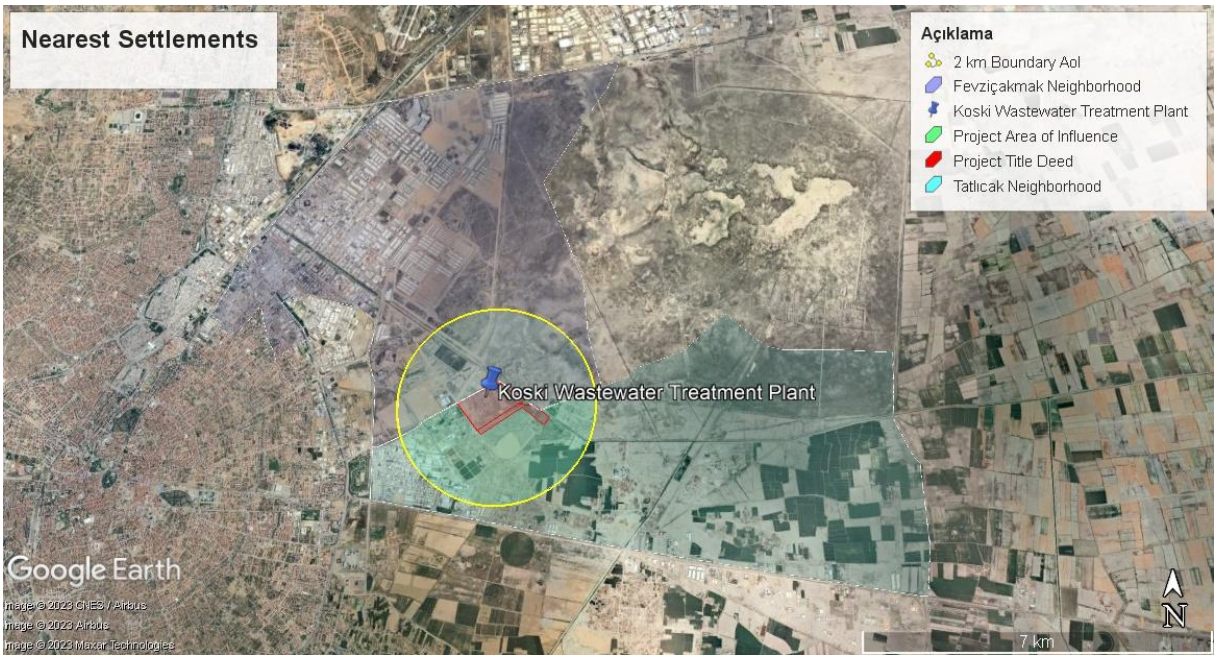

Figure 5-2 Social AoI

5.2 Impact Assessment Approach and Methodology

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

Impact assessment and defining relative mitigation measures are based on identification, assessment and understanding the significance of potential impacts as well as risks on identified receptors and resources. These studies incolves developing and outlining measures to prevent or reduce any potential adverse effects, while also enhancing potential benefits. It also comprises reporting on the significance of the remaining impacts after mitigation efforts have been implemented.

Impact assessment is based on the desk studies and site visit findings. The assessment of environmental and social impacts / risks has been done based on the criteria provided v-below using mainly expert judgement, relevant standards and guidelines:

- Nature of the impact: Positive (+), Negative (-)

- Type of Impact: Direct, Indirect, Cumulative
- Extent/area of Impact: On-site/project footprint, Local, Regional, National
- Duration of Impact: Short term, Mid-term, Long term, Permanent
- Likelihood of Impact Occurrence: Very likely/certain, Likely, Unlikely.

The magnitude and severity of the adverse impacts have been assessed based on the criteria given above and significance of the impacts has been determined based on this assessment and sensitivity of the receiver/source exposed to the impact, as much as possible. The sensitivity of the environment to change refers to how susceptible the natural surroundings are to alterations or disturbances, including those that may be introduced by a project.

The matrix given in Table 5-2 combines the sensitivity information with the magnitude of impacts. The significance of the impact is first designated without mitigation measures and then evaluated with mitigation measures. This evaluation serves to determine the significance of the residual impacts (impact left after employing mitigation measures).

Table 5-2 Impact Significance Matrix

Sensitivity	Magnitude of Impact			
	High	**Medium**	**Low**	**Negligible**
High	High	High	Medium	Negligible
Medium	High	Medium	Low	Negligible
Low	Medium	Low	Low	Negligible

The overall objective of the environmental and social impact assessment is to identify social impacts, risks, and mitigation measures within the scope of the Project. The environmental and social impact assessment process began with the review of E&S screening report, introductory meetings with the ILBANK PIU and KOSKİ. Where the impact assessment indicated that identified impacts as potentially arising, mitigation measures have been developed and the actions to be taken were described. Once relevant mitigation mesures were identified, potential impacts were assessed.

Table 5-3 indicated the identification of impact levels in terms of environmental and social attributes.

5.2. Environmental and Social Impacts

In this Section, the potential environmental and social impacts and levels of the Project are given in Table 5-3 and detailed overview of these identified impacts and relevant assessments are presented in the following subheadings.

Table 5-3 Environmental and Social Impacts Matrix Table

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 ESIA	Impact Significance with ESIA
		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. CONSTRUCTION PHASE																					
Physical Environment																					
Soil Quality																					
1	Contamination of soil		✓	✓			✓					✓				✓		**Medium**	**Medium**	**Medium**	**Low**
2	Loss of topsoil		✓	✓			✓							✓		✓		**Medium**	**Medium**	**Medium**	**Low**
3	Erosion potential		✓	✓			✓						✓			✓		**Low**	**Low**	**Low**	**Low**
Air Quality																					
1	Increase in dust concentration		✓	✓			✓					✓			✓			**Medium**	**Low**	**Low**	**Negligible/ None**
2	Increase in SO_2 PM, NO_x emissions		✓	✓			✓					✓			✓			**Medium**	**Low**	**Low**	**Negligible/ None**
Noise and Vibration																					
1	Increase in noise level		✓	✓				✓				✓			✓			**High**	**Low**	**Medium**	**Low**
2	Increase in vibration level		✓	✓			✓					✓				✓		**Medium**	**Low**	**Low**	**Negligible/ None**
Water Quality																					

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 ESIA	Impact Significance with ESIA
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely	High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
1	Change in surface water quality		✓	✓				✓				✓					✓	**Medium**	**Low**	**Low**	**NegligibleNegligible / None**
2	Change in groundwater quality		✓	✓			✓					✓				✓		**Medium**	**Medium**	**Medium**	**Low**
Waste and resources																					
1	Improper waste management		✓	✓				✓				✓				✓		**Medium**	**Low**	**Low**	**Negligible / NoneNone**
2	Excess Use of Resources during works		✓	✓				✓				✓			✓			**Low**	**Low**	**Low**	**Negligible / None**
Biological Environment																					
1	Disturbance on flora and fauna species		✓		✓			✓				✓				✓		**Medium**	**Low**	**Low**	**Negligible/ None**
2	Usage of Chemicals		✓	✓			✓					✓			✓			**Medium**	**Low**	**Low**	**Low**
Socio-economic Environment																					
1	Local Population and Livelihood (Job creation and local procurement)	✓		✓				✓					✓		✓			**Positive**			
2	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 ESIA	Impact Significance with ESIA
		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
3	Impact on demographic structure and social cohesion		✓		✓			✓				✓					✓	**Mediım**	**Medium**	**Mediım**	**Low**
4	Impacts on disadvantaged/vulnerable groups		✓	✓				✓				✓				✓		**Mediım**	**Medium**	**Mediım**	**Low**
Labor and Working Conditions																					
1	Workers' exposure to work related occupational health and safety risks		✓	✓			✓				✓	✓	✓		✓			**High**	**High**	**High**	**Low**
2	Child labor and forced labor risks		✓	✓			✓					✓					✓	**Medium**	**Medium**	**Medium**	**Low**
3	Informal employement		✓	✓			✓					✓				✓		**Medium**	**Medium**	**Mediım**	**Low**
4	Sexual exploitation, abuse, and harassment risks		✓	✓			✓					✓				✓		**Mediım**	**Medium**	**Mediım**	**Low**
Community Health and Safety and Security																					
1	Project traffic and construction activities related risks		✓	✓				✓				✓				✓		**Low**	**Low**	**Low**	**Negligible/ None**
2	Community encroachment		✓	✓			✓					✓					✓	**Medium**	**Medium**	**Low**	**Negligible/ None**
Archaeological and Cultural Heritage																					
1	Chance finds		✓	✓			✓				✓						✓	**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 ESIA	Impact Significance with ESIA
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely				
																		High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
B. OPERATION PHASE																					
Soil Quality																					
1	Soil contamination		✓	✓			✓						✓				✓	**Medium**	**Low**	**Low**	**Negligible/ None**
Air Quality																					
1	Odorous gas emission		✓	✓				✓					✓		✓			**Medium**	**Medium**	**Medium**	**Low**
Noise and Vibration																					
1	Increase in Noise Level		✓	✓			✓						✓			✓		**High**	**Low**	**Medium**	**Low**
Water Quality																					
1	Change in overall physicochemical water quality	✓		✓					✓				✓		✓			**Positive**			
2	Change in surface water quality		✓	✓				✓			✓					✓		**Medium**	**Low**	**Low**	**Negligible/ None**
2	Change in groundwater quality		✓	✓				✓			✓					✓		**Medium**	**Low**	**Low**	**Negligible/ None**
Waste and Resources																					

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 ESIA	Impact Significance with ESIA
		Positive (+)	Negative (-)	Direct	Indirect	Cumulative	On-site/project footprint	Local	Regional	National	Short term	Mid-term	Long term	Permanent	Very likely/ certain	Likely	Unlikely				
																		High	High	High	High
																		Medium	Medium	Medium	Medium
																		Low	Low	Low	Low
																		Negligible/ None	Negligible/ None	Negligible/ None	Negligible/ None
1	Generation of different types of waste		✓	✓				✓					✓			✓		**Medium**	**Low**	**Low**	**Negligible/ None**
2	Sludge generation		✓	✓				✓					✓		✓			**Medium**	**Medium**	**Medium**	**Low**
Biological Environment																					
1	Damage or loss terrestrial habitats and flora-fauna species		✓		✓			✓					✓					**Medium**	**Low**	**Low**	**Negligible/ None**
2	Damage or loss of aquatic habitat and/or aquatic species		✓		✓			✓					✓					**Medium**	**Low**	**Low**	**Negligible/ None**
3	Change in surface water quality	✓		✓					✓				✓		✓			**Positive**			
Socioeconomic Environment																					
Employment and Procurement Opportunities																					
1	Local procurement	✓		✓				✓					✓		✓			**Positive**			
2	Employment Opportunities	✓		✓				✓					✓		✓			**Positive**			
Labor and Working Conditions																					
1	Workers' exposure to work related occupational health and safety risks		✓	✓			✓				✓	✓	✓		✓			**High**	**High**	**High**	**Medium**
2	Hazards of Maintenance and Repair Activities		✓	✓			✓				✓	✓	✓		✓			**High**	**High**	**High**	**Medium**

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 ESIA	Impact Significance with ESIA
		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
Community Health, Safety and Security																					
1	Increased traffic due to maintenance operation		✓		✓			✓			✓						✓	**Low**	**Low**	**Low**	**Negligible/ None**
2	Failure of operation		✓	✓					✓		✓						✓	**Medium**	**High**	**High**	**Low**

The risks and impacts of the project are evaluated in detail in the following sections as per the relevant WB ESSs. Table 5-4 lists the World Bank standard against which each impact is assessed.

Table 5-4 WB ESSs used for the Assessment of the Risks and Impacts

Risks / Impacts	WB ESSs
Environmental Attributes	
Soil Quality	ESS 1, ESS3
Air Quality, Climate Change and Odor	ESS 1, ESS3
Noise and Vibration	ESS 1, ESS3
Water Quality	ESS 1, ESS3
Waste Management	ESS 1, ESS3
Biodiversity	ESS 1, ESS6
Social Attributes	
Labor and Working Conditions	ESS 1, ESS 2
Employment and procurement opportunities	ESS 1
Community Health and Safety	ESS 1, ESS 4
Occupational health and Safety	ESS 1, ESS 2
Land Acquisiton	ESS 1, ESS 5
Demographic structure and Social Cohesion	ESS 1
Livelihood	ESS 1, ESS 2, ESS 5
Archeological and Cultural Heritage	ESS 1, ESS 8

5.2.1 Impacts on Soil

The project site itself is a typical anthropogenic land, where the former natural layer is practically disturbed and/or destroyed. Therefore, in general project activities will have minor impacts on the soil quality. In addition to that, as the activities will be performed at current KWWTP's site, there will be no additional land acquisition and/or access road requirement that otherwise might create negative impacts on soilsoil quality.

General potential impacts on soil can be described as; loss of topsoil, contamination of soil and erosion. As a result of these, the components that are likely to be affected during construction and operation phases of the project are; soil quality, flora-fauna, surface and ground water and nearest settlements.

Construction Phase:

Impacts on soil quality potentially will occur mainy during the construction phase of the project because of the construction machinery movement. During construction works of the project, inadequate geotechnical works could increase erosion potential of the site. However, this could be easily eliminated by following the implementation guidance to be given in design documents.

In the construction phase of the project, soil contamination may be seen due to accidental oil leakages in the areas where the works are carried out as well as improper disposal of wastes. This may affect the soil quality in the project area, if necessary mitigation measures are not taken. These impacts can be easily managed and mitigated to low in significance.

Another impact during the construction of the Project is loss of topsoil and soil erosion which are mostly valid for the WWTP site. Earthworks to be performed during the construction phase will generate around 118,000 m^3 excavation material.material. The suitable part of the excavationexcavation material will be used for filling and compaction and the remaining will be sent to the disposal site operated by KMM. With the worst-case scenario approach, all generated excavationexcavation material is accepted to be sent to final disposal. The existing wwtp area will be used in the scope of the project and so potential impact is considered to low in significance.

Operation Phase:

During the operation phase, impact on soil environment might be related with the accidental spillage/leakage of hazardous materials such as chemical storage areas to store oil, paint, fuel, etc. Chemicals shall be stored in a safe manner and each shall be properly labelled. These issues can be easily prevented by implementation of regular mitigation measures and spill response detailed in Section 7 to lower the impact significance.

As result of the activities of the WWTP during the operation period; sludge will be generated. As indicated in relevant sections od this ESIA, In line with permit requirements, in accordance with Article 8, paragraph 2, subparagraphs (c) and (ç) of the relevant regulation, for agricultural lands permitted for sludge application (i.e., where the concentration of heavy metals in the soil exceeds 50% of the limit values stated in Annex I-A), soil sampling and analysis will be carried out every twelve months. In addition, sludge samples will be collected every six months and analyzed for the parameters specified in Annexes II-A and II-B of the regulation. The results of these analyses will be submitted to the Provincial Directorate of Environment, Urbanization and Climate Change.

In case the sludge is not deemed suitable for agricultural use based on laboratory analysis or regulatory requirements, or the sludge is not demanded by farmers for agricultural use, dewatered sludge will be stored temporarily and further dried in the temporary sludge disposal area (see Figure 2 11, Figure 2 12 and Figure 2 13), and it will be transported by licensed transportation vehicles for final disposal to the Konya Sanitary Landfill when it reaches 50% dryness rate (see Annex O for official acceptance document). If dewatering of the sludge would not be achieved in the desired amount, the sludge will be transported by licensed transportation vehicles for final disposal to the existing incineration facility within the Konya Sanitary Landfill. The protocol regarding incineration, which has a capacity covering the amount of sludge to be generated from the 1st and 2nd stage facility and whose validity date is the end of 2059, is included in Annex P.

A comprehensive Sludge Management Plan will be prepared prior to the commissioning of the treatment plant. This plan will define the sustainable procedures for sludge management and final disposal.

Details on the mitigation measures regarding with soil contamination are given in Section 7.. Impact significance assessment of sludge is given under Waste and Resources section.

In the operation phase of the Project, the activities will have a limited physical interaction with the environment. In the operation phase of the Project, no additional significant direct impacts on topography, soil and land use are anticipated under normal operating conditions. Impacts of operation phase of the Project are related with the risks arise during repair and maintenance works. The extent of these negative impacts will be limited with the Project's footprint, the significance of the impacts/risks on soil environment would be considered as low if mitigation measures will be applied accordingly. With the implementation of mitigation measures, the residual impacts will be negligible in significance. The defined mitigation measures are presented in Section 7..

5.2.2 Impacts on Air Quality and Odor Impacts on and Odor

In this section, impacts on air quality, odor and climate change are assessed. The major impacts on air quality will arise from the construction activities and any major adverse impact during the operation phase of the project on air quality is not expected. As a result of impacts on air quality and odor; the components that are likely to be affected are; flora-fauna and nearest settlements.

Construction Phase

During construction phase of the Project, impacts on air quality will be mainly due to dust emissions caused by the vehicle movement and earthworks to be performed within the Project area. Dust and exhaust emissions will occur during the excavation and filling loading, unloading activities and transport of materials with vehicles. Primary emissions from exhaust gases of vehicles are NO_2, CO, HC, SO_2 and PM. This dust and exhaust emission will affect the people living in the project area and the parks, gardens, fruit trees and other trees owned by people in the gardens, and ornamental plants for landscaping. Hovewer, with the implementation of proper control measures such as dust suppression, the generated dust amount is expected to be reduced effectively.

ThThe construction activities are planned to be completed in three years and as stated previously.. the amount of excess excavation waste will bbe disposed to KMM disposal site located 3 km away from the project site. The calculations indicates that, the total controlled and uncontrolled PM_{10} emission rates are 0.096 kg/h and 0.190 kg/h, respectively. These emission rates are calculated based on the worst-case scenario and it is found that the emission rates are lower than the IAPCR threshold value defined for non-stack sources, which is 1 kg/h. Therefore, the amount of dust to be generated by the Project is negligible and there is no need to run a dispersion model.

Another source of emission during the construction phase is the exhaust gases to be emitted from heavy machinery. Primary pollutants would be NO_2, CO, HC, SO_2, and PM. During the construction phase, two trucks, one excavator, one loader, one mobile crane, and two truck mixers are planned to be used. Exhaust emissions are estimated based on the number of machinery and the assumed distance that the machineries will make. The daily distance of each machinery is assumed as 5 km/day as a worst-case scenario. The calculated emissions are presented in Table 5-5.Table 5-5

Table 5-5 Exhaust Emissions During the Construction Phase

Emissions (kg/h)				
NOx	CO	SO_2	HC	PM

0.031	0.052	0.005	0.009	0.003

The calculated exhaust emissions are well below the IAPCR threshold values defined for non-stack sources.

Operation Phase

During the operation phase, there will be no adverse impacts on air quality. However, odor is generally generated in physical treatment and sludge units of wastewater treatment plants. Screens, aeration tanks, sedimentation tanks, sludge thickeners and dewatering units and operations performed within these units can result in generation of odor which may result in disruptive impacts around the treatment plant.

Wastewater treatment operations may emit hydrogen sulphide, methane, gaseous or volatile chemicals used for disinfection processes, and bio aerosols. Among those, hydrogen sulphide and methane gases are the most significant odorous gas. Also; ammonia, sulphur compounds, fatty acids, aromatic compounds and some hydrocarbons can also cause odor during the sludge treatment process. Petroleum and organic solvents are also sources of disruptive odor.

Establishing a buffer zone between the treatment plant and sensitive receptor, and isolating odor is the main method to prevent odor generated in a treatment plant to be dispersed to the receptors. Suggested buffer zone distances between treatment plant units and nearest sensitive receptor are presented in Table 5-6.. Distance of the treatment units to the nearest sensitive receptor is also presented in that table. As seen in Figure 2-4,, the nearest receptor is not within the buffer zone.

Table 5-6 Recommended Distances to Settlements for Odor Prevention and Nearest Receptors

Treatment unit	Buffer zone, m	Nearest Sensitive Receptor, m	
		Distance to the Existing Units	Distance to the Planned Units
Sedimentation Tank	122	420	415
Aeration Tank	152	490	480
Sludge Disposal Units	305	370	340

Source: Tchobanoglous, 1991

Additional measures for the construction and operation phases of the project are presented in the Mitigation Plan will need to be taken in case the emission levels cause negative impacts on the sensitive receiving environments and the communities in the vicinity.

The project's contribution to the climate change during the construction phase will be due to the emission of GHG. Most greenhouse gas emissions will be due to construction machinery/equipment usage. The major greenhouse gas emission will be CO_2 emissions resulting from the combustion of petroleum-based products, like gasoline, in internal combustion engines. Relatively small amounts of methane and nitrous oxide will also be emitted during fuel combustion. Therefore, these emissions will contribute to the climate change.

5.2.3 Noise and Vibration

In this section, impacts on noise and vibratiom change are assessed. The major impacts will arise from the construction activities and impact during the operation phase. As a result of

impacts on noise and vibration; the components that are likely to be affected are; flora-fauna and nearest settlements.

Construction Phase

During construction phase of the Project, the noise would be potentially generated by vehicles and machinery to be used during land preparation activities. The noise would propoably be generated by construction machinery and vehicles worked during construction activities. There is no sensitive receptor in the close vicinity of the project such as health center, school, etc.

During the operation phase of the project, the noise will be generated from the WWTP equipment such as engines, compressors, pumps and blowers. 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. Additionally relevant limit values defined şn both national legislation and WBG General EHS Guidelines and Sectoral Guidelines will be compiled with. Therefore, significant noise is expected to be generated during the operation of the project.

The indicative list of machinery and equipment, which will be used during the construction phase and are likely to cause noise, and their number and noise intensity levels are presented in Table 5-7.

Table 5-7 Machinery and Equipment and their Noise Intesity Levels (L_w)

Machinery and Equipment	Number	Noise Intensity Level* (dBA)
Truck	2	85
Excavator	1	115
Loader	1	115
Crane	1	105
Truck mixer	2	111

Source: Industrial Noise Control and Environmental Noise, Ozguven H.N.

To assess the noise impacts of the construction activities, the total noise generations are calculated for the worst-case scenario and compared with the legislative and WBG requirements. To satisfy this need, noise generation calculation is performed below with the assumption of worst-case scenario. The worst-case scenario assumes that all machines and equipment operate simultaneously at maximum noise intensity levels at the same location in the project Area.

L_{wt} is calculated as 119.62 dBA. The noise level at the nearest receptor, L_{pt}, (which is 340 m away from the WWTP) is calculated as 58 dBA. With topographical absorption at 340 m the $L_{pt,\ total}$ is 45.34 dBA.

As it is mentioned before, in the equations given above, it is accepted that construction equipment and machinery are used at the same physical location (at the border of the WWTP area), non-stop at maximum noise intensity levels (worst case scenario). Therefore, it is expected that in reality noise level caused by construction activities will be much smaller than the worst-case scenario calculation result.

National Legal Framework

Environmental noise in Türkiye is regulated by the Regulation on the Assessment and Management of Environmental Noise (RAMEN), which is published on 30.11.2022 in Official Gazette No: 27601. 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 environment. For construction activities, noise limit values set forth by RAMEN are provided Table 5-8.

Table 5-8 Environmental Noise Standards

Type of Activity	L_{day} (dBA)		
	Day	Evening	Night
Industrial plants, transportation sources	65	60	55
Broadcast Music Places	60	55	50
Workplaces	Background+5		Background+3
In case of multiple workplaces	Background+7		Background+5
All Resources	100		

In addition to the national legislation, WB Standards for noise are described under EHS Guidelines, General EHS Guidelines: Environmental Noise. The noise limit values are based on WHO Guidelines for Community Noise. Noise limit levels defined by WB are presented in Table 5-9.

Table 5-9 Noise Level Guidelines of WB General EHS Guidelines

Receptor	One Hour L_{Aeq} (dBA)	
	Daytime 7:00 – 22:00	Nighttime 22:00 – 07:00
Residential, institutional, educational	**55**	**45**
Industrial, commercial	70	70

Environmental noise level at the nearest receptor which is located at a distance about 340 m from the source (340 meters southwest of the border of the WWTP area) is calculated as 58 dBA. With topographical absorption at 340 m the $L_{pt,\ total}$ is 45.34 dBA. Although it meets the WB limit valu for daytime, it is just above the WB nighttime limits (45 dBA). However, it meets the national regulatory limit values, which are 65 dBA, 60 dBA and 55 dBA for day, evening and night respectively.

On the other hand, WB requires that noise impacts should result in a maximum increase in background noise levels of 3 dB at the nearest receptor location off-site, if the background measurement values are higher than the WB limit values. As mentioned in Section 4.3,, background noise levels are higher than the WB limit values. Therefore, it is concluded that, the construction activities should not increase the background noise measurements presented in Section 4.3 more than 3 dB.

For this reason, in order to be able to reduce the noise level at a reasonable value in complient with the project standards some mitigating measures will be applied such as adding silencers or barriers to noise-generating equipment, restriction of construction activities during nighttime hours etc.

Therefore, the noise impact of the construction activities will not exceed the regulatory limit values and will not increase the background noise level at the nearest sensitive receptors.

The impact is assessed as direct and negative with short term duration, local and low in significance by taking necessary mitigation measures.

Vibration

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

Operation PhaseOperation Phase

During the operation phase of the Project, noise will be generated from WWTP equipment such as engines, compressors, pumps and blowers. 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 WWTP. However, as the nearest building to the WWTP is 50 m away, natural noise barriers such as trees should be planted to the east and south borders of the WWTP. During the procurement of equipment and machinery, sound levels given in the technical specifications/data sheet will be taken into consideration. Moreover, relevant provisions and limit values of national legislations and World Bank Group's General EHS Guidelines and Sectorial Guidelines will be complied with during the operation phase. On the other hand, all pumping stations will be built underground and building materials that provide sound insulation will be used. Also, machinery and equipment at the pumping stations will be in enclosed structures. Therefore, no significant impact is expected from the pumping stations regarding noise generation. However, regular maintenance activities will be carried in order to ensure that. The impact is assessed as direct and negative with long term duration, local and low in significance.

The impact is assessed as direct and negative with long term duration, local and low in significance by taking necessary mitigation measures.

Details about noise impacts are shared in Annex AD.

Vibration

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

5.2.4 Impact on Water Resources

In this section, impacts on water resources are assessed. As a result of impacts on surface and ground water quality; the components that are likely to be affected are; flora-fauna and nearest settlements.

Construction

Since existing discharge line will be used in the scope of the project, a new discharge line will not be established and the likelihood of occurrence is unlikely and limited with the construction works period. Therefore, impact significance on the surface water is low.

As part of the Project, there is no planned groundwater extraction, and as such, no adverse effects on the groundwater table are anticipated. Furthermore, there are no intentions to utilize groundwater or discharge into groundwater resources. By implementing adequate measures for preventing spills and chemical leaks, it will be ensured that groundwater quality remains unaffected and impact significance is low.

During the construction phase, employees'needs and dust suppression will require water supply. The water used for dust suppression and utility water will be supplied from the water supply already provided to the project site (i.e. the existing KWWTP) via municipal water distribution system. In the scope of the proposed, the water supply will be provided in the same way. There will be no accommodation on the construction site, and water use will be limited to the working hours of the employees.

The peak number of personnel who will work during the construction phase is planned to be 300. Therefore, by using the TurkStat 182018 data for water consumption rate of Konya Province, the peak amount of water to be used by project employees is calculated as 63.3 m^3/day.

In addition to the employee consumption, water will also be used in the concrete curing process. The amount of water to be used for this puspose is accepted as 10 m^3/day. Similar to this, amount of water to be used for dust suppression during earthworks is assumed to be 10 m^3/day.

During the operation phase, water will be majorly used by the employees. Using the same approach as above, the daily water consumption rate is found as 21.1 m^3/day during the operation phase.

Employee Usage Current Status

The number of personnel currently working in the plant is 58. The amount of water used by the personnel is 211 liters/day according to the 2018 Konya data of the Turkish Statistical Institute. Accordingly;

Daily: 58 Person x 211 L/Person = 12,238 Lt /dday (12.23 m^3/day) water is used.

Employee Usage Status After Capacity Increase

The number of personnel to work in the plant after the capacity increase is planned to be 101. The amount of water used by the personnel is 211 liters/day according to the 2018 Konya data of the Turkish Statistical Institute. Accordingly;

Daily: 101 Person x 211 L/Person = 21,100 Lt /dday (21.3 m^3/day) water is used. During the operation phase, water will be majorly used by the employees. Using the same approach as above, the daily water consumption rate is found as 21.1 m^3/day during the operation phase.

The above calculations are summarized in Table 5-10.Table 5-10.

Table 5-10 Water Consumption Rates

Source	Amount	
	Construction	Operation
Employee Usage	63.3 m^3/day	21.10 m^3/day
Concrete Irrigation	10 m^3/day	-
Dust Suppression	10 m^3/day	-
Cleaning Puposes	-	100 m^3/day (estimated)
Total Water Usage	83.3 m^3/day	21.30 m^3/day

Operation

During the operation phase of WWTP, the facilities will use and store some chemicals such as acids and bases for pH control. In addition, maintenance chemicals will be used at the facility during the maintenance of the machines, engines and pumps. All storage tanks and drums will be stored in accordance with the MSDSs and placed in concrete areas with proper secondary containments and adequate ventilation. When necessary, spill kits, absorbent pads or materials and absorbent sands will be provided near the chemical storage areas at all times. Thus, the risk of soil, surface water and groundwater contamination during the operation will be minimized. In other words, it can be concluded that the impacts will be low in significant upon implementation of the mitigation measures and adherence to good engineering methods. On the other hand, since the project provide discharge of treated water, during long term period the project impact will be direct and positive.

During the operation phase of the plant, the equipment such as screens, sludge pipes, etc. will be backwashed with water according to the clogging conditions. Since the amount of water to be used is proportional to the incoming waste, it is difficult to express a clear value. In addition, water will be used for washing scum lines or general field cleaning purposes. The design envisages the recovery of these needs from the treated wastewater as much as possible.

Total treated wastewater consumption is expected to be around 100 m^3/day.

For garden irrigation purposes in the operation phase of the project, the current plan is to supply the need from the WWTP itself. For the reuse of the treated effluent, the provisions of Comminique on the Technical Procedures of Wastewater Treatmenet Plants (Official Gazette Date: March 20, 2010, Number: 27527) and the WBG EHS Guidelines shall be complied with. In this case, there would be no negative impact on water resources.

5.2.5 Waste and Resources

The use of resources and the generation and treatment of waste place significant environmental pressures on extraction, production, use and scrap. Therefore, environmental management objectives include reducing the amount of materials used, increasing resource efficiency, reducing waste generation and recycling waste into a resource. Within the scope of the project, ready-mixed concrete will be purchased from the producers and brought to the project area.

Construction Phase

All the wastes to be generated during the construction phase of the Project are required to be properly managed in line with the requirements of national waste management legislation and international good practice in order to avoid adverse impacts on soils nearby water resources and flora and fauna elements.

During the construction and operation phase of the project, wastes will be generated from operation/maintenance activities as well as domestic requirements of the personnel throughout the lifetime of the Project. The anticipated solid waste types to be generated in the project are as follows:

- Domestic solid waste
- Packaging waste
- Excavation waste / spoils (limited with the construction phase)

- Hazardous waste (waste oil, vegetable oil, battery and accumulators, end of life tires, medical waste, sludge, etc.)

The anticipated waste generation rate for the different phases of the project is calculated and presented in

Table **5-11**.

Table 5-11.

Table 5-11 Anticipated Waste Generation Rates

Type	Main Source	Generation Rate	
		Construction	Operation
Domestic Waste*	Employees	321 kg/day	107 kg/day
Packaging Waste**	Employees, procurement of goods	64.2 kg/day	21.4 kg/day
Spoils***	Earthworks	180 m^3/day	-
Hazardous Waste	Hazardous materials	640 kg in total	200 kg/year wastes contaminated with hazardous materials 1 kg/year fluorescent lamps 7500 L/year waste oil 1 kg/year battery 80 kg/year laboratory chemicals
Medical Waste	Infirmary	0.3 kg/day	0.1 kg/day
Sludge	Treatment process	-	88,000 ton/year
Screening waste	Screening	-	2,000 ton/year
Oil and Grit	Grit Chamber	-	2,500 ton/year
Domestic Wastewater	Personnel	63,30 m^3/day	21,10 m^3/day

* Calculation is based on TurkStat daily per person waste generation rate for Konya: 1.07 kg/day (2018)
** 20% of the domestic waste
***Duration for the earthworks is taken as 100 days.

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 mid term duration, local and low significance. However, mitigation measures proposed in Section 7 in order to prevent and/or minimize likely impacts will be implemented and so impact significance will be negligible.

Operation Phase

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

The filtrate water coming out of the desulphurization unit is returned to the wastewater treatment plant. Since there is no other removal process, it is not considered as waste but as a part of the process.

In addition, the disposal of equipment in the existing facility that will be scrapped with the 2nd stage construction will be carried out within the same procedures and principles as other waste disposal. For post-storage sales, the provisions in the current legislation will be applied.

As long as the proper waste handling strategy is implemented, it is not anticipated to have significant adverse impacts associated with waste generation. The strategies are provided in the ESMP given in Section 7.

The maximum amount of stabilized treatment sludge for 2040 was calculated as 170,242 kg/day in the process report.

The treatment sludge to be generated during the operational phase of the project will be used for agricultural purposes, as is currently practiced. In line with this, a permit renewal application was submitted by KOSKİ to the Provincial Directorate of Environment, Urbanization and Climate Change with the letter dated 13/01/2025 and numbered E-20824400-220.04.02-92632. In response, the Konya Provincial Directorate issued a letter numbered E-684495568-110.03.01-11756064 (see Annex N), establishing a commission and requesting that soil and treatment sludge samples be collected by authorized laboratory personnel under the supervision of the Directorate and submitted along with the analysis results. These sampling and analysis activities were conducted by an accredited laboratory, and the permit process has been successfully completed.

In line with permit requirements, in accordance with Article 8, paragraph 2, subparagraphs (c) and (ç) of the relevant regulation, for agricultural lands permitted for sludge application (i.e., where the concentration of heavy metals in the soil exceeds 50% of the limit values stated in Annex I-A), soil sampling and analysis will be carried out every twelve months. In addition, sludge samples will be collected every six months and analyzed for the parameters specified in Annexes II-A and II-B of the regulation. The results of these analyses will be submitted to the Provincial Directorate of Environment, Urbanization and Climate Change. A new 20,000 m² temporary sludge storage area has been designated within the existing boundaries of the KWWTP (see Figure 2.12 and Figure 2.13) and will be used for storage during the operational phase of the project.

In case the sludge is not deemed suitable for agricultural use based on laboratory analysis or regulatory requirements, or the sludge is not demanded by farmers for agricultural use, dewatered sludge will be stored temporarily and further dried in the temporary sludge disposal area (see Figure 2 11, Figure 2 12 and Figure 2 13), and it will be transported by licensed transportation vehicles for final disposal to the Konya Sanitary Landfill when it reaches 50% dryness rate (see Annex O for official acceptance document). If dewatering of the sludge would

not be achieved in the desired amount, the sludge will be transported by licensed transportation vehicles for final disposal to the existing incineration facility within the Konya Sanitary Landfill. The protocol regarding incineration, which has a capacity covering the amount of sludge to be generated from the 1st and 2nd stage facility and whose validity date is the end of 2059, is included in Annex P.

A comprehensive Sludge Management Plan will be prepared prior to the commissioning of the treatment plant. This plan will define the sustainable procedures for sludge management and final disposal.the The impact is assessed as direct and negative with long term duration, local and low in significance. However, mitigation measures proposed in Section 7 in order to prevent and/or minimize likely impacts will be implemented and impact significance will be lowered to negligible.

Currently, the content of the sewage sludge (Annex A) is suitable for agricultural use and the necessary permits (Annex B) have been obtained. It can be given to farmers for this purpose.

5.3 Impacts on Biological Environment

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. The magnitude of construction activities on the terrestrial habitat and flora species has been evaluated as low.

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 medium to large mammals and birds will leave the construction sites due to impacts and move towards similar habitats in the immediate vicinity.

Controlled disposal of the wastes generated during construction is essential to prevent the Keçili Creek from being negatively affected by the project-related works. No construction work will be done in Keçili Creek since discharge point will not change. The magnitude of construction activities on the Keçili Creek has been evaluated as low. It has been determined that the Keçili Creek has been evaluated as "medium" sensitive. As a result, the Project's impact on aquatic biodiversity during the construction phase is considered low. In this context, the mitigation measures given in Section 7 will be followed.

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 in the vicinity of the Project Area once the construction works are concluded.

It has been determined that the aquatic environment is currently under anthropogenic influences, which is explained in the above headings. With the planned WWTP, treated water will be discharged into the creek, local and national legislation regarding wastewater discharge will be complied with and the water quality in Keçili Creek will be monitored regularly during the operation phase. That can be a step towards conserving biodiversity and improving the

water quality of the receiving bodies. That is considered the most significant positive impact of the Project on the aquatic environment.

The discharge point of the project area is within the kyay Plan KBA. Akyay Plain KBA includes Akyay Lake, a shallow and salty wetland, and the extensive lowland steppe and salt marshes around the plain.

KBA criteria of the project is given in Table 5-12. Table 5-12.The presence of these species in the Project area is provided in Section 4.5.. Since the project area will be in the boundaries of the existing KWWTP area, it is a previously modified area. Therefore the project area has been exposed to antropogenic effects and its natural biodiversity has cahanged widely.

Table 5-12 Biodiversity elements triggering KBA criteria

Taxonomic Group	Scientific Name	IUCN
Reptile	*Testudo graecca*	VU
	Mauremys capsica capsica	NT
	Ophisops elegans elegans menetries & Lacerta trilineata	NT
	Coronella najadum & M. vittata	NT
Avians	- (All of the species are LC)	
Mammals	- (All of the species are LC)	

5.4 Impacts on Socioeconomic Environment

5.4.1 Employment and Procurement Opportunities

The workforce needed during the construction and operation phases of the project (300 employees for the construction, and 101 for the operation) will be sourced locally, regionally, and nationally. Due to the technical nature of the project, skilled labor is expected to be provided locally or at least regionally. The general approach of construction companies operating in Türkiye is to employ labor from the local communities, primarily to reduce costs associated with travel and accommodation.

Employment of locals will provide significant benefits on those who are employed; however, this will be a minor portion of the entire population. The employment of individuals from local communities will however be beneficial as it is expected to lead to improved relationships between the project and local communities.

Employment of non-locals, as well as the increase of incomes of local employees, may also bring in some minor benefits for local communities, associated with increased spending in the project area.

Another benefit of the project will be indirect employment opportunities, and these will be associated with the project supply chain (goods and services) and spending of project employees in local communities.

5.4.2 Infrastructure and Services

As the number of machinery and equipment to be needed by the project is very limited, and all access roads are of high quality, no negative impact is anticipated on the public infrastructure.

In the scenario where all employees are recruited from non-local sources, it is important to note that the total workforce will be negligible compared to the population of Karatay district and the robustness of the infrastructure and services available there. Prioritizing of local workforce for the recruitment of employees for the Project will not potentially place additional stress on the existing infrastructure and services (such as health and education) in the Karatay district.

All the construction activities will be performed within the bordes of the existing KWWTP, and therefore, the risk to underground utility networks is negligible.

5.4.3 Demographic Structure and Social Cohesion

The vulnerable groups in Tatlıcak Mahallesi, including refugees and individuals with chronic health conditions, are more likely to be affected by project activities due to higher levels of economic and social challenges. The project should ensure inclusive practices, such as providing information in accessible formats, organizing community meetings in easily reachable locations, and offering transportation support for participants.

In addition, Fevzi Çakmak Neighborhood includes vulnerable groups such as disabled persons and poor households. These groups may face accessibility difficulties for participation activities if appropriate arrangements are not made, including accessible meeting places and transportation. Moreover, impoverished households may face difficulties in participating in engagement activities, particularly when transportation is required or when it conflicts with their income-generating activities.

During the construction and operation phases of a Sub-project, potential impacts on the local population could arise from migration patterns related to direct and indirect employment opportunities. However, these impacts are anticipated to be minimal in both neighborhoods due to the lack of unemployment in Fevzi Çakmak and the already employed status of refugees in Tatlıcak. As previously mentioned, the labor influx associated with the Sub-project is unlikely to significantly affect the demographic structure or social cohesion of the settlements in the Sub-project's area of influence. In particular, the employment of refugees in Tatlıcak does not present additional risks compared to the local residents, and any potential issues at a national level may apply similarly to the Sub-project area.

Both neighborhoods have relatively stable social cohesion, with Fevzi Çakmak showing a working-age population predominantly engaged in employment. As there is no unemployment in Fevzi Çakmak, economic vulnerability is not a significant barrier to participation. Similarly, the limited number of disadvantaged households reduces the likelihood of substantial impacts from the project in this area.

Concerns about social cohesion between residents and Sub-project workers in both neighborhoods are relatively low. Sub-project workers, whose needs will largely be met on-site, are unlikely to have close interactions with the local population. Given the construction site’s proximity to the city center and the fact that workers will source most of their needs from outside the neighborhood, any possible incompatibilities between workers and residents are expected to be minimal.

Considering these factors, the overall impact on social cohesion and demographic structure in both Tatlıcak and Fevzi Çakmak Mahalleleri is expected to be minor. While vulnerable groups

should be given special attention to ensure their participation, the overall risk to social cohesion and demographic stability is minimal.

5.4.4 Livelihood

The project will not lead to physical and economic displacement..

As mentioned previously, main sources of income in the settlements located within the project's area of influence depend on agriculture and livestock activities. The project has not direct interaction with agricultural lands and pasture lands.

Project's positive impacts on livelihood during the construction phase will be tthe direct and indirect job opportunities to be created by the project, supporting local businesses through pproject's supply chain and spending of project employees in local communities.

The use of stabilized treatment sludge in soil was initiated by KOSKİ in 2014 after obtaining the necessary permits. In the first years, it was given free of charge to be used on lands where permission was obtained, but due to the high number of applications, it is given for a fee of 100 TL/m^3 to lands where permission was obtained.

It is animplementation that has high individual and social benefits, as it has a longer-lasting nutritional effect compared to chemical fertilizers, is low in cost and contributes to the circular economy. More farmers will be able to benefit from this opportunity, thanks to the amount of fertilizer that will increase with the 2nd stage.

Although the nearest agricultural fields located approximately 2 km away from the project site, fugitive dust emissions to be observed during the excavation works might decrease agricultural yield. Whenever necessary, the mitigation measures described in the ESMP will be taken to prevent any damage to agricultural areas.

In the operation phase, project will have a limited interaction with the livelihood of the settlements located in the Project's area of influence. As stated previously, effluent discharge of the existing KWWTP and this project, will be directly in relation with the agricultural activities performed at the downstream of discharge location since farmers draw water from the receiving body to be used in irrigation. The water quality of receiving environment is therefore important for agricultural production.

5.4.5 Labor and Working Conditions

This section presents application of ESS2 and the Labor Management Procedures (LMP) prepared for the WCEIP.

In general, labor and working conditions for the construction and operation phase include the following:

- •Protection of Workers
- •Occupational Health and Safety
- •Employees Employed by Third Parties and Supply Chains

The workforce will be provided with written contracts specifying working hours and other working conditions and will be employed without discrimination based on gender/religion and ethnicity. In addition, the workforce will be paid at least the national minimum wage.

Protection of Labor

KOSKİ will take measures to prevent child labor and forced labor. In this context, children under the age of 18 will not be employed during the construction and operation phases. Contractors will develop an age verification system to ensure that child laborers are not involved in hazardous work.

Additionally, the following measures will be taken to prevent informal (unregistered) and uninsured employment:

- Ensuring Insurance Coverage: Contractors will ensure that all workers are legally registered and insured. Regular checks will be conducted to verify the registration of workers.
- Inspection Mechanisms: Regular inspections will be carried out during the project to prevent informal employment and uninsured labor. These inspections will be conducted by both the contractors and KOSKİ.
- Providing Workers' Legal Rights: Workers will be informed about their legal rights, and training will be provided to raise awareness regarding issues such as insurance coverage.
- Employment Contracts: All employment contracts will ensure that legal requirements, including insurance, are met. Contracts will include clauses to discourage informal and uninsured work.

- Transparency in Recruitment: A transparent system will be established to ensure all workers are registered and insured during the recruitment process. Employment contracts will be checked regularly to confirm their validity and legal compliance.

These measures will help reduce the risks of child labor, forced labor, informal employment work.

Occupational Health and Safety and Working Conditions

The construction phase of the Project includes the following main fabrication items;

Excavation Works: Foundation excavations, trenching, trenches for pipelines, slope stabilization.

Concrete and Construction Works: Formwork, concrete pouring, prefabricated structure assembly, structural reinforcement.

Waterproofing and Coating Works: Waterproofing for tanks, settling basins, pipe penetrations.

Mechanical Works and Equipment Installation: Heavy lifting operations, installation of mechanical equipment (pumps, mixers, decanters, etc.), ventilation and gas systems.

Electrical Works: Substations, cabling, lighting, electrical panels and power systems.

Automation Works: Installation of automatic control systems, sensors and data acquisition equipment.

Piping Works: Wastewater inlet and outlet lines, sludge transfer pipes, aeration and discharge lines.

Rehabilitation Works: Landscaping and landscaping, on-site access roads, fences, barriers and security systems, etc.

During site preparation and construction work, Occupational Health and Safety (OHS) risks may also arise due to the risk of pollution, exposure to chemicals, dust emission and noise

generation In addition, risks of sexual abuse, exploitation and harassment may arise. Training will be provided to the workforce on these issues. In addition, employees will be trained on the Code of Conduct.

During the operation phase of the project, some impacts may occur due to the use of treatment chemicals and air emissions from the WWTP. There may also be impacts resulting from maintenance and repair works. During maintenance and repair activities, the Work Permit System and Lockout-Tagout Systems must be effectively implemented to ensure the safety of employees. While the Work Permit System ensures that the necessary security measures are taken in the area where the work will be carried out and that the process will be carried out only by authorized persons, the Lockout-Tagout Systems prevent possible dangers by ensuring that the energy sources are properly isolated and preventing intervention to the system other than authorized personnel.

OHS risks and impacts should be managed and reduced by the OHS Management Plan and Risk Assessment (including Emergency Plans) to be prepared by the Contractor during construction and by the KOSKİ during operation. One of the Health and Safety expert of KOSKİ will be assigened by KOSKİ and will be involved in PIU.

The Project is classified as Very Hazardous during construction and operation phases. Therefore, Class A occupational safety specialist and workplace physician will be assigned for the management of OHS risks. Assignments of these personnel will be made through the OHS clerk system and their monthly duty periods will be determined according to the number of employees in the project.

Third Party and Supply Chain Assigned Workers

KOSKI has sufficient capability and capacity to manage the implementation of the project and particularly the E&S. Furthermore, KOSKI has the existing staff and capacity to ensure the implementation of the ESMS and ESMP. A PIU will be established to carry out operational and administrative tasks. The PIU staff will be KOSKI's own staff. Since the project is a World Bank Project and the PIU team has previous pproject experience, no additional training will be required.

KOSKI will ensure that contractors have an appropriate ESMS to ensure that they are reputable and legitimate businesses and operate in accordance with the working conditions provided by KOSKI.

KOSKI will monitor the performance of contractors to ensure that all workers' human rights policy and labor rights are properly implemented and that relevant/appropriate non-compliance measures are included in their contracts.

KOSKI will ensure that contractor workers have access to the grievance mechanism to be established for workers under the project.

KOSKI will monitor the primary supply chain for safety issues related to supply chain workers and, when necessary, implement procedures and mitigation measures to ensure suppliers take action to prevent or correct life-threatening situations. To accomplish this, KOSKI will prepare and ensure the implementation of a Contractor Management Plan prior to the construction phase.

The key labor risks, which will be majorly associated with the occupational health and safety, as described by the project-level LMP, are as follows:

- Work at height

- Labour Accomodaiton
- Emergency Preparedness
- Fire
- Explosion
- Natural disasters
- Electric hazards
- Exposure to chemicals (as paints, solvents, lubricants, fuels, etc.)
- Travel and working on steep and treacherous terrain
- Traffic accidents
- Excavations hazards
- Lifting of heavy structures
- Exposure to airborne agents
- Ergonomic hazards during construction
- Insect and animal hazards (snakes, wasps, bees, etc.)
- Welding hazards (fumes, burns and radiation)
- Steel erection (towers) hazards
- Lack of awareness on OHS requirements such as the use of personal protective equipment (PPE) and safe workplace practices
- Use of rotating and moving equipment
- Infectious diseases
- Employment of child labor
- Sexual exploitation and abuse/sexual harassment

In the context of workers' accommodation, the risk of sexual exploitation and abuse/sexual harassment can arise due to factors such as inadequate living conditions, lack of supervision, and insufficient awareness or enforcement of protective measures. These risks are especially relevant for workers in isolated or substandard housing where privacy may be compromised, and workers may feel vulnerable.

Key risks that should be considered for managing these concerns include:

Inadequate Privacy and Security: Poor accommodation facilities might lead to situations where workers feel unsafe, leading to potential harassment or exploitation. Ensure that accommodation meets basic standards of privacy and security, such as separate sleeping quarters for different genders, adequate lighting, and security measures to prevent unauthorized access.

Lack of Supervision or Awareness: In poorly managed accommodation, the absence of oversight can contribute to an environment where abusive behavior is not reported or addressed. Regular monitoring by supervisors, clear reporting mechanisms for workers to raise grievances, and awareness campaigns on sexual exploitation and harassment should be

part of the accommodation management plan. Contractors must provide training on appropriate behavior and workers' rights, emphasizing zero tolerance for harassment.

Cultural and Social Sensitivities: In some regions, workers may not be familiar with the rights and regulations surrounding sexual harassment and abuse, or there may be social stigmas attached to reporting such incidents. Implement a strong, accessible grievance mechanism with anonymity options. Provide training to both workers and managers to foster understanding of acceptable conduct and legal rights.

Isolation: Workers living in isolated or remote locations might feel particularly vulnerable to abuse or exploitation, especially if they have limited access to support networks. Create a support network that includes health professionals, counselors, and designated personnel to handle complaints. Workers should have regular access to communication channels to report issues safely.

Inadequate Sanitation and Overcrowding: Overcrowded, poorly ventilated, or unsanitary accommodation may contribute to poor mental and physical health, creating a stressful environment that can heighten the risk of abuse. Ensure that accommodation meets established standards for space, hygiene, and sanitation. This includes ensuring adequate restrooms, clean living areas, and access to basic amenities.

By proactively addressing these factors, KOSKI can significantly reduce the risk of sexual exploitation and abuse, ensuring that the accommodation provided for workers is safe, respectful, and conducive to their well-being.

In addition to the above, the project-level LMP highlights the potential risk of facing with excessive overtime working hours during the construction phase. Therefore, a set of mitigation measures are provided in the ESMP. KOSKİ is obliged to follow the Project-level LMP and ESMP measures.

5.4.6 Community Health and Safety

The community health, safety and security impacts of the project are mostly limited to the construction phase. In the construction phase, emissions of gaseous pollutants and fugitive dust from equipment and machinery used, noise generation, poor handling of wastes to be generated, requirement to shut down the entire plant and/or specific units for construction works and risks associated with community encroachment might create negative impacts on community health, safety and security. Impacts associated with emissions, noise and waste generation will be managed with the proper implementation of mitigation measures presented previously in the related sections of this report.

project includes both rehabilitation and construction of new structures. Since the existing plant will continue to operate and construction work will be carried out during the construction period, there are some difficulties in accessing and controlling the work areas. The measures to be taken will aim to ensure that these two processes run smoothly. Therefore, this problem will be tried to be overcome with physical separations, working hours arrangement and some arrangements to be made in the work schedule.

Additionally, in order to protect public health and safety, access to work areas will be physically restricted during the construction and maintenance phases. Barriers, fencing, and signage will be installed to prevent unauthorized entry into construction zones. This will ensure the safety of the community by minimizing the risk of accidents and exposure to hazardous conditions associated with the ongoing work.

In the operation phase of the WWTP, there would be times that the entire plant or specific units need shutdown due to excessive precipitation, planned or unplanned maintenance requirements, or any other foreseen or unforeseen challenges. A shutdown has major consequences for wastewater treatment, especially biological wastewater treatment. Stopping a physical-chemical treatment generally does not present many problems.

5.4.7 Archeology and Cultural Heritage

It is not anticipated to discover a chance finds during the earthworks to be performed in construction phase as the project is a rehabilitation and capacity expansion project. Therefore, the project's impact on archaeological and cultural heritage is determined as negligible.

It should be noted that a chance find is always possible for a development project that involves earthworks. Specific measures will be developed for such findings as described in the ESMP.

6 ANALYSIS OF ALTERNATIVES

In the following sections, factors considered in the site and technology selection are described and evaluation of alternatives is presented in line with the ESS1 requirements.

6.1 "No-Project" Alternative

Project alternatives are below:

1) No Project,

2) Delayed implementation of stage 2,

3) only rehab of existing WWTP without extension (i.e. without project).

The "no project" alternative refers to the scenario in which the Project does not become operational, considering both the negative and positive potential outcomes of this scenario. As highlighted in previous sections, the existing KWWTP struggles to handle the influent flow rate due to population growth. Without addressing this issue, alongside anticipated future population increases, the KWWTP's treatment efficiency is expected to decline, causing increased pollution stress on the receiving body. The project aims to enhance KWWTP's treatment performance significantly.

As the capacity of the plant will be insufficient as a result of the realization of Alternative 2.

In the absence of the project, the adverse environmental and social impacts identified in this ESIA report would not materialize. However, the identified impacts are deemed manageable through the adoption of appropriate mitigation strategies and the implementation of relevant environmental and social management plans. Nonetheless, given the national benefits and local advantages offered by the project, the "no-project" alternative is not considered a viable option. The project's benefits are crucial for the well-being of the local population and the environment, outweighing any potential disadvantages.

6.2 Process, Site Alternatives

As the existing KWWTP constructed by considering the 2nd stage construction in the future, the land required for this expansion has already been allocated. Therefore, the project does not have a site alternative. However, process alternatives are evaluated below.

During design of KWWTP 1st Stage nearly 20 years ago, the design consultant has evaluated some advanced treatment processes which ensures treatment of nitrogen and carbon in order to find the most effective process. As shown in Table 6-1considered processes were:

- A^2O Process
- Standard UCT Process
- Modified UCT Process
- Simultaneous Nitrification Denitrification Process
- Sequential Batch reactor (SBR)
- 4-Stage Bardenpho Process

4-Stage Bardenpho process is chosen during design of 1st Stage to remove carbon (C) and nitrogen (N). This process was not suitable for phosphorous (P) removal. 1st Stage KWWTP is commissioned in 2009 with the 4-stage Bardenpho process.

In addition to this situation, during the 2nd stage project phase of Konya WWTP, interviews were held with all stakeholders regarding the process selection. Many different ideas were expressed during this time. Discussions were held on whether the current structure needed to be transformed into another process, the advantages that could be obtained when it was changed, and the difficulties that could be encountered. As a result of these evaluations, it was concluded that the most appropriate method was to continue with the current design.

Instead of the plant capacity being 300,000 m^3/day as it was in the initial design phase, the effects and costs of changes in the land conditions, sewer main line and current status were evaluated and it was decided to reconsider the on-site capacity as 400,000 m^3/day. The existing lines can easily meet this flow rate. Already, in line with the same idea, a place has been reserved for the installation of another plant in the area opposite the by-pass channel for future periods.

However, it was evaluated that construction of a plant with a capacity of 100,000 m^3/day, located opposite the WWTP by-pass channel, would create two facilities operating side by side but separately, which would create an extremely inefficient and difficult structure in terms of operation, and the use of this area for this purpose was abandoned, and as stated above, the capacity of the facility to be built in the same area was set at 400,000 m^3/day. It has been concluded that a treatment plant that may be needed after the target year of 2040 should be built in another part of the city by evaluating the population and wastewater flow rates. In line with the information provided here.

It has been decided that the most accurate solution is the design presented with this project.

Currently, sensitive conditions of Konya closed basin and aiming legislative criteria for N and P removal, the Design Consultant (Mena Ltd.) and KOSKI have analyzed advance treatment methods for additional P removal as well as current C and N removal. During, 2nd Stage design as addition to the above-mentioned processes, advanced processes were also considered. Some of these processes are as the following:

- 5 Stage Bardenpho Process
- IFAS Process (Integrated Fixed Film Activated Sludge)
- MBBR Process (Moving Bed Biological Reactor)
- ANAMMOX Process (Anaerobic Ammonium Oxidation)

As a result of the discussions of the process type for the KWWTP 2nd Stage by KOSKİ and Design Consultant (MENA Ltd.) considering many factors such as land conditions, wastewater pollution loads, discharge standards, previous big-scale applications in Türkiye, investment and operating costs, it was decided to upgrade the existing 4-Stage Bardenpho process to 5-Stage Bardenpho process for extension of KWWTP.

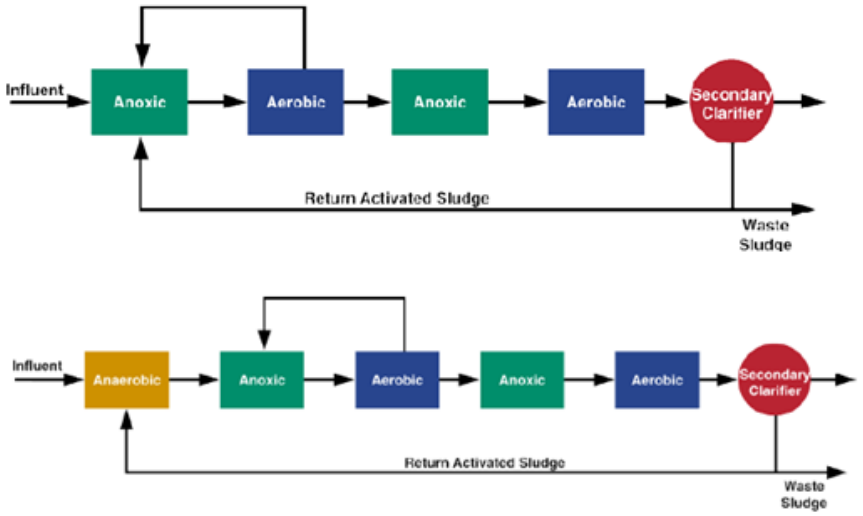

Figure 6-1 Typical 4-Stage and 5-Stage Bardenpho Process

The decision to upgrade to the 5-Stage Bardenpho process during the design of the 2nd Stage was influenced by several factors, reflecting a shift in priorities and conditions:

- Sensitive Environmental Conditions: The Konya closed basin's sensitive conditions necessitated a more rigorous approach to nutrient removal, including phosphorus, to prevent eutrophication and other environmental impacts.
- Legislative Criteria: New or more stringent legislative criteria for nitrogen and phosphorus removal drove the need for enhanced treatment capabilities.
- Process Efficiency: The 5-Stage Bardenpho process offers improved phosphate removal in addition to nitrogen and carbon, aligning with the new environmental and legislative requirements. The process involves anaerobic, anoxic, and aerobic stages that facilitate the growth of phosphorus-removing bacteria and enable nitrification-denitrification processes for comprehensive nutrient removal.
- Operational Continuity and Cost-Effectiveness: Choosing a process that is an extension of the existing setup (from 4-stage to 5-stage Bardenpho) ensures operational continuity and leverages the existing infrastructure. This decision supports the efficiency of the treatment process, minimizes the need for new operational training, and is considered cost-effective in terms of both investment and operating costs. The addition of anaerobic tanks for phosphorus removal and the rehabilitation of some 1st Stage units further exemplifies the emphasis on integrating advanced capabilities while maintaining the integrity of the overall treatment process.

The Bardenpho process, particularly in its 5-stage configuration, offers several advantages that underpin its selection:

- High Nutrient Removal Efficiency: It provides superior removal of biological carbon, nitrogen, and phosphorus, crucial for meeting stringent discharge standards.
- Low Sludge Production: It produces less sludge compared to other processes, reducing handling and disposal costs.
- Fertilizer Value: The high phosphorus content in the sludge enhances its value as a fertilizer.
- No Chemical Use: This process does not require chemicals for nutrient removal, reducing operational costs and environmental impact.
- Stabilized Sludge Production: The process ensures the production of well-stabilized sludge, beneficial for safe disposal or use in agriculture.

The selection and evolution of wastewater treatment processes at KWWTP reflect a comprehensive approach to addressing environmental, regulatory, and operational considerations. The upgrade to the 5-Stage Bardenpho process exemplifies a strategic response to evolving environmental challenges and legislative requirements, ensuring the effective treatment of wastewater while optimizing cost and operational efficiency.

Table 6-1 Advantages and Disadvantages of Different Processes

Process	Advantages	Disadvantages
A^2O	- Nitrogen and phosphorus removal - Provides alkalinity for nitrification - Produces sludge with good sedimentation properties - Easier to operate - Possibility of energy saving	- Since the return sludge contains nitrate, it affects the phosphorus removal capacity - Internal return rate limits nitrogen removal - Need for qualified operators
UCT	- Nitrate recirculation to the anaerobic reactor is reduced, thus improving phosphorus removal efficiency - Provides good phosphorus removal in wastewater with poor organic matter content - Production of sludge with good sedimentation properties - Good nitrogen removal	- Complex operation - Requires additional return sludge
Modified UCT	- The system was improved by adding a separate anoxic tank to the Standard UCT process. Thus, the risk of nitrate in the recirculation flow from the anoxic tank to the anaerobic tank in the Standard UCT process was eliminated. - It gives better results than the UCT process in terms of phosphorus removal.	- Highly complex operation. - Requires additional anoxic tank compared to standard UCT process. - Requires additional return sludge process. - Requires larger anaerobic volume.
Simultaneous Nitrification Denitrification Process	- Low nitrogen concentration in the effluent - Possibility of significant energy savings - Applicable to existing plants without new construction - Alkalinity production	- High operating costs - Need for methanol feeding system - Need for SCADA - Need for large basin volumes and qualified operators
Sequence Batch Reactor (SBR)	- Operational flexibility in nitrogen-phosphorus removal - No final sedimentation and return sludge required.	- Highly complex operation in terms of process control - Design complexity

	- Low output SS with a good sedimentation and discharge system	- Effluent quality requires secure discharge system - Phosphorus removal is inconsistent - Suitable for low flow rate plants
5 Stage Bardenpho	- Nitrogen and phosphorus removal - Low nitrogen concentration in the effluent - Producing sludge with good sedimentation properties - Resulting in less sludge formation than all biological phosphorus removal processes - Resulting in increased carbon oxidation capacity if operated at long sludge ages	- Low efficiency phosphorus removal - Larger basin volumes - Need for qualified operators - Includes a large number of reactors - Need for primary sedimentation to remove phosphorus at high rates.

Table 6-2 Evaluation Criteria Thnak and Weighted Score of Processes

Evaluation Criteria	Importance Level	Conventional Nutrient Removal Systems					Sequence Batch Reactor (SBR)
		A^2O	UCT P	Modified UCT	Simultaneous Nitrification Denitrification Process	5 Stage Bardenpho	
Ability to Achieve Discharge Standards	25	9	9	9,5	9	9,5	7
Operation & Maintenance Challenges	20	8	7	6,5	8	8,5	6
Land Requirements	20	7	7	7,5	7	6,5	8
Operation & Maintenance Costs	15	8	7	6,5	8,5	8	8
Investment Costs	10	8	7	6,5	8	8	7,5
Flexibility Against Flow and Load Changes	5	7	7	7	8	8,5	9
Resistance to Toxic Substances	5	7	7	7	7	7	7
Total (Weighted) Score	100	7,95	7,5	7,5	8,08	8,15	7,3

Currently, the stabilized treatment sludge formed in the Konya 1st Stage Treatment Plant is dewatered in the existing sludge dewatering building via decantors (see Figure 2-11) and then

is stored temporarily in the existing sludge storage area (see Figure 2-13) and later it is disposed of by giving it to users who request it for agricultural purposes with the permission issued by the Konya Provincial Directorate of Environment, Urbanization and Climate Change in 2014 within the scope of the “Regulation on the Use of Domestic and Urban Treatment Sludge in Soil”. This approval was issued by the Ministry of Environment, Urbanization and Climate Change under the "Regulation on the Use of Domestic and Urban Treatment Sludge in Soil" by a commission consisting of the personnel of the Provincial Directorate of Environment, Urbanization and Climate Change, the Provincial Directorate of Agriculture and Forestry, the Provincial Directorate of Health, and the 4th Regional Directorate of State Hydraulic Works.

The treatment sludge to be generated during the operational phase of the project will be used for agricultural purposes, as is currently practiced. In line with this, a permit renewal application was submitted by KOSKİ to the Provincial Directorate of Environment, Urbanization and Climate Change with the letter dated 13/01/2025 and numbered E-20824400-220.04.02-92632. In response, the Konya Provincial Directorate issued a letter numbered E-684495568-110.03.01-11756064 (see Annex N), establishing a commission and requesting that soil and treatment sludge samples be collected by authorized laboratory personnel under the supervision of the Directorate and submitted along with the analysis results. These sampling and analysis activities were conducted by an accredited laboratory, and the permit process has been successfully completed.

In line with permit requirements, in accordance with Article 8, paragraph 2, subparagraphs (c) and (ç) of the relevant regulation, for agricultural lands permitted for sludge application (i.e., where the concentration of heavy metals in the soil exceeds 50% of the limit values stated in Annex I-A), soil sampling and analysis will be carried out every twelve months. In addition, sludge samples will be collected every six months and analyzed for the parameters specified in Annexes II-A and II-B of the regulation. The results of these analyses will be submitted to the Provincial Directorate of Environment, Urbanization and Climate Change. A new 20,000 m² temporary sludge storage area has been designated within the existing boundaries of the KWWTP (see Figure 2.12 and Figure 2.13) and will be used for storage during the operational phase of the project.

In case the sludge is not deemed suitable for agricultural use based on laboratory analysis or regulatory requirements, or the sludge is not demanded by farmers for agricultural use, dewatered sludge will be stored temporarily and further dried in the temporary sludge disposal area (see Figure 2 11, Figure 2 12 and Figure 2 13), and it will be transported by licensed transportation vehicles for final disposal to the Konya Sanitary Landfill when it reaches 50% dryness rate (see Annex O for official acceptance document). If dewatering of the sludge would not be achieved in the desired amount, the sludge will be transported by licensed transportation vehicles for final disposal to the existing incineration facility within the Konya Sanitary Landfill. The protocol regarding incineration, which has a capacity covering the amount of sludge to be generated from the 1st and 2nd stage facility and whose validity date is the end of 2059, is included in Annex P.

7 ENVIRONMENTAL & SOCIAL MANAGEMENTMANAGEMENT PLAN

The project's anticipated environmental and social impacts were previously identified in Section 5. Where significant impacts were identified (i.e. those with a minor, moderate or major rating), mitigation measures have been developed to find practical ways of addressing negative impacts and enhancing positive impacts. The key objective was to mitigate impacts to a level that is as low as reasonably possible.

A hierarchy of mitigation options is considered, with avoidance at the source of the impact as a priority and compensatory measures or offsets to reduce the impact significance as a last resort. The preference is to avoid the impact at source, and least desirable option is to provide compensation or an offset for residual impacts that cannot be further reasonably avoided.

Embedded controls (i.e., physical, or procedural controls that are planned as part of the project design and are not added in response to an impact significance assignment), were considered as part of the project (i.e. prior to the impact assessment stage of the ESIA Process). Accordingly, they are not described as mitigation measures in the individual topic assessment chapters.

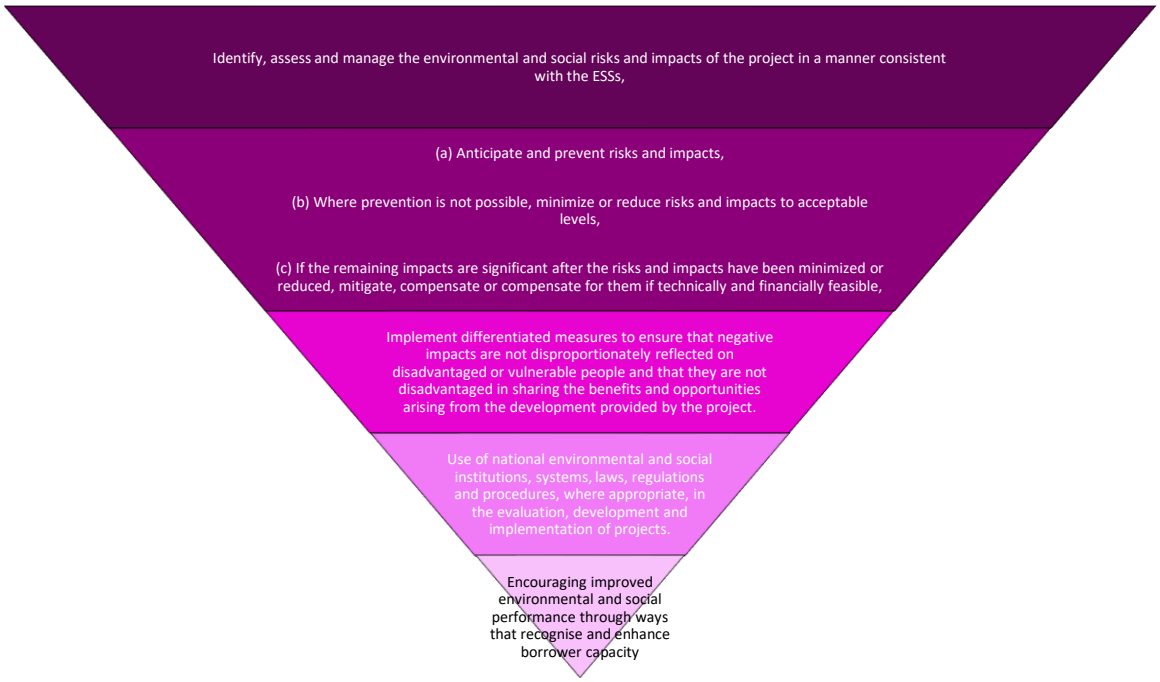

Figure 7-1 Hierarchy of Options for Mitigation

Mitigation and monitoring actions should be implemented properly during the lifetime of the project to reduce identified environmental and social risks and impacts. Therefore, project specific mitigation and monitoring tables were established in the scope of the project and presented in Table 7-1 and Table 7-2 respectively.

The relevant responsibilities to be used during the implementation of the mitigation and monitoring plan is given below:

Responsibilities of Mitigation

Contractor: Responsible for developing and implementing the mitigation measures given in the report.

Consultant: Will act as a control within the scope of the project, site inspections will be conducted by qualified environmental, social and occupational safety experts, will review monitoring reports, will include their own observations and assessments. Non-conformances will be reported to KOSKİ. Will ensure that sub-management plans comply with the requirements addressed in this report.

KOSKİ: Construction contract packages will be managed by KOSKİ PUB. Will act as a control. Will adhere to the responsibilities specified in this report. Will review the Environmental and Social Reports prepared by the Contractor and the consultant and submit them to İLBANK. The grievance mechanism to be established within the scope of the project will also be managed by KOSKİ.

ILBANK: Responsible for the satisfactory implementation of the project, including environmental and social performance. Will regularly visit Project site, monitor non-conformances, complaints and protection measures, and monitor the project.

World Bank: Will periodically review the project development stages and prepare reports on the EHS performance of the project.

Following the identification of mitigation measures, impacts are re-assessed to determine their residual impact. This is essentially a repeat of the impact assessment steps discussed before, albeit with a consideration of the assumed implementation of the mitigation measures.

Table 7-1 Environmental and Social Mitigations Table

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
CONSTRUCTION PHASE						
1	Soil Soil Quality	Soil Contamination Contamination	Soil Environment Nearest settlements Flora-Fauna	A Soil Management Plan that is in line with the ESS1, ESS3, and WBG EHS Guidelines (both general and sector specific) will be prepared prior to construction. A Spill Response Procedure that is in line with the ESS1, ESS3, and WBG EHS Guidelines (both general and sector specific) will be prepared prior to the construction. Quantity of soil that could be subject to contamination will be minimized by ensuring th use of only designated worksites. Machinery and equipment will be checked regularly for leaking oil and fuel. Storage and handling of fuels, oils and other hydrocarbons should be done at designated areas with solid grounds (not soil) that are located at least 50 m away from any watercourse. In an event of an accident, leak or spill, necessary repair works and/or replacement of parts will be performed promptly in accordance with the standards. Corrugated pipes cut into small pieces should be collected separately and given to licensed recycling companies. These pieces of pipes should not be left in the soil during backfilling. Provision of spill kits will be ensured at high risk and/or sensitive sites. The provisions of the Regulation on the Control of Excavation Soil, Construction and Demolition Wastes and Regulation on the Control of Soil Pollution and Sites Contaminated by Point Sources will be complied. Mobile toılets will be provided at site if required.	Contractor KOSKİ Supervision Consultant	Soil Management Plan Spill Response Procedure

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Wastes and wastewater (rainfall filled in trenches) to be generated during the land preparation and construction phases of the Project will be stored and disposed of in a controlled manner in accordance with the Waste Management Regulation and Water Pollution Control Regulation and in line with the management practices described in this report. 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 are taken. In line with permit requirements, in accordance with Article 8, paragraph 2, subparagraphs (c) and (ç) of the relevant regulation, for agricultural lands permitted for sludge application (i.e., where the concentration of heavy metals in the soil exceeds 50% of the limit values stated in Annex I-A), soil sampling and analysis will be carried out every twelve months.		
2	Soil Quality	Loss of topsoil	Soil Environment Nearest settlements Flora-Fauna	Topsoil will be stripped to a sufficient depth (minimum 30 cm) prior to the start of the construction activities. To avoid soil compaction, stripping operation will not be done when soil is wet. Average height of topsoil stacks will be 1.5 meters. Side slope of these stacks will not exceed 3:1 (h:v). Topsoil stacks will be covered if necessary, to prevent wind erosion. 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. In case of the need for the area relevant permit will be obtained before the construction.	Contractor KOSKİ Supervision Consultant	Soil Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				At the end of the land preparing phase, the stored topsoil will be used for landscaping. Unnecessary land clearance will be avoided. Minimize duration of topsoil stockpiles through implementing ongoing rehabilitation of works areas on completion of construction in each work area. Topsoil stockpiles should not be left for more than 6 months after which they will need upgrading. The provisions of the Regulation on the Control of Excavation Soil, Construction and Demolition Wastes shall be complied during land preparation and construction phase of the Project and excess excavation material will be re-used as appropriate or disposed of in existing licensed excavation waste storage sites.		
3	Soil Quality	Erosion potential	Soil Environment Nearest settlements Flora-Fauna	Stripping of topsoil will not be conducted earlier than required to prevent the erosion of soil (wind and water); The disturbed areas and soil piles will be kept moist to prevent wind erosion Topography will be restored to provide stabilization immediately after the completion of construction at each location. Construction activities (especially excavation works) will be undertaken in the dry weather condition as much as possible. Circulation of heavy machinery to minimal areas will be limited. Any damage observed should be repaired immediately to avoid further damage and the eventual collapse. Unnecessary land clearance should be avoided. Additional measures will be implemented in areas identified as having a high erosion potential.	Contractor KOSKİ Supervision Consultant	Soil Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
4	AirAir Quality	IncreaseIncrease in dust emissions	Air Environment, Nearest settlements, farmers Flora-Fauna	An Air Quality Management Plan will be prepared in line with ESS1, ESS3, and WBG EHS Guidelines (both general and sector specific) before thethe commencement of the construction phase. Dust will be minimized from open area sources, including temporary storage piles, by using control measures such as installing enclosures and covers, and increasing the moisture content. Dust suppression methods such as watering with water trucks should be applied to roads (especially during dry season). Water intended for this purpose should be used in quantities that will not result in generation of run-off. 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 sensitive receptors The contractor together with KOSKİ should analyze the presence of sensitive receptors prior to start of works. Extra care should be taken when dealing with pollutants in close proximity to areas recognized as sensitive receptors. Sensitive receptors include, but are not limited to, hospitals, schools, residents, livestock and agricultural lands. These are areas where the occupants are more susceptible to the adverse effects of exposure to air pollutants. Sensitive receptors will be included in the Air Quality Management Plan. Loading and unloading of excavated material should be carried out without throwing or scattering. Proper covering of trucks will be done that carry dusty materials; Soil and similar material stacks should be carefully followed with the aim of reducing the risk of dust being carried by the wind. Wind shields/barriers should be placed at work sites such as material storage areas to prevent dust dispersion where necessary. The drop height of potentially dust generating materials will be kept as low as possible.	Contractor KOSKİ Supervision Consultant	Air Quality Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Excavated materials should be covered with nylon canvas during transportation. .PPE will be provided to workers on worksites, such as dust masks where dust levels are likely to be excessive. The ground will be compacted, where practical, that are heavily used by vehicles and machinery. Weather conditions will be monitored constantly (especially wind) during work activities. Prevailing wind direction will be considered to reduce the likelihood of affecting sensitive receptors. When the wind speed is above 20 km/hour the digging and excavation will not be carried out or only small areas will be excavated, covered and compacted immediately after work is completed or additional measures such as use of dust curtains will be taken. Speed limitations will be applied for vehicles. Speed limits should be set to as low as possible on unpaved roads. Accordingly, the speed limit will not exceed 30 km/h on roads with a poor coating. Grievance Redress Mechanism will be implemented to collect complaints and suggestions with respect to dust. For the owners of adjacent agricultural lands and sensitive receptors, special attention will be given for their grievances and related measures will be taken immediately. Any damage caused by insufficient or lack of dust suppression (transportation of dust to a residential area, wind borne dust deposits etc.) measures will be compensated by the contractor. The route to be used in the transport of the excavation will be carefully selected and care will be taken not to pass through the densely populated areas. Compliance with the air emission limit values stipulated in national legislation and WBG General EHS Guidelines will be ensured.		

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				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 supp		
5	Air Quality	Increased inexhaust emissions	Air Environment Nearest settlements, farmers Flora-Fauna	To keep the negative impacts in “Negligible” level: Well and adequately maintained vehicles will be used. Regular maintenance of machinery and equipment will be ensured. Maintenance forms will be filled regularly; Construction vehicles will not be permitted to keep engines running while waiting to enter the site or waiting on-site. 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; Vehicles that can provide European Euro VI standards will be selected; Generator units, if it is necessary to use, should be located as far as possible from residential areas in workplaces. All machinery and equipment will be inspected before use, including visual inspection of exhaust emissions, and if excessive, such machinery and equipment should not be used until appropriately maintenance has been carried out. Daily maintenance will be performed at the end of each shift; the operation time of each vehicle will be recorded by the operator so that periodic maintenance can be done in a timely manner. Workers should be adequately informed about equipment and machineries likely to cause emissions of pollutants and trained on the application of relevant	Contractor KOSKİ Supervision Consultant	Air Quality Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				mitigation measures including dust management when they are employed before starting work. This training will be conducted by HSE expert of the contractor or by the HSE third party organization hired by contractor. 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 and compliance with WBG General EHS Guidelines will be ensured. Provisions of the Regulation on Exhaust Gas Emission Control will be complied during land preparation and construction phase of the Project Imposing time constraints for works (e.g. 7 AM to 5 PM). Establishing schedules and/or other forms of specific limitations for works.		
6	Noise and VibrationVibration	Increase in noise levels and vibrationvibration	Employees Residents businesses around the site Flora-Fauna	A Noise and Vibration Management Plan that is in line with the WB OP 4.01 and WBG EHS Guidelines (both general and sector specific) will be prepared by Construction Contractor prior to the construction and the employees will be trained on the plan. The contractor together with KOSKİ should analyze the presence of sensitive receptors prior to start of works. Sensitive receptors include, but are not limited to, hospitals, schools, residents, livestock and agricultural lands. These are areas where the occupants are more susceptible to the adverse effects of exposure to noise. Sensitive receptors should be included in the Noise and Vibration Management Plan. Regular noise monitoring will be done by KOSKİ for sensitive receptors. Construction activities in and around the residential areas cannot be sustained in the evening and nighttime outside the daytime period. The daytime period is 07:00–19:00. The environmental noise limit value permitted between these hours in Table 5 of Annex VII of the Regulation on Environmental Noise Control is 70 dBA. Construction activities will be carried out at specified times and so as not to	Contractor KOSKİ Supervision Consultant	Noise and Vibration Management Plan Grievance Mechanism ProcedureProcedure

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				exceed the specified environmental noise limit so that the noise does not affect the work/rest activities. Construction will not be continued in the evening and nighttime periods unless required. In the event that the construction works will be continued overnight, or the noise level will be high, the people to be affected will be informed one (1) week in advance. A noise screen will be used around the working area where these limit values are exceeded. In this scope, muffler or noise-cancelling parts will be used in all motor vehicles. The equipment and vehicles to be used in excavation, construction, transportation, pipe laying and asphalting stages will be periodically maintained. The machinery and equipment to be used during the land preparation and construction activities will not be operated at the same point/location but homogeneously distributed in the site. All vehicles to be used in transportation activities will obey the speed limits set out in the Regulation on Highway Traffic. Care will be taken in equipment and part selection to comply with ground vibration velocity values shown in Table 7 of Annex VII as specified in Article 25 of the Regulation on Environmental Noise Control. In case of observations and complaints that the selected vehicles and equipment generate vibration above the expected level during the construction phase, measurement will be carried out and necessary arrangements will be made. A grievance redress mechanism will be established to manage noise related grievances as well. Site management will periodically check the site and nearby residences (or other sensitive land uses) for noise related issues so that solutions can be efficiently and timeously applied. Identification of buildings located within 50m of significant sources of vibration ahead of construction works will be done. Evaluation of the sensitivity of the identified buildings and building occupants to vibration impacts will be		

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				undertaken. This will include photos to show the structural conditions of the buildings and its foundation. In case of any complaint additional measures such as adding silencers or barriers to noise-generating equipment, restriction of construction activities during nighttime hours etc. All construction activities will be carried out in compliance with the noise limits set out in the Regulation on Environmental Noise Control and noise limits of WBG and the contractor will take additional mitigation measures in case of a requirement revealed by the monitoring.		
7	Water QualityWater Quality	Change in the surface water and groundwater quality	Water Resources Nearest Settlements Flora-Fauna	A Water Resources Management Plan that is in line with the ESS1, ESS3, and WBG EHS Guidelines (both general and sector specific) will be prepared prior to the construction phase. Surface runoff or wastewater generation due to dust suppression activities will be prevented. The limited amount of domestic wastewater generated at the KWWTP construction site will be sent to the existing KWWTP. 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. All chemical storage containers, including diesel fuel, and hazardous liquid waste drums/containers should be placed to minimize the risk of soil, surface water and groundwater contamination during construction. All unit shutdown requirements due to construction activities will be scheduled at least one week beforehand by the construction contractor, Consultant and KOSKİ will be informed to make necessary adjustments. Construction activities may pose the potential for accidental release/leakages of petroleum-based products, such as lubricants, hydraulic fluids, or fuels during	Contractor KOSKİ Supervision ConsultantSupervision Consultant	Water Resources Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				their storage, transfer, or use in equipment. All chemical storage containers, including diesel fuel, and hazardous liquid waste drums/containers will be placed in designated storage areas with their secondary containment so as to minimize the risk of soil, surface water and groundwater contamination during construction. The washing of Project vehicles in any surface water bodies will be prohibited. The wastewater arising from cleaning or washing vehicles and construction equipment will be collected in tanks and disposed of via the septic trucks. Spill kits will always be available on construction sites.		
8	Waste and resources	Improper handling of waste	Natural environment Soil Water Nearest settlements	A Waste Management Plan that is in line with WBG EHS Guidelines (both general and sector specific) will be prepared by Construction Contractor prior to the construction and the employees will be trained on the plan. Wastes to be generated within the scope of the Project will be managed in accordance with the waste management hierarchy. Waste will be segregated into three at source - organic (food residues), recyclables (woods, metals) and non-recyclables (plastic and glass wastes). Separated waste bins will be provided for the disposal of waste generated at each site. The management of organic domestic solid waste originating from the personnel to be employed during the construction phase of the project will be performed in accordance with the provisions of the Waste Management Regulation. Solid wastes that cannot be recycled and utilized will be collected in the garbage containers at the construction site and will be collected by the Municipality on a daily basis and sent to nereasetnearest Sanitary Landfill Facility.	Contractor KOSKİ Supervision Consultant	Waste Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				In the case of cooking at the cafeteria of construction site facilities, vegetable oil will be regularly collected and given to enterprises licensed under the Regulation on Control of Vegetable Waste Oils. Excess material in the construction of ditches will be classified, recycled, reused separately as asphalt, curb, parquet, concrete and soil, and opportunities for reuse in the construction site must be taken. The excavation material will be deposited on the edge of ditch until reused as filling material. Unused material, wastes of asphalt-concrete and excavation according to the Regulation on Control of Excavation Soil, Construction and Demolition Wastes will be sent to licensed landfill. Waste oils that will originate from maintenance-oil change operations of the vehicles and heavy equipment that will operate during the construction phase will be collected in sealed tanks/containers placed on impermeable ground according to Regulation on Control of Waste Oils. There will be overfill prevention in the tanks/containers, and they will be filled to the marked point. Tanks/containers should be colored red according to the regulation and should contain the phrase “Waste Oil”. Waste oil removal process will be controlled by the Municipality. Hazardous waste that will be generated during the construction phase will be kept temporarily in sound, leak-proof, secured containers at the temporary storage area complying with internationally accepted standards. The phrase “hazardous waste” should be stated on the containers, the amount of the stored substance and the storage date will be indicated on the containers. The containers will be kept closed at all times, and the wastes will be stored temporarily in a way that will not enter into chemical reaction. These materials will be kept in this area against the spillage and leakage. If hazardous waste is stored in temporary storage area, they will be stored in this area for a maximum of 180 days. Hazardous waste will be sent to the nearest licensed hazardous waste recovery facility or licensed hazardous waste disposal facility. Licensed vehicles will be used for transport.		

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				In case of encountering asbestos in the project area, it will be clearly identified as hazardous substance. The temporary hazardous waste storage area (should have a roof to avoid contact with rain, snow, etc.) 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 in order to collect the spilled liquid materials to the blind hole for any incident. The accumulators coming out of the vehicles and the batteries coming out of the construction site should be disposed of in accordance with the Consumer Obligations as specified in Article 13 of Regulation on Control of Waste Batteries and Accumulators. Accordingly, the batteries will be collected separately from domestic wastes and delivered to the waste battery collection points of Association of Portable Waste Battery and Exporters and Importers (TAP). Packaging materials (such as sacks, pallets, parcels, plastic coatings) from the products used at the head office and work sites will be collected separately according to the provisions of the "Regulations for Control of Packaging Wastes". Incineration or burying of wastes by any means at site and/or dumping of wastes to nearby roads or water resources will be forbidden End-of-life tire waste will be generated during maintenance-repair works of the heavy equipment to be operated during the construction phase. End-oflife tire wastes that will be possibly generated due to maintenance and repair works of the heavy equipment during construction should be delivered to environmentally licensed recycling facilities pursuant to the Regulation on Control of End-of-Life Tires. Asbestos-containing waste (if produced) will be transported and disposed of in accordance with Regulation on the Road Transportation of Hazardous Goods by signing a contract with a waste transport company licensed by the Ministry of		

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Environment, Urbanization and Climate Change and an authorized waste disposal organization. Relevant measures for minimum waste generation, i.e., training personnel to raise awareness and manage in accordance with waste management hierarchy (prevent, reduce, reuse, recycle, recover, dispose) will be taken.		
9	Waste and resources	Excess use of resources	Natural environment Soil Water Nearest settlements	To reduce the footprint Project's construction phase, KOSKİ will supervise the construction contractor to select most appropriate raw materials by evaluating clean production options provided by contractor for implementation.	Contractor KOSKİ Supervision Consultant	Waste Management Plan
10	Biological environment	Disturbance to biological environment	Biological environment / Flora-Fauna KBA	Prior to the site preparation works, definite working areas will be set up where activities (e.g. vegetation clearing, vegetation removal, levelling and construction) and permanent structures (units and roads) will be established. Project construction sites and access roads will be separated from other areas with appropriate signboards, signs and fences. Therefore, staff and vehicle access to the area will be limited to the construction site. Avoid and/or minimize dust emissions by lightly watering the immediate surroundings of construction sites and wetting the stored material. Construction waste generated due to project activities will first be stored at designated storage areas and then disposed of. Construction work will be done gradually so that it will have enough time to escape for possible fauna species to be found.	Contractor KOSKİ Supervision Consultant	Environmental and Social Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				If there is a nest of bird species, the nest will be marked with a safety strip about 3 meters in diameter and an expert ornithologist will be informed. Project workers will not be allowed to bring any live animals or plants into the site to avoid the risk of pest/invasive species establishing in the Project Area.		
11	Socio economic	Positive Impact on Local Population and Livelihood	Nearest Settlements	Workforce and employment will be provided by the local people as much as possible. KOSKİ will take all necessary actions and measures for labor and employment to be in compliance with Turkish Labor Law and international standards. The recruitment processes will be transparent, public and non-discriminatory, providing equal opportunities with respect to ethnicity, religion, language, gender and sexuality.	Contractor KOSKİ Supervision Consultant	Labor Management Plan
12	Socio economic	Negative impact on Local Population and Livelihood	Nearest Settlements	Design works will be conducted to minimize the involuntary land take. Grievance redress mechanism will be implemented for the public to lodge their complaints. Any inadvertent damages to adjacent ands and structures will be repaired and compensated immediately by contractor.	Contractor KOSKİ Supervision Consultant	Stakeholder Engagement Plan comprising Grievance Mechanism Procedure
13	Socio economic	Infrastructure damage	Nearest Settlements	Any damage to infrastructure will be repaired or compensated by contractors promptly in accordance with the responsible authority. To prevent residents' habits of use in the project area during the construction phase, the relevant institutions and organizations (Municipality, electricity distribution company, natural gas distribution and operating companies will be informed by KOSKİl/Contractor before construction starts.	Contractor KOSKİ Supervision Consultant	Stakeholder Engagement Plan comprising Grievance Mechanism Procedure

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Time schedule for all construction works will be communicated with local communities prior to construction. Alternative and secure means to access resources and services will be introduced. The construction activities will be performed in a way not to give any damage to the utilities located in the working area. Plans from the Municipality indicating the location of underground service utilities (power, telecom, other) will be obtained.		
14	Socio economic	Community Health and Safety and Security Project traffic and construction activities related risks & Community encroachment	Nearest Settlements	A Community Health, Safety, and Security Management Plan that is in line with WB ESSs and WBG EHS Guidelines (both general and sector specific) will be prepared by Construction Contractor prior to the construction and the employees will be trained on that Plan. The Contractor will be required to prepare and implement a Traffic Management Plan. Traffic Management Plan will be prepared by the Contractor 30 days prior to commencement of the works and the employees will be trained on that Plan. The traffic management plan will explain what will be considered when the traffic will be closed to vehicular traffic due to the works and where local permission will be obtained. Adequate road warning signs will be posted at vantage points to warn and direct traffic. Positioning clear warning and information signs around the construction zone. Working areas will be secured with barricades. The appropriate signage will be determined based on the Regulation on Traffic Signs. Prior to construction activities, the Contractor will install all signs, barriers and control devices needed to ensure the safe use of the roads by traffic and pedestrians.	Contractor KOSKİ Supervision Consultant	Community Health, Safety, and Security Management Plan Traffic Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				The disabled, women, children and people with special needs will be considered while locating and marking alternative roads (roundabouts) if required. The contractor will take the necessary safety measures for the residents in the areas where the works will be carried out before construction works. KOSKİ / Contractor will inform the authorized representative of the institution/organization of the matter before construction works to be performed in front of buildings such as school, workplace, mosque, etc. and ask the institution/organization for contribution to taking necessary measures during the construction Works. Information on Gender Based Violence risks should be shared during public/stakeholder consultations. Project GRM will be designed to receive GBV grievances anonymously, and addressed in a confidential manner. Grievance redress mechanism is established for the public and will be implemented to lodge their complaints.		
15	Labor and working conditions	Potential Impact on Worrker's rights Child labor and forced labor risks Informal employement Sexual exploitation, abuse, and harassment risks	Project Workers	Employment of child labor and forced labor will be prevented. Turkish Labor Law and relevant regulations cover the basic principles of international labor standards and ESS2 on equal treatment of employees, restrictions on working age and employment of children, prevention of forced labor and ensuring occupational health and safety in workplaces. It is essential to monitor the implementation to ensure full compliance of the activities with the relevant legislation. Contractor is required to have an age verification system, ensuring no one under 18 years old are involved in hazardous works as indicated in the LMP. OHS Management Plan that is in line with ESS1, ESS2, WBG EHS Guidelines (both general and sector- specific), and national legislation will be prepared by the contractor before the construction activities commence. Contractor will review and update the OHS and Safety Management Plan to reflect operation conditions	Contractor KOSKİ Supervision Consultant	OHS Management Plan Labor Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				three months before the commencement of operation, submit the revised version for Consultant and KOSKİ's initial approval. For the SEA/SH and GBV risks: Code of Conduct training will be performed for all employees. Appropriate and proportional security measures will be applied for women workers (e.g., lighting, alarms, separate toilets), A confidential grievance process will be available for GBV/SEA/SH grievances regular outreach to workers, but also to the local community, to address GBV/SEA/SH risks in the context of the worksite and labor influx.		
16	Labor and working conditions	Impacts on Workers OHS	Project Workers	An OHS Management Plan in accordance with ESS1, ESS2, World Bank EHS Guidelines (both general and sector specific) and national legislation will be prepared by the contractor prior to the start of construction activities. The following elements will be detailed within this plan: - Risk assessment: Occupational health and safety risk assessment will be conducted for the activities to be carried out under the Project and risk mitigation measures will be identified. - Trainings: OHS awareness trainings, on-the-job trainings and trainings for special risk groups will be organized for employees. - Emergency Preparedness: Plans will be created and drills will be organized for fire, chemical leakage, injuries and other emergency scenarios. - Safe Working Instructions: Safe working procedures specific to activities will be prepared and implemented. - Work Permit Procedure: A work permit procedure will be established for high-risk jobs such as confined space work, hot work, working at height and using electrical equipment.	Contractor KOSKİ Supervision Consultant	OHS Management Plan Labor Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				- Personal Protective Equipment (PPE): Appropriate PPE will be provided for each work area, employee use will be monitored and risk assessments will be conducted to select appropriate PPE. - According to the National OSH Law, KOSKİ must report OSH-related incidents to the Ministry within 3 working days. In cases where notification is mandatory in accordance with national legislation, such as accidents involving death or injury, and which cause loss of workforce, Ilbank must be notified within 24 hours by the KOSKİ. In such cases KOSKİ will notify ILBANK and the İLBANK will notify the Bank as soon as it is notified. The incident report, which includes the root cause analysis, measures taken and compensation measures, will be forwarded to ILBANK within 30 working days, and ILBANK will send it to the World Bank. - The Contractor shall review the OHS Management Plan three months before the start of the activity, update it to reflect the operational conditions and submit the revised version for the initial approval of the Consultant and KOSKI.		
17	Labor and working conditions	Woriking at height	Project Workers	The following specific measures, in addition to national requirements, will be taken: Fall protection systems, The safety harnesses, Use of guardrails, Training on working at heights. Security network applications in areas deemed necessary, for work at height, work in confined areas, work in presence of water, sludge and gasses, etc – as specified in accordance with the national standards.	Contractor KOSKİ Supervision Consultant	OHS Management Plan Labor Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Ensuring that ladders and scaffolds are in compliance with standards and well-maintained control, Installation of scaffolds by experts, Safe access to high areas must be ensured, Work should not be carried out in adverse weather conditions such as wind, Emergency procedures should be established for personnel working at height and these procedures should be tested regularly through drills, Appropriate rescue equipment (e.g. rope pulling devices, descent systems, etc.) should be available for emergencies and work in confined spaces. A work permit system should be used for work at height and electrical work.		
18	Labor and working conditions	Delays in emergency response	Project Workers	A detailed and comprehensive emergency plan will be prepared for any emergency situation. This plan will include scenarios such as fire, natural disasters, power outages, chemical leaks, explosions. Plans will be reviewed and updated regularly. All employees will be trained on emergency procedures. These trainings will include critical information such as first aid, fire extinguishing, evacuation routes and transportation to safe areas. Drills will be conducted regularly and employees will be prepared for emergency scenarios. Drills will test how well all teams have mastered the emergency response plan.	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Emergency equipment, e.g. fire extinguishers, first aid kits, safe evacuation systems, generators and emergency lighting systems will be checked and maintained on an ongoing basis. Emergency equipment will be made available in locations known and easily accessible to all workers. Reliable communication systems will be established and regularly tested to ensure rapid communication during emergencies. Emergency call numbers, contact information of emergency services and evacuation routes will be notified to employees in advance. Work areas shall have designated evacuation routes and safe areas for emergencies. These areas will be used for all kinds of emergencies.		
19	Labor and working conditions	Fire	Project Workers	Fire extinguishing equipment such as fire extinguishers, fire hoses, sprinkler systems will be available in all work areas. It will be ensured that fire equipment is always available and effective and will be regularly maintained. Work areas shall be free of any materials that may pose a fire risk (e.g. easily ignitable materials, gases). Storage and use of such materials will be in accordance with fire safety procedures. Employees will be trained on how to use fire equipment. Alarm systems will be installed in work areas to give a quick warning in case of fire.	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan OHS Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Fire alarm systems will be tested regularly and it will be ensured that the system is always in working order. Fire drills will be conducted regularly. These drills will enable employees to learn how to behave during a fire, safe evacuation routes and fire extinguishing procedures in practice. Drills will be conducted under different scenarios and performance evaluation will be carried out after the drill. Signs and markings directing to evacuation points will be placed appropriately. Electrical systems will be regularly checked for short circuits or overheating that may pose a fire risk. Work Permit system will be used during hot work and its requirements will be met. In areas that appear risky after hot work, an environmental surveillance will be carried out for half an hour after work. Chemical substances will be stored in fire resistant areas and labeled cabinets. In addition, necessary safety precautions will be taken during the use of such substances, taking into account their flammable properties. When choosing a fire extinguisher, foam fire extinguishers for chemical fires and CO_2 fire extinguishers for electrical fires will be specially selected.		
20	Labor and working conditions	Explosion	Project Workers	Areas at risk of explosion will be clearly marked and accessible only by authorized personnel. These areas will be isolated from other work areas and surrounded by safe distances.	Contractor KOSKİ	Emergency Response and Preperedness Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Regular leakage tests will be carried out against gas and vapor leaks that may cause explosion. In areas where leaks are detected, intervention will be made immediately and leaks will be eliminated. Gas detection devices will be installed and gas levels will be continuously monitored. In areas where there is a risk of explosion, flammable substances and materials will be avoided. Any equipment or materials that may cause fire and explosion will be stored properly. Explosion-proof electrical equipment and lighting will be used in explosion risk areas. Electrical panels, motors, electrical devices and other equipment will have explosion safety certificates. Chemical substances shall be stored in accordance with substances that may cause an explosion. These substances will be stored in safe, explosion-proof areas at the correct temperature and humidity conditions. In areas at risk of explosion, cooling systems and heating devices will be operated in a controlled manner to prevent excessive heat. In addition, warning systems will be activated in case of excessive temperatures. In processes with explosion risk, all procedures will be clearly standardized and each employee will be informed about the safety precautions to be taken during the process.	Supervision Consultant	OHS Management Plan
21	Labor and working conditions	Natural Disasters	Project Workers	Workspaces and accommodation facilities will be built to local construction standards and resistant to natural disasters.	Contractor KOSKİ	Emergency Response and

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				The materials in the foundations, walls and roofs of the structures will be reinforced to withstand natural disasters such as earthquakes, floods and storms. Emergency kits (first aid kits, water, food, flashlights, batteries, fire extinguishers, etc.) that can be used during natural disasters will be available in every area. Necessary materials (tents, blankets, etc.) will be provided for employees to shelter and stay healthy in case of disaster. In addition, emergency warning systems will be installed and all employees will be informed quickly in case of a disaster and necessary warnings will be made. Employees will be regularly trained on how to act in case of disaster, which emergency exits to use and how to stay safely after the disaster. Regular drills will be conducted under disaster scenarios such as earthquakes, floods and storms, and employees will be able to react correctly in the event of a disaster. Drainage systems will be installed in areas at risk of flooding to prevent puddles and ensure water evacuation. In areas at risk of storms, wind resistance of roofs and structures will be increased and safety measures will be taken to prevent loose materials from flying. Work areas will be built on raised ground to reduce the effects of disasters such as flooding and storms.	Supervision Consultant	Preperedness Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Areas at risk of disaster will be assessed through geological surveys conducted in advance. Risks such as ground liquefaction or landslide will be minimized by conducting ground surveys. The places where the basic materials (food, water, medicine, blankets, etc.) required in case of disaster will be stored in advance will be determined.		
22	Labor and working conditions	Electrical Hazards	Project Workers	Electrical equipment and systems will be regularly checked and maintained by specialists. Defective or worn equipment will be replaced or repaired immediately. All electrical systems will be designed in accordance with local regulations and safety standards and installations will be carried out by VQA qualified electricians. All electrical equipment and metal structures will be grounded so that electrical leakage is safely conducted to earth. Grounding systems will be regularly tested and checked for proper functioning. Electrical cables will be securely insulated and protected against overheating. Electrical cables and equipment will be insulated against external factors (water, moisture, physical impact). Personnel working in electrical work shall use appropriate Personal Protective Equipment (PPE). In particular, materials such as insulated gloves, electrical safety shoes and face protection equipment will be provided against electrical hazards. PPE will be checked periodically and equipment worn or damaged over time will be replaced with new ones.	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan OHS Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Electrical panels will be located in enclosed and secure areas, accessible only by authorized personnel. Before intervening in the electrical panels, the energy in the system will be cut off. Intervention to electrical panels will not be allowed except in emergencies. All energy sources in the work area will be isolated with a locking and labeling system. Workers will start their work after verifying that the power has been cut off. All power lines and equipment will be clearly labeled and locked out before maintenance or repair is carried out. Emergency de-energization systems will be provided in all work areas. These systems will be able to quickly interrupt the energy supply when workers are in danger. Emergency cut-off buttons will be in easily accessible locations and workers will be trained in the use of this system. All employees will receive training on electrical hazards, with a particular focus on electric shock, safe working methods and emergency procedures. Employees will receive periodic training on safety precautions to be taken when working with electrical equipment. First aid training will be provided to employees against injuries that may occur as a result of electric shock. Emergency response to the struck person, disconnection of the electric current and application of correct first aid procedures will be ensured.		

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				In addition, first aid kits will be available in each area and the contents of these kits will be checked regularly. High voltage lines will only be operated by authorized, trained personnel and these areas will be made safe. Before entering high voltage areas, equipment shall be properly grounded and de-energized.		
23	Labor and working conditions	Chemical Exposure	Project Workers	Chemicals shall be stored in a safe manner and each shall be properly labeled. Labels will clearly indicate the chemical's hazard class, instructions for use and emergency procedures. Personnel working with chemicals will wear appropriate personal protective equipment (PPE). Protective gloves, aprons, goggles and protective masks will be provided to prevent the risk of skin contact. Air purifiers, respirators or respirators or hoods will be used to prevent respiratory exposure. Respiratory protection will be provided by masks with appropriate filters according to the chemical substance. All personnel working with chemicals will be trained in appropriate PPE. Areas containing chemical substances will be clearly marked with warning signs and labels. Signs such as “Dangerous Chemical Substance” or “Poison” will be placed in these areas and employees will be informed before entering these areas. Emergency procedures will be determined and regular drills will be conducted for employees in order to provide fast and effective intervention in case of chemical exposure. First aid methods to be applied in case of exposure to chemical	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan OHS Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				substances will be clearly determined and emergency response guides will be provided to the employee. Employees will be trained on the health effects of chemicals, exposure risks and personal protection methods. In addition, specific safety information, instructions for use and hazardous situations will be provided for each chemical substance. SDS (Safety Data Sheets) about chemical substances will be provided and all employees will have access to these forms. Appropriate ventilation systems will be provided in areas where chemicals are used and regular maintenance and control of ventilation systems will be carried out. Local ventilation systems will be installed to prevent chemical vapors from polluting the ambient air. Spill kits and absorbent materials will be readily available against chemical substance leaks. Spill control procedures will be established to ensure immediate response in the event of chemical spills. All necessary measures will be taken to prevent chemical spills; for example, areas at risk of spills will be protected with special containment boxes. Procedures for the proper storage and disposal of chemical waste will be implemented in accordance with local regulations. Chemical waste will be collected in labeled, secure containers and regular disposal will be ensured. Trained personnel will be employed for waste management and waste will be stored and handled appropriately.		

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Persons working with chemicals must wash their hands and faces before entering food and drinking areas. Suitable areas will be provided for body cleaning after chemical contact. Workers will be informed about eating or drinking after working with chemicals. Workers exposed to chemicals for long periods of time will be subjected to regular health checks and the results of these checks will be recorded. Biological monitoring will be carried out for early detection of potential health problems during exposure to chemical substances, allowing early intervention as symptoms are detected.		
24	Labor and working conditions	Travel and working on steep and treacherous terrain	Project Workers	Employees will receive training and information on safe behavior and risks in difficult terrain conditions. Employees will receive first aid training. PPE suitable for work areas and working environments will be selected and used. They will wear durable, waterproof and weatherproof clothing. Terrain conditions of the work area (rocky, hilly, swampy, etc.) will be analyzed in advance. Physical fatigue will be prevented through regular rest intervals. Workers will be provided with adequate fluid intake and a balanced diet. Employees will participate in regular exercise and fitness programs. Workers will not work alone and will work in pairs.	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan OHS Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Excessive fatigue will be prevented by limiting the time workers spend in the field.		
25	Labor and working conditions	Traffic Accidents	Project Workers	Advanced and defensive driving techniques training will be provided. Regular safe driving briefings will be provided to drivers. Regular maintenance and periodic inspections of vehicles will be carried out. In-vehicle safety equipment (seat belts, ABS, ESP, etc.) will be checked. Traffic safety protocols will be established in residential areas. Speed limits, pedestrian crossings and traffic signs will be made clear. Speed barriers and road lighting will be implemented in risky areas. Drivers' working hours and rest periods will be monitored. Deterrent measures will be taken against traffic safety violations. Speed and route control will be carried out with vehicle tracking systems.	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan Trafic Management Plan
26	Labor and working conditions	Excavation Hazards/ Collapses, falling into excavations, injuries.	Project Workers	Appropriate support methods (shoring, fortifications, etc.) will be applied in the excavation area. Anti-fall barriers and warning signs will be placed at the edges of the excavation. Excavation works will be supervised by competent and experienced persons. The excavation area will be fenced to prevent unauthorized access. Underground lines and existing infrastructure will be identified prior to excavation.	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan OHS Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Inclined excavation techniques will be used to prevent landslides during excavation. Water accumulated in the excavation area will be drained in wet weather conditions. Emergency action plans will be prepared and communicated to employees. Oxygen levels will be monitored by continuous gas measurements in the excavation area. An excavation work permit procedure will be established to ensure that excavation works are carried out in a controlled manner. Appropriate roads and access platforms will be established to ensure safe access to excavation areas.		
27	Labor and working conditions	Lifting of Heavy Structures/ Crushing, stretching, fractures.	Project Workers	Cranes and lifting equipment of appropriate capacity will be used for lifting operations. Periodic checks and maintenance of lifting equipment will be carried out regularly. During crane selection, crane selections will be made by leaving a 10% safety margin between the weight of the load and the capacity of the crane. Lifting operations will be carried out by competent and trained personnel. Risk assessment will be made before lifting operations. Safe working areas will be created by prohibiting work and movement under load.	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan OHS Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Wind, ground conditions and environmental conditions will be taken into consideration during lifting. Appropriate ropes, hooks and fasteners will be used for safe attachment and balancing of the load. Appropriate signaling and radio systems will be used for communication. Emergency procedures will be prepared and communicated to employees.		
28	Labor and working conditions	Exposure to airborne agents	Project Workers	Appropriate respiratory protective equipment (FFP2, FFP3 mask etc.) will be provided. Adequate ventilation system will be installed in work areas. Protection of workers will be ensured by limiting exposure time. Ambient air quality will be measured regularly and risk assessment will be made. Local and general ventilation systems will be used to control dust, smoke and chemical vapors. Workers will be trained on respiratory risks and protection methods. The necessity to work in areas close to polluted air sources will be minimized. Personal hygiene practices will be encouraged to reduce the risk of contamination. Emergency procedures will be established and communicated to employees	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan OHS Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
29	Labor and working conditions	Ergonomic Hazards/ Musculoskeletal injuries, strains or discomfort.	Project Workers	Ergonomic equipment and tools will be provided in work areas. Workers will be trained in proper lifting and handling techniques. Task rotation will be implemented to reduce strain from repetitive movements. Work areas and equipment height will be arranged in accordance with ergonomic principles. Appropriate supportive equipment (foot rest platforms, supported chairs, etc.) will be provided for those who work standing or sitting for long periods of time. Mechanical lifting and transportation systems will be used to prevent manual handling of heavy loads. The load on the musculoskeletal system will be reduced by planning regular stretching and break times during work. Employees will be trained on ergonomic risks and protection methods. Improvements will be made to reduce the risks arising from vibration and forced positions in work areas.	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan OHS Management Plan
30	Labor and working conditions	Insect and Animal Hazards / Bites, stings, allergic reactions, infections.	Project Workers	Workers will be provided with appropriate protective clothing (long-sleeved clothing, gloves, etc.). Regular spraying will be carried out in work areas against insects and pests. Insect and rodent traps will be set in risky areas. First aid kits will be kept and necessary materials against allergies and stings will be provided.	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Employees will be trained on protection against insect and animal stings and first aid. Pests and animals will be prevented from being attracted to the area by preventing food and drink from being left in open areas. Appropriate physical measures (door and window screens, etc.) will be taken to prevent pest entry into campsites. Poisonous and dangerous animal species will be identified and employees will be informed. Emergency procedures will be established for rapid response in case of a sting or bite.		
31	Labor and working conditions	Hazards of Welding /Burns, respiratory problems, eye damage.	Project Workers	Appropriate Personal Protective Equipment (PPE) (welding mask, gloves, goggles, heat resistant clothing) will be provided for use in welding operations. Adequate ventilation and smoke extraction systems will be installed in welding areas. Hot work work permit will be obtained before welding in areas with fire risk. Flammable and explosive materials will be kept away from the welding area. Fire extinguishers and emergency equipment will be available in the welding area. Employees will be trained on welding fume exposure, eye protection methods and fire safety.	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan OHS Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Welding operations will only be carried out by personnel holding Vocational Qualifications Authority (VQA) certificates. Unauthorized access will be prevented by marking in welding areas. Sufficient time will be allowed for hot surfaces to cool down after welding and safety checks will be carried out. Regular maintenance of equipment will be carried out to prevent electrical risks. A confined space work permit will be obtained for welding operations in confined spaces. If ventilation systems are inadequate, portable fume extraction and fresh air supply systems will be used. Oxygen levels in the environment will be measured regularly and gas detectors will be available to prevent toxic gas accumulation. The suitability of employees to work in confined spaces will be assessed in advance and personnel trained in confined space work will be assigned. Welders working in confined spaces will be constantly monitored by an outside supervisor. Emergency evacuation plans will be created and notified to employees. Health surveillance of employees will be carried out by conducting different health examinations for the personnel working in welding work at the period determined by the workplace physician.		

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
32	Labor and working conditions	Steel Erection (Towers) Hazards / Falls, crushing, falling objects	Project Workers	Employees will be trained on working at height. Fall arrest systems (safety harness, lanyard, lifeline, etc.) will be used in steel erection operations. Safe scaffolds, platforms and ladder systems will be installed. If equipment such as articulated lifting platforms and manlifts will be used, suitable ground conditions will be provided and employees will be provided with the necessary competencies to use this equipment. Materials will be properly secured and personal and collective protection measures will be taken to prevent falling objects during assembly. Hard hats and appropriate personal protective equipment will be provided for workers in overhead working areas. Standing under load during lifting of steel structural elements shall be prohibited. Erection operations will only be carried out by competent and trained personnel. Safety barriers and warning signs will be placed around the work area to prevent unauthorized access. Weather conditions (wind, rain, icing, etc.) will be constantly checked and work will be stopped in adverse conditions. During assembly, connection points will be securely controlled and all screwing operations will be performed at the appropriate torque value. Steel erection safety protocols will be established and implemented on site.	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan OHS Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Emergency evacuation plans will be created and notified to employees.		
33	Labor and working conditions	Lack of OHS Awareness / Increase in accidents, injuries	Project Workers	Regular occupational health and safety (OHS) trainings will be organized and all employees will participate. Awareness campaigns and safety information meetings will be organized. Personal protective equipment (PPE) use will be audited and appropriate PPE use will be maintained. Toolbox talks will be held regularly (minimum at weekly intervals) and employees will be reminded of safety procedures. Accidents and near misses will be analyzed and the results will be shared with employees. Incentive mechanisms (rewarding, positive feedback, etc.) will be implemented to create a safe working culture. Field audits and observations will be increased, safety violations will be identified and necessary improvements will be made. OHS instructions and procedures will be posted in visible areas and kept accessible to employees	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan OHS Management Plan
34	Labor and working conditions	Rotating and Moving Equipment/ Traps, breaks, crushing.	Project Workers	Appropriate safety protection equipment (cages, covers, barriers, etc.) will be installed for all rotating and moving parts. Safe operating procedures of the equipment will be determined and employees will be trained.	Contractor KOSKİ Supervision Consultant	Emergency Response and Preperedness Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Machinery and equipment will be regularly maintained and periodic checks will be carried out. Unauthorized and untrained personnel will be prohibited from using machinery. Intervention while the machine is running will be prohibited and LOTO (Lockout-Tagout) procedures will be applied during maintenance. Emergency stop buttons and warning systems will be operated effectively. Appropriate floor markings will be made in machine and equipment usage areas and safe working distance will be maintained. Accidents and near misses will be analyzed and improvement measures will be taken		OHS Management Plan
35	Archaeological and Cultural Heritage	Damage to any chance find	Archaeological and cultural heritage	Chance Finds Procedure will be implemented during land preparation and construction works. This procedure will be implemented in an appropriate manner with Article 4 of Law on the Conservation of Cultural and Natural Properties (Law No. 2863). In this content: Construction works will be stopped immediately in case of a chance find, site will be fenced and guarded 24 hrs. Related Conservation Boards or Museum Directorate will be informed immediately. Works will not proceed until official notification is received.	Contractor KOSKİ Supervision Consultant	Chance Finds Procedure

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
OPERATION PHASE						
1	Soil Quality	Possible soil contamination	Soil Environment Nearest Settlements Flora-Fauna	A Sludge Management Plan will be prepared in line with ESS1, ESS3, and WBG EHS Guidelines (both general and sector specific) before three months of the commencement of operation phase. In line with permit requirements, in accordance with Article 8, paragraph 2, subparagraphs (c) and (ç) of the relevant regulation, for agricultural lands permitted for sludge application (i.e., where the concentration of heavy metals in the soil exceeds 50% of the limit values stated in Annex I-A), soil sampling and analysis will be carried out every twelve months Sludge samples will be collected every six months and analyzed for the parameters specified in Annexes II-A and II-B of the regulation. The results of these analyses will be submitted to the Provincial Directorate of Environment, Urbanization and Climate Change. Establish safe delivery/storage/handling procedures in accordance with material safety data sheets (MSDSs). Immediately contain and clean-up any spilled material.	KOSKİ	Sludge Management Plan
2	Air Quality	Odorous gas emissions and nuisance in the close vicinity of the KWWTP	Air Environment Nearest Settlements Flora-Fauna	The first level measures: Prevention of wastewater influent which exceed treatment plant capacity. Reduction of solid waste and activated sludge amounts. Increasing disposal frequency of screenings. Proper and timely disposal of sludge in order to prevent flies and odor. Increasing aeration rate in biological treatment process.	KOSKİ	Air Quality Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Addition of lime to activated sludge. Keeping water level under control in order to prevent turbulence as a result of instant decrease of water Within the scope of the project a biological odor removal unit will be installed in the plant.		
3	Noise and VibrationVibration	Increase in noise levels	Nearest Settlements Flora- Fauna	The Noise Management Plan prepared by the Contractor will be reviewed and updated, if necessary, before the acceptance of the works. 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 national legislations and WBG General EHS Guidelines and Sectoral Guidelines will be complied with during the operation phase. After the plant is put into operation, gas engine-related noise measurements will be renewed. In order to be able to reduce the noise level at a reasonable value in complient with the project standards some mitigating measures will be applied such as adding silencers or barriers to noise-generating equipment, restriction of construction activities during nighttime hours etc.	KOSKİ	Noise Management Plan
4	Water QualityWater Quality	Discharge of treated effluent	Surfaca Water Nearest Settlements Flora- Fauna	A Water Resources Management Plan that is in line with WB ESSs and WBG EHS Guidelines (both general and sector specific) will be prepared and implemented by KOSKİ or Third Party E&S Consultant. Drainage system will ve established to collect the stormwater within the scope of the Project. The limited amount of domestic wastewater generated at the KOSKİ will aim to have no direct bypasses of the treatment system.	KOSKİ	Water Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
5	Waste and resources	Operation Improper handling of waste	Nearest Settlements Flora- Fauna Soil environment	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 KMM. Incineration or burying of waste by any means at site and/or dumping of waste to nearby roads or water resources will be forbidden. 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 wastes 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. Hazardous or non-hazardous inscription, waste code, stored waste amount and storage date will be indicated/labelled on wastes temporarily stored by classifying according to their properties. The reaction of wastes with each other will be prevented by the measures taken in the Temporary Storage Area.	KOSKİ	Waste Management Plan
6	Waste and Resources	Improper handling of excess sludge	Nearest Settlements Flora- Fauna Soil environment	A Sludge Management Plan in line with ESS1, ESS3 and WBG EHS Guidelines (both general and sector specific) will be constituted and implemented. The excess sludge, if any, will be managed in line with the Sludge Management Plan. The excess sludge will be stored in special containers designated for this purpose only and carried to agricultural lands, KMM Sanitary Landfills or Incineration only with licensed trucks.	KOSKİ	Sludge Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
7	Biological Environment	Disturbance to biological environment	Flora-Faua	Minor Construction and operation sites will be fenced to prevent fauna species' entrance into these areas.	KOSKİ	Environmental and Social Management Plan Waste Management Plan
8	Socioeconomic Environment	Positive impact on Local Procurement and Employment opportunities	Nearest Settlements	KOSKİ will take all necessary actions and measures for labor and employment to be in compliance with Turkish Labor Law and international standards. KOSKİ will aim at employing local workers to the extent possible, in order to increase the Project's local benefits. The recruitment processes will be transparent, public and non-discriminatory, providing equal opportunities with respect to ethnicity, religion, language, gender and sexuality.	KOSKİ	Labor Management Plan
9	Community Health, Safety and Security	Community health and safety and Security	Nearest Settlements	Community Health, Safety and Security Management Plan that was prepared before preconstruction phase is in line with WB ESSs and WBG EHS Guidelines (both general and sector specific) will continue to be continue to actively implemented in operation phase. Persons and/or organizations with the necessary permits will be assigned to ensure the security of the Project Area (e.g., private security companies/officials). These people and/or organizations shall regularly monitor the facility and its surroundings. The special security applications and officials' authorities within the scope of the Project shall comply with the provisions of the Regulation on the Implementation of the Law on Private Security Services and the Law on Private Security Services. KOSKİ will ensure that the contractor is in line with the WB ESSs Guideline which is related to security forces.	KOSKİ	Community health and safety management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Restrict access to waste management facilities by implementing security procedures, such as perimeter fencing of adequate height and suitable material, with lockable site access gate; security cameras at key access points, and security alarms fitted to buildings and storage areas; and use of a site visitor register. Sufficient lighting of the WWTP will be ensured. Entry of staff and third parties into the working site will be carried out in a controlled manner from the doors at which authorized security personnel will work, and No unauthorized garbage collectors will be let into the construction site. All types of waste shall be transferred to a licensed disposal facility via licensed waste transportation companies following the relevant legislation on waste. A public grievance mechanism will be established.		
10	Community health and safety	Unit Failure and/or Shutdown	Nearest Settlements	During the longer shutdowns or failures, KOSKİ will inform Provincial Directorate of Environment, Urbanization and Climate Change regarding the situation. During excessive loads that the KWWTP cannot handle, the bypass line of the existing plant will be used to bypass the load. In case of direct discharge of untreated wastewater to receiving body due to the failures and/or shutdowns, KOSKİ will immediately inform mukhtar(s) of the settlements downstream to request farmers to stop withdrawing water from the receiving body.	KOSKİ	Community health and safety management Plan
11	Labor and Working Conditions	Chemical Exposure	Project Workers	Chemicals will be stored in closed and ventilated areas. Workers will be provided with appropriate PPE (gloves, goggles, respiratory protection).	KOSKİ	Emergency Preparedness and Response Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Emergency shower and eyewash stations will be set up against chemical spills. Chemical safety trainings will be organized. Interactions and potential hazards of chemicals will be communicated to employees during trainings. Safety Data Sheets (SDS) will be summarized and posted in visible areas. Emergency response procedures specified in SDS will be taught to personnel working with chemicals through trainings.		Occupational Health and Safety Management Plan
12	Labor and Working Conditions	Gas Accumulation and Respiratory Hazards	Project Workers	Gas detectors will be installed in confined spaces. Confined space entry procedures will be implemented. Respiratory protective equipment will be provided to workers. Regular gas measurements will be carried out. Emergency procedures will be prepared and drills will be organized.	KOSKİ	Emergency Preparedness and Response Plan Occupational Health and Safety Management Plan
13	Labor and Working Conditions	Biological Risks/ Infections, skin diseases	Project Workers	Appropriate PPE (gloves, masks, goggles) will be provided to employees. Hand hygiene and sanitation measures will be implemented. Vaccination of employees will be encouraged. Special precautions will be taken for workers in direct contact with wastewater.	KOSKİ	Emergency Preparedness and Response Plan Occupational Health and Safety Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
14	Labor and Working Conditions	Mechanical and Electrical Hazards / Crush, cut, electric shock	Project Workers	Machine protection covers will be used. LOTO procedures will be applied in maintenance and repair operations. Electrical panels will be checked regularly and proper insulation will be ensured. Safe working instructions will be prepared for employees. Maintenance plan for Machinery and Equipment will be implemented. Periodic Inspections of machinery and equipment will be carried out and validation of inspection dates will be carried out through a tracking list.	KOSKİ	Emergency Preparedness and Response Plan Occupational Health and Safety Management Plan
15	Labor and Working Conditions	Slips, Trips and Falls / Fractures, sprains, injuries from falls	Project Workers	Non-slip floor coverings will be applied in wet and applicable areas. Guardrails and barriers will be installed around open channels and pools. Work areas will be cleaned regularly. Warning signs will be installed for wet floors.	KOSKİ	Emergency Preparedness and Response Plan Occupational Health and Safety Management Plan
16	Labor and Working Conditions	Explosion and Fire Risks	Project Workers Project Workers	Ventilation systems will be actively operated to prevent accumulation of methane and flammable gases. Flammable chemicals will be stored in safe and authorized areas. Fire extinguishing equipment will be checked regularly. Electrical equipment will be checked regularly and grounding systems will be properly operated.	KOSKİ	Emergency Preparedness and Response Plan Occupational Health and Safety

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Fuses and circuit breakers will be used to protect against short circuits and overheating. Fire alarms, smoke detectors and emergency lighting systems will be tested regularly. Emergency exit routes, signage and safety gates will always be clear and unobstructed. All employees will be regularly trained and informed on how to act in case of fire and explosion. Fire drills will be conducted periodically to improve the response capabilities of emergency teams. Waste containing hazardous materials will be disposed of properly. Gas detection systems for methane and other flammable gases will be installed and regularly checked. Employees will receive authorized training on fire safety and these trainings will be updated and maintained every year.		Management Plan
17	Labor and Working Conditions	Confined Space Works/ Asphyxiation, gas poisoning, difficulty escaping in an emergency	Project Workers	A work permit system will be implemented for working in confined spaces. Adequate ventilation will be provided in confined spaces, oxygen levels will be continuously monitored and mechanical ventilation will be used to prevent gas accumulations. Workers will be trained on potential hazards, escape routes and rescue procedures before starting work in confined spaces. Each worker will be briefed to be prepared for emergencies. During confined space work, external hazards (e.g. chemicals, electrical hazards) will be isolated in advance and these areas will be made safe.	KOSKİ	Emergency Preparedness and Response Plan Occupational Health and Safety Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				A secure communication system (radio, telephone, intercom) will be provided and accessible at all times to keep in constant contact with those working in the confined space. Gas levels, oxygen levels and other hazardous conditions in the confined space will be regularly monitored and alarm systems will be activated. Rest intervals of personnel working in confined spaces will be regularly planned and working times will be managed in a controlled manner. Respirators and other personal protective equipment to be used will be regularly checked, maintained and tested. Spare respirators and rescue equipment will be kept ready to be used in case of an emergency in confined spaces. In confined spaces, emergency exit routes will be clearly marked and these routes will not be obstructed in any way. Prior to each confined space operation, specific risks will be assessed and measures to be taken against these risks will be implemented based on a specific plan.		
18	Labor and Working Conditions	Noise Exposure	Project Workers	Noise levels will be measured regularly. Isolation panels will be used for sound insulation. Hearing protection equipment (earplugs, earmuffs) will be provided to employees. Workers will be provided with hearing protective equipment. Audiometry examinations will be performed on employees at periods determined by the workplace physician. If possible, noise-causing machines will be removed or insulation will be provided.	KOSKİ	Emergency Preparedness and Response Plan Occupational Health and Safety Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Rotating work patterns will be implemented. Employees will be informed about noise. Soundproofing equipment will be regularly maintained and tested. Where possible, equipment operating at low noise levels will be preferred. Only essential personnel will enter areas with high noise levels.		Labor Management Plan
19	Labor and Working Conditions	Lighting and Restricted Visibility	Project Workers	Lighting in work areas will be regularly checked and increased when necessary. Lighting equipment will be regularly maintained and tested. The direction and placement of the light source will be adjusted to avoid straining the eyes. Adequate area lighting will be provided for night shift workers and additional lighting will be provided in case of insufficient light. Points in the workplace where light levels are sufficient for safe movement will be identified and emergency exit routes will be illuminated. Reflective signs and warnings will be placed for workers in areas with restricted visibility. Portable light sources and emergency lighting systems will be continuously checked and kept accessible.	KOSKİ	Emergency Preparedness and Response Plan Occupational Health and Safety Management Plan Labor Management Plan
20	Labor and Working Conditions	Weaknesses in OHS management processes / Failure of employees to	Project Workers	Regular trainings and awareness programs will be implemented to improve safety culture. Senior management will be ensured to lead OHS. Regular drills will be conducted for emergency scenarios, and employees will be provided with simplified and visually narrated emergency guides.	KOSKİ	Emergency Preparedness and Response Plan Occupational Health and

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
		comply with safety rules, increase in accidents Panic, wrong or incomplete response in emergency situations Employees not recognizing risks, increased accident rates, etc.		Occupational health and safety information boards will be created, daily on-the-job talks and periodic trainings will be organized. Accident and near-miss analyses will be conducted, results will be shared with all employees and corrective/preventive actions will be taken. Risk assessments will be carried out regularly by expert teams and active participation of employees in the process will be ensured. Risk analyzes will be updated periodically. LOTO (Lockout-Tagout) and work permit procedures will be developed, regular trainings will be provided to employees and the full implementation of work permits will be audited. Internal and external audits will be conducted periodically and action plans will be created for the deficiencies identified. The use of PPE (Personal Protective Equipment) will be regularly audited and employees will be informed when deficiencies are identified. Training participation and effectiveness will be monitored and supplementary training will be provided to employees who receive incomplete training. The health status of employees will be regularly checked by the workplace physician. The workplace detection and suggestion book will be regularly monitored by the OHS specialist and workplace physician and deficiencies will be eliminated. In cases where the number of employees is over 50, OHS Board meetings will be held regularly. Risk assessment will be carried out to determine the PPE to be used in the work areas and a PPE risk map will be created in the business departments. Reward and discipline systems will be established to strengthen the OHS culture.		Safety Management Plan

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Near-miss incidents will be recorded and preventive and corrective actions will be taken. Industrial hygiene environment measurements will be carried out at the workplace and necessary improvement activities will be carried out. Weekly and monthly field observation reports will be prepared and Corrective and Preventive Action (CPA) processes will be carried out for nonconformities identified. A maintenance plan will be created for machinery and equipment, and periodic inspections will be carried out regularly. Training needs of employees will be determined according to risk assessments, an Annual Training Plan will be prepared every year and necessary trainings will be provided to employees. Work environment inspections will be carried out before the works and employees will be given Toolbox trainings on occupational safety risks. A Fire Brigade Report will be obtained for the plant in the periods determined by Konya Metropolitan Municipality Fire Department. Pedestrian routes within the facility will be determined and traffic safety will be increased by making arrangements such as traffic signs and speed bumps.		
21	Labor and Working Conditions	Hazards of Maintenance and Repair Activities / Crush, cut, electric shock	Project Workers	Electrical panels will only be opened by authorized personnel. Electrically insulated gloves, fireproof clothing and insulated tools will be used. Safety belts and fall protection systems will be used. Ladders, scaffolds and platforms will be checked regularly. Personnel working at height will be authorized and trained.	KOSKİ	Emergency Preparedness and Response Plan Occupational Health and Safety

No	IssueIssue	Potential ImpactImpact	Sensitive Receptor	Management/ Mitigation MeasureMeasure	Responsible	Relevant Management Plan / Procedure
				Machine safety locking systems will be activated. Dangerous areas will be marked and entrances will be restricted. Cut resistant gloves, goggles and appropriate work clothes will be worn. Work permit system will be applied. Proper ventilation will be provided when working in confined spaces. Gas measurements will be made regularly. Appropriate personal protective equipment (PPE) will be used when working with chemicals. Emergency equipment will be available during maintenance and repair work. Appropriate protective clothing will be worn against the risk of wastewater and mud contact. Pressure will be relieved before working on pressurized lines. Non-sparking tools will be used in areas where there is a risk of fire and explosion. Appropriate warning signs will be placed around the work area.		Management Plan

Table 7-2 Environmental and Social Monitoring Table

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
1	Construction	Soil contamination contamination	Amount of contaminated soil	AtAt WWTP site Work sites and storage areas	Environmental incident register Grievance records Sampling and anlaysing by an authorized laboratory	Monthly starting from the initialization of construction phase Upon grievance and observationobservation	Regulation on Control of Soil Pollution and Sites Polluted by Point Sources	Number of events that trigger spill and leakage response Environmental spill/leak incident records/report Environmental and Social Monitoring Report (ESMR) Findings Soil analysis results Contaminated soil amount Contaminated soil treatment/disposal methodology Stripped/stored/reuse dreused	Contractor Supervision Consultant KOSKİ
2	Construction	Soil pollution	Number of oil/fuel and chemical leakages/spills	At WWTP site Work sites and storage areasareas	VisualSoil sampling Visual observation Site Inspections Environmental incident registers	Monthly	-	Hazardous materials and chemicals inventory The number of events that trigger spill and leakage response	Contractor Supervision Consultant KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
								Environmental spill/leak incident records/report Storage conditions of chemicals and hazardous material Floors of the chemical and hazardous material storage areas Material Safety Data Sheets (MSDSs) of all chemicals listed in the inventory Written training records covering the chemicals and hazardous materials management issuesissues	
3	Construction	Historical soil pollution status	Soil quality, including, pH, heavy metals, phosphorus,	At least three locations within the site	Sampling and anlaysing by an authorized	Before construction phase	See relevant section of ESIA Report	Soil analysis results	Contractor Supervision Consultant

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
			nitrogen, Na, Ca, salts, PAHs		laboratorylaboratory		Regulation on Control of Soil Pollution and Sites Polluted by Point Sources		KOSKİ
4	Construction	Excavation waste	Amount of refilled, stored, and disposed excavation materials Amount of stripped and reused topsoil by indicating reuse locations Storage conditions of topsoil (humidity and pile height)	Excavation areas and storage fieldsfields	Visual observation Records of the amount of excavated, refilled and disposed materials Daily Cheklists	Daily starting from the initialization of construction phasephase	No loss of topsoil Proper management of excavation wastes	Excavation volume Reused excavation volume Volume of excavated material sent to final disposal ESMR Findings	Contractor Supervision Consultant KOSKİ
5	Construction	Chemicals and hazardous materials	Conditions of the storage area Number of leaks, spills, etc.	StorageStorage areas	Visual observation Site inspections Environmental incident register	Weekly	NoNo spill / leakage incident	Hazardous materials and chemicals inventory The number of events that trigger spill and leakage response Environmental spill/leak incident records/report	Contractor Supervision Consultant KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
								Storage conditions of chemicals and hazardous material Floors of the chemical and hazardous material storage areas Material Safety Data Sheets (MSDSs) of all chemicals listed in the inventory Written training records covering the chemicals and hazardous materials management issues ESMR FindingsESMR Findings	
6	Construction	Air quality	Settled dust, PM10 and PM2.5 Number of complaints Maintenance and exhaust records of all machinery and equipment	Nearest industrial/commercial building At the complainants house / workplace	Sampling, analysis Visual check of maintenance and exhaust records	Quarterly	Below the regulatory limit values defined in Industrial Air Pollution Control Regulation No air quality related grievance receivedreceived	Daily visual observations Vehicle exhaust measurements Recorded status of equipment and vehicles on site	Contractor Supervision Consultant KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
								Dust grievance records Number of trucks to be used for water prinkling daily ESMR FindingsFindings	
7	Construction	Air quality	Maintenance and exhaust decal records of all machinery and equipment	Entire Project	Records	Annual	See relevant section of ESIA Report	Exhaust emission decal follow-up	Contractor Supervision Consultant KOSKİ
8	Construction	GHG emissions	Scope-1 and Scope-2 emissions	Entire Project	Reporting	Annually	GIIP	GHG Inventory Annual GHG Emission Reporting	Contractor Supervision Consultant KOSKİ
9	Construction	Noise	Noise levels	Nearest industrial/commercial building At the complaint point	At least 24-hr measurements Grievance Mechnism	Upon grievance Monthly and during the activities that noise level	Not exceeding the limit values defined in Regulation on Environmental Noise Control	Noise level measurement results Machinery and equipment maintenance log	Contractor Supervision Consultant KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
						increases (might be done more frequently with respect to the public complaints) In the event of a change in activities causing increase in noise level In the event of doing permitted night worksworks	No noise related grievance receivedreceived	Noise grievance records	
10	Construction	Water Resources	Surface water / groundwater quality analysis and measurements that include spill-related pollutants	At related water resource (wells, surface water bodies, etc.)	Sampling and in situ / laboratory measurements Spill notices / correspondences to authorities in case of major spills	In case of a leak/spill reaches to water bodies In case of a major spill	PreventionPrevention of water quality deteriotion compared to current surfac water and ground water quality	Incident records ESMR Findings Visual observation	Contractor Supervision Consultant KOSKİ
11	Construction	Effluent water quality	pH, BOD5, COD, TSS, TDS, TP, TKN, NO3-N, NO2-N, TN, Salinity, Cl,	Discharge location	Automatic measurement for relevant parameters,	Continuous monitoring for the detectable parameters by	See the relevant section of the ESIA Report	Commissioning Report	Contractor

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
			SAR, Cl, SO4, Electrical Conductivity, B, Cd, Cr, Fe, Pb, Ni, Zn, Fecal Coliforms		laboratory analysis for others	automatic measurement devices			Supervision Consultant KOSKİ
12	Construction	Waste GenerationGeneration	Classification of the hazardous wastes generated Amount of waste generated per typetype	Construction site, storage areas, and administration officeoffice	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 Disposal truck register	Weekly	Minimizing the amount of wastes to be sent for disposal and implement waste management hierarchy	Waste segregation practices (amount of waste per type) Temporary waste storage records Waste Disposal Agreements and Records Waste Grievance Records Monitoring Report Findings	Contractor Supervision Consultant KOSKİ
13	Construction	Waste Generation	Waste oil amount	Construction site, storage areas	Visual observation Waste records Site inspections Disposal truck register	Daily	Minimizing the amount of wastes to be sent for disposal and implement waste management hierarchy	Waste segregation practices (amount of waste per type) Temporary waste storage records	

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
					National Waste Transportation Forms Daily checklist			Waste Disposal Agreements and Records Waste Grievance Records Monitoring Report Findings	
14	Construction	Biological Environment	Number of incidents with fauna mortality Removal of vegetation and subsequent replanting of the area	WorkWork Sites and around	Incident records Visually in the course of works, examination and photographing before and after the works	Monthly	To prevent or minimize impact on biological envitronment	Fauna mortality records Visual Observations ESMR Findings	Contractor Supervision Consultant KOSKİ
15	Construction	Insfrastructure Damage	Interruptions in water supply	Project work site	Public consultations Grievance records	Daily	No infrastructure problems / complaints	Grievance Records Official correspondences ESMR Findings	Contractor Supervision Consultant KOSKİ
16	Construction	Job Creation	Number of employed persons from the local community	Entire Project	Employment records	Quarterly	-	Workers' Grievance Records	Contractor Supervision Consultant

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
								Presence of union or workers' representative Labor/social security records	KOSKİ
17	Construction	Working Conditions	Workers' grievances	Entire Project	Records	Weekly	-	Workers' Grievance Records Presence of union or workers' representative Labor/social security records	Contractor Supervision Consultant KOSKİ
18	Construction	Child labor	Age of candidate employee	Entire Project	National ID	Before each recruitment	-	No child and forced labor Code of Conduct trainings Code of Conduct violations Grievance Records	Contractor Supervision Consultant KOSKİ
19	Construction	Occupational health and safety	Number of incidents Incident investigation	Entire Project	Incident records	Daily	-	Incident Records	Contractor Supervision Consultant KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
20	Construction	Monthly Field Observation Report (OHS)	Monthly Site Observation Report	Entire Project	Site observation reports	Monthly	-	Site observation findings and corrective measures	Contractor Supervision Consultant KOSKİ
21	Construction	Occupational health and safety	Period of disease occurrence Number of employees with infectous disease	Entire Project	Disease follow-up register	Daily	-	Number of nonconformities opened Number of nonconformities resolved Average nonconformity resolution duration	Contractor Supervision Consultant KOSKİ
22	Construction	Occupational health and safety	Training Hours completed % of Trainings completed	AnnualAnnual Training Plans	VisualVisual	AnnualAnnual	-	Training records	Contractor Supervision Consultant KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
23	Construction	Drills	Number and subject of emergency drills	Entire Project	Drill reports	Quarterly	-	Emergency drills	Contractor Supervision Consultant KOSKİ
24	Construction	Workers Engaged by Third Parties and the Supply Chain	Contractor and subcontractor agreements	Entire Project	Contract reviews by E&S expert(s)	Before each agreement made	-	Sub-contractor agreements Grievance Records	Contractor Supervision Consultant KOSKİ
25	Construction	Community health	General construction related impacts	Entire Project	Grievance records	Monthly	-	Incident records Grievance records	Contractor Supervision Consultant KOSKİ
26	Construction	Traffic	Number of traffic related grievances	Entire Project	Grievance records	Monthly	-	Grievance records Vehicle maintenance log Condition of traffic signs	Contractor Supervision Consultant KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
27	Construction	Traffic	Number of road traffic accidents	Entire Project	Accident records/reports	Monthly	-	No of reported traffic accidents	Contractor Supervision Consultant KOSKİ
28	Construction	Traffic	Number of drivers trained	Entire Project	Training records	Monthly	-	Training records	Contractor Supervision Consultant KOSKİ
29	Construction	Community and project workers	Number of community cases	Entire Project	Security reports Visitor logs	Weekly	-	Security reports Visitor logs	Contractor Supervision Consultant KOSKİ
30	Construction	Community and project workers	Condition of CCTV system	Entire Project	System checks	Daily	-	Active CCTV system	Contractor Supervision Consultant KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
31	Construction	Community health	Number and duration of unit/plant shutdowns (planned and unplanned)	Entire Project	Shutdown/failure reports	Weekly	-	Number and duration of unit shutdowns Number and duration of plant shutdowns	Contractor Supervision Consultant KOSKİ
32	Construction	Community health	Amount of discharge during shutdown / failure	Entire Project	Measurements	During each shutdown / failure	-	Amount of discharge during shutdown/failure	Contractor Supervision Consultant KOSKİ
33	Construction	Community health	Engagement records with mukhtar(s) on direct discharge due to shutdown/failure	Entire Project	Engagement records	Before each planned shutdown/failure, during each unplanned failure	-	Engagement records Correspondences	Contractor Supervision Consultant KOSKİ
34	Construction	Chance finds	Number of chance finds	Entire Project	Visual observation Official notification to authorities	Daily	-	Visual observation Official notification to authorities Number of chance finds	S Contractor Supervision Consultant KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
35	Construction	External and internal grievances (Grievances from public and workers will be recorded separately)	Number of received grievances Number of open and closed grievances Average grievance response and closure time Identification of grievance channels	Entire Project	Grievance records (grievance log, received grievance forms, etc.)	Upon grievance	-	Grievance records	Contractor Supervision Consultant KOSKİ
36	Construction	Stakeholder engagement	Stakeholder engagementactivitiesengagementactivities as defined in SEP	Entire Project	Engagement records	Upon each engagement	-	Engagement records	Contractor Supervision Consultant KOSKİ
37	Operation	Soil contamination	Number of spills leaks	Entire Project	Incident reports Soil sampling Sludge analysis	Annually Bi annually	-	Soil analysis results	KOSKİ
38	Operation	Soil contamination	Amount of contaminated soil	Entire Project	Incident reports	After each incident	-	Contaminated soil amount Environmental spill/leak incident records	KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
39	Operation	Air quality	Maintenance and exhaust decal records of all machinery and equipment	Entire Project	Records	Annual	See relevant section of ESIA Report	Exhaust emission decal follow-up	KOSKİ
40	Operation	Odour	Odour level	Location of grievance	Measurement	Upon grievance	-	Grievance records Odor measurement results	KOSKİ
41	Operation	GHG emissions	Scope-1 and Scope-3 emissions	Entire Project	Reporting	Annually	-	Annual GHG Emission Reporting	KOSKİ
42	Operation	Noise	Noise level	Nearest industrial / commercial building	At least 24-hr noise measurement	Twice a year for the first two years of operation, then upon grievance	See the relevant section of the ESIA Report	Noise level measurement results Machinery and equipment maintenance log Noise grievance records	KOSKİ
43	Operation	Water Resources	Surface water / groundwater quality analysis and measurements that include spill-related pollutants	At related water resource (wells, surface water bodies, etc.)	Sampling and in situ / laboratory measurements Spill notices / correspondences to authorities in case of major spills	In case of a leak/spill reaches to water bodies	WPCR	Incident records	KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
44	Operation	Effluent water quality	pH, BOD5, COD, TSS, TDS, TP, TKN, NO3-N, NO2-N, TN, Salinity, Cl, SAR, Cl, SO4, Electrical Conductivity, B, Cd, Cr, Fe, Pb, Ni, Zn, Fecal Coliforms	Discharge location	Automatic measurement for relevant parameters, laboratory analysis for others	Continuous monitoring for the detectable parameters by automatic measurement devices Twice a month for the others (at minimum 24 samplings in a year)	See the relevant section of the ESIA Report	Monthly Report Results of Future Studies (assimilative capacity of the receiving body)	KOSKİ
45	Operation	Wastes	Type and amount of wastes generated	Entire Project	Visual observation Waste Records	Monthly	-	Waste segregation practices (amount of waste per type) Temporary waste storage records Waste Disposal Agreements and Records Waste Grievance Records Monitoring Report Findings	KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
46	Operation	Wastes	Excess sludge	Entire Project	Visual observation Waste Records	Monthly	-	Waste Disposal Agreements and Records Waste Grievance Records Monitoring Report Findings	KOSKİ
47	Operation	Biological Environment	Number of incidents with fauna mortality	Entire Project	Incident records	Monthly	-	Fauna mortality records	KOSKİ
48	Operation	Working conditions	Workers' grievances	Entire Project	Grievance records	Weekly	-	Workers' Grievance Records Presence of union or workers' representative Labor/social security records	KOSKİ
49	Operation	Occupational health and safety	Number of incidents Incident investigation	Entire Project	Incident records	Daily	-	Incident Records	KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
50	Operation	Monthly Field Observation Report (OHS)	Monthly Site Observation Report	Entire Project	Site observation reports	Monthly	-	Site observation findings and corrective measures	KOSKİ
51	Operation	Occupational health and safety	Period of disease occurrence Number of employees with infectous disease	Entire Project	Disease follow-up register	Daily	-	Number of nonconformities opened Number of nonconformities resolved Average nonconformity resolution duration	KOSKİ
52	Operation	Occupational health and safety	Training requirements	Entire Project	Training records Training plan	Monthly	-	Training records Work Permits OHS Reports Minutes of OHS Meetings	KOSKİ
53	Operation	Drills	Number and subject of emergency drills	Entire Project	Drill reports	Annual	-	Emergency drills	KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
54	Operation	Workers Engaged by Third Parties and the Supply Chain	Contractor and subcontractor agreements	Entire Project	Contract reviews by E&S expert(s)	Before each agreement made	-	Sub-contractor agreements Grievance Records	KOSKİ
55	Operation	Community health	Number and duration of unit/plant shutdowns (planned and unplanned)	Entire Project	Shutdown/failure reports	Weekly	-	Number and duration of unit shutdowns Number and duration of plant shutdowns	KOSKİ
56	Operation	Community health	Amount of discharge during shutdown/failure	Entire Project	Measurements	During each shutdown / failure	-	Amount of discharge during shutdown/failure	KOSKİ
57	Operation	Community health	Engagement records with mukhtar(s) on direct discharge due to shutdown/failure	Entire Project	Engagement records	Before each planned shutdown/failure, during each unplanned failure	-	Engagement records Correspondences	KOSKİ
58	Operation	External and internal grievances	Number of received grievances	Entire Project	Grievance records (grievance log,	Monthly	-	Grievance records	KOSKİ

No.	ProjectProject Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference / Threshold Level (if applicable)	Monitoring / Key Performance Indicators – KPI's*	Responsibility for Monitoring
		(Grievances from public and workers will be recorded separately)	Number of open and closed grievances Average grievance response and closure time Identification of grievance channels		received grievance forms, etc.)				
59	Operation	Stakeholder engagement	Stakeholder engagement activities as defined in SEP	Entire Project	Engagement records	Every six months	-	Engagement records	KOSKİ

*: The values that naturally show/understand the high or low performance in the situations such as increase, decrease, stability etc. of the data to be obtained from sources such as reports/records/logs/minutes/application results etc. in the "Monitoring / Key Performance Indicators – KPI's" column will be used as KPIs.

7.1 Basis Key Measures And Actions For The Esap

This section summarizes the key measures, actions and the timeframe required for the Sub-project to meet the requirements of ESSs. Table 7-3, which should be considered as the preliminary version of the ESAP, sets out recommended actions to deliver by the Sub-project (i.e. KOSKİ), or via its agents, to address risks identified in the ESIA Report and to deliver ongoing compliance with the ESSs throughout Project delivery. The final ESAP will be developed as an output of Environmental and Social Due Diligence (ESDD) study.

Reference to 'Environmental and Social (E&S)' refers to all environmental and social matters addressed by the ESSs, including labour and working conditions and occupational health and safety.

Where reference is made to 'WB/İLBANK satisfaction' or 'WB/İLBANK-accepted', this will be via review and approval by the WB/İLBANK.

Actions are colour coded as follows:

- Actions requiring completion as a condition precedent to before the construction are show in red text.
- Actions due within the first quarter following financial closure are shown in blue text.
- All other actions, including those that are ongoing throughout the financing period are shown in black text.

Table 7-3 Key Measures and Actions for ESAP

#	Issue	Requirement / Best Practice	Description of Action	Resources, Investment Needs/ Responsibility	Completion Deliverable(s)	Timetable for Completion	Target and Evaluation Criteria for Successful Implementation	Status at Loan Signing
ESS1								
1	Design review	-	Design review to be completed as soon as possible, and necessary review in the ESIA Report to be made right after	KOSKİ resources	Final design Revised ESIA (if necessary)	Before the construction	WBG/İLBANK acceptance	TBD
2	ESMP	ESS1 and Best Practice	KOSKİ to update the ESMP to the WBG/İLBANK satisfaction to account for anfor any new information relevant to the Project, including but not limited to results of any supplemental assessments, monitoring, inspections and audits; changes in Turkish law or legal requirements; or to capture the environmental and social management system structure required to deliver ESIA commitments and ESSs for the operations phase of the Project	KOSKİ or contracted resources	Operations-phase ESMP (or updates to Construction-phase ESMP, if required)	As a minimum, update required at least 6 months prior to the planned start of operations.	WBG/İLBANK acceptance of Construction-phase ESMP	TBD

#	Issue	Requirement / Best Practice	Description of Action	Resources, Investment Needs/ Responsibility	Completion Deliverable(s)	Timetable for Completion	Target and Evaluation Criteria for Successful Implementation	Status at Loan Signing
3	Operations Environmental and Social Management Plans	ESS1	Develop the Operations-phase Management Plans set out in the WB-accepted Operations-phase ESMP to WB satisfaction.	KOSKİ or contracted resources	Unless amended in Operations-phase ESMP, the following deliverables are envisaged: a. Air Quality Management Plan b. Noise Management Plan c. Water Resources and Effluent Management Plan d. Occupational Health and Safety Management Plan e. Waste Management Plan f. Stakeholder Engagement Plan and Grievance Mechanism Procedure g. Emergency	At least 3 months prior to the start of operations	İLBANK acceptance of plans and programmes	TBD

#	Issue	Requirement / Best Practice	Description of Action	Resources, Investment Needs/ Responsibility	Completion Deliverable(s)	Timetable for Completion	Target and Evaluation Criteria for Successful Implementation	Status at Loan Signing
					Preparedness and Response Plan h. Community Health, Safety, and Security Management Plan i. Subcontractor and Supply Chain Management Plan j. Human Resources Management Plan k. Landscape Management Plan l. Security Management Plan			
4	Construction Environmental and Social Management Plans	ESS1	Develop the Constructions-phase Management Plans set out in the WB-accepted Operations-phase ESMP to WB satisfaction.	KOSKİ or contracted resources	Unless amended in Constructions-phase ESMP, the following deliverables are envisaged: a. Air Quality Management	Before the construction and throughout the financing period	İLBANK acceptance of plans and programmes	TBD

#	Issue	Requirement / Best Practice	Description of Action	Resources, Investment Needs/ Responsibility	Completion Deliverable(s)	Timetable for Completion	Target and Evaluation Criteria for Successful Implementation	Status at Loan Signing
					Plan b. Noise Management Plan c. Water Resources and Effluent Management Plan d. Occupational Health and Safety Management Plan e. Waste Management Plan f. Stakeholder Engagement Plan and Grievance Mechanism Procedure g. Emergency Preparedness and Response Plan h. Community Health, Safety, and Security Management			

#	Issue	Requirement / Best Practice	Description of Action	Resources, Investment Needs/ Responsibility	Completion Deliverable(s)	Timetable for Completion	Target and Evaluation Criteria for Successful Implementation	Status at Loan Signing
					Plan i. Subcontractor and Supply Chain Management Plan j. Human Resources Management Plan k. Security Management Plan			
5	Construction and Operations Environmental and Social Management Plans	ESS1	Implement the management policies, plans, programmes, and procedures referred to in the ESAP as a fully integral part of the Project ESMS	KOSKİ resources	Records demonstrating implementation Appropriate implementation to be confirmed by İLBANK	Throughout the life of financing	Records maintained İLBANK implementation reports	TBD
6	Organisational structure and competency	ESS1	KOSKİ to recruit and retain an experienced E&S team to deliver E&S commitments to Government and WB appropriate to the phase of the Project throughout the financing term. The team shall be led by an appropriately experienced E&S Manager, competent in WB	KOSKİ resources	E&S Team, including E&S Manager and HSE Expert(s), in position	Before the construction and throughout the financing period	E&S Team, including E&S Manager and HSE Expert(s) accepted by İLBANK, named on Project's Organisation Chart	TBD

#	Issue	Requirement / Best Practice	Description of Action	Resources, Investment Needs/ Responsibility	Completion Deliverable(s)	Timetable for Completion	Target and Evaluation Criteria for Successful Implementation	Status at Loan Signing
			requirements and accepted by the İLBANK, for the duration of the financing period.					
7	Emergency Preparedness and Response Plan	ESS1 and best practice	Develop EPRPs for the construction and operational phases in line with ESS1 requirements, including involvement of relevant stakeholders (appropriately experienced Project personnel, third party responders and representatives of affected people, as relevant) and reflect the outputs of a comprehensive risk identification and assessment processes. The EPRP shall cover the requirements of Turkish legislation as well.	KOSKİ or contracted resources	Emergency Preparedness and Response Plan	Before the construction	İLBANK acceptance	TBD
8	Permits and authorisations	ESS1 and Legislative requirement	Acquire and comply with all required E&S- related permits and authorizations	KOSKİ resources	Legal, permit and authorisations register and management system in place to deliver and track compliance	Before the construction Throughout the financing period	Permit management system records demonstrate compliance İLBANK confirmation in periodic monitoring	TBD

#	Issue	Requirement / Best Practice	Description of Action	Resources, Investment Needs/ Responsibility	Completion Deliverable(s)	Timetable for Completion	Target and Evaluation Criteria for Successful Implementation	Status at Loan Signing
9	Disclosure of E&S information	Best practice	Publicly disclose the policies, ESIA, NTS, ESMP, and SEP in Turkish and English	KOSKİ resources	Documents disclosed	Throughout financing period	Required documents available via KOSKİ's website and locally at all times	TBD
10	Associated facilities	ESS1	Determine the requirement to prepare an ESIA Addendum for the irrigation system to be constructed by DSİ	KOSKİ resources	Identification Report that discusses whether an ESIA Addendum is required or not	Before construction and after the details of DSİ's system become clear	ESIA Addendum or Identification Report	TBD
ESS2								
11	Occupational Health and Safety (OHS)	ESS2	Develop work instructions / procedures for high-risk works (as identified in the construction and operations-phase OHS Plans) to İLBANK satisfaction	KOSKİ resources	Work instructions / procedures	Two weeks prior to any "high risk" work activities commencing	Instruction/ procedures approved by İLBANK	TBD

#	Issue	Requirement / Best Practice	Description of Action	Resources, Investment Needs/ Responsibility	Completion Deliverable(s)	Timetable for Completion	Target and Evaluation Criteria for Successful Implementation	Status at Loan Signing
12	Occupational Health and Safety (OHS)	ESS2	Recruit and retain competent H&S and construction management personnel, experienced in delivering H&S management programmes to international standards in similar projects to manage / train / oversee high risk works (as defined in the OHS plans for construction and operation)	KOSKİ resources	CV of H&S personnel and Construction Manager	Before the construction phase	CVs approved by İLBANK	TBD
ESS3								
13	Resource Conservation and Energy Efficiency	ESS3	KOSKİ and its contractors to establish targets and objectives for resource sonservation and energy efficiency for the construction and operation phases. Monitor and report performance against the targets and objectives and seek continual improvement in line with ISO 14001 requirements	KOSKİ resources	Targets and objectives for resource conservation and efficiency incorporated into ESMS Performance monitoring records	Construction phase – within 12 months after start Operations phase – within 12 months of start of operations.	Resource/energy consumption data to demonstrate compliance with target levels.	TBD
14	GHG Assessment	ESS3	Prepare GHG inventory and report Scope-1 and Scope-2 annual GHG emissions of the Project. Scope-3 emission reporting is not mandatory but encouraged.	KOSKİ or contracted resources	Annual GHG Emission Report	Inventory to be developed within 12 months after start of construction Annual	All studies approved by İLBANK	TBD

#	Issue	Requirement / Best Practice	Description of Action	Resources, Investment Needs/ Responsibility	Completion Deliverable(s)	Timetable for Completion	Target and Evaluation Criteria for Successful Implementation	Status at Loan Signing
						reporting afterwards		
15	Odor	ESS3	Robustly implement grievance mechanism especially for odor-related grievances, and take physical measures to eliminate these, if necessary	KOSKİ resources	Grievance register and odor measurements	Throughout the operation phase	İLBANK review and confirmation of records during periodic monitoring	TBD
16	Effluent quantity and quality	ESS3 and Legislative requirements	Submit monthly records of effluent quality, quantity, treatment performance, and the water quality of the receiving environment for legislation-defined parameters, amount of bypassed influent volume with rationale to İLBANK.	KOSKİ resources	Monthly reports	Throughout the operation phase	İLBANK review and confirmation of records' compliance with WB and Legislative limits	TBD
17	Pesticides and herbicide use	ESS3	KOSKİ to develop a Landscape Management Procedure (or similar) to deliver the mitigation measures relating to the selection, handling, storage and use of pesticides and herbicides committed in the ESIA to WB satisfaction	KOSKİ resources	Landscape Management Procedure (or similar)	Three months before the start of operation	Approval by İLBANK	TBD
18	Historical soil contamination	ESS3	KOSKİ to perform soil sampling and analysis to identify historical contamination at site, if any. If observed, remedial measures will be developed and taken by KOSKİ	KOSKİ resources	Analysis report(s)	Before the construction	Approval by İLBANK	TBD

#	Issue	Requirement / Best Practice	Description of Action	Resources, Investment Needs/ Responsibility	Completion Deliverable(s)	Timetable for Completion	Target and Evaluation Criteria for Successful Implementation	Status at Loan Signing
ESS4								
19	Worker Code of Behavioural Conduct	ESS4	KOSKİ and its contractors to develop and adopt a Worker Code of Conduct that includes strict protocols governing interactions with local communities	KOSKİ or contracted resources	Worker Code of Conduct addressing interactions with local communities	Before the construction	Code of Conduct accepted by İLBANK	TBD
ESS5								
20	Land Acquisition and Involuntary Resettlement	ESS5	Providing assurance that there will be no impact on land acquisition and displacement and monitoring relevant processes.	KOSKİ resources	Confirmation of no land acquisition requirements, title deed documents.	Before the construction	Follow-up of complaints and court records and evaluation with consent forms, if any.	TBD
ESS6								
21	Biodiversity Conservation and Sustainable Management of Living Natural Resources	-	-	-	-	-	-	-
ESS7								
22	Indigenous Peoples/ Sub-Saharan African Historically Underserved	-	-	-	-	-	-	-

#	Issue	Requirement / Best Practice	Description of Action	Resources, Investment Needs/ Responsibility	Completion Deliverable(s)	Timetable for Completion	Target and Evaluation Criteria for Successful Implementation	Status at Loan Signing
	Traditional Local Communities							
ESS8								
23	Cultural Heritage Protection	Legislative requirement	Consult with the relevant Regional Boards for Conservation of Cultural Heritage Assets on appropriate mitigation measures for both registered and non-registered Cultural Heritage assets	KOSKİ resources	Agreed mitigation measures for registered and non-registered cultural heritage assets.	Prior to construction activities commencing	The requirements Turkish Legislation are fully met.	TBD
ESS9								
24	Financial Intermediaries	-	-	-	-	-	-	-
ESS10								
25	Stakeholder Engagement Plan (SEP)	ESS1 and ESS10			SEP accepted by İLBANK available on KOSKİ's website in Turkish and English	For construction by the end of first quarter of construction phase At least three months before the operation phase	SEP and grievance mechanism determined to substantially meet ESS1 requirements, accepted by İLBANK, and disclosed through KOSKİ's website	TBD

#	Issue	Requirement / Best Practice	Description of Action	Resources, Investment Needs/ Responsibility	Completion Deliverable(s)	Timetable for Completion	Target and Evaluation Criteria for Successful Implementation	Status at Loan Signing
26	SEP and Grievance Mechanism	ESS1 and ESS10	WB-accepted SEP and grievance mechanism to be demonstrably implemented throughout financing term	KOSKİ resources	Review and update the Stakeholder Engagement Plan, inclusive of Grievance Mechanism, to WB satisfaction such that it remains relevant to project implementation phase and as a minimum, prior to construction and prior to operation.	Continuous	İLBANK review and confirmation of records during periodic monitoring Evidence provided of grievances being adequately addressed in the required timeframe.	TBD

8 ANALYSIS OF ALTERNATIVES

In alignment with the overarching goals of the project, this chapter delineates the comprehensive suite of design measures instituted. These measures are meticulously crafted to harmonize with the environmental, social, and health safety directives underscored by international guidelines and local regulations. The chapter expounds on the rationale behind the selection of specific design paradigms, the incorporation of WB ESSs and WBG Environmental, Health, and Safety (EHS) Guidelines, and the justification for any deviations thereof. Furthermore, it elucidates the pollution prevention and abatement strategies, underscoring their conformity with Generally Accepted International Industry Practices (GIIP).

8.1 Basis for Selecting Project Design

The project design was conceptualized following an exhaustive evaluation of various alternatives, as presented in Section 66, with a keen focus on environmental sustainability, cost-effectiveness, technological feasibility, and E&S impact mitigation. The chosen design emphasizes resilience, efficiency, and adaptability, integrating advanced wastewater treatment technologies to meet and exceed the stringent quality standards set forth by Turkish Regulation and EHSGs.

8.2 Integration of EHSGs

In the development of the project, paramount importance has been placed on aligning with the ESSs and WBG Environmental, Health, and Safety Guidelines (EHSGs). As specified previously, the key standards and guidelines followed by the Project are WBG ESSs, except ESS7, WBG General EHSG, and WBG EHSG for Water and Sanitation.

Water and Wastewater Management

Adhering to the EHSGs, the project itself is an advanced treatment process that significantly reduces the pollution load, enables water circularity options, and aims to surpass requirements set forth in the EHSG for Water and Sanitation. These measures not only aim to conserve water but also to protect local waterways from contamination, aligning with the guidelines' recommendations on effluent quality and water conservation.

Air Emissions Control

The project implements comprehensive air emissions control strategies to minimize and manage air pollutants, including dust and greenhouse gases. By integrating low-emission technologies and optimizing the energy efficiency of treatment processes, the project aims to adhere to the "General EHS Guidelines," aiming to reduce the carbon footprint and mitigate the impact on air quality. These efforts are reflective of KOSKI’s dedication to maintaining a safe and healthy environment for both the community and the ecosystem.

Waste Management and Hazardous Materials Handling

Consistent with EHSG recommendations, the Project should establish rigorous waste management protocols to ensure the safe handling, treatment, and disposal of waste materials, including hazardous substances. By prioritizing waste minimization, recycling, and the safe disposal of residuals, the project not only complies with the guidelines but also sets a benchmark for sustainable waste management practices within the industry.

Noise and Vibration Control

In line with EHSGs, measures to control noise and vibration during both construction and operational phases have been planned and covered by the relevant sections of this ESIA

report. The deployment of noise-reducing technologies and the strategic scheduling of high-impact activities minimize the acoustic footprint, ensuring compliance with noise regulations and mitigating potential disturbances to the surrounding communities.

Occupational Health and Safety

The project's design and operational measures incorporate comprehensive health and safety measures for all personnel. By adhering to the WBG General EHSG and Turkish legislation on OHS, the project promotes a culture of safety, emphasizing risk identification, employee training, and emergency preparedness. These measures not only protect the workforce but also ensure the project's alignment with international best practices in occupational health and safety.

Environmental and Social Monitoring and Management

An extensive environmental and social monitoring program, as presented in SectionSection 7, supports the continuous assessment and management of the project's environmental and social performance. This program, designed in accordance with EHSGs, enables the timely identification and mitigation of environmental impacts, ensuring the project's ongoing compliance with environmental standards and its commitment to sustainable development.

In conclusion, the project exemplifies the successful integration of EHSGs into the development. Through diligent adherence to these guidelines, the project will achieve a harmonious balance between technological advancement, environmental conservation, and social responsibility.

8.3 Pollution Prevention and Abatement Measures

The ESIA Report elaborates on the comprehensive strategies developed for the project to mitigate its environmental and social impacts. These will ensure high levels of pollutant removal, contributing to water conservation and ecosystem protection by highlighting the project's commitment to reduce air emissions through energy-efficient practices and the integration of renewable energy sources. Furthermore, the relevant sections of this report provides solid and hazardous waste management strategies to be followed by the project, emphasizing waste reduction, recycling, and safe disposal practices.

8.4 References to GIIP

This section is dedicated to summarizing the principles and standards that constitute GIIP, emphasizing their relevance and application to ensure environmental sustainability, operational efficiency, and social responsibility within the Project.

- Environmental Sustainability: GIIP underscores the importance of adopting practices that minimize the environmental footprint of wastewater treatment operations. This includes the implementation of technologies and processes that reduce water and energy consumption, lower emissions, and promote the recycling and reuse of resources.
- Operational Efficiency: Efficiency is a cornerstone of GIIP, with a focus on optimizing the operational aspects of wastewater treatment to ensure cost-effectiveness while maintaining high standards of environmental protection. This involves the use of advanced treatment technologies, process optimization, and automation to achieve significant efficiencies.
- Social Responsibility: GIIP also encompasses social responsibility towards affected communities and stakeholders. This includes ensuring access to clean water,

mitigating negative impacts on local communities, and engaging with stakeholders through transparent and inclusive communication practices.

- Compliance with International Standards and Regulations: Adherence to international environmental and safety standards is integral to GIIP. This involves aligning project operations with global benchmarks such as those set by the WBG ESSs and EHSGs, among others.
- Adaptability and Resilience: GIIP promotes adaptability and resilience in wastewater treatment projects, encouraging the incorporation of practices that enable projects to respond to changing environmental conditions, technological advancements, and evolving regulatory landscapes.
- Innovation and Continuous Improvement: Continuous improvement and innovation are key aspects of GIIP, advocating for the ongoing evaluation of wastewater treatment practices and the exploration of new technologies and methodologies to enhance project outcomes over time.

For the Project, the application of GIIP principles will ensure that the Project not only meets current environmental and social standards but also positions itself to adapt and thrive in the face of future challenges. By embracing GIIP, the project will demonstrate a commitment to leading practices in sustainability, efficiency, and community engagement.

The references to GIIP within this chapter provide a framework for understanding the Project's alignment with globally recognized best practices in wastewater treatment. This approach underscores the project's dedication to achieving exemplary environmental and social outcomes through adherence to the highest standards of operational excellence and sustainability.

9 INSTITUTIONALINSTITUTIONAL ARRANGEMENTS AND CAPACITY BUILDING

The main responsible organization for the implementation of this ESIA is KOSKİ. KOSKİ has the adequate ability and capacity to manage the implementation of the project and in particular the E&S. A PMU will be established to carry out operational and administrative tasks. The PMU staff will be the KOSKİ's own staff who have previous similar projects experience. 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 parts. All mentioned works will be coordinated by the KOSKİ. Mitigation and monitoring tables, which are given in this ESIA, summarize the relevant responsibilities. In that scope, it is suggested to add below mentioned liabilities to tender documents of any possible contractor(s):

9.1 Environmental and Social Management Structure

In the scope of the ESMP presented in Section 7 comprisises the project specific Mitigation Plan and Monitoring Plans which have to be compiled exactly during all phases of the project execution.

ILBANK is responsible for environmental and social impact asessments and monitoring environmental and action plans, and also responsible preparing periodic reports fort he World Bank. The WorldWorld Bank is the Project financer and provides ILBANK a loan to finance the proosed Project.

The management of the Project will be carried out by ILBANK and a special Project Implementation Unit (PIU) to be established within KOSKİ.

KOSKİ 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, KOSKİ holds ultimate responsibility for the environmental and social performance of the overall Project, including the performance of its contractors and any other contractors. ESMS of KOSKİ covering all phases of the Project and consisting on management plans on different subjects has available staff and capacity to ensure ESMP implementation. All the Project Works will be coordinatoed by KOSKİ. The relevant responsibilities are given in the Monitoring and Mitigation Tables presented in Section 7. Construction Works will be controlled by Supervision Consultant. The consultant to be determined as per WB Tender Procedures will provide the necessary supervision and consultancy services.

9.2 Roles and Responsibilities

The studies to be carried out within the scope of project ESIA and ESMP and the parties responsible for these studies are presented in Table 9-1.

Table 9-1Roles and Responsibilities

Institution	Roles and Responsibilities
World Bank	• Supervising the implementation and recommendations of project ESIA, • Recommend additional measures for strengthening the management framework and implementation performance, • Overall provision of technical support and guidance to ensure that the Project is in compliance with WB Safeguards Policies,

Institution	Roles and Responsibilities
	• Visit project sites on occasion, and as required, as part of project supervision, • Reviewing, approving, and disclosing ESMPs on WB's official website.
ILBANK	• Preparation of KOSKİ's project documents in accordance with WB requirements and providing guidance on public participation and announcement requirements, • Providing guidance to KOSKİ officials and consultants on WB's requirements for protection measures (documents and procedures) on cultural assets, land acquisition and involuntary resettlement, natural habitats, forests and international waterways, • Reviewing the documents related to the environmental and social assessment of the project, provide comments to consultants, and giving official approval to these documents and procedures in accordance with the WB safeguards requirements, performing an overall quality assurance function that the EA documents prepared meet WB requirements, • Monitoring work such as the implementation of the ESIA and other environmental and social mitigation measures, • Monitoring and auditing KOSKİ's ESIA practices and giving feedback on its performance, recommendations and further steps to be taken within the overall project audit, • Informing WB via Environmental and Social Monitoring Reports (ESMRs), which will be submitted by KOSKİ quarterly. • ILBANK PIU will submit Project Progress Reports to WB every 6 months, • Obtaining the opinions of relevant groups and local environmental/social experts about the environmental and social aspects of the project implementation and meeting with these groups during the field visits, when necessary, • Providing coordination and communication regarding the field visits to be made within the scope of the WB inspection missions regarding the environmental and social protection measures of the project implementation.
KOSKİ	• Preparing the tender documents during the implementation, carrying out the tenders in accordance with the legislation of the Public Procurement Authority and the legal requirements of WB, following the Construction Contract and working in cooperation with ILBANK for construction supervision, • Implementation of the ESIA and related management plans and fulfillment of all commitments under the ESIA, • Sharing the ESIA with the Contractor, guiding the Contractor in preparing the sub-management plans, approving these plans, • Updating the ESIA when necessary and sharing additional commitments with the Contractor, • Environmental review, monitoring and audits related to ESIA practices, evaluation of results, • KOSKİ will submit the monthly and quarterly reports prepared by the Contractor and submitted to it by the Supervision Consultant to İLBANK in the same period. • Auditing contractor activities in line with ESMP requirements, • Providing EHS trainings to all Project staff, • Ensuring compliance with project standards, taking urgent action in case of non-compliance, • Stopping work in any situation that threatens environment and community and occupational health and safety, • Providing follow-up and analysis of environmental (including OHS) and social accidents/incidents,

Institution	Roles and Responsibilities
	• Ensuring stakeholder participation, implementing the grievance redress mechanism, ensuring continuous information transfer through open communication, • Notify ILBANK and WB within 24 hours of 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, • 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.
Contractor	• Fulfillment of all requirements of ESIA and management plans, • Implementation of additional commitments determined by KOSKİ, • Ensuring compliance with project standards, obtaining all relevant permits and licenses, • Monitoring of construction activities (including subcontractor activities) and taking measures within the scope of ESIA, • Development of sub-management and monitoring plans/procedures in accordance with the ESIA structure, implementation after the approval of KOSKİ, • Employment of competent Environmental, Social and OHS Experts (at least one Social Expert, one Environmental Expert and one OHS Expert) within the scope of the project, • Providing necessary training on environmental and social issues to contractor and subcontractor personnel, • Ensuring the follow-up and analysis of environmental and social accidents, • Environmental audits, monitoring and audits related to ESMP practices, reporting to KOSKİ, • Contractor will submit the monthly and quarterly Environmental and Social Monitoring Reports (ESMRs) to the Supervision Consultant who will submit them to KOSKİ,,accordingly, • Immediate notification of the contingencies such as environmental, social and labor issues or accidents, incidents or loss of time to the KOSKİ 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 ILBANK and WB within 15 days.
Supervision Consultant	• Supervision of construction and/or rehabilitation works and installation of equipment, • Identification and management of environmental, social and OHS related risks, • Ensuring initiation of corrective actions where necessary implementation of mitigation measures by the contractor, and sufficient capacity in the team to perform E&S supervision effectively in accordance with the requirements of the ESIA, • Supervision Consultant will submit the monthly and quarterly Environmental and Social Monitoring Reports (ESMRs) prepared by Contractors to KOSKİ , • Preparing time-bound action plans for the contractor in case of non-compliance, • Using the contractual authority and notifying ILBANK and the Municipality on time if non-compliances persist, • Monitoring and evaluating the performance of the services provided by the Contractor, • Providing guidance on public participation and announcement requirements in compliance with WB requirements, • Providing guidance to KOSKİ officials and consultants on the WB's requirements (documents and procedures).

9.3 Training

One of the main necessities of the ESIA is training for the KOSKİ'sKOSKİ's and contractor's top-level management and employees. Necessary training will be given to the personnel immediately after the recruitment process which will be also refreshed during the work period and will be performed at a number of levels. Some short-term training is required for the Environment Manager, other staff members of the PIU and the contractor staff to raise their levels of environmental awareness. The training can be conducted by either some external experts or through the help of in-house expertise of the PIU and the consultants and help of ILBANK and WB. In the long-term training, special environmental and social issues will be examined, and likely solutions provided to the PIU. 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 incl- Code of Conduct, GBV & SEA/SH, GRM, EHS and ESMP and
- First-Aid and Emergency Preparedness Measures.
- Environmantal and Social Trainings (Induction and E&S Awareness, OHS, chance find procedure etc.).

The KOSKİ shall ensure that all personnel responsible for implementing this ESIA are competent regarding education, training and experience. All personnel shall be provided with environmental and social training appropriate to their scope of activity and level of responsibility.

An example of the basic training program to be developed and delivered by the PIU for the ESIA implementation is given in Table 9-2.

Table 9-2 Recommended Training Program

	Item-1	Item-2
Training course	Environmental supervision, monitoring and reporting	Implementation of mitigation measures
Participants	Environmental staff, technical staff, and administrative staff of the PIU	Contractor, related authorities: On-site construction management staff, environmental staff of contractor, related authorities

	Item-1	Item-2
Time	Soon after the project effectiveness but at least 1 month before the construction of the contract. The follow-up training will be scheduled as needed.	After signing the works contract
Duration	Two days of training twice a year to be repeated on a yearly basis	Two days of training twice a year to be repeated on a yearly basis depending on needs.
Content of the Training	General environmental and social management relating to the Project Requirements on environmental 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	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 Code of Conduct Other areas to be determined
Trainer	Environmental and Social Consultant or ILBANK	PIU with support of the Technical Assistance team

9.4 Environmental and Social Monitoring Report

Environmental and Social Monitoring Report is an important tool to record the monitoring activities.

The results of technical assessments of relevant issues given Table 7-1 and Table 7-2 will be presented in the monitoring report. The results shall be compared with the national legislative requirements and WBG EHS Guidelines. The results of the visual observations together with the key issues observed will be submitted in written form. The report should focus on the negative findings as well as the good practices. The negative findings should be supported with photographical evidence. For each negative observation, corrective action should be suggested with a reasonable due date. Any analysis/sampling/measurement report should be given as an annex of the report together with the relevant assessment and necessary remediation activities.

Semi annual ESMP Monitoring Reports will comprise all of the environmental, social and health and safety risks and impacts but is not limited to the ones defined in this ESIA and ESMP of the Project. Besides ESMR's will comprise the Key Performance Indicators (such as Proportion of appropriately prepared E&S assessment/management tools (ESIAs, ESMPs, SEPs, etc., Percentage of approved E&S assessment/management tools (ESIAs, ESMPs, SEPs, etc.) per subproject completed in the previous reporting period, Ratio of assessed stakeholder

complaints to those received during the monitoring period, Ratio of stakeholder complaints resolved during the monitoring period to those received in the previous reporting period, Number of environmental non-conformances for each subproject during the reporting period, Ratio of resolved environmental nonconformities to those detected during the monitoring period, Time Loss Injury Frequency Rate for each subproject). The findings of the Environmental and Social Monitoring Reports will keep the ESMP as a living document; thus, the ESMP should be reviewed and revised by the environmental and social unit of the Municipality according to these findings.

In that scope, KOSKİ' PIU should produce monthly and quarterly ESMRs and monitor quality of reporting throughout the duration of works and reporting requirements should be included in bidding documents of the contractors. Moreover, Grievance Register shall be provided to ILBANK with ESMRs. Also, ILBANK should prepare and submit regular monitoring reports (semi-annually) on the environmental, social, health and safety performance of the Project, including but not limited to the implementation of the ESIA, status of preparation and implementation of E&S documents required under the ESIA, stakeholder engagement activities, performance of the grievance redress mechanism(s) to the Bank, together with Project Progress Reports. The reports will be prepared in Turkish and English.

10 STAKEHOLDER ENGAGEMENT

As part of the Environmental and Social Impact Assessment (ESIA) process, a Stakeholder Consultation Meeting was held on May 15, 2025, for the Konya Centrum Wastewater Treatment Plant Rehabilitation and 2nd Stage Construction Sub-Project. The meeting was organized in accordance with the Stakeholder Engagement Plan (SEP), prepared by POSEIDON Consulting in line with ILBANK's Environmental and Social Management System and the World Bank's Environmental and Social Standards (ESSs). During the meeting, key project details were shared and feedback from stakeholders was recorded.

In addition to the consultation meeting, various stakeholder interviews and engagements were also carried out during the ESIA preparation process. Since the sub-Project is subject to Environmental Impact Assessment (EIA), an EIA report was prepared on November 9, 2020, and a public participation meeting was carried out on November 30, 2020, at the Aziziye Cultural Center of Karatay District. Apart from the staff of KOSKİ and the consulting firm, only one person attended the meeting, which was chaired by the Deputy Director of Konya Provincial Directorate of Environment, Urbanization and Climate Change.

Further stakeholder engagement activities included:

- A face-to-face meeting with producers at the Karatay Chamber of Agriculture on July 15, 2020.
- An online consultation meeting with the same institution on May 13, 2024.
- Interviews with the mukhtar of Tatlıcak Neighborhood on August 17, 2023.
- Meetings with representatives from the Konya Provincial Directorate of Environment, Urbanization and Climate Change, the Climate Change and Zero Waste Department of Konya Metropolitan Municipality, the General Directorate of State Hydraulic Works (DSİ), and Karatay Municipality between August 28 and September 18, 2023.

- A telephone interview with the Mukhtar of Fevziçakmak Neighborhood on January 21, 2025.

These activities aimed to share information about the project and gather stakeholders' views, concerns, and expectations. For detailed information on stakeholder identification, engagement methods, and consultation outcomes, please refer to the SEP document.

For details regarding the SEP minutes and the subsequent notifications, please refer to the **Annex AE** "Stakeholder Consultation Meeting (SCM) Report and Information Messages Sent to Participants Following the Stakeholder Engagement Meeting"