
DÜZCE MUNICIPALITY DIRECTORATE OF WATER AND SEWERAGE

DÜZCE (CENTRUM) WATER SUPPLY PROJECT - PHASE 1



ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)



NOVEMBER 2024

ANKARA



DÜZCE (CENTRUM) WATER SUPPLY PROJECT - PHASE 1

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

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ABBREVIATIONS

AC	Asbestos Cement
ACM	Asbestos-Containing Material
AMP	Asbestos Management Plan
AoI	Area of Influence
AQG	Air Quality Guideline
AYBIS	Infrastructure Information System
AYKOME	Infrastructure Coordination Centre
C-ESMP	Contractor's Environmental and Social Management Plan
CIMER	Presidency's Communication Centre
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CoC	Code of Conduct
DM	Düzce Municipality
DWS	Düzce Municipality Directorate of Water and Sewerage
DSI	General Directorate of State Hydraulic Works
DWTP	Düzce Water Treatment Plant
E&S	Environmental and Social
EBRD	European Bank for Reconstruction and Development
EHS	Environment, Health, and Safety
EIA	Environmental Impact Assessment
EPRP	Emergency Preparedness and Response Plan
ESHS	Environmental, Social, Health and Safety
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMR	Environmental and Social Monitoring Report
ESS	Environmental and Social Standard
EUCC	Environment, Urbanization and Climate Change
GBV	Gender Based Violence
GM	Grievance Mechanism
HAVS	Hand Arm Vibration Syndrome
HDPE	High Density Polyethylene
HEP	Hydroelectric Plant
IFC	International Finance Corporation
ILBANK	İller Bankası A.Ş.
ILO	International Labour Organization

IUCN	International Union for Conservation of Nature
ISKI	Istanbul Water and Sewerage Administration
LC	Least Concern
LMP	Labour Management Procedures
MoEUCC	Ministry of Environment, Urbanization and Climate Change
Mw	Moment Magnitude
NAF	North Anatolian Fault
NCR	Non-Compliance Report
OHS	Occupational Health and Safety
OG	Official Gazette
OIZ	Organized Industrial Zones
O-PVC	Oriented Poly Vinyl Chloride
PAP	Project Affected Person
PE	Polyethylene
PID	Project Identification Document
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PVC	Poly Vinyl Chloride
PVC-U	Un-Plasticised Poly Vinyl Chloride
RCA	Root Cause Analysis
SDS	Safety Data Sheet
SEA/SH	Sexual Exploitation and Abuse/Sexual Harassment
SEP	Stakeholder Engagement Plan
TEFWER	Türkiye Earthquake, Floods and Wildfires Emergency Reconstruction
TurkStat	Turkish Statistical Institute
UKOME	Transportation Coordination Centre
VG	Vulnerable Group
VU	Vulnerable
WB	World Bank
WBG	World Bank Group
WHO	World Health Organization
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant
YIMER	Foreigners Communication Centre

EXECUTIVE SUMMARY

Türkiye Earthquake, Floods and Wildfires Emergency Reconstruction (TEFWER) Project (hereinafter the “*Project*”) has been developed by the participation of İller Bankası A.Ş. (ILBANK) and World Bank (WB) to support municipalities to undertake urgent repairs, structural strengthening, and if needed demolition/reconstruction, rehabilitation, or new construction of damaged municipal owned infrastructure and to put in place measures aimed at increasing disaster preparedness and climate adaptation.

The “*Düzce (Centrum) Water Supply Project - Phase 1*” (hereinafter referred to as “*the sub-project*”) is proposed to be financed under the TEFWER Project by the World Bank (WB) due to the limited loan amount available. The remaining Phase 2 part of the Düzce (Centrum) Water Supply Project will be implemented using the Düzce Municipality (hereinafter “*DM*”)’s own resources. These phases are identified as:

- Phase 1 (Scope of the TEFWER),
- Phase 2 (DM’s own sources).

The sub-project will be evaluated under TEFWER Component 1 - Green and Resilient Rehabilitation, Reconstruction and Construction of Municipal Infrastructure and Actions to Strengthen Municipal Resilience, specifically under Subcomponent 1.c - Restored and improved resilience of water and wastewater services.

Projects by the General Directorate of State Hydraulic Works (DSI), including Stage 1 and Stage 2 for the renewal of the Düzce Water Treatment Plant (DWTP) and water source structures, are financed by the DSI with a loan provided to the DM. Accordingly, short-term priority projects to be funded by the DM’s own sources and DSI include:

- Construction of Düzce (Centrum) Water Supply Project - Phase 2 (to be funded by DM’s own sources),
- DSI Renewal of Reservoirs, Transmission Lines (1st Stage) (to be funded by DSI),
- DSI Renewal of DWTP (2nd Stage) (to be funded by DSI).

The Düzce Municipality is the owner of the sub-project that includes the water supply system project components.

Therewith, the site walkover of the sub-project area (see Appendix-C for photos of the sub-project area) was conducted, and the environmental and social (E&S) risks of the sub-project were identified according to the WB Environmental and Social Standards (ESS)s and TEFWER’s Environmental and Social Management Framework (ESMF). The E&S risks associated with the sub-project are assessed as “Moderate” according to the E&S Screening Form of the sub-project (see Appendix-A). Therefore, this Environmental Social Management Plan (ESMP) has been prepared.

The Düzce (Centrum) Water Supply Project is divided into two (2) interconnected phases, with Phase 2 being an associated facility¹ of the WB-financed Phase 1. The related Environmental and Social (E&S) impacts under Phase 2 are accordingly assessed in this ESMP. There are no other associated facilities such as roads or energy transmission lines, and no major impacts are expected besides dust, noise, and traffic load increment during the construction phase. No land acquisition is required for the sub-project.

The Project Identification Document (PID) of the Sub-Project has been prepared and approved by ILBANK and WB. The sub-project's construction works are expected to last 24 months and be completed in the September 2027. Throughout the operation phase, the economic life of the buildings is predicted as 40 years, machinery-equipment economic life of 15 years, and vehicles as 15 years. Construction will primarily progress along the existing road route, an area previously excavated. Before starting construction activities, an opinion letter will be received from the Museum Directorate and forwarded to ILBANK to manage activities in terms of cultural heritage. A Chance Find Procedure has been prepared to handle any unexpected cultural heritage findings (see Appendix-D). Also, most common Occupational Health and Safety (OHS) risk areas and corresponding general mitigation measures throughout the life of the sub-project are provided in Appendix-E.

The sub-project is out of the scope of the national Environmental Impact Assessment (EIA) as it is not included in the Annex I and Annex II lists of the Regulation on EIA published dated 29.07.2022 (Official Gazette (OG) No: 31907). In addition, DM has initiated the procedure for "horizontal drilling" operations to be applied in vertical crossing under the highways belonging to the General Directorate of Highways. The official application letter and the relevant response document are given in Appendix-B.

Since Phase 1 and Phase 2 of Düzce (Centrum) Water Supply Project are connected (Phase 2 being an associated facility), the E&S impact assessment was considered cumulatively without the phase separation. Moreover, there is a risk of old water supply network that may contain asbestos. Thus, an assessment will be carried out at each workplace to identify any Asbestos Containing Materials (ACMs) that may be present. As a first attempt, during renewal of the pipelines, existing asbestos pipes will be left under the ground in the existing location. If they need to be removed because of new pipe installation requirements, then removal process will be executed, and specific precautions will be determined in line with the Regulation on Health and Safety Measures in Working with Asbestos dated 25.01.2013 (OG No 28539). Besides, disposal of ACMs as a hazardous waste will be carried out in accordance with the Regulation on Waste Management dated 02.04.2015 (OG No: 29314). In this respect, the generic Asbestos Management Plan, which is largely compliant with the national legislation, is presented in Appendix-F. Hence, it is recommended that this plan for managing ACMs is developed by the Contractor prior to construction. Relevant mitigation measures to be taken

¹ Facilities or activities that are not funded as part of the project and, in the judgment of the Bank, are: (a) directly and significantly related to the project; and (b) carried out, or planned to be carried out, contemporaneously with the project; and (c) necessary for the project to be viable and would not have been constructed, expanded or conducted if the project did not exist. For facilities or activities to be Associated Facilities, they must meet all three criteria.

for the waste management, occupational, health and safety are given in Table 4-1. In addition, maintenance and repair works will be required during the operation phase of the water supply system.

As part of the mitigation measures, management plans and procedures on different subjects will be developed by the contractor prior to the construction works. These plans will be based on the risks and mitigation measures specified in the ESMP. These plans will be prepared for construction and operation phases of the sub-project, at least one (1) month before the start of the relevant phase and will be submitted to ILBANK for approval. Employees will be trained on the relevant plans to be developed. A list of management plans for both phases of the sub-project are presented below.

- Asbestos Management Plan,
- Waste Management Plan,
- Spill Response Plan,
- Occupational Health and Safety (OHS) Management Plan,
- Emergency Preparedness and Response Plan (EPRP),
- Construction Site Traffic and Transport Management Plan,
- Labour Management Plan (based on the TEFWER's Labour Management Procedures (LMP)),
- Community Health and Safety Management Plan.

1 INTRODUCTION

Düzce province has suffered a series of disasters including catastrophic earthquakes and floods in last 25 years. Düzce is in the high danger earthquake zone under influence of 4 important fault lines. As a result of the last two devastating earthquakes in 1999 (on 17 August and 12 November 1999), high loss of lives and properties were experienced. There was great damage to the superstructure and infrastructure, and the city was hit economically. In addition to the earthquake, Düzce is one of the provinces that has the potential to flood in terms of precipitation regime and topography and these events are experienced seriously at regular intervals. Latest flood disaster observed recently was 17.09.2019. These catastrophic natural disasters have also caused increase in migration from the surrounding rural areas to Düzce Centrum. In the early 1990s, Düzce district centrum consisted of 12 neighbourhoods, and it was a district of Bolu Province. After 1999 earthquakes and gaining the “province” status, number of Düzce Centrum neighbourhoods increased to 29 neighbourhoods. In the last 20 years, the borders of Düzce Centrum increased to 76 neighbourhoods. This rapid development result in drinking water and sewerage facilities to reach full capacities earlier than expected. Natural disasters including the earthquakes, landslides and recent floods have damaged the infrastructure and exacerbated the existing challenges and effective operation of the existing water supply and wastewater collection systems.

Türkiye Earthquake, Floods and Wildfires Emergency Reconstruction (TEFWER) Project (hereinafter the “Project”) has been developed by the participation of İller Bankası A.Ş. (ILBANK) and World Bank (WB) to support municipalities to undertake urgent repairs, structural strengthening, and if needed demolition/reconstruction, rehabilitation, or new construction of damaged municipal owned infrastructure and to put in place measures aimed at increasing disaster preparedness and climate adaptation.

Due to the limited loan amount of TEFWER Project, only Phase 1 part of the Düzce (Centrum) Water Supply Project is proposed to be financed under TEFWER Project by the WB. The remaining Phase 2 part of the Düzce (Centrum) Water Supply Project will be implemented by the Düzce Municipality (DM)’s own sources. These are identified as:

- Phase 1 (Scope of the TEFWER) and,
- Phase 2 (DM’s own sources).

Hence, “Düzce (Centrum) Water Supply Project - Phase 1” (hereinafter “the sub-project”) will be financed by the Project and will be implemented under TEFWER Component 1 - Green and Resilient Rehabilitation, Reconstruction and Construction of Municipal Infrastructure and Actions to Strengthen Municipal Resilience and following concerned subcomponent.

- Subcomponent 1.c -Restored and improved resilience of water and wastewater services.

Remaining construction works identified as “Düzce (Centrum) Water Supply Project - Phase 2” will be financed by the DM’s own sources. Since Phase 1 and Phase 2 of the Düzce

(Centrum) Water Supply Project are connected, Phase 2 is an associated facility² of the WB-financed Phase 1, and the related E&S impacts under Phase 2 are accordingly assessed in this ESMP. There are no other associated facilities such as roads, energy transmission lines, etc., and no major impact is expected besides dust, noise, and traffic load increment during the construction phase.

Projects of the General Directorate of State Hydraulic Works (DSI) (Stage 1 and Stage 2 for renewal of Düzce Water Treatment Plant (DWTP) and water source structures) are being financed by DSI with a loan provided to the DM. Accordingly, short term priority projects to be funded by DM's own sources and DSI will be as follows:

- Construction of Düzce (Centrum) Water Supply Project - Phase 2 (to be funded by the DM's own sources),
- DSI Renewal of Reservoirs, Transmission Lines (1. Stage) (to be funded by DSI),
- DSI Renewal of DWTP (2. Stage) (to be funded by DSI).

The Düzce Municipality (hereinafter "DM") is the owner of the sub-project that includes the water supply system project components.

The Project Identification Document (PID) of the sub-project has been prepared and approved by ILBANK and WB. The Sub-project's construction works are expected to last 24 months and be completed in the September 2027. Throughout the operation phase, the economic life of the buildings is predicted as 40 years, machinery-equipment economic life of 15 years, and vehicles as 15 years.

In addition, Environmental and Social (E&S) risks of the sub-project have been identified according to the WB Environmental and Social Standard (ESS)s and TEFWER's Environmental and Social Management Framework (ESMF) developed by ILBANK. The E&S risks associated with the Sub-project are assessed as "Moderate" by following the E&S Screening Form of the Sub-project (see Appendix-A). This Environmental Social Management Plan (ESMP) has been prepared by the 2U1K Engineering and Consultancy Inc. (Consultant). Within the scope of E&S studies, the site walkover of the Sub-project Area (see Appendix-C for photos of the sub-project area) was conducted, followed by the meeting between the Düzce Municipality Directorate of Water and Sewerage (DWS) and Consultant were held on December 28, 2023. The concerned participants are below.

- Samet GÜMÜŞ, Deputy Director (DWS),
- Eray ÖZEN, Environmental Engineer (2U1K),
- Deniz DİRİER, Sociologist (2U1K).

² Facilities or activities that are not funded as part of the project and, in the judgment of the Bank, are: (a) directly and significantly related to the project; and (b) carried out, or planned to be carried out, contemporaneously with the project; and (c) necessary for the project to be viable and would not have been constructed, expanded or conducted if the project did not exist. For facilities or activities to be Associated Facilities, they must meet all three criteria.

Within the scope of the sub-project under the various main roads of the sub-project area, renewal of water supply lines will be made (87,017 m Ø140-Ø1800 O-PVC³ (Oriented Poly Vinyl Chloride) and ductile⁴ pipes) and water will be diverted from the existing reservoir on the DWTP Area (location shown at Map Figure 2-1). No land acquisition is required for the sub-project. .

When the sub-project is evaluated in terms of national legislation environmental impact assessment requirement, the sub-project as infrastructure project is out of the scope of national Environmental Impact Assessment (EIA) as it is not included in the Annex I and Annex II lists of the Regulation on EIA published dated 29.07.2022 (OG No: 31907). In addition to this, DM has initiated the procedure for "horizontal drilling" operations to be applied in vertical crossing under the highways belonging to the General Directorate of Highways. The official application letter and the relevant response document are given in Appendix-B.

In addition to this, in operation phase, there will be maintenance, and repair works in the water supply system. As in the construction phase, there are no other associated facilities excluding the other phase of the Düzce (Centrum) Water Supply Project, so no major impact is expected besides dust, noise, and traffic density load increment during the operation phase.

As a part of the mitigation measures, management plans and procedures on different subjects should be developed by the contractor prior to the construction works. These management plans are based on the risks specified in the ESMP. These plans will be prepared for construction and operation phases of the sub-project, at least one (1) month before the start of the relevant phase and will be submitted to ILBANK for approval. Employees will be trained on the relevant plans to be developed. A list of management plans for both phases of the sub-project are presented below.

- Asbestos Management Plan,
- Waste Management Plan,
- Spill Response Plan,
- Occupational Health and Safety (OHS) Management Plan,
- Emergency Preparedness and Response Plan (EPRP),
- Construction Site Traffic and Transport Management Plan,
- Labour Management Plan (based on the TEFWER's Labour Management Procedures (LMP)),
- Community Health and Safety Management Plan.

³ O-PVC is made by realigning the PVC (Poly Vinyl Chloride) molecules through a process of biaxial orientation. This greatly enhances the material properties - around twice the strength and ten times the impact resistance is achieved compared to traditional PVC-U (Un-plasticised Poly Vinyl Chloride) material.

⁴ Ductile iron pipe is made of cast iron, carbon and silicon alloy. It is a product of blast furnace smelting of iron ore.

2 SITE/LOCATION DESCRIPTION

Düzce is a city located in the western Black Sea Region of Türkiye, which gained the status of province in 1999. According to TurkStat data for 2023, the population of the city centre is 194,097, and the population of the entire province is 405,131.

The sub-project area is composed of the existing roads of Düzce centre for the construction and renewal of the water pipelines and the Düzce Water Treatment Plant (DWTP) site where water will be diverted from the existing reservoir (see [Figure 2-1](#) and [Figure 3-1](#) **Hata! Başvuru kaynağı bulunamadı.**).

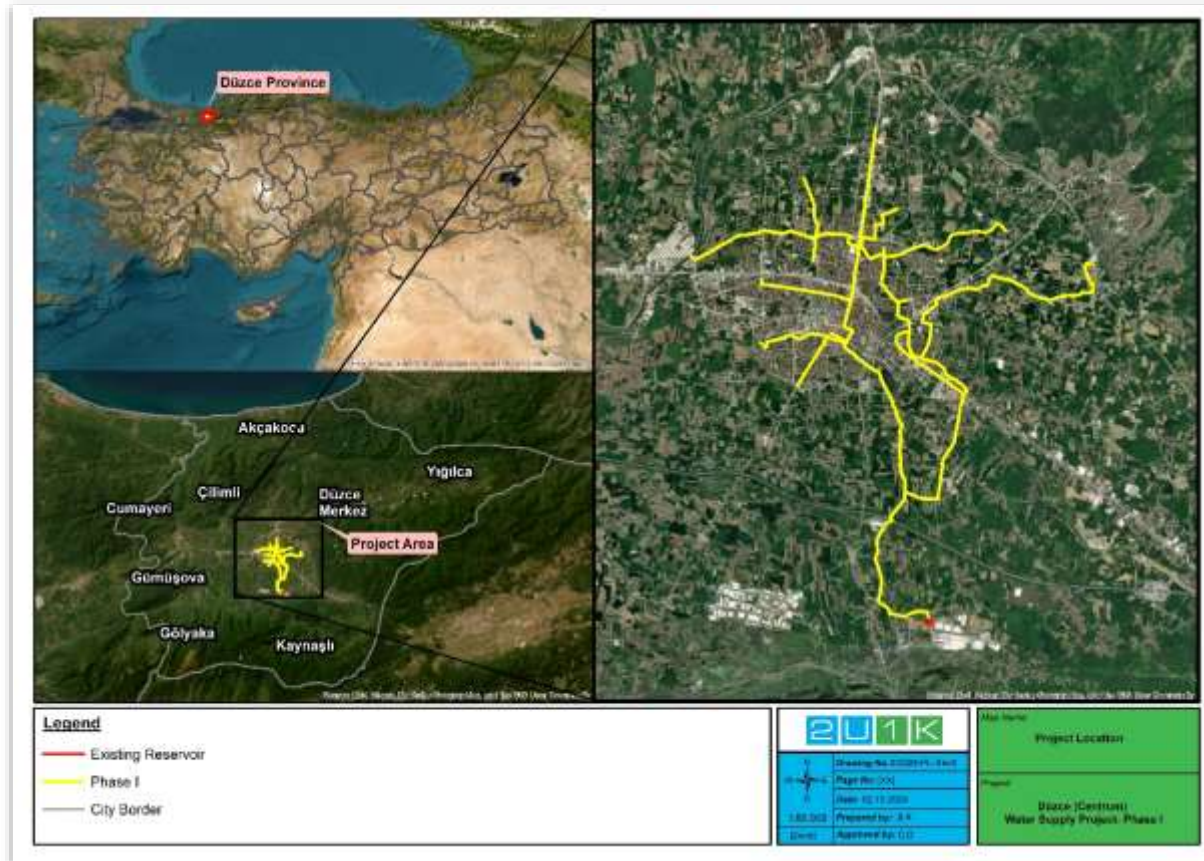


Figure 2-1. Location Map of the Sub-Project Area

3 SUB-PROJECT DESCRIPTION AND ACTIVITIES

Düzce infrastructure, specifically; water supply system has serious problems. Existing components of Düzce water supply system are hydraulically insufficient after this rapid development and expansion of city centrum. It's near to end its economic lifetime with the effects of the damages caused by earthquake, floods, or improper installations. The existing infrastructure system including water supply and treatment, wastewater and waste management in the sub-project area is detailed in Section 3.1.1.9.

For solving of these problems in water supply system, General Directorate of State Hydraulic Works (DSI) and ILBANK has initiated Projects. DSI has already started a Project for improvement of “water sources” i.e. renewal of water supply (Uğursuyu regulator⁵) (and addition of another regulator; Bıçkı regulator), transmission lines and renewal of the DWTP (see [Figure 3-1](#)). Construction of DSI Project 1. Stage including regulators and transmission lines has already started and 85% of the construction is currently completed. Construction of 2. Stage for the renewal of DWTP is expected to start in 2025 at the earliest.

For the improvement of “water distribution system”, design of “Düzce (Centrum) Water Supply Project” was executed under coordination of ILBANK and Düzce Municipality (DM). Design is approved by ILBANK on 02.09.2021. Currently, construction of this sub-project is a short-term priority and needs financing. In this context, sub-project's layout plan is given in [Figure 3-1](#).

⁵ A regulator is a concrete wall for regulating the flow of water, used for diverting or partially raising a river. It is used to raise and direct water in river-type dams. The control structure used in the control of flood waters and in directing the waters to the canals is also called a regulator.

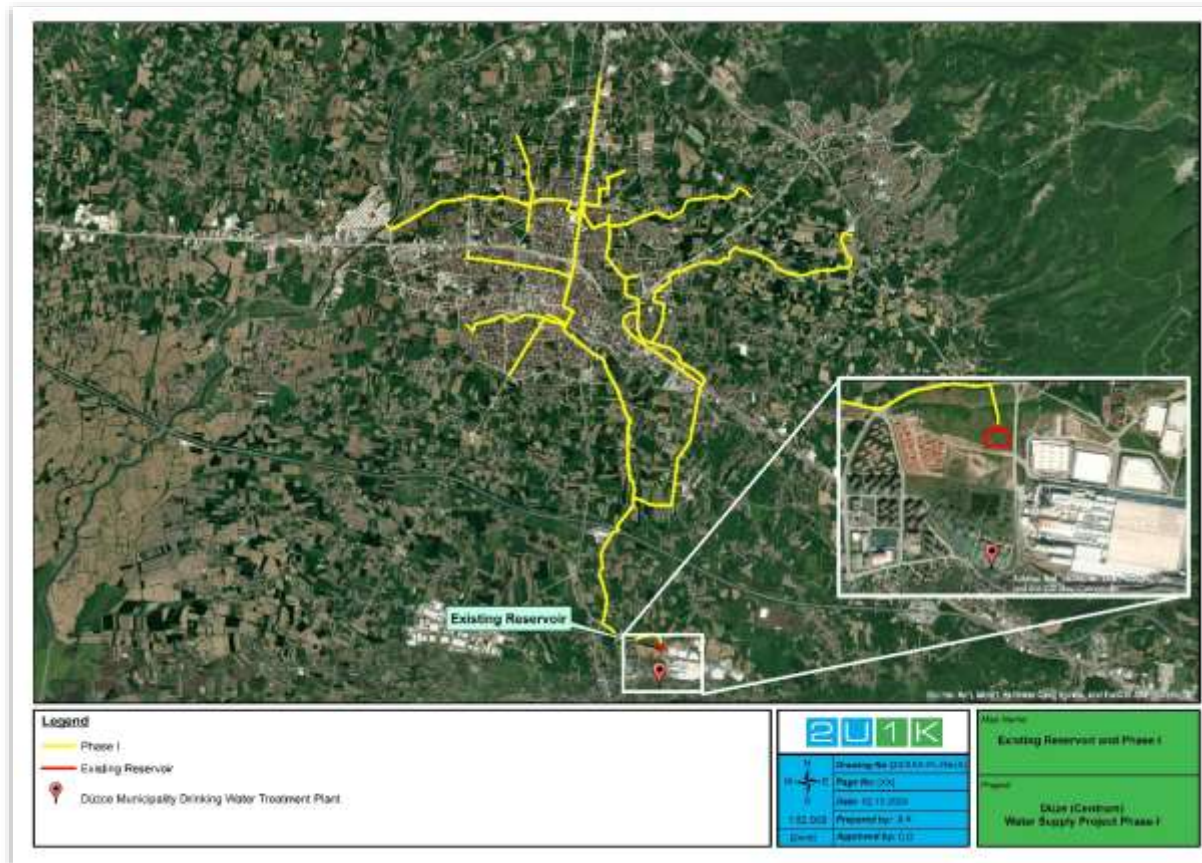


Figure 3-1. Sub-Project's Layout Plan

Phase 1 as a sub-project (Scope of TEFWER Project) includes:

- 87,017 m Ø140-Ø1800 O-PVC and ductile pipes (see Table 3-1 for the breakdown of pipe diameters and lengths),
- Line valves with valve chamber,
- Flowmeter chambers,

- Valve chambers ahead of flowmeter,
- Line valve chambers,
- Subscriber connections,
- Fire hydrants,
- Road renewal,
- Electrical automation works.

Table 3-1. Pipe Diameter and Lengths to be used within the Scope of the Sub-Project

Pipe diameter (mm)	Pipe Length (m)
Ø1800	2,930
Ø1600	3,826
Ø1400	3,593
Ø1200	4,918
Ø1000	4,900
Ø800	2,622
Ø700	1,495
Ø500	2,665
Ø450	351
Ø400	15,148
Ø350	2,998
Ø315	416
Ø225	3,690
Ø140	37,465
Total	87,017

Remaining components will be constructed contemporaneously under Phase 2 scope by Municipality's own sources.

Specific objectives of Düzce Water Supply Project including the sub-project is:

- Ensure effective operation of the whole water supply system till design horizon and increase service quality levels in means of hydraulic requirements,
- Renewal of existing line which is hydraulically insufficient and consists asbestos pipes that has already completed economic lifetime,
- Renewal of existing pump lines, that has apparent leakage problems and frequent breakdowns which increase water losses,

- Minimization of water losses and non-revenue water ratios that has currently reached to more than 50% of non-revenue water and compliance with Türkiye's "Regulation on Control of Water Loss in Water Supply and Distribution Systems (May 2014)".

3.1 BASELINE DATA

Environmental and social (E&S) baseline data for the sub-project area is assessed under this section, while E&S risks/impact assessment of the sub-project is provided in Section 3.2.

Based on the potential environmental, social, and community/occupational health and safety risks and impacts during the construction phase of the sub-project and the associated Phase 2 Area, the Area of Influence (Aoi)⁶ has been determined to be 100 meters in all directions from the areas where pipeline works will be carried out on expert opinion. During the operation phase, the sub-project will serve the entire city centre. The location of the sub-project area, and the designated Aoi are presented in [Figure 3-11](#).

3.1.1 Physical Environment

3.1.1.1 Topography

The territory of the Düzce province, except for the coastal part, consists of areas surrounded by mountains with a hollow centre. There are Akçakoca Mountains in the northern part, Bolu Mountains in the eastern part, and western extensions of Abant Mountains in the southeastern and southern parts. The height of Düzce is 150 metres above the sea.

Düzce Plain, which is of great importance in terms of agricultural production, is located in the hollow area in the central part.

The main river of the province is Melen Stream. The section of this river, which originates from Akçakoca Mountains, up to Efteni Lake, also called Lake Melen, is called Small Melen Stream, and the section between this lake and Melenağzı, where it flows into the sea, is called Great Melen Stream. Hasanlar Dam, which was built on the Little Melen Stream in order to irrigate agricultural areas and to protect these areas from flooding, was completed in 1972. Hasanlar Dam Lake is the only artificial lake in the province (T.C. Düzce Governate Official Web Site, 2024).

⁶ During the life of the sub-project, the Aoi of the sub-project can be expanded by experts who will be in the implementation unit of the sub-project and will participate in monitoring studies.

3.1.1.2 Geology

Düzce is in the active earthquake belt. This region, which is very active in tectonic terms, shows its effect in Düzce. Düzce land is not yet fitted and settled. Therefore, convection and subsidence movements are the main factors.

The Düzce city is located on a plain with a slope of 0.5-3 degrees towards the southwest, away from the basic rocks. The river, canal and flood plain are located and expanding on the sedimentary areas. Late sedimentary thickness is between 175-225 m in these sections. Asar and Melen streams pass through the city and overflow in unregulated channel areas. The lithology on which it is located consists largely of silt and clay, and to a lesser extent of sand and pebbles. It is about 7 km from the active fracture line in the south. A thick soil cover has developed in the flood-protected areas of the flood plain. The water table depth is between 2.5-3.5 metres from the surface and becomes shallower towards the south. This low water table level has been achieved to a large extent by the canal arrangements and the fact that the Melen stream is buried in its bed between 2.5-4.0 m. (Geological Structure Düzce Surroundings, 2024) The geological map of Düzce province is given in [Figure 3-2](#).

Figure 3-2. Geological Map of Düzce

Source: (T.C. Düzce Governorate Directorate of Provincial Disaster and Emergency State, 2021)

On the other hand, in the scope of “Düzce (Centrum) Water Supply Project”, a geotechnical survey report is prepared by Çevikkaya Sondaj Ltd. in 2021 to understand the ground conditions of areas where project components will be constructed. The ground investigation report includes test pit logs, laboratory results and other geological information. Main results of the report are summarized as the following.

At a depth of 11.00-20.00 meters, three (3) boreholes of 51.00 m in total, and 67 research pits of 165.50 m in total, at varying depths of 0.80-3.50 m were drilled. In addition, three (3) research pits at a depth of 3.50 meters were drilled by Düzce Municipality (DM) in the DWTP site.

While groundwater was not detected in three (3) boreholes at a depth of 11.00-20.00 meters, drilled within the scope of the field studies of the drinking water project, groundwater was encountered at depths varying between 0.70-2.50 m in eight (8) of a total of 67 research pits at depths between 0.80-3.50 m.

Çilimli Fault, Yiğilca Fault, Dokurcun Fault, Karadere Fault and Düzce Fault, whose activity was revealed by the 17 August 1999 Izmit Gulf and 12 November 1999 Düzce earthquakes, are active faults affecting the region. In addition, the transmission line to be designed in the south of the study area is cut by the Düzce Fault. For this reason, it is necessary to take into account the seismic risk in the design and to comply with the provisions of the “Regulation on Türkiye Building Earthquake dated 18.03.2018 (OG No: 30364)” (Çevikkaya Sondaj Ltd., 2021).

3.1.1.3 Tectonic and Seismicity

Düzce basin is located on the North Anatolian Fault (NAF), one of the most important active faults of our country. Starting from Karlıova region in the east, this fault traverses the northern half of the country from east to west. This fault, which is generally followed in a narrow zone consisting of single fractures until Bolu region, bifurcates west of Bolu (Dokurcum Valley). And it divides into two main branches and extends towards the Marmara Sea. The Hendek faults in the Sakarya-Düzce region also join the NAF system and the width of the fault zone reaches 40 km. The Earthquake Hazard Map of the Düzce is presented in [Figure 3-3](#).

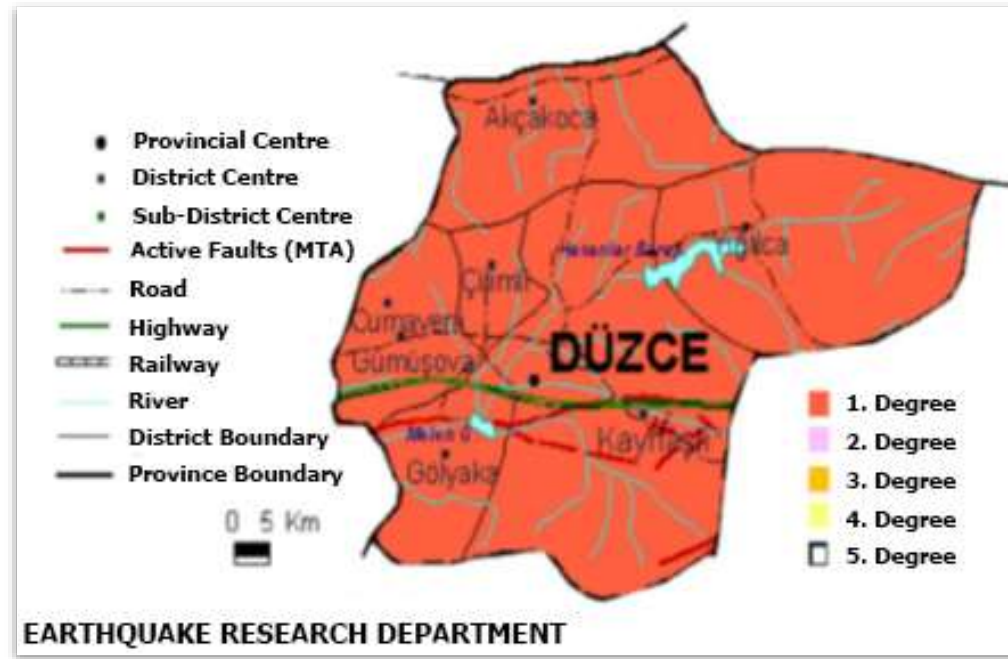


Figure 3-3. Düzce Earthquake Hazard Map

Source: (T.C. Düzce Governorate Directorate of Provincial Disaster and Emergency State, 2021)

The settlements in the Düzce basin have been under the destructive effects of large earthquakes caused by the active faults in this zone in the last century. Earthquakes in 1944, 1957 and 1967 caused surface faulting between Bolu Abant and Abant Lake-Adapazarı Plain. The active faults that are closest to Düzce basin and have earthquake potential are Düzce and Hendek faults, which led to the formation of this basin, are active faults. Çilimli fault is a possible active fault (Geological Structure Düzce Surroundings, 2024).

Since Düzce is located on the NAF zone, it was greatly affected by 2 major earthquakes that occurred consecutively in 1999. These are follows. 17 August 1999 Gölçük and 12 November 1999 Düzce earthquakes. When the data of these 2 major earthquakes are analysed, it is obvious that Düzce has a great risk in terms of earthquake disaster (see Table 3-2Table 3-2).

Table 3-2. Data of Two Major Earthquakes of 1999 Occurred in Düzce

Date of Earthquake	Loss of Life	Injured	Number of Severely Damaged/Demolished Independent Units	Number of Moderately Damaged Independent Units	Number of Less Damaged Independent Units
17 August 1999	270	1,157	20,503	13,541	14,676
12 November 1999	710	2,679			

Source: (T.C. Düzce Governorate Directorate of Provincial Disaster and Emergency State, 2021)

When the distribution of earthquake-affected disaster victims by provinces is analysed, it is seen that the rate of earthquake-affected disaster victims in Düzce is very high. Düzce is among the top four (4) provinces of Türkiye with the highest number of earthquake-affected disaster victims (Gökçe O, Özden Ş, Demir A, 2008).

3.1.1.4 Soil and Land Composition

The sub-project area is the existing roads of Düzce centre for the construction and renewal of the water pipelines and the Düzce Water Treatment Plant (DWTP) site where water will be diverted from the existing reservoir (see **Figure 3-1 Hata! Başvuru kaynağı bulunamadı.**). In this context, within the scope of E&S studies, 2U1K Engineering and Consultancy Inc. (Consultant) conducted the site walkover to the sub-project area on December 28, 2023. The roads involved are mostly asphalt. Moreover, the related site visit also covered the areas to be constructed within the scope of the Düzce (Centrum) Water Supply Project's Phase 2. In this context, no traces of soil contamination were found for the related areas during the site visit. All photographs of the related areas are presented in Appendix-C.

Apart from that, according to the database of Ministry of Agriculture and Forestry, the land composition of central district of Düzce are as shown in **Figure 3-4** **Figure 3-4**.

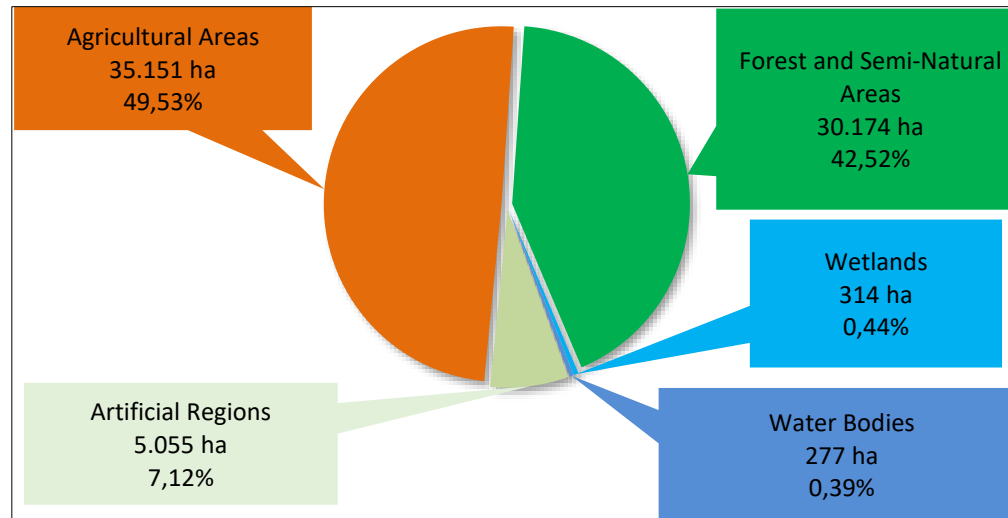


Figure 3-4. Land Usage Classes of Düzce Centrum District

Source Web Site: (Database of T.C. Ministry of Agriculture and Forestry, 2024)

3.1.1.5 Meteorology and Climatic Characteristics

Düzce province is under the influence of the humid and not too harsh climate seen in the coastal parts of the Black Sea Region. The average annual temperature is 13.3 °C, the average annual total precipitation is 822.6 kg/m² and the average relative humidity is 75.2 % (T.C. Düzce Governate Official Web Site, 2024).

According to the metrological data of Düzce province measured by the Meteorology General Directorate of Ministry of Environment, Urbanization and Climate Change (MoEUCC) between 1959 and 2022, the highest temperature measured in the region is 42.4 °C and the lowest temperature is -20.5 °C. Detailed meteorological information of Düzce province between these years is given in Table 3-3Table 3-3.

Table 3-3. According to the Months and Annual Average Precipitation and Temperature Values of Düzce

Düzce	January	February	March	April	May	June	July	August	September	October	November	December
Average Values Over Many Years (1959 – 2022)												
Average Temperature (°C)	3.7	5.2	7.6	12.2	16.5	20.3	22.4	22.3	18.6	14.1	9.4	5.7
Average Highest Temperature (°C)	8.2	10.5	13.6	19.0	23.4	27.1	29.1	29.2	26.0	20.8	15.7	10.3
Average Lowest Temperature (°C)	0.5	1.4	3.4	7.2	11.2	14.8	16.9	17.0	13.4	9.8	5.3	2.5
Average Sunshine Duration (hours)	1.9	2.9	3.8	5.3	6.8	8.0	8.6	8.2	6.6	4.4	2.9	1.8
Average Number of Rainy Days	15.30	13.42	13.69	12.19	11.64	9.83	6.22	6.03	7.69	10.84	11.66	15.33
Average Monthly Total Rainfall (mm or kg/m ²)	91.3	70.4	73.9	59.3	62.8	70.5	45.1	51.4	52.3	79.1	76.5	100.9
Highest and Lowest Values in Many Years (1959 – 2022)												
Highest Temperature (°C)	26.1	26.9	32.2	34.7	39.5	39.0	42.4	42.0	38.7	38.2	30.2	29.2
Lowest Temperature (°C)	-20.5	-17.3	-13.6	-3.0	0.4	6.6	8.8	7.6	4.5	-1.2	-6.8	-16.5
Yearly Average	Average Temperature (°C)		Average Highest Temperature (°C)		Average Lowest Temperature (°C)		Average Sunshine Duration (hours)		Average Number of Rainy Days		Average Monthly Total Rainfall (mm or kg/m ²)	
	13.2		19.4		8.6		5.1		133.8		833.5	
Daily Total Highest Rainfall	14.07.1965	118.0 mm or kg/m ²	Daily Fastest Wind		26.01.2022		164.88 km/h		Maximum Snow Thickness		02.01.1983 80 cm	

Source Web Site: (Meteorology General Directorate of T.C. Ministry of Environment, Urbanization and Climate Change, 2024)

3.1.1.6 Air Quality

In Düzce, there are three (3) national air quality monitoring stations under the supervision of MoEUCC. The information of their locations and locations map can be seen in Table 3-4Table 3-4, and Figure 3-5 Figure 3-5 respectively.

Table 3-4. Air Quality Monitoring Stations Under the Supervision of MoEUCC in Düzce

No	Name	Coordinates	Location
----	------	-------------	----------

		(Latitude - Longitude)	
1	Düzce - Centrum	40,8414 - 31,1389	Within the sub-project area
2	Düzce - Bahçeşehir	40,8608 - 31,2294	
3	Düzce - Municipality	40,8386 - 31,1627	



Figure 3-5. The Air Quality Monitoring Stations within the Sub-Project Area

Source Web Site: (Database of T.C. Ministry of Environment, Urbanization and Climate Change, 2024)

Table 3-5, Table 3-6 and Table 3-7 Table 3-7 Source Web Site:

Table 3-7 represent the mean monthly pollutant concentrations based on the national air quality monitoring system for the last 12 months at the corresponding monitoring stations in Düzce.

Table 3-5. Monthly Average Air Quality Parameters of Düzce - Centrum (1) Air Quality Monitoring Station

Month year \ Unit ($\mu\text{g}/\text{m}^3$)	SO ₂	PM ₁₀	PM _{2.5}	CO	NO	NO ₂	NO _x	O ₃
January 2023	4.41	109.10	61.78	970.47	82.47	29.93	112.40	-
February 2023	2.60	62.64	32.23	1,005.43	35.03	29.78	64.77	-
March 2023	2.55	46.21	19.64	677.12	21.46	22.25	43.71	-
April 2023	2.96	33.43	12.59	469.04	11.68	19.38	31.06	-
May 2023	3.92	33.89	9.81	379.83	9.35	16.31	25.66	-
June 2023	5.21	28.73	10.21	379.77	12.44	17.19	29.61	-
July 2023	7.18	32.45	14.04	421.93	9.84	19.50	29.34	-
August 2023	5.01	41.54	19.41	466.96	7.71	18.20	25.91	-
September 2023	3.49	35.16	12.98	489.32	19.42	21.31	40.73	-
October 2023	3.40	39.82	24.94	726.77	43.91	20.25	64.16	-
November 2023	2.41	43.06	23.57	964.78	49.50	20.36	69.86	-
December 2023	2.01	100.31	59.11	1,446.14	99.28	23.57	122.85	-

Source Web Site: (Database of T.C. Ministry of Environment, Urbanization and Climate Change, 2024)

Table 3-6. Monthly Average Air Quality Parameters of Düzce - Bahçeşehir (2) Air Quality Monitoring Station

Month year \ Unit ($\mu\text{g}/\text{m}^3$)	SO ₂	PM ₁₀	PM _{2.5}	CO	NO	NO ₂	NO _x	O ₃
January 2023	8.58	46.82	-	-	22.95	55.97	78.92	13.56
February 2023	6.36	36.07	-	-	18.69	71.95	90.64	10.19
March 2023	5.20	24.79	-	-	17.01	58.88	75.88	12.79
April 2023	5.91	23.80	-	-	14.38	35.66	49.89	22.32
May 2023	6.83	30.59	-	-	14.01	20.94	34.95	23.08

Month year \ Unit (µg/m³)	SO ₂	PM ₁₀	PM _{2.5}	CO	NO	NO ₂	NO _x	O ₃
June 2023	14.92	24.41	-	-	16.34	37.03	53.36	39.75
July 2023	32.97	26.57	-	-	16.59	42.18	58.78	66.20
August 2023	21.47	53.30	-	-	16.46	52.29	78.74	72.79
September 2023	17.43	43.08	-	-	9.88	34.30	46.36	69.09
October 2023	17.12	44.87	-	-	7.74	29.58	37.32	43.91
November 2023	17.11	41.29	-	-	10.07	28.84	39.28	41.64
December 2023	-	19.40	-	-	20.25	35.41	55.66	18.44

Source Web Site: (Database of T.C. Ministry of Environment, Urbanization and Climate Change, 2024)

Table 3-7. Monthly Average Air Quality Parameters of Düzce - Municipality (3) Air Quality Monitoring Station

Month year \ Unit (µg/m³)	SO ₂	PM ₁₀	PM _{2.5}	CO	NO	NO ₂	NO _x	O ₃
January 2023	7.09	92.81	54.59	1,682.13	-	-	-	-
February 2023	6.25	58.65	46.48	1,415.53	-	-	-	-
March 2023	5.21	42.41	32.79	1,182.88	30.22	61.16	91.39	-
April 2023	4.93	35.01	23.87	825.56	24.21	53.49	76.61	-
May 2023	6.12	36.86	23.91	688.97	18.13	46.58	64.30	-
June 2023	5.64	35.83	22.41	616.51	16.41	42.11	58.52	-
July 2023	5.90	36.17	23.53	888.66	16.68	46.57	63.25	-
August 2023	6.63	44.90	26.13	799.80	16.19	47.94	64.13	-
September 2023	4.73	35.89	19.64	724.18	18.34	48.10	66.39	-
October 2023	3.25	51.18	40.92	735.07	42.18	58.58	100.76	-
November 2023	3.28	52.79	39.31	1,075.72	56.24	64.42	120.42	-
December 2023	5.27	95.83	70.89	1,442.52	128.13	73.99	202.12	-

Source Web Site: (Database of T.C. Ministry of Environment, Urbanization and Climate Change, 2024)

In this context, on the website of the MoEUCC, the current air quality index of Düzce is described as “good” in terms of parameters including particulate matter PM₁₀, PM_{2.5}, SO₂, O₃, CO, NO₂ due to below corresponding national and international (WHO Ambient Air Quality Guidelines (AQG)s global update 2005) specified IFC General EHS Guideline) limit values.

In addition, the WHO Global AQGs offer global guidance on thresholds and limits for key air pollutants that pose health risks. These guidelines are of a high methodological quality and are developed through a transparent, evidence-based decision-making process. In addition to the guideline values, the WHO Global air quality guidelines provide interim targets to promote a gradual shift from high to lower concentrations. In this context, the WHO has updated its Ambient AQGs levels in 2021 as specified in Table 3-8.

Table 3-8. WHO Ambient AQGs Thresholds and Limits for Key Air Pollutants That Pose Health Risks

WHO AQGs value in (µg/m ³)	Interim target				Averaging time	AQG level
	1	2	3	4		
SO ₂	125	50	-	-	24-hour	40
PM ₁₀	150	100	75	50	24-hour	45
PM _{2.5}	75	50	37.5	25	24-hour	15
CO	7,000	-	-	-	24-hour	4,000
O ₃	160	120	-	-	8-hour	100
NO ₂	120	50	-	-	24-hour	25

According to the relevant monitored values, which are assessed to the WHO Ambient AQGs, while SO₂, CO and O₃ monthly mean values are below the corresponding recommended AQG level, it is seen that NO₂, and PM values monitored (especially in winter months for PM values) can only meet the interim 1 target. Hence, the air quality of the sub-project area cannot be characterized as good due to high PM and NO₂ monitored values.

3.1.1.7 Noise

The following noise baseline data for the sub-project area was taken from the thesis study (Özgür YERLI and Zeki DEMİR, 2012), which is completed in 2012, on seasonal noise in Düzce. Within the scope of this thesis, noise measurements in line with local legislation were carried out at a total of 150 points in Düzce province between August 2010 and July 2011 (see [Figure 3-6](#)Figure 3-6).

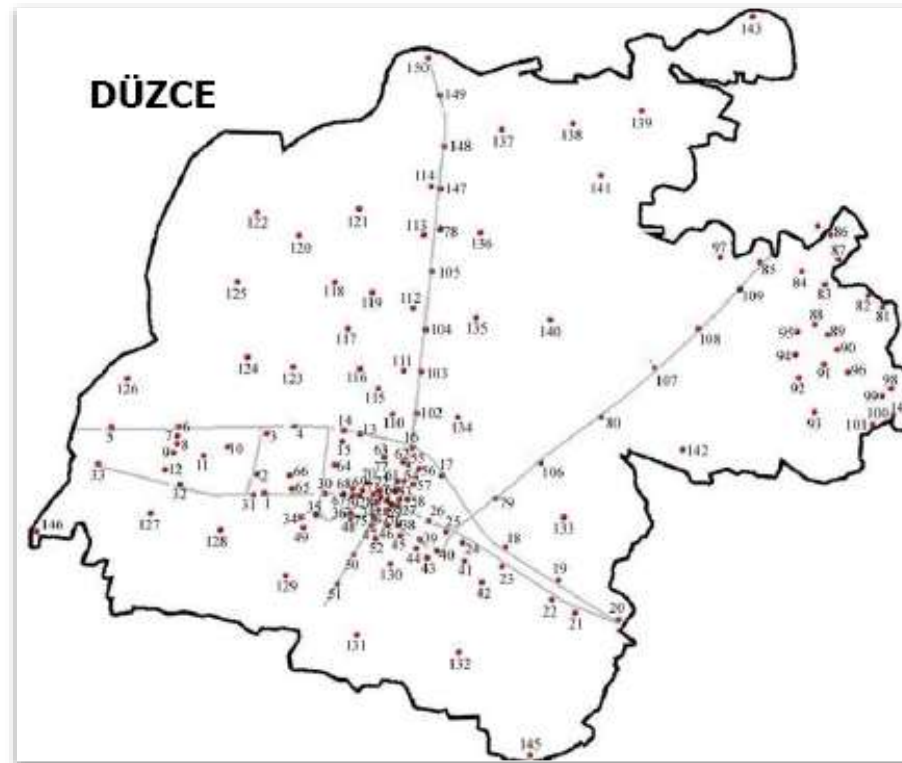
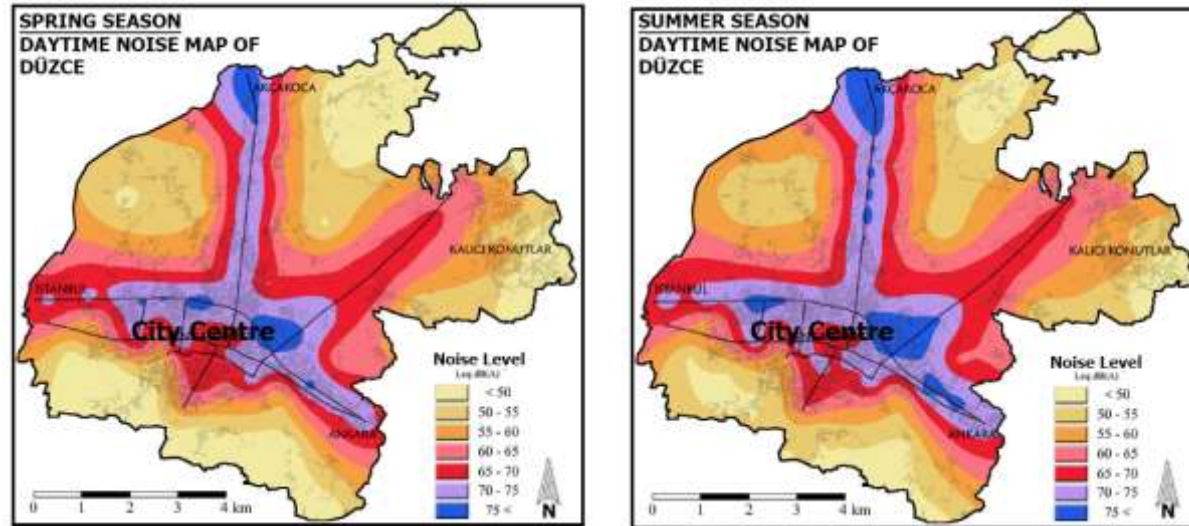


Figure 3-6. Map Showing the Noise Measurement Points in Düzce between August 2010 and July 2011

When the maps resulting from all studies are assessed (see [Figure 3-7](#)Figure 3-7), noise measurements conducted in Düzce show that the noise levels are below the limits set by the national legislation in only residential and green areas, while noise levels are high in industrial and commercial

areas. Especially in areas where urban land uses are diversified, it is evident that there is an increase in noise levels with the increase in the diversity of uses. When the relationship between urban land use types and noise is examined, it is seen that transportation is the main source of noise. Noise levels were measured to be high on the main arteries within the city. Noise levels decrease in areas where transportation axes are not dense.



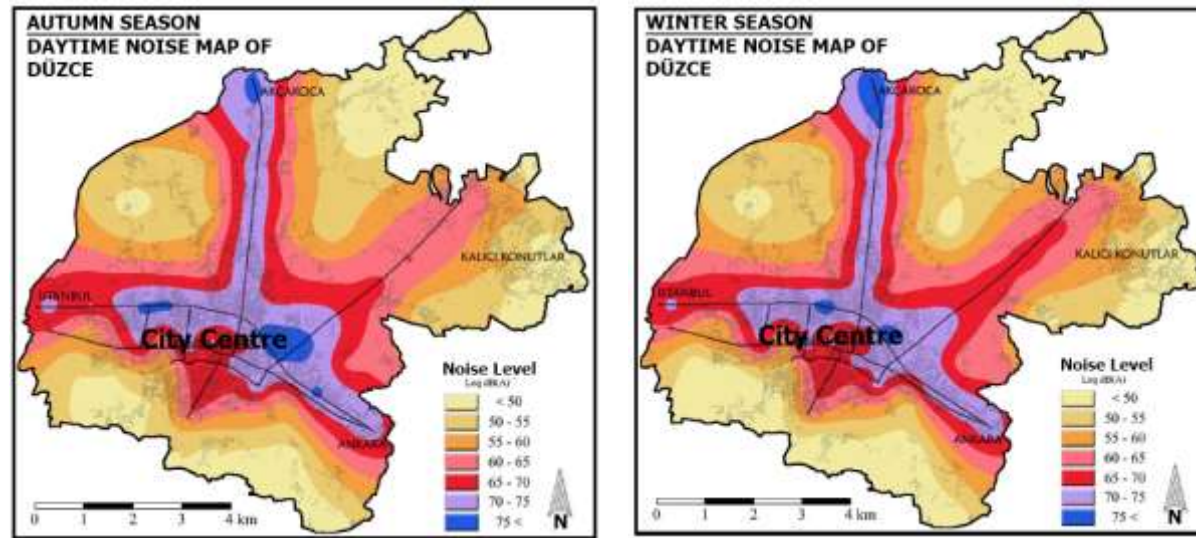


Figure 3-7. Düzce Seasonal Daytime Noise Distribution Maps

3.1.1.8 Water Resources

Since the sub-project area covers Düzce province, water resources data on the province basis is presented in this section. The main rivers in Düzce are Small Melen, Asar Suyu, Uğur Suyu, Aksu Creek and Great Melen Brook. All the rivers in the area outside the coastal part of Akçakoca District of Düzce province belong to the Melen Basin, or Efteni Basin, which is a sub-basin of the Western Black Sea Basin. Melen Water Collection Basin constitutes the basin of the Great Melen Project, which provides drinking water to Istanbul Province. Except for Akçakoca District, the entire province is within the Great Melen Project Basin. Water resources near the sub-project area are presented in Figure 3-8. Characteristics of Düzce's Water Bodies, Existing Lakes, Ponds, and Reservoirs and Groundwater Potential in Düzce are given Figure 3-8. Water Resources near the Sub-Project Area

Source:

Table 3-9, Table 3-10 and Table 3-11, respectively.

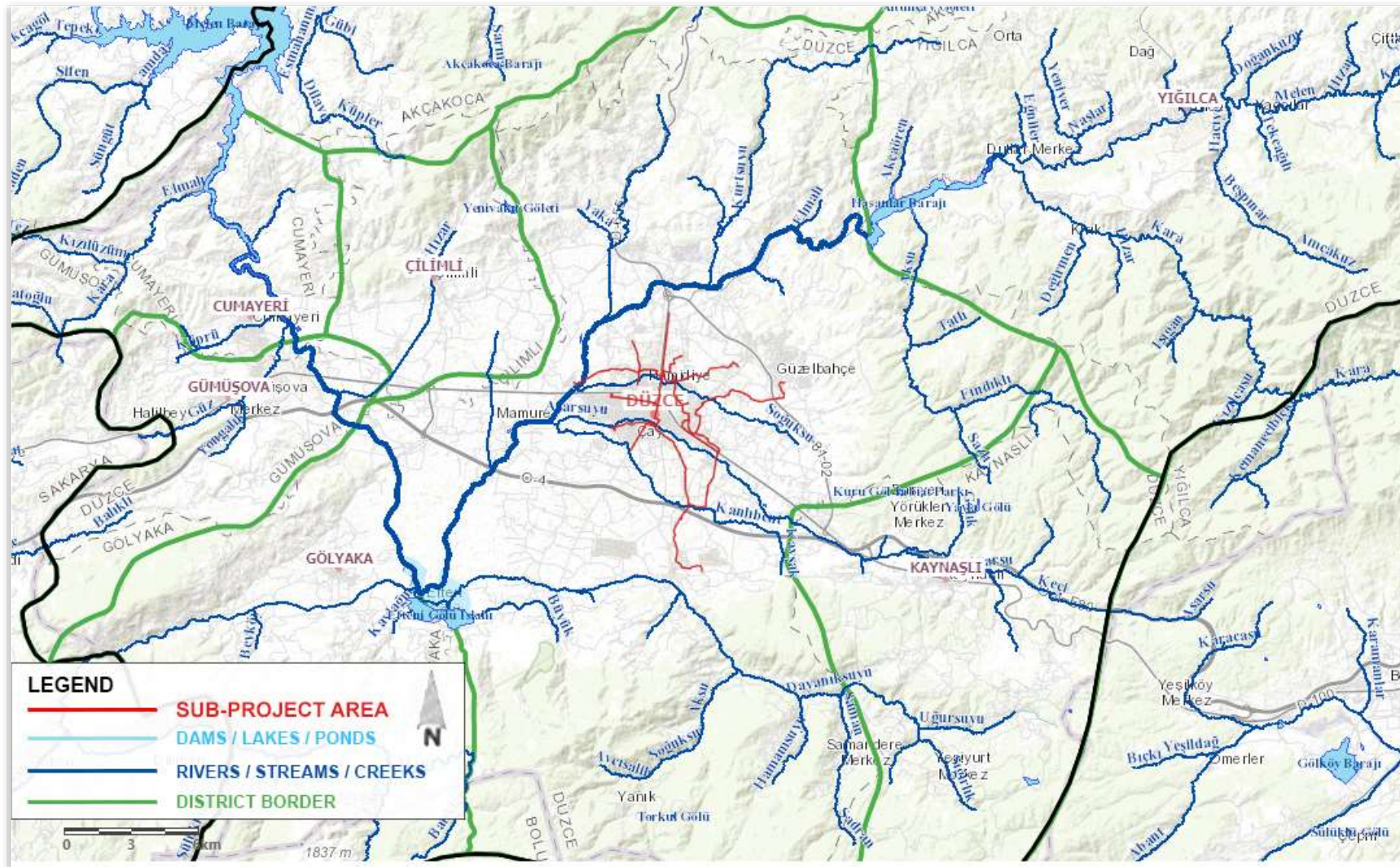


Figure 3-8. Water Resources near the Sub-Project Area

Source: (Database of T.C. Ministry of Agriculture and Forestry, 2024)

Table 3-9. Characteristics of Düzce's Water Bodies

Water Body Name	Total Length (km)	Flowrate (m ³ /s)	Tributary Stream	Purpose of Use
Çilimli Creek	-	0.325	▪ Great Melen	Datum
Aksu Creek	53.31	1.744	▪ Efteni Lake ▪ Great Melen Brook	Supply of Datum for Hydroelectric Plant (HEP) and Flood Control
Small Melen Creek	-	5.737	▪ Hasanlar Dam ▪ Small Melen ▪ Efteni Lake	Hasanlar Dam Supply of Datum
Small Melen Creek	-	5.826	▪ Small Melen ▪ Efteni Lake	Hasanlar Dam Supply of Datum
Kara Creek	-	3.914	▪ Hasanlar Dam ▪ Small Melen	Hasanlar Dam Supply of Datum
Asar Suyu	39.39	1.938	▪ Efteni Lake	Datum
Uğur Suyu	36.62	2.576	▪ Asar Suyu ▪ Efteni Lake	Datum
Aksu Creek	53.31	1.481	▪ Efteni Lake ▪ Great Melen Brook	Supply of Datum for Düzce Province Drinking Water Project
Great Melen Creek	144.54	36.376	▪ Black Sea	Datum
Aksu Creek	53.31	Q100= 487.81 Q500= 691.63	▪ Efteni Lake ▪ Great Melen Brook	Supply of Datum for HEP, Flood Control and Düzce Province Drinking Water Project
Asar Suyu	39.39	Q100= 153.56 Q500= 208.82	▪ Efteni Lake ▪ Great Melen Brook	Datum
Uğur Suyu	36.62	Q100= 352.11 Q500= 476.80	▪ Efteni Lake ▪ Great Melen Brook	Datum
Great Melen	144.54	Q100=2,244.52 Q500=2,971.50	▪ Black Sea	Datum

Source: DSI 55th Branch Directorate and (Düzce Governorate Provincial Directorate of EUCC, 2023)

Table 3-10. Existing Lakes, Ponds, and Reservoirs in Düzce

Name of the Lake/Pond/Reservoir	Type	Lake Volume (m ³)	Irrigation Area (ha)	Quantity of Water Withdrawn (m ³)	Quantity of Water Added (m ³)	Purpose of Use
Hasanlar	Dam	37,415,000	10,907	307,405,000	358,055,000	Energy, Irrigation, Flood
Akçakoca	Dam	1,746,000	-	1,904,000	1,973,000	Drinking
Düzce Gölyaka Efteni Lake Wetland of National Importance	Mixed Structure Lake	2,550,000	-	-	-	Recreational use
Korugöl Nature Park	Mixed Structure Lake	243,500	-	-	-	Recreational use (angling)
Akçakoca Sarıyayla Nazmi Çiloğlu Dam	Cylindrical Compacted Filled Concrete	1,860,000	-	2,400,000	-	Drinking and Potable Water Purposes

Source: DSI 55th Branch Directorate, Directorate of Nature Conservation and National Parks, Akçakoca Municipality, 2022 and (Düzce Governorate Provincial Directorate of EUCC, 2023)

Table 3-11. Groundwater Potential in Düzce

Source Name	hm ³ /year
Akçakoca-Kocaali Basin	15
Great Melen Basin	120
Hacikadirler Drilling 1	1,100,000
Hacikadirler Drilling 2	900,000

Ground Water Levels

Aquifers, which are rich and widespread in terms of groundwater, are generally in plains and alluvial deposits along large rivers. According to the data obtained from General Directorate of State Hydraulic Works (DSI) observation wells and private wells, groundwater levels in two (2) groundwater basins in Bolu province vary widely and vary between 1-10 m depending on hydrogeological, meteorological, and topographical conditions and water use.

In Great Melen Basin, Düzce plain; the groundwater level in the upper free aquifer is between 0.5 - 5 meters, and in the lower pressurized aquifer it is artesian (the groundwater level is higher than the natural ground).

In the Akçakoca-Kocaali Basin, there are not enough wells to reveal the distribution of the groundwater level. Since the basin is very hilly, it is estimated that there may be large variations in groundwater levels according to the quota and hydrogeologic conditions. The groundwater level in the valley alluvium is between 0.5 - 5 m. (Düzce Governorate Provincial Directorate of EUCC, 2023)

Drinking and Potable Water

The population of Düzce city centre in 2022 is 194,097 people and the drinking water requirement for 2022 is 15.85 hm³/year. The current drinking water need of Düzce province is met from Uğursuyu regulator (13.12 hm³/year) and existing wells (1.23 hm³/year). The existing treatment plant was built by ILBANK and put into service in 1993. The capacity of the plant is 700 l/s (60,480 m³/day). In 1999, it could not be operated at full capacity due to earthquake damage. The water collected in Uğursuyu regulator⁷ comes to the existing drinking water treatment plant with a capacity of 60,480 m³/day by gravity. Drinking water will be supplied 25.8 hm³/year from Uğursuyu regulator and 1.25 hm³/year from Bıçkı regulator, whose project works are completed and under construction. A new 130,000 m³/day treatment plant project to be constructed by the Düzce Municipality (DM) is at the tender stage⁸. In addition, water is also supplied from Kurtsuyu Creek located in Kemerkasım locality. All the water supplied is for drinking and domestic use. (Düzce Governorate Provincial Directorate of EUCC, 2023)

⁷ A regulator is a concrete wall for regulating the flow of water, used for diverting or partially raising a river. It is used to raise and direct water in river-type dams. The control structure used in the control of flood waters and in directing the waters to the canals is also called a regulator.

⁸ Source: DSI 55th Branch Directorate

3.1.1.9 Existing Infrastructure System

3.1.1.9.1 Water Supply and Treatment

Currently, drinking water demands of Düzce Centrum is provided mainly from Uğursuyu regulator and Düzce Water Treatment Plant (DWTP) which is located within the borders of Beyköy Municipality, and 7 km far to Düzce Centrum. In dry seasons some wells are also being used, however this comprise 4-5% of total water produced from Uğursuyu regulator and planned to be abandoned after completion of DSI Project.

DWTP is a conventional type of treatment plant and has the following process units:

- Inlet Structure
- Chemical Dosing (AlSO₄, Polyelectrolyte)
- Coagulation and flocculation
- Clarifiers
- Sand filters
- Disinfection (gas chlorine)

Uğursuyu regulator, transmission line and DWTP are constructed in year 1997 and had damages during latest flood disaster. Accordingly, DSI has initiated project for renewal of those structures. Existing water distribution network was planned by ILBANK and constructed in 1990's with cast iron pipes, PVC (Poly Vinyl Chloride) pipes (Ø 63 mm - Ø 80 mm- Ø 100 mm) and Asbestos Cement (AC) pipes for diameters of Ø 125 mm and above. After the earthquakes in Düzce in 1999, network renewals were done under coordination of ILBANK and consists of Polyethylene (PE) pipes. Later with the rapid development of the city, additions and renewals are done by the DM without planning a new backbone. Pipe bursts from joints and breakages on the distribution network pipes are frequently observed which cause high water losses. Operators also reported some vertical cracks which is estimated to be happened because of wrong storage or installation techniques. As addition to network lines, transmission lines also need renewal (Arisu Engineering Architecture Consultancy Ltd., 2024).

Total water produced in Düzce Centrum is reported by the DM as in Table 3-12 **Hata! Başvuru kaynağı bulunamadı..**

Table 3-12. Water Production in Düzce Centrum

Water Production of Düzce Centrum	2020	2021	2022
	16,663,336 m ³ /year	16,466,236 m ³ /year	18,213,500 m ³ /year

Source: Düzce Municipality

Uğursuyu regulator has been damaged after the flood disasters in recent years. Accordingly, DSI has initiated a new Project including:

- Stage 1: Renewal of Uğursuyu regulator, transmission lines to DWTP and introduction of a new source (construction of Bıçkı regulator, Pump Station, and collection tank)

- Stage 2: Renewal of DWTP (also capacity increase from 60,480 m³/year to 130,000 m³/year)

Construction of Stage 1 is already started. For Stage 2 of the DSI Project, plannings for tendering has been carried on.

On the other hand, treated water is distributed to the city from the 10,000 m³ existing reservoir in the DWTP via a 1,000 mm diameter steel pipeline. This existing reservoir is the reservoir to which the water network line of the sub-project will be connected. Capacities of the reservoirs in Düzce Centrum are given in Table 3-13 **Hata! Başvuru kaynağı bulunamadı..**

Table 3-13. Capacity of Düzce Centrum Reservoirs

	Reservoirs	Volume (m ³)
1	Beyköy – DWTP Reservoir (*)	10,000
2	Collection Tank (MTD)	500
3	Existing Reservoir DM1	1,500
4	Existing Reservoir DM2	2,000
5	Existing Reservoir DM3	600
6	Existing Reservoir 2A	300

(*) The reservoir to which water network line of the sub-project will be connected
Source: Düzce Municipality

Four (4) pump stations are used to pump water from the lower reservoir to upper network distribution reservoir. In general, all pumping stations require improvement and maintenance. All pumps are manually operated.

In early 1990's main skeleton of the existing water distribution network is constructed under coordination of ILBANK. It consists of cast iron pipes, PVC pipes (Ø 63 mm - Ø 80 mm- Ø 100 mm) and AC pipes for diameters of Ø 125 mm and above.

After the earthquakes in Düzce on 17 August and 12 November 1999, network renewals are done under coordination of ILBANK and consists of PE pipes for all dimensions.

In the following years, pipes were partially laid in new settlements by the DM. Estimated length of the pipes and diameters are given as in Table 3-14 **Hata! Başvuru kaynağı bulunamadı..**

Table 3-14. Estimated Lengths of Düzce Water Supply Network

Pipe Diameter and Type	Estimated Length
Ø63 PVC	133 km
Ø90 PVC	173 km
Ø90 PE	37 km
Ø110 PVC	276 km
Ø110 PE	51 km
Ø100 AC	1 km
Ø 150 AC	1 km
Ø 180 PE	3 km
Ø 250 PE	2 km

Pipe Diameter and Type	Estimated Length
Ø315 PE	2 km
Ø 355 PE	20 km
Ø 500 Steel	10 km
Ø 500 PE	8 km
Ø1000 Steel	7 km
TOTAL	724 km

Source: Düzce Municipality

AC, cast iron and PVC pipes have already completed economical lifetime, in addition, natural disasters occurred (1999 earthquakes and floods/landslides in last 10 years) effected the operation of whole network which decrease service levels and increase water losses. Existing water distribution network is hydraulically insufficient and needs renewal according to a hydraulic design that comprise whole centrum development area (Arisu Engineering Architecture Consultancy Ltd., 2024).

3.1.1.9.2 Wastewater

First sewage and stormwater system of Düzce Centrum was planned and constructed in 1980's. Afterwards, additions are done by the Municipality with the development of the city. Stormwater and sewage are collected in separate systems. Estimated sewage network length is 536 km including Ø150-Ø1000 concrete pipes, estimated stormwater network is 419 km including Ø150-Ø1000 concrete pipes, Although the sewer network of Düzce city centre was damaged after the earthquakes and floods, it continues to function with the additional installations done. Düzce Municipality (DM) is planning a tender for the design of a new sewage system for whole Düzce Centrum sewerage by the end of 2023.

The sewage system ends up with Düzce Central Wastewater Treatment Plant (WWTP). Düzce WWTP was first built in 1993 and was subsequently renovated by Istanbul Water and Sewerage Administration (ISKI) in 2008 since it's discharge point in inside Melen Basin which is one of the water sources of Istanbul. Düzce WWTP was put into operation in 2009 to serve a population equivalent to 250,000 people with 50,000 m³/day. Process of the WWTP is stated as advanced biological treatment and includes grit removal unit, main pump station, bio-phosphorus tanks, aeration tanks, return and excess sludge pump station, final sedimentation tanks, sludge thickeners, sludge dewatering units. Rehabilitation and expansion of the existing Düzce WWTP is under planning period by Istanbul Water and Sewerage Administration (ISKI) and the DM (Arisu Engineering Architecture Consultancy Ltd., 2024).

3.1.1.9.3 Waste Management

With the decision of the Council of Ministers dated 27.12.2002 and No 5,116, Düzce Provincial Solid Waste Association was established by Düzce, Beyköy, Boğaziçi, Akçakoca, Cumayeri, Çilimli, Gölyaka, Gümüşova, Kaynaşlı and Yığılca municipalities.

Düzce Landfill has been commissioned in 2020, and wastes belonging to all association members including Düzce Centrum municipality are collected, sorted, and landfilled complying

with the national environmental legislation. Düzce solid waste landfill is constructed on 309,000 m² area and includes facilities like; 1. and 2. stage storage lots, control building, administration building, 60-ton weighbridge unit, garage-workshop building, fire water tank, transformer building, wheel washing unit, waste battery temporary storage unit, leachate balancing pool, co-generation unit, roads, and protection fence. Storage lots consists of an impermeability layer on the base and slopes with 50 cm thick natural clay and a geosynthetic clay liner on the ground, high-density polyethylene cover (HDPE geomembrane), a protective cover (geotextile), and 50 cm thick, 16x32 mm granular gravel drainage layer (Arisu Engineering Architecture Consultancy Ltd., 2024).

3.1.1.10 Biodiversity

The sub-project area is under the influence of Mediterranean climate. According to the Corine 2018 Land Cover data, the sub-project area is in commercial units and agricultural lands. The surroundings of the sub-project area are consisting of modified habitats such as continuous urban fabric, discontinuous urban fabric, industrial areas, orchards, and agricultural lands. The habitats within the sub-project area have experienced a significant degradation of their natural structure. The habitats in the sub-project area and its immediate surroundings are given in Figure 3-9.

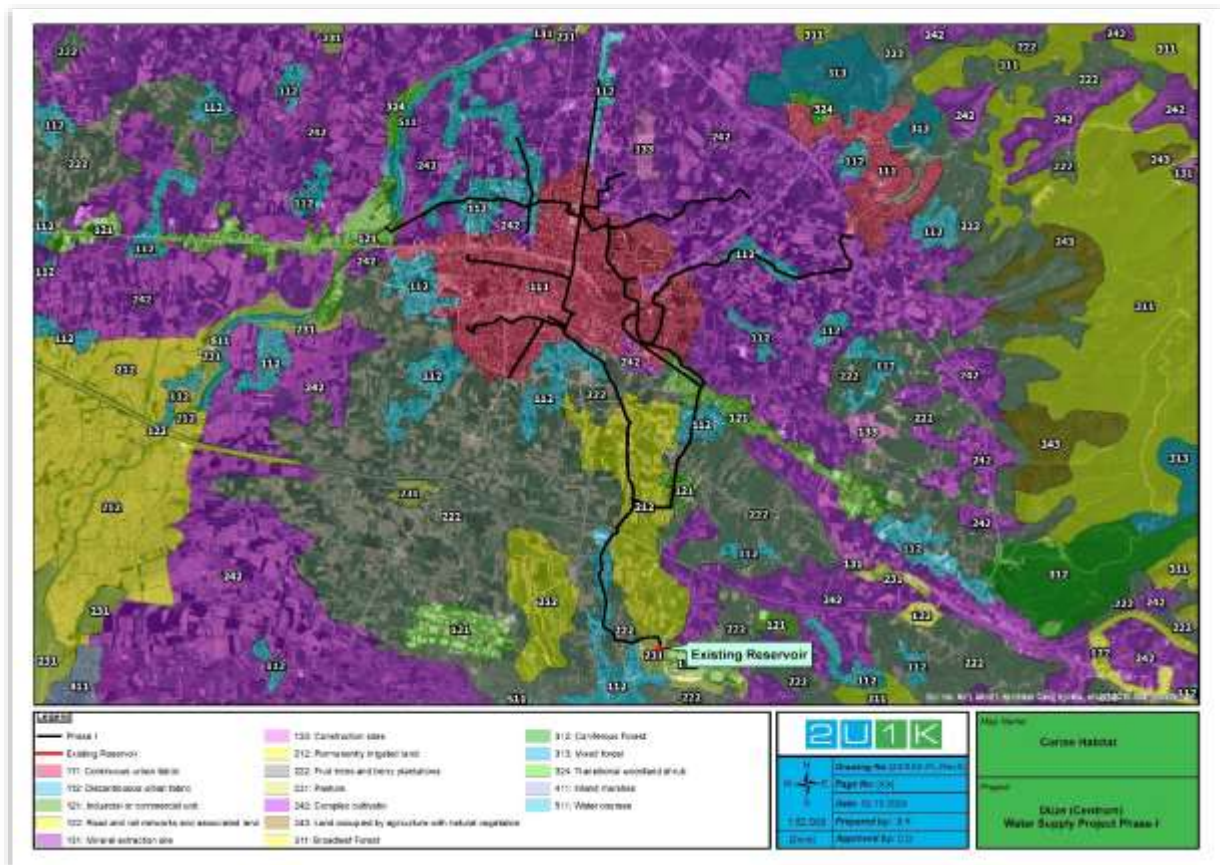


Figure 3-9. Habitats in the Sub-Project Area

Due to the intense anthropogenic impact observed in the sub-project area, the distribution of flora and fauna is highly suppressed. The flora and fauna species that can be observed in the area comprise cosmopolitan species.

In evaluating the threat/protection status of species, Bern Convention (Convention on the Conservation of European Wildlife and Natural Habitats); and IUCN (International Union for Conservation of Nature) Red List Database were used.

Bern Convention

The Convention was put into force in 1982 for the conservation of European wildlife and natural habitats. Fauna species protected by Bern Convention are listed in four categories:

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

IUCN Red List of Threatened Species

The International Union for Conservation of Nature (IUCN) Red List is published to draw attention to the species whose population is under risk or threatened. IUCN includes the species to the Red List after researching the reasons causing decrease in its population. IUCN Red List categories are given below:

- EX: Extinct
- EW: Extinct in the Wild
- CR: Critically Endangered
- EN: Endangered
- VU: Vulnerable
- NT: Near Threatened
- LC: Least Concern
- DD: Data Deficient
- NE: Not Evaluated

Red Book of Flora in Türkiye (Ekim et al., 2000), which is prepared as per the 1994 IUCN Red List Categories and Criteria, is used during the determination of risk status of the flora species in the study area.

Flora

The sub-project area is under intense anthropogenic influence. There is no natural habitat for natural plant species to survive in the construction area. The species found in the sub-project area are ruderal species. There are 53 species belonging to 24 families, and no endemic species among the identified species. The flora species found and likely to be found in and around the sub-project area are given in Table 3-15.

Table 3-15. Flora Species in the Sub-Project Area

Species Name	Common Name	Endemism	IUCN	BERN	CITES
Amaranthaceae					
<i>Amaranthus retroflexus</i>	-	-	-	-	-
<i>Chenopodium album</i>	-	-	-	-	-
Asparagaceae					
<i>Muscari armeniacum</i>	Grape Hyacinth	-	-	-	-
Asteraceae					
<i>Conyza canadensis</i>	Canadian Fleabane	-	-	-	-
<i>Inula viscosa</i>	Sticky Fleabane	-	-	-	-
<i>Lactuca serriola</i>	Prickly Lettuce	-	-	-	-
<i>Matricaria matricarioides</i>	Pineappleweed	-	-	-	-
<i>Senecio vernalis</i>	Hoary Ragwort	-	-	-	-
<i>Senecio vulgaris</i>	Groundsel	-	-	-	-
Boraginaceae					
<i>Heliotropium europaeum</i>	European Heliotrope	-	-	-	-
Caryophyllaceae					
<i>Cerastium fontanum</i>	Common Mouse-ear Chickweed	-	-	-	-
<i>Stellaria media</i>	Common Chickweed	-	-	-	-
Convolvulaceae					
<i>Convolvulus arvensis</i>	Field Bindweed	-	-	-	-
Cyperaceae					
<i>Cyperus rotundus</i>	Nutgrass	-	-	-	-
Brassicaceae					
<i>Capsella bursa-pastoris</i>	Shepherd's Purse	-	-	-	-
<i>Erophila verna</i>	-	-	-	-	-
<i>Sinapis arvensis</i>	Wild Mustard	-	-	-	-
Equisetaceae					
<i>Equisetum telmateia</i>	Great Horsetail	-	-	-	-
Euphorbiaceae					
<i>Euphorbia seguieriana</i>	Seugeir's Spurge	-	-	-	-
<i>Euphorbia helioscopia</i>	Sun Spurge	-	-	-	-
<i>Mercurialis annua</i>	Annual Mercury	-	-	-	-
Fabaceae					
<i>Medicago arabica</i>	Spotted Medick	-	-	-	-
<i>Trifolium repens</i>	White Clover	-	-	-	-
<i>Trifolium tomentosum</i>	-	-	-	-	-
<i>Vicia sativa</i>	Common Vetch	-	-	-	-
Geraniaceae					
<i>Geranium robertianum</i>	Herb-Robert	-	-	-	-
<i>Geranium tuberosum</i>	-	-	-	-	-
Lamiaceae					
<i>Lamium purpureum</i>	Dead-nettle	-	-	-	-
<i>Mentha longifolia</i>	Horse Mint	-	-	-	-
<i>Salvia verbenaca</i>	Wild Clary	-	-	-	-
Malvaceae					
<i>Malva neglecta</i>	Common Mallow	-	-	-	-
Oxalidaceae					
<i>Oxalis corniculata</i>	Yellow Wood Sorrel	-	-	-	-
Papaveraceae					
<i>Papaver rhoeas</i>	Common Poppy	-	-	-	-
<i>Fumaria officinalis</i>	Common Fumitory	-	-	-	-
Plantaginaceae					
<i>Plantago lanceolata</i>	Ribwort Plantain	-	-	-	-
<i>Veronica persica</i>	Common Field-speedwell	-	-	-	-
Poaceae					
<i>Avena sterilis</i>	Wild Oat	-	-	-	-
<i>Bromus tectorum</i>	Downy Brome	-	-	-	-
<i>Cynodon dactylon</i>	Bermuda Grass	-	-	-	-
<i>Dactylis glomerata</i>	Orchard Grass	-	-	-	-
<i>Hordeum murinum</i>	Wall Barley	-	-	-	-
<i>Lolium perenne</i>	Perennial Ryegrass	-	-	-	-
<i>Poa annua</i>	Annual Bluegrass	-	-	-	-
<i>Poa bulbosa</i>	Bulbous Bluegrass	-	-	-	-
Polygonaceae					
<i>Rumex crispus</i>	Curly Dock	-	-	-	-
Ranunculaceae					
<i>Ranunculus repens</i>	Creeping Buttercup	-	-	-	-
Rubiaceae					
<i>Galium tricomutum</i>	Rough Bedstraw	-	-	-	-
Rosaceae					

Species Name	Common Name	Endemism	IUCN	BERN	CITES
<i>Sanguisorba minor</i>	Salad Burnet	-	-	-	-
<i>Fragaria vesca</i>	Wild Strawberry	-	-	-	-
Salicaceae					
<i>Salix alba</i>	White Willow	-	-	-	-
<i>Populus alba</i>	White Poplar	-	-	-	-
Solanaceae					
<i>Datura stramonium</i>	Jimsonweed	-	-	-	-
<i>Solanum nigrum</i>	Black Nightshade	-	-	-	-

Fauna

Fauna species in the sub-project area have been heavily suppressed due to the urban structure, human presence, and the presence of domestic fauna species. The species found and likely to be found in the sub-project area are species adapted to these conditions.

Amphibians

There are a total of two (2) amphibian species belonging to two (2) families in the sub-project area and all of them are in the LC category according to the IUCN Red List. *Bufo variabilis* is the strictly protected species (App-II) according to the BERN convention. There are no endemic species among the identified species. The amphibian species found and likely to be found in and around the sub-project area are given in Table 3-16.

Table 3-16. Amphibian Species in the Sub-Project Area

Species Name	Common Name	Endemism	IUCN	BERN
Bufo				
<i>Bufo variabilis</i>	Green Toad	-	LC	App -II
Rana				
<i>Rana ridibundus</i>	Marsh Frog	-	LC	App-III

Reptiles

There are a total of four (4) bird species belonging to three (3) families in the sub-project area, and all except *Testudo graeca* (VU) are in the LC category according to the IUCN Red List. Within the scope of the Bern Convention, three (3) species are in the App-II category and one (1) specie is in the App-III category. There are no endemic species among the identified species. The reptile species found and likely to be found in and around the sub-project area are given in Table 3-17.

Table 3-17. Reptile Species in the Sub-Project Area

Species Name	Common Name	Endemism	IUCN	BERN
Testudo				
<i>Testudo graeca</i>	Tortoise	-	VU	App II
Gekkonidae				
<i>Hemidactylus turcicus</i>	Turkish gecko	-	LC	App-III
Lacertidae				
<i>Ophisops elegans</i>	Snake-eyed Lizard	-	LC	App II
<i>Lacerta viridis</i>	Green Lizard	-	LC	App II

Birds

There are a total of 13 bird species belonging to seven (7) families in the sub-project area, and all of them are in the LC category according to the IUCN Red List. Within the scope of the Bern Convention, five (5) species are in the App-II category and four (4) species are in the App-III category. There are no endemic species among the identified species. The bird species found and likely to be found in and around the sub-project area are given in Table 3-18.

Table 3-18. Bird Species in the Sub-Project Area

Species Name	Common name	Endemism	IUCN	BERN
Corvidae				
<i>Pica pica</i>	Eurasian Magpie	-	LC	-
<i>Corvus monedula</i>	Eurasian Jackdaw	-	LC	-
Paridae				
<i>Parus major</i>	Great Tit	-	LC	App-II
Ciconiidae				
<i>Ciconia ciconia</i>	White Stork	-	LC	App-II
Muscipidae				
<i>Muscicapa striata</i>	Spotted Flycatcher	-	LC	App-II
Passeridae				
<i>Passer montanus</i>	Eurasian Tree Sparrow	-	LC	App-II
<i>Passer domesticus</i>	House Sparrow	-	LC	-
<i>Passer hispaniolensis</i>	Spanish Sparrow	-	LC	App-III
Motacillidae				
<i>Motacilla alba</i>	White Wagtail	-	LC	App-II
Columbidae				
<i>Columba livia</i>	Rock Dove	-	LC	App-III
<i>Columba palumbus</i>	Common Woodpigeon	-	LC	-
<i>Streptopelia decaocto</i>	Eurasian Collared-dove	-	LC	App-III
Rallidae				
<i>Fulica atra</i>	Common Coot	-	LC	App-III

Mammals

There are 11 mammal species belonging to seven (7) families in the sub-project area and all of them are in the LC category according to the IUCN Red List. Within the scope of the Bern Convention, three (3) species are in the App-II category and four (4) species are in the App-3 category. There are no endemic species among the identified species. The mammal species found and likely to be found in and around the sub-project area are given in Table 3-19.

Table 3-19. Mammal Species in the Sub-Project Area

Species	Common Name	Endemism	IUCN	BERN
Erinaceidae				
<i>Erinaceus concolor</i>	Southern, White-breasted Hedgehog	-	LC	-
Vespertilionidae				
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	-	LC	App-3
Cricetidae				
<i>Cricetulus migratorius</i>	Grey Dwarf Hamster	-	LC	-
Soricidae				
<i>Crocidura leucodon</i>	Bicolored Shrew	-	LC	App-3
<i>Sorex minutus</i>	Eurasian Pygmy Shrew	-	LC	App-3
<i>Sorex araneus</i>	Common Shrew	-	LC	App-3
Rhinolophidae				
<i>Rhinolophus ferrumequinum</i>	Greater Horseshoe Bat	-	LC	App-2
<i>Rhinolophus hipposideros</i>	Lesser Horseshoe Bat	-	LC	App-2
Sciuridae				
<i>Sciurus anomalus</i>	Caucasian Squirrel	-	LC	App-2
Muridae				
<i>Mus Musculus</i>	House Mouse	-	LC	-
<i>Rattus norvegicus</i>	Brown Rat	-	LC	-

Nationally Protected Areas and Internationally Recognized Areas

There is not Nationally Protected and Internationally Recognized Areas within the sub-project area.

3.1.1.11 Other Natural Hazards

Düzce is one of the provinces which has flood and inundation potential in terms of rainfall regime and where these events are experienced seriously at certain intervals. The most important of these are the floods and inundations that occurred on 1 July 1961, 12 July 1995, 25 July 1995, 11 August 1997, and 21 May 1998. Finally, the flood disaster dated 17.09.2019 was observed recently.

Mass movements are common around Düzce Basin due to its abundant rainy climate and geological-geomorphological structure. The change in the number of geological study reports prepared by Düzce Provincial Directorate of Disaster and Emergency between 2010-2020 as a result of landslide incidents is given in Figure 3-10. As can be seen from the graph, it is seen that landslides occur every year in Düzce and four (4) times more landslides occurred than the average of previous years due to the heavy rainfall and subsequent flood disaster in 2019.

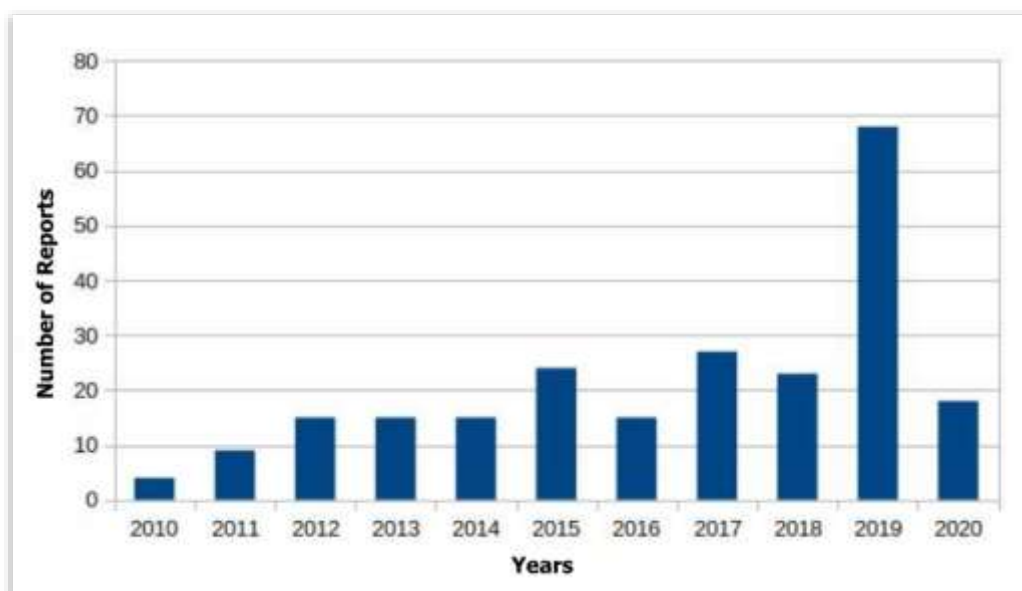


Figure 3-10. Number of Reports Prepared on Landslide Incidents Occurred Between 2010-2020

Source: (T.C. Düzce Governorate Directorate of Provincial Disaster and Emergency State, 2021)

When the above-mentioned disaster events are analysed, the priority order of the disaster events causing significant losses in Düzce is earthquake, flood/ inundation, and landslide. The important factor in this is that the settlement centres are located on fault lines or very close to fault lines in terms of earthquake hazard and the buildings are constructed without complying with earthquake regulations. In terms of flood/ inundation hazard, being located on or close to stream beds and narrowing the cross-section of stream beds after construction are effective. In terms of landslide hazard, especially the fact that the village areas are in lands with high topography and slopes is effective (T.C. Düzce Governorate Directorate of Provincial Disaster and Emergency State, 2021).

3.1.2 Socio-economic Environment

The socioeconomic information given in this section belongs to Düzce Province. Düzce province is a very small city. Formerly a district of Bolu province, it became a province in 1999. For this reason, there is no special livelihood difference between the central district of Düzce and other districts. All settlements are physically, climatically and geographically similar to each other. For this reason, information about Düzce Province is given within the scope of the project.

3.1.2.1 Demography and Population

According to 2023 data of the Address-Based Population Registration System of the Turkish Statistical Institute, the population of Düzce Province is 409,865 consisting of 205,131 females and 204,734 males.

The sub-project will be located in Düzce Centrum, which has a total population of 259,527 consisting of 131,787 females and 127,740 males. Since the sub-project is a line renewal project in general, it will cover all neighbourhoods in the centre of Düzce. Thus, there will be 76 neighbourhoods within the impact area of the sub-project. The population of Düzce Central neighbourhoods in 2021, 2022 and 2023 is presented in Table 3-20.

Table 3-20. List of Düzce Centrum Neighbourhoods and Populations

	Neighbourhoods	2021	2022	2023
1	Ağaköyü	4,060	4,152	4,159
2	Akınlar	1,603	1,721	1,888
3	Akpınar	528	515	529
4	Akyazı			402
5	Arapçiftliği	2,094	2,347	2,599
6	Aziziye	10,522	10,682	10,886
7	Azmimilli	7,850	7,753	7,608
8	Bahçelievler	4,650	4,827	4,748
9	Ballar	228	228	268
10	Beyciler	10,129	10,932	10,879
11	Beytepe	2,009	2,093	2,238
12	Burhaniye	3,009	2,976	2,758
13	Çakırlar	961	958	981
14	Camikebir	1,408	1,379	1,322
15	Çamköy	2,222	2,291	2,270
16	Çamlievler	3,686	3,696	3,711
17	Çavuşlar	2,136	2,212	2,273
18	Çayırtarla	8,145	8,149	292
19	Çay	233	245	8,057
20	Cedidiye	3,764	3,586	3,536
21	Çiftepınarlar	1,801	1,780	1,728
22	Cumhuriyet	812	831	892
23	Cumhuriyet	2,873	3,030	3,047
24	Darıcı	4,831	5,063	5,059
25	Dedeler	318	337	361
26	Değirmenbaşı	819	806	811
27	Demetevler	2,405	2,416	2,424
28	Derelitütüncü	3,149	3,249	3,418
29	Dokuzpınar	233	228	296
30	Esentepe	3,808	3,774	3,776
31	Fatih	1,476	1,608	1,656
32	Fevziçakmak	4,849	5,185	4,229

	Neighbourhoods	2021	2022	2023
33	Gökçe			664
34	Güzelbahçe	6,161	6,047	5,985
35	Hamidiye	7,593	7,642	7,455
36	İstiklal-	681	702	718
37	Kabalak			975
38	Karaca Hacımusa	4,928	5,156	5,188
39	Karaca	4,021	4,095	4,064
40	Kazukoğlu	1,219	1,348	1,573
41	Kirazlı			702
42	Kiremitocağı	3,525	3,595	3,322
43	Koçyazı	15,128	15,499	15,453
44	Körpeşler	5,288	5,659	6,026
45	Kültür	830	830	844
46	Kültür	7,070	6,889	6,542
47	Kuyumcuhaliali	368	448	588
48	Mamure			479
49	Mergiç	854	945	1068
50	Nalbantoğlu	1,072	1,164	1,189
51	Nusrettin	4,549	4,500	4,385
52	Orhangazi	3,223	3,667	4,023
53	Otluoğlu			1,985
54	Ozanlar			608
55	Sallar	1,024	1,042	1,054
56	Sancaklar	3,761	3,798	3,680
57	Sarayyeri	569	579	617
58	Şehit Bayram Gökmen	2,681	3,139	3,279
59	Şehit Hüseyin Kıl	840	825	816
60	Şehit Kemal İşildak	687	578	615
61	Şehit Murat Demir	1,959	2537	2,834
62	Şekerpınar	676	686	726
63	Şerefiye	3,443	3,424	3,235
64	Şıralık	1,951	1,932	2,006
65	Soğukpınar	827	841	852
66	Taşköprü			722
67	Terzialiler	594	583	583
68	Tokuşlar	543	549	556
69	Uzunmustafa	6,523	6,388	5,901
70	Yahyalar	1,515	1,703	1,751
71	Yazlık	928	913	1,006
72	Yeni	646	669	680
73	Yeni	1,813	1,906	1,751
74	Yeşilköy	534	525	550
75	Yeşiltepe	2,616	2,693	2,709
76	Yukarı Yahyalar	306	308	334

Source: TurkStat

3.1.2.2 Land Acquisition

The proposed drinking water lines do not require any private land. The routes of the lines are exclusively on public roads (which are under responsibility of Düzce Municipality (DM)) and therefore no land acquisition nor resettlement is needed. There will be vertical crossings from highways (that belongs to General Directorate of Highways). These crossings will be carried out under the highway through horizontal drillings according to the technical requirements of General Directorate of Highway.

Phase 1 (TEFWER Scope) primarily focuses on the DWTP area, one of the largest zones, serving 412,934 out of the total 540,875 inhabitants as seen in [Figure 3-1](#). DWTP is located in Beyköy neighbourhood of Düzce. Municipality officials stated that this area was formerly owned by the General Directorate of National Real Estate under the Ministry of Environment and Urbanisation (see Appendix-B).

The remaining construction works, identified as "Düzce (Centrum) Water Supply Project - Phase 2," will be financed by the DM's own sources. Since Phase 1 and Phase 2 of the Düzce (Centrum) Water Supply Project are connected, Phase 2 is an associated facility of the WB-financed Phase 1, and the related E&S impacts under Phase 2 are accordingly assessed in this ESMP. There are no other associated facilities such as roads or energy transmission lines, and no major impacts are expected besides dust, noise, and traffic load increments during the construction phase.

Projects of the General Directorate of State Hydraulic Works (DSI) (Stage 1 and Stage 2 for renewal of Düzce Water Treatment Plant (DWTP) and water source structures) are being financed by DSI with a loan provided to the DM. Accordingly, short-term priority projects to be funded by DM's own sources and DSI include:

- Construction of Düzce (Centrum) Water Supply Project - Phase 2 (to be funded by the DM's own sources)
- DSI Renewal of Reservoirs, Transmission Lines (1st Stage) (to be funded by DSI)
- DSI Renewal of DWTP (2nd Stage) (to be funded by DSI).

3.1.2.3 Vulnerable and disadvantage groups

Vulnerable groups (VG)s are people who might be directly and differentially or disproportionately affected by the sub-project because of their disadvantaged or vulnerable status. This disadvantaged or vulnerable status may stem from an individual's or group's race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth, or other status. Vulnerable and disadvantaged groups can be children, people over the age of 65, people with chronic diseases or in need of special care, people with disabilities and Refugees/Immigrants.

The identified disadvantaged/VGs and their potential impacts under the sub-project are as follows:

Children:

- Negative Impact: Construction hazards pose safety risks.
- Mitigation: Implement safety measures and provide alternative play areas.

People over 65 years of age:

- Negative Impact: Disruption of routines and access to services.
- Mitigation: Prioritize non-peak construction hours and offer assistance during disruptions.

People with chronic illnesses or in need of special care:

- Negative Impact: Disruption of services exacerbating health issues.
- Mitigation: Ensure continuity of care and provide transportation assistance.

Disabled people:

- Negative Impact: Disrupted accessibility routes.
- Mitigation: Ensure compliance with standards and provide alternative routes.

Refugees/Immigrants:

- Negative Impact: Language barriers and lack of awareness may lead to safety risks and hinder access to necessary information and services.
- Mitigation: Provide multilingual information and outreach programs to ensure refugees and immigrants are informed about the construction activities and safety measures.

Detailed information on vulnerable/disadvantaged groups are provided in the SEP.

3.1.2.4 Education

According to 2022-2023 academic year statistics, there are 451 schools, 3,330 classrooms, 5,298 teachers and 72,490 students in Düzce province. In Düzce centrum, there are a total of 180 schools affiliated to the Ministry of National Education.

3.1.2.5 Health

According to 2021 TurkStat statistics, there are a total of 9 hospitals in Düzce province and the bed capacity in these hospitals is 899. The total number of physicians in the province is 798. The number of Family Medicine units is 127 and the population per each physician is 3,157. In Düzce Centre, there are a total of 8 hospitals. This includes both public and private medical facilities, ensuring that residents have access to various healthcare services ranging from general medical care to specialized treatments.

3.1.2.6 Means of Livelihood and Employment

Düzce province has a dynamic economy due to its location between two (2) metropolises (Istanbul-Ankara). Since it is considered as a transit point, the industry and transport sector has developed. There are two (2) OIZs in the province. Düzce is a province that experienced the devastating effects of the earthquakes in 1999, and its urban life has undergone a great change due to its transition to province status at the end of the same year. Especially the

second earthquake centred on Düzce-Kaynaşlı affected the industry of the province by causing production losses and high unemployment rates due to physical damage and closed workplaces.

Of the total area of 259,300 hectares, 88,419 hectares are agricultural land, 7,932 hectares are meadow pasture, and 39,536 hectares are land unsuitable for agriculture. 53,668 hectares, which is 45% of the 88,419 hectares of agricultural land, is used as hazelnut garden. Düzce accounts for 15% of Türkiye's hazelnut production. Apart from hazelnut, beet, corn, wheat, paddy, and Virginia tobacco are cultivated in the region.

In addition, cattle, sheep, goat, and poultry breeding is carried out in Düzce Province. In addition, there are fish farms in the province.

3.1.2.7 Transportation and Traffic

Düzce Province is 2-2.5 hours away from both Istanbul and Ankara. Akçakoca district of Düzce has a seaside coast. It is a transition point in the connection of Anatolian Provinces to Istanbul in the transport network. Travel from Düzce Centre to other districts and provinces is facilitated by bus, minibuses, and train services. No other transportation networks are available for inter-district and inter-provincial travel.

3.1.2.8 Cultural Heritage

According to ancient writers like Herodotus, Xenophon, and Strabo, Düzce Province was the homeland of Thracian peoples between 1200-700 BC. In the 6th century BC, Persian ruler Darius included Düzce in the 3rd Satrapy Region. After 334 BC, Alexander the Great incorporated the area into his empire, and following his death in 323 BC, it became part of the Kingdom of Bithynia. The Kingdom, founded by Zipoites I in 297 BC, was bequeathed to the Roman Empire in 74 BC by the last king, Nicomedes IV. During the Ottoman period, Akçakoca Bey and Konuralp Bey integrated the region into Islamic geography in the early 14th century.

Since the mentioned infrastructure project proceeds on the existing roads and since no cultural heritage elements have been identified in this area before, it is not expected that any of the work will affect cultural heritage. However, in case any archaeological elements are encountered during construction activities, a Chance Find Procedure has been prepared as can be seen in Appendix-D.

3.2 ENVIRONMENTAL AND SOCIAL RISKS AND ADVERSE IMPACTS

The sub-project's construction works are expected to last 24 months and be completed in September 2027. Throughout the operation phase, the economic life of the buildings is predicted as 40 years, machinery-equipment economic life of 15 years, and vehicles as 15 years.

In addition to this, in operation phase, there will be maintenance, and repair works in the water supply system. No major impact is expected besides dust, noise, and traffic density load increment during the operation phase.

Based on the environmental, social, and community/occupational health and safety risks/impacts that will potentially occur during the construction phase of the sub-project and Phase 2 Area (as an associated facility), the area of influence (AoI) has been determined as 100 m in all directions from the areas where pipeline works will be carried out on expert opinion, while during the operation phase, the sub-project will serve the entire city centre. The location of the sub-project area, and designated AoI are presented in [Figure 3-11](#).

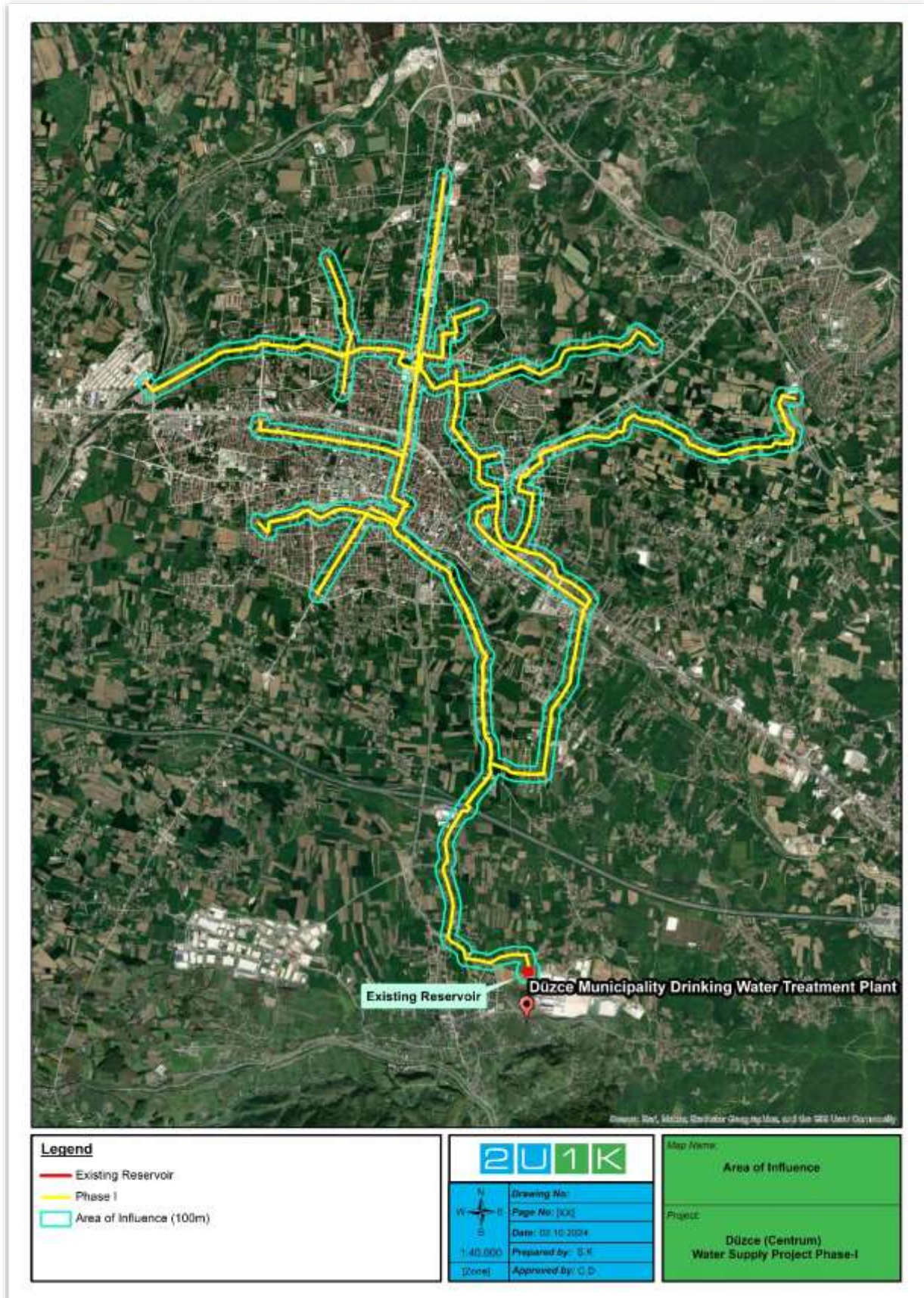


Figure 3-11. The Location of the Sub-Project Area, and Designated AoI

Within the scope of the sub-project, water supply lines in [Figure 3-11](#) will be constructed under the various main roads of the sub-project area and water will be diverted from the existing reservoir. In this context, the environmental and social impacts of the sub-project construction and operation phases are detailed below.

The following sections include the environmental, social, and community/occupational health and safety potential risks/impacts of the sub-project. E&S mitigation measures to be taken for the sub-project due to these impacts and related monitoring table are given in Table 4-1, Table 4-2 and Table 4-4, respectively.

3.2.1 Air Quality

Construction phase

Sub-project's environmental impacts at Aol are limited and these impacts are effective for limited time during construction phase. In case of complaints regarding air quality, air quality measurements will be made for impact area.

There will be temporary greenhouse gas emissions from mini cylinder, asphalt cutting machine, truck, excavator, and digger that will be used for construction activities.

Operation phase

During the operation phase, maintenance and repair activities may create dust and other airborne pollutants that can impact air quality.

The methods to reduce and effectively manage the negative environmental impacts for both phases of the sub-project that may occur are provided in Table 4-1 and Table 4-2.

3.2.2 Water Use

Construction phase

The contractor for construction works has not yet been selected. The contractors to be involved in the construction phase will be selected by tender. During the construction phase, daily potable water demand of personnel will be met by carboys purchased from licensed companies according to the list of licensed companies announced by the Ministry of Health in compliance with the requirements of the Regulation on Water Intended for Human Consumption and Public Health Law.

The maximum number of the personnel planned to be employed during the construction phase of the subproject is about 50 people. The average daily water consumption per person is

regarded as 272 L/day (TurkStat-2022)⁹, and the estimated daily amount of water that will be required during the construction phase of the sub-project is calculated below.

$$\text{Daily Water Demand} = 50 \text{ person} \times \frac{272 \text{ L}}{\text{person} \times \text{day}} = 13.6 \text{ m}^3/\text{day}$$

Operation phase

During the operation phase of the sub-project, there will be no continuous water use daily.

3.2.3 Wastewater

Construction phase

The wastewater to be generated during the construction phase will be domestic wastewater from the personnel. 50 personnel will be employed during the construction phase of the sub-project.

Daily discharged wastewater per person is regarded as 138 L/(person.day) according to TurkStat data (2022)¹⁰, and the estimated daily amount of wastewater to be discharged during the construction phase of the sub-project is calculated below.

$$\text{Daily Wastewater Amount to be Discharged} = 50 \text{ person} \times \frac{138 \text{ L}}{\text{person} \times \text{day}} = 6.9 \text{ m}^3/\text{day}$$

The existing sewage system will be used to discharge the wastewater generated by the personnel.

Operation phase

Since there will be no continuous water use during the operation phase of the sub-project, constant daily wastewater generation is not expected.

3.2.4 Waste Management

Pollution prevention

Throughout the life of the sub-project, workers will be recruited from the region as much as possible.

⁹ TurkStat, Daily Amount of Water Usage Per Capita (Liters/Person-Day) Data (Düzce), 2022

¹⁰ TurkStat, Daily Amount of Wastewater Discharged Per Capita (Liters/Person-Day) Data (Düzce), 2022

Priority will be given to working with local suppliers and procuring services from the local employees in the service industry, as much as possible (fuel supply, vehicle maintenance/food, beverage, and spare parts supply, etc.).

Resource efficiency and management actions will be taken; use of renewable energy and energy efficiency measures, reducing the carbon footprint, financing for green building, responsible supply chain management and green procurement.

Construction phase

Domestic Solid Waste

Domestic solid waste will be generated from the personnel who will work during the construction phase of the sub-project. The domestic solid waste generated will mostly consist of organic waste.

The amount of domestic solid waste from the personnel is calculated according to the data established by TurkStat (2022)¹¹ that an average of daily 0.93 kg of domestic solid waste will be generated per capita in Düzce.

$$\text{Daily Amount of Solid Waste to be Generated} = 50 \text{ person} \times \frac{0.93 \text{ kg}}{\text{person} \times \text{day}} = 46.5 \text{ kg/day}$$

The domestic solid waste generated will be stored in available trash containers and collected by the district municipality via garbage trucks. The waste collected will be delivered to licensed solid waste landfills.

Packaging Waste

The ratio of recyclable packaging waste is in metropolitan cities in Türkiye as follows. 48 kg/P-year paper and board, 14 kg/P-year plastic, 6 kg/P-year nylon, 8 kg/P-year metal, 8 kg/P-year glass, in total 84 kg/P-year¹².

$$\begin{aligned} \text{Daily Amount of Packaging Waste to be Generated} &= 50 \text{ person} \times \frac{84 \text{ kg}}{\text{person} \times \text{year}} \times \frac{1 \text{ year}}{365 \text{ day}} \\ &\cong 11.5 \text{ kg/day} \end{aligned}$$

Packaging wastes made of plastic, metal, glass, paper and board, composite and similar materials should be collected separately from other wastes and given to Packaging Waste Collection, Segregation and Recovery Facilities licensed by the MoEUCC.

¹¹ TurkStat, Daily Amount of Municipal Waste Per Capita (Kg/Person-Day) Data (Düzce), 2022

¹² Solid Waste Management and Recovery, Environmental Protection and Packaging Waste Recovery and Recycling Foundation (ÇEVKO) Publications

Excavation and Construction Waste

In accordance with the Regulation on the Control of Excavation Soil, Construction and Demolition Wastes, the producers of excavated soil and construction waste are responsible for transferring the excavated soil and generated construction waste to storage areas that have necessary permits, using transportation vehicles with the necessary transportation permits.

The excavation soil and construction wastes generated during the construction phase of the sub-project will be transferred to the permitted landfill belonging to the Düzce Municipality (DM).

Hazardous Waste

At each workplace, an assessment will be carried out to identify any Asbestos Containing Materials (ACMs) that may be present. As a first attempt, during renewal of the pipelines, existing pipes of water supply network that may contain asbestos will be left under the ground in the existing location. If they need to be removed because of new pipe installation requirements, then removal process will be executed, and specific precautions will be determined in line with the Regulation on Health and Safety Measures in Working with Asbestos dated 25.01.2013 (OG No 28539). Besides, disposal of ACMs as a hazardous waste will be carried out in accordance with the Regulation on Waste Management dated 02.04.2015 (OG No: 29314). In this respect, the Generic Asbestos Management Plan, which is largely compliant with the national legislation, is presented in Appendix-F. Hence, it is recommended that this plan for managing ACMs is developed by the Contractor prior to construction. Relevant mitigation measures to be taken for the waste management are given in Table 4-1.

During the construction phase of the sub-project, petroleum-based products, such as lubricants, hydraulic fluids, or fuels, may result in the potential for release into the environment during storage, transportation or use in equipment. Additionally, contaminated / oily fabrics, cloths and filters, contaminated packaging materials, toner cartridges, paint residues, fluorescent tubes, cleaning cloths and filters, hazardous insulating materials and pressurized tubes are other hazardous wastes that are likely to be generated.

Hazardous wastes that are likely to be generated during the construction phase will be collected separately in specific vessels / containers at the construction site and stored in a specific area that is established on the concrete floor and connected to the drainage channel to prevent it from reaching the ground or other bodies of water. A roof or overhead cover will be provided for the hazardous waste storage area to protect waste containers from rainwater exposure, thus preventing spills, leaks, and environmental pollution while safeguarding workers' safety. Additionally, prevailing wind directions will be considered when designing the storage area to prevent the dispersal of particulate matter, dust, or contaminants, thereby reducing health risks to workers and the environment. The waste generated should be temporarily stored at their source in line with the criteria set based on their types. The

temporarily stored waste will be labelled with the phrase 'hazardous or non-hazardous waste' as well as the waste code, the amount of waste stored and the date of storage.

Waste will be delivered to licensed disposal / recycling facilities with separate waste codes. Hazardous waste will be transported by licensed vehicles within the scope of the "Communiqué on the Waste Transportation by Road".

Waste Batteries and Accumulators

Waste batteries will be collected separately in waste battery bins. The collected waste batteries will be delivered to the Portable Battery Manufacturers and Importers Association (TAP) (authorized waste battery collector) for disposal at the licensed facility.

These wastes will be handled in accordance with the procedures and principles of the Regulation on the Control of Waste Batteries and Accumulators. If not handled properly, these wastes can have an adverse impact on human health and the environment.

Medical Waste

During the construction phase, medical waste will be generated from first aid responses. According to the Regulation on Control of Medical Waste, medical wastes stored in specific containers and areas will be collected by licensed vehicles and delivered to licensed disposal companies.

It is expected that the medical waste produced during the construction phase will be generated in very small amounts due to first aid actions. While medical waste is expected to be generated in trace amounts, they can lead to significant effects such as contracting infectious diseases if not handled properly.

Operation phase

Maintenance and repair activities may generate waste materials that require proper disposal. Waste generated during maintenance and repair activities should be segregated into different categories based on their type and potential for reuse or recycling. This can include categories such as hazardous waste, recyclables, and non-recyclables. Each category of waste should be disposed of in the appropriate manner, according to national regulations.

3.2.5 Noise

Construction phase

Noise will be generated from vehicles, machinery and equipment that will operate during the construction activities of the sub-project.

The list of vehicles, machinery and equipment planned to be used in the sub-project construction works is below.

- Mini cylinders (compression operations),
- Asphalt cutting machine,
- Trucks,
- Excavators,
- Diggers.

The equipment and machines used during the construction will be monitored and maintained at regular intervals. In case of complaints regarding noise, noise measurements will be made for impact area.

Operation phase

No activities that could be considered as a noise source is expected during the operation phase of the sub-project except for the repair and maintenance activities that will be local and short termed.

3.2.6 Land Use and Soil Quality

Construction phase

A change in land use is not expected since the sub-project area is located within the boundaries of the existing settlement zone, and work will be conducted along open public roads, that is under the responsibility of the DM, and at the Municipality service area, and the affected areas will be restored after work. Since there will be no fuel or similar hazardous chemical storage within the sub-project area, it is not anticipated to experience spill-like accidents. Measures to be taken to prevent soil pollution are given in Table 4-1.

Operation phase

No change in land use is foreseen during the operation phase of the sub-project.

No change in soil quality is expected during the operation phase of the sub-project since there will be no storage or soil related activity.

3.2.7 Landscape

Construction phase

There are residential areas, hotels, schools, health facilities, and commercial units around the sub-project area. A temporary disturbance on landscape due to construction is expected, but it will be of short duration.

Operation phase

Since the sub-project is the infrastructure project, no landscape effect is expected during operation phase.

3.2.8 Biodiversity and Protected Areas

Construction phase

Considering the location of the sub-project, no negative impact on the biological environment is expected during the construction phase.

Operation phase

Since the sub-project is the infrastructure project, no biodiversity effect is expected during operation phase.

3.2.9 Population / Demography

Construction and Operation phase

Since the construction works for the sub-project will be carried out in central neighbourhoods, it is foreseen by the Düzce Municipality (DM) that no accommodation will be built for the employees within the scope of the sub-project. However, containers can be placed on the sub-project area for those who will work on the sub-project to rest, eat and also for sanitary facilities. These containers will meet standards for worker accommodation prepared by International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD) and approved by the WB.

On the other hand, in the settlements that are expected to be affected during the construction phase of the sub-project, no negative impact induced by the sub-project is anticipated regarding the population level.

Required work permits for the workers employed as part of the sub-project will be monitored by the DM, and recruitments will be carried out within the framework of legal practices. Recruitments will be performed by checking the legal work permits to meet the labour conditions during construction and operation periods. In accordance with the 4857 numbered and 10.06.2003 dated Labour Law and WB ESS2, the LMP of the TEFWER project, and child labour or forced labour will not be allowed.

DM has not yet entered into a contract with a Contractor for the construction phase, and any Contractors to be involved in the construction phase of the sub-project must act in accordance with the commitments and standards provided within the scope of ESMP and prepare own Labour Management Plan based on the parent project LMP.

For the avoidance of any negative impact on the local communities due to presence of workers during the construction phase and their potential interaction with community members, contractors are responsible for providing Code of Conduct (CoC) training to each worker and ensuring that all workers are informed about the this.

3.2.10 Land Acquisition

No land acquisition will be required within the scope of the sub-project. Similarly, there will be no physical and/or economic displacement within the scope of the sub-project. Any unintended damages to adjacent land and structures during construction will be compensated and repaired by the Düzce Municipality and contractor.

3.2.11 Vulnerable/Disadvantaged Groups and Stakeholders

Construction and Operation phase

The sub-project construction will have short-term, temporary effects. Vulnerable/disadvantaged groups in the area are not expected to be specifically negatively affected. However, the general population, including VGs, may face temporary negative impacts during construction. Mitigation measures for these impacts are outlined below.

Children:

Negative Impacts: Increased risk of accidents due to construction activities, exposure to hazardous materials or equipment, disrupted routines affecting education and sleep.

Mitigation Measures:

- Erecting safety barriers and warning signs around construction sites.
- Conducting safety awareness programs in schools and communities.
- Implementing traffic management plans to ensure safe passage to schools.
- Scheduling noisy construction activities during school hours to minimize disturbance.

People over 65 years of age:

Negative Impacts: Physical strain due to noise and dust, increased risk of falling or tripping around construction sites, disrupted access to healthcare facilities.

Mitigation Measures:

- Providing alternate routes for pedestrians, especially near healthcare facilities.
- Offering transportation assistance for medical appointments.
- Implementing noise reduction measures during sensitive hours.

People with chronic disorders or special care needs:

Negative Impacts: Disrupted access to medical services, exacerbation of health conditions due to stress or environmental factors, increased vulnerability to infections.

Mitigation Measures:

Establishing temporary healthcare facilities or mobile clinics near affected areas.

Providing advance notice of construction activities to medical service providers.

Ensuring clear and accessible routes to existing medical facilities and clinics are maintained or alternative routes are provided during construction periods.

Disabled people:

Negative Impacts: Limited mobility due to blocked pathways or inaccessible infrastructure, heightened risk of accidents or discrimination.

Mitigation Measures:

Ensuring compliance with accessibility standards in all construction activities.

Providing alternative transportation options for disabled individuals.

Conducting accessibility audits and addressing barriers promptly.

Training construction personnel on interacting with and assisting disabled persons.

Refugees/Immigrants:

Negative Impact: Language barriers and lack of awareness may lead to safety risks and hinder access to necessary information and services.

Mitigation: Provide multilingual information and outreach programs to ensure refugees and immigrants are informed about the construction activities and safety measures. Offer assistance and support services to help them navigate any disruptions.

Throughout the sub-project's lifespan, it is crucial for stakeholders to have information about the sub-project's route, duration, and alternative passages. Special efforts should be made to identify disadvantaged and vulnerable stakeholders who might be affected differently or face challenges in participating and engaging in the development process. Stakeholder identification is an ongoing process that will require regular review and updates. To identify sub-project stakeholders and establish methods for their future participation, a Stakeholder Engagement Plan (SEP) has been prepared for this sub-project, guiding the DM in consultation methods with stakeholders.

During the construction phase, consultations with stakeholders will take place, allowing for the creation of special passages for vulnerable/disadvantaged individuals or groups, such as the elderly, pregnant women, young children, and disabled individuals, by implementing additional measures. Given that the work will be conducted in publicly accessible areas, public access to these areas will be restricted in any way necessary. If trenches need to be left open overnight, the contractor will ensure that the area is adequately lit, appropriate signage is provided, and barriers are installed.

3.2.12 Economy / Employment

Construction phase

It is anticipated that the sub-project will result in temporary employment. Priority will be given to contributing to the local economy through the use of local materials during the construction and to paying attention to the procurement of various goods and services from local resources.

In addition, the negative impacts that local businesses in the region where construction activities will be carried out may face and the measures to be taken for these negative impacts are given below.

Negative Impacts

- **Disruption of Access:** Construction activities may impede or restrict access to businesses, leading to a decrease in foot traffic and customer visits.
- **Noise and Dust:** Noise and dust generated by construction can deter customers and affect the ambiance of the business premises, leading to reduced patronage.
- **Traffic Congestion:** Increased traffic congestion due to construction vehicles and road closures may discourage customers from visiting local businesses.
- **Loss of Parking Spaces:** Construction activities may result in the loss of parking spaces near businesses, making it inconvenient for customers to park.

Mitigation Measures:

- Coordinate with local authorities to minimize disruptions and schedule construction activities during off-peak hours whenever possible.
- Maintain clear signage and alternative routes to ensure uninterrupted access to businesses throughout the construction period.
- Schedule noisy activities during non-business hours or weekends to mitigate disturbances to business operations.
- Develop traffic and transport management plan to minimize congestion and ensure smooth flow of vehicles near business areas.
- Designate temporary parking areas for construction vehicles to free up parking spaces for customers.
- Provide financial assistance or grants to affected businesses to help offset temporary revenue losses.
- Implement a robust monitoring system to track the impacts of construction on local businesses and adjust mitigation measures accordingly.
- Solicit feedback from business owners and stakeholders regularly to identify any emerging issues and address concerns promptly.

Operation phase

With the implementation of the sub-project, only personnel will be needed for maintenance and repair works. The number of personnel within the existing structure of the DM is sufficient for these maintenance and repair works and there will be no need to recruit personnel for the operation period.

3.2.13 Labour Conditions

The DM will be responsible for human resources for construction and operation phases. Türkiye is currently in the middle of a harmonization process with the European Union, and labour laws are being reviewed to ensure harmonization. The sub-project will comply with 4857 numbered and 10.06.2003 dated Labour Law as well as the principles and standards of the International Labor Organization convention and WB Environment and Social Standards ESS2 Labour Force and Working Conditions, and adherence to the LMP of TEFWER.

Contractor will develop own site-specific Labour Management Plan on the basis of the LMP of TEFWER prior to commencement of any civil works in the sub-project area. Based on the national principles in the International Labor Organization convention, the DM will take the following measures:

- Not employing children under the age of 18 nor any forced labour,
- Eliminating forced labour and ensuring a Human Resources Policy compatible with the European Convention on Human Rights and the Turkish Constitution,
- Eliminating discrimination based on language, race, gender, political thought, philosophical belief and religion in business relations,
- Ensuring workers' access to the right of collective bargaining (Law No. 6,356 on Trade Unions and Collective Bargaining Agreements, and Labor Law No. 4,857),
- All employees will be issued written employment contract defining work, work hours, wages, rights, and duties, etc. and,
- Ensuring access to the sub-project Grievance Mechanism (GM) that is functional effectively.

The Labor Law (No: 4857 Date: 10.06.2003) applies to all workplaces and employers, employees, employer representatives and worker representatives, regardless of the business activity.

3.2.13.1 Training

According to OHS Site Training Plan, the occupational health and safety training will be provided to the employees of contractor as part of each contract executed within the scope of the sub-project, which will at least include the subjects provided in the Regulation on the Procedures and Principles of Occupational Health and Safety Training of Employees, and the Contractor's Environmental and Social Management Plan (C-ESMP) to be developed by the contractor, based on this ESMP, will contain the plans regarding the training to be provided to personnel.

Additionally, the contractor will provide training to its personnel, who will work during the performance of the work, on the environmental and social impacts that will be considered during the on-site work and are included in this ESMP document. The contractor will train its

personnel in the fulfilment of all measures to prevent and/or minimize environmental and social impacts during the on-site construction, subject to inspection by the DM.

The contractor will ensure that the on-site personnel are primarily trained in the issues that include the risks and protection measures specific to the worker's job and post before starting work.

In addition, training on risks that may arise from the circumstances, such as changes in post or job, replacement of work equipment or application of new technology and work instructions training, will be provided.

Training programs will be repeated periodically considering the changing and emerging risks provided in the Regulation on the Procedures and Principles of Occupational Health and Safety Training of Employees. Information and training will be provided not only for personnel, but also for the measures to be taken for public health and safety.

The contractor is required to separately and measurably demonstrate the knowledge, skills, behaviours, and attitudes that the on-site personnel will have regarding occupational health and safety, environmental and social issues.

The Contractors are obliged to give CoC training, including Gender Based Violence (GBV) and Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH), to each worker so that the presence of workers who will work during the construction do not result in any disturbance/conflict within the local communities and their interaction with community members do not result in inappropriate behaviours/misconducts. The DM will ensure that the Contractors develop a CoC and that all workers are informed and receive training about it before starting to work. A CoC will be part of the employment contract to be signed by all workers at the job start-up phase. The training given in the CoC will be checked and reported by Environmental and Social Experts. Scaling and evaluation will be carried out at the end of the training provided. According to the results of the evaluation, training material will be updated by adding the learnings from near misses or incidents when happen.

3.2.14 Occupational Health and Safety

If the necessary measures are not taken during construction works, this may especially result in accidents that will threaten the health and safety of workers. In this regard, the DM and the contractor are liable for providing a safe and healthy working environment for workers. During the construction phase, workers may be exposed to a range of hazards, such as exposure to noise, dust, heat, hazardous chemicals, working at height, working in confined spaces, working with electrical equipment's, working with small cranes, etc. Most common OHS Risk areas and general mitigation measures are provided in Appendix-E.

Occupational accidents and injuries may take place during these activities if potential risks at various stages of the sub-project are not managed properly. Potential accidents occurring

during the operation phases of sub-project may lead to potential health concerns associated with non-routine risks.

Dust suppression techniques such as the application of water or non-toxic chemicals should be used to minimize dust from vehicle movements. During the operation, the storage, use and disposal of hazardous materials will be strictly controlled in alignment with occupational health and safety, near-miss accidents, work permits, driving permits, height work permits, and environmental protection and good industrial practices.

Employees will receive adequate information about job descriptions, responsibilities and risks that may threaten occupational health and safety. Employees will be provided with the necessary personal protective equipment (PPE) that meet national and international standards as well as information on work and occupational safety provided through regular training.

The DM will require all employees and contractors to adhere to local and international health and safety legislation and guidelines. This will include using OHS Management Plan and suitable PPE (safety helmets, ear protectors, protective gloves, etc.), implementing a management system for activities associated with health and safety risks, keeping available the permits for working at height, working in hot work permits (welding, cutting, grinding), and driving vehicles, and adhering to these rules.

Lastly, the Occupational Health and Safety Management Plan and Emergency Preparedness and Response Plan (EPRP), which will include the response measures for the risks and impacts associated with the works to be conducted, in case of accident, sabotage, fire and electric shock, infectious diseases, earthquake, dent, flood, storm and chemical spill, will be developed with the regular exercises according to regulation by the DM for operation phase and by the Contractor for the construction phase.

3.2.15 Community Health and Safety

Community health and safety issues are associated with risk factors that may arise from construction and operation phases of the sub-project. It is anticipated that the local people will be affected by the resulting dust and dust that may contain asbestos (in case the relevant mitigation measures specified in Table 4-1 are not taken during the intervention to old water pipeline), noise and traffic, especially during the construction phase.

In this context, all mitigation measures in Table 4-1 that may affect communities at the sub-project area's Aol will be strictly adhere to.

Besides, to minimize the impact of the traffic activities that are expected to intensify during the construction phase, the working hours will be adjusted according to the peak hours of transportation. The views of relevant stakeholders will be sought to determine a common working strategy for construction activities to be performed especially in front of and/or around areas, such as schools and hospitals. The construction activities to be performed around or in

front of hospitals and/or healthcare providers will be planned not to hinder the public access to these services. Special crossings will be developed by taking additional measures for the elderly, pregnant women, people with small children and the disabled. The DM and Contractors will comply with the measures presented in this ESMP to create temporary security measures so that the construction works to be carried out around the mosque, hospitals, educational institutions, and the residences located next to the sub-project area will not cause unjust treatment to the citizens.

In addition, due to the sewerage construction work, partial water outages can be expected in neighbourhoods which are in the scope of the sub-project. It can have a negative impact on both residents and public houses. In case of any planned water outage, hospitals, schools, public houses, and residents will be warned at least two (2) days in advance through communication channels such as mukhtars, sending text messages, publishing an announcement on the DM's website.

Accidents and failures can be expected in the site of construction. The DM is responsible to prevent the adverse impacts of the construction phase over the community. However, since the scope of the sub-project is not land but a network, it will not be possible to encircle the construction site completely. Yet, pits and dangerous materials, which will be present at the construction site will be managed by safety standards. Necessary warning signs and with physical barriers with no gaps in between will be provided by the DM to protect the community health and provide safety.

Existing roads will be used within the scope of construction works. Possible damage to road surfaces due to traffic caused by heavy machinery will be rehabilitated by the Contractor. In case of any damage to the infrastructure elements on private lands due to construction activities, it will be compensated by the Contractor. Mitigation measures will be implemented by the Contractor. In order to make a clear assessment, the present condition of the roads and existing infrastructure can be documented (e.g. by photographs) by the contractor before the start of construction works. DM will monitor and manage the compensation process for these damages.

Communities in the vicinity of the sub-project area may be exposed to physical hazards, such as exposure to noise, exposure to dust emissions, hazard from electricity, traffic accidents, etc., associated with sub-project components during the construction phase. Additionally, confined spaces or falling hazards may occur due to unattended infrastructure. Construction activities will be announced to the affected local people, businesses, and governmental bodies at least two (2) days in advance. In this context, within the scope of the Regulation on Coordination Centres of Metropolitan Municipalities, Infrastructure Coordination Centre (AYKOME) and Transportation Coordination Centre (UKOME) will continue to use the Infrastructure Information System (AYBIS) to systematically carry out, monitor and control the documentation of all excavation permits (electricity, gas, telephone, etc.) in the sub-project area. Sub-project work areas will not be opened to the public until all checks have been

coordinated, approved and completed by the concerned interested parties including especially electricity, gas distribution companies in the sub-project area. A Community Health and Safety Management Plan of the sub-project will be prepared, developed, and implemented to include this coordination throughout the lifetime of the sub-project.

Additionally, confined spaces or falling hazards may occur due to unattended infrastructure. Construction activities will be announced to the affected local people, businesses, and governmental bodies at least two (2) days in advance through communication channels such as mukhtars, sending text messages, publishing an announcement on the DM's website.

3.2.16 Traffic and Transportation

Since there is no activity such as transportation of heavy items or construction crew that will create heavy traffic in the sub-project area where the sub-project will be carried out both during the construction and operation periods, no additional impact requiring special mitigation measures (such as new access road arrangements or arrangements at critical locations) are anticipated.

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

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

3.2.17 Cultural Heritage

Construction phase

The sub-project's construction will primarily progress along the existing road route. Particularly for the area where underground horizontal drilling will take place, prior to commencing construction activities, an opinion letter will be obtained from the Museum Directorate. When the relevant letter is obtained, it will also be submitted to ILBANK. To manage activities in terms of cultural heritage, a chance find procedure has been prepared (see Appendix-D). The contract with the contractor participating in the construction work will include clauses related to the application of the chance find procedure. As an appendix to the contract, the chance find procedure will be shared with the contractor, and it will be ensured that the relevant personnel are knowledgeable and trained in this regard. In the event of any archaeological remains or artifacts being discovered during construction, all activities will be halted, recorded

as specified in the chance find procedure, and reported to the Museum Directorate in accordance with Article 4 of Law No. 2863.

Operation phase

During the operational phase of this sub-project, it is essential to acknowledge that maintenance and repair activities of the water system will be limited to routine tasks, ensuring the continued functionality of the existing infrastructure without posing any adverse effects on cultural heritage.

Nevertheless, it is imperative to remain vigilant and consider the potential for unexpected circumstances or emergency situations that might necessitate excavation activities beyond the current routes or deeper excavation. In such instances, there exists a possibility of encountering cultural heritage finds. The sub-project's operational team will be well-prepared to address these contingencies, adhering to protocols for the chance discovery of cultural heritage artifacts, ensuring their preservation, documentation, and the required reporting to the relevant authorities.

All personnel involved will receive training on the chance find procedure underscoring the sub-project's commitment to minimizing any potential negative impact on cultural heritage during the operational phase. The respect and safeguarding of cultural heritage sites are paramount for the sub-project's sustainability and will remain a fundamental consideration across all sub-project stages.

3.3 STAKEHOLDER ENGAGEMENT

A stakeholder is any person, organization, or group that may be affected by the sub-project or has an interest in it. Stakeholder participation is crucial for the sub-project's success and sustainability. Engaging stakeholders allows for more effective design and implementation by considering the needs and concerns of local communities. Special effort is necessary to identify disadvantaged and vulnerable stakeholders who may be disproportionately or differently affected.

Stakeholder Engagement Plan (SEP)

A SEP has been prepared to identify sub-project stakeholders and create participation methods. The SEP outlines the following:

- **Identification of Stakeholders:** This is an ongoing process requiring regular review and updates. Stakeholders are grouped based on their connection to the sub-project.
- **Engagement Tools:** A range of tools will be used for stakeholder engagement, maintaining and establishing communication mechanisms.
- **Grievance Mechanism (GM):** This will guide the DM in managing the stakeholder participation process, recording engagement activities through the SEP consultation form.
- **Consultation Meetings:** These will be held with affected groups after the draft ESMP report is completed, with notifications given ten days in advance.

Responsibilities

Specific personnel will be assigned to implement and manage the SEP and GM, with the final responsibility belonging to the DM. The DM will keep the following information up to date and accessible:

- Key sub-project phases and schedules
- Disruptions related to the sub-project
- Important consultations/meetings
- Environmental, health, and safety performance

For more detailed information, please refer to the SEP.

4 ESMP MATRIX: RISK AND IMPACTS, MITIGATION, MONITORING

4.1 RISK AND IMPACTS, MITIGATION

Table 4-1. ESMP Construction Phase Matrix Table of the Sub-project

Ref.	Impact Description	Sub-Project Phase	Sensitive Receptor(s)	Management/ Mitigation Measure	Responsibility for Implementation of Mitigation Measures)	Relevant Management Plan or Procedure
1	Labour and Working Conditions					
1.1	Inadequate workers health and safety conditions	Construction	Workers at the Sub-project Area	<ul style="list-style-type: none"> ▪ The Project Implementation Unit (PIU) to be formed by the DM and the contractor's project team will include staff(s) (at least one environmental and social expert and "A" Class OHS expert) who will take part in full-time and effectively control the implementation of the Sub-project. Also, The DM will make sure that the measures provided below are taken by the contractor and enforce necessary actions/sanctions in case lack of these measures on site. In this regard, most common OHS risk areas and corresponding general mitigation measures throughout the life of the sub-project are provided in Appendix-E. ▪ Including sub-project engineers, management team and workers shall be informed about job descriptions, responsibilities, and risks according to be prepared "Sub-project OHS Management Plan". The workers will be provided working conditions in accordance with the Labour Law (No: 4857 Date: 10.06.2003) and the LMP of TEFWER Project (such as wages, working hours, payment for overtime hours, period of rest, social security benefits). The workers will be provided with the necessary personal protective equipment and information on works and occupational safety through regular trainings. Before the construction works starts, a Construction Site OHS Risk Assessment Plan shall be prepared for all works to be carried out and necessary measures shall be taken to avoid related risks. Emergency Preparedness and Response Plans (EPRP)s shall be prepared for possible accidents and emergency situations (i.e., fires, earthquakes, floods, etc.) events and emergency teams shall be established and drills and training shall be carried out in line with the emergency scenarios. ▪ OHS Management Plan will be prepared to outline all the actions and procedures for ensuring OHS for all workers by the contractor during the construction period and by the DM during the operation period. ▪ To control the cases (fire, earthquake, etc.), which may occur during the construction activities under the sub-project, and which require urgent action, an EPRP and an OHS Management Plan will be prepared by the contractor and shared with all employees. The contractor will prepare a training program regarding the plans. ▪ The DM will ensure a safe working environment for the workers and will require all employees and contractors to adhere to local and international health and safety legislation and guidelines. Workers will be provided with all necessary Personal Protective Equipment (PPE) (hard hats, safety harnesses, protective coveralls, glasses, gloves, armour-clad shoes, etc.). ▪ Smoking areas will be allocated at the construction site. ▪ Appropriate hand and face washing facilities will be provided for the employees, and shower facilities for dusty works. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ OHS Management Plan ▪ Emergency Preparedness and Response Plan ▪ Construction Site OHS Risk Assessment Plan ▪ Labour Management Plan (based on the TEFWER's Labour Management Procedures (LMP))

			<ul style="list-style-type: none"> ▪ Technical and OHS training, including the CoC indicating the possible risks regarding the work site and the work to be carried will be given to workers by the contractor with a training plan including toolbox talks. These will include regular training to workers on COVID-19 symptoms and other epidemics, how to be protected and what to do when symptoms appear. Training will also be given in risks that may arise due to changes in the workplace or job, change of work equipment, application of new technology. Information and training activities will be carried out not only for the employees, but also about the measures to be taken for public health and safety. ▪ All employees will receive written contracts with job description, wages, working hours, rights and duties, Code of Conduct (CoC) etc. ▪ Workers will be required to comply with all national OHS regulations, WB ESSs and necessary inspections will be made. ▪ Contractor will prepare their site-specific Labour Management Plan on the basis of the LMP of TEFWER prior to commencement of any civil works in the sub-project area. ▪ All activities will be implemented in line with both the Law on Occupational Health and Safety (No:6331 Date:30.06.2012) and its relevant regulations, and the WBG EHS Guidelines. ▪ The contractor will assign full-time personnel with relevant certification and experience in charge of OHS and she/he shall lead OHS Program at the site. ▪ Emergency teams will be formed, and drills and training programs will be carried out in line with emergency scenarios. ▪ Employees will have a good command of EPRP, and the grievance will be reported to the authorized teams and resolved, if they require urgent action. ▪ Appropriate signposting of the sites will be provided and then workers will be informed of key rules and regulations to follow. ▪ First aid kit will be kept available at the construction site, taking into account that first aid response may be required before the casualty is referred to the nearest healthcare provider. ▪ First aiders will be provided according to the national regulation. ▪ Both trainings, incidents (fatalities, lost time incidents, any significant events including spills, fire, outbreak of pandemic or communicable diseases, social unrest, etc.) and near misses will be recorded. ▪ The DM will report details of any significant environmental or social incidents (e.g. fatalities, lost time incidents, environmental spills etc.) within 48 hours and submit an incident report, including Root Cause Analysis (RCA), precautions and compensation measures taken within 30 business days. ILBANK will forward the incident report to the WB immediately upon receipt from the DM. In addition, regular site tours will be conducted, safe situations and behaviours related to OHS will be observed and reported, unsafe behaviours and situations will be corrected by ensuring site discipline. ▪ The areas to be excavated will not be accessible except by authorized personnel. Loading and unloading activities will be carried out together with the persons who will supervise the personnel who will carry out the activity. ▪ Unauthorized access to the construction site will be restricted. The construction areas will be surrounded, and necessary security measures will be taken, no one will be allowed to enter except for the staff. If a trench needed to be left open for night, the sufficient illumination of the area shall be ensured by the Contractor and necessary signs shall be placed, and the area shall be enclosed with physical barriers without any gaps between. 		
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				<ul style="list-style-type: none"> ▪ Installation of concrete moulds, concreting, installation of water tank etc. may require working at height, working in confined space etc. Therefore, workplace relevant procedures such as Confined Space Entry Procedure, Working at Height Procedure, etc. will be prepared and work permit system will be applied in accordance with applicable national requirements and internationally accepted standards. ▪ Adequate and appropriate training in confined space hazard control, atmospheric testing, use of required PPE as well as the serviceability and integrity of PPE shall be verified before workers are required to enter a permitting confined space. In addition, adequate and appropriate rescue and/or rescue plans and equipment shall be in place before the worker enters the confined space. In the event of an accident, coordination will be established with the emergency response teams to ensure that the most accurate first aid is given. The EPRP will be revised in accordance with the operation period and necessary training will be given to workplace physician approved employees can enter to confined space. ▪ Only physician approved employees can work at height holding the height work permit will work at height, and safeguarding measures (guardrails, fall arrest) will be in place. ▪ The WBG General EHS Guidelines will apply. ▪ All equipment used during the construction phase will be kept in good working condition. Equipment that meets international standards in terms of performance and safety will be used. ▪ The contractor will assign a full-time staff responsible for OHS with relevant certification and experience and lead field practices. 		
1.2	Inadequate workers health and safety conditions related to asbestos	Construction	Workers at the Sub-Project Area	<ul style="list-style-type: none"> ▪ At each workplace, an assessment will be carried out to identify any Asbestos Containing Materials (ACMs) that may be present. As a first attempt, during renewal of the pipelines, existing pipes of water supply network will be left under the ground in the existing location. If they need to be removed because of new pipe installation requirements, then removal process will be executed, and specific precautions will be determined in line with the Regulation on Health and Safety Measures in Working with Asbestos dated 25.01.2013 (OG No: 28539). In this respect, the generic Asbestos Management Plan, which is largely compliant with the national legislation, is presented in Appendix-F. Hence, it is recommended that this plan for managing ACMs is developed by the Contractor prior to construction. This plan includes but not limited to: <ul style="list-style-type: none"> ▪ If ACMs are identified, the relevant authorities will be notified, and approval obtained before starting any work. The approval will specify the type of work that can be carried out and the requirements for safe removal and disposal. ▪ During asbestos removal, measures will be taken to prevent the release of asbestos fibres into the air. This can include wetting down the materials with water to prevent dust, using negative air pressure systems, and using airtight containers to transport the waste. ▪ Workers involved in asbestos removal will be provided with appropriate personal protective equipment, including respirators, gloves, and protective clothing. ▪ Asbestos-containing waste will be disposed of at designated facilities that are authorized to handle hazardous waste. The waste will be securely packaged, labelled, and transported to the facility in accordance with the regulations. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ Asbestos Management Plan

				<ul style="list-style-type: none"> ▪ The work area will be monitored for asbestos fibres during and after removal to ensure that the work is being carried out safely. Records of the work will be kept, including the type and quantity of ACMs removed, the methods used, and the disposal sites. ▪ Provisions of the Regulation on the Regulation on Health and Safety Measures in Working with Asbestos shall be complied with within the scope of the sub-project. ▪ During the demolition phase, under the supervision of the employer, asbestos removal workers, other workers in the workplace and employee representatives will be informed by the asbestos removal specialist. ▪ Regarding the works including a risk of exposure to asbestos dust, a risk assessment will be made by considering the type and physical properties of asbestos and the degree of exposure of workers. ▪ Necessary markings for asbestos will be posted at the work area and warning signs will be placed. ▪ Places reserved for food will be chosen outside the places with a risk of contamination with asbestos dust. 		
1.3	Inadequate workers health and safety conditions related to COVID-19	Construction	Workers at the Sub-Project Area	<ul style="list-style-type: none"> ▪ Guidance, directives and recommendations of Ministry of Health, Ministry, Labour, and Social Services, WHO and the WB shall be followed, and all relevant necessary measures shall be taken, both for occupational health and safety of employees and for workplaces, in case of an outbreak of any other pandemic/communicable disease including COVID-19. ▪ The contractor will ensure a safe working environment for the workers in line with international best practice and Turkish Legislation including the health and safety measures related to COVID-19 provided by the Ministry of Health and Ministry of Labour, and Social Services. ▪ Before the construction works start, a Risk Assessment study will be implemented for all works to be carried out. EPRP will be prepared and put into practice. Both the Risk assessment and EPRP will take into consideration the COVID-19 risks and other communicable disease risks, as relevant. ▪ Sub-project and site-specific OHS Management Plan based on construction site OHS risk assessment and that will also cover measures to address COVID-19 and/or any other pandemic/communicable disease risk, which will be in line with the WBG EHS Guidelines (both general and sector specific) will be developed before the commencement of works and implemented on site. ▪ OHS trainings and toolbox talks will be provided to the employees including the CoC indicating the possible risks regarding the work site and works to be carried out. These will include regular training to workers on COVID-19 symptoms, how to be protected and what to do when symptoms appear. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ OHS Management Plan ▪ Emergency Preparedness and Response Plan ▪ Construction Site OHS Risk Assessment Plan
1.4	Child labour, forced labour and unregistered employment contribution to economy	Construction	Local Parties, Workers, and Settlements within the Aol	<ul style="list-style-type: none"> ▪ Priority will be given to the local labour where possible and practical. ▪ Efforts will be exercised to allocate employment opportunities to the local parties and the settlements within the Aol. ▪ The work permits of the employees will be controlled within the scope of the sub-project, prohibiting child labour, forced labour, and child labour under the age of 18. ▪ A Contractor's Labour Management Plan, based on the TEFWER LMP, will be prepared by contractor prior to commencement of any civil works in the sub-project area. This plan 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ Labour Management Plan (based on the TEFWER's LMP) ▪ SEP

				<p>will manage the contractor's work process and ensure that written contracts are issued to all workers.</p> <ul style="list-style-type: none"> Discrimination in the workplace will be eliminated. Necessary measures will be taken by contractor to make sure that workers coming from outside the city will be given a training program on dialogue and communication with local communities, and that there are no social or cultural issues between host communities and external workers. It is the DM's responsibility to ensure that the contractor complies with the determined criteria. 		
1.5	Improper working conditions, Child labour forced labour and unregistered employment. (GBV/SEA/SH)	Construction	Workers at the sub-project area	<ul style="list-style-type: none"> Workers will be provided access to the Workers' Grievance Mechanism (GM) and will be informed about this mechanism. Information on GBV/SEA/SH service providers should be shared during public consultations. The sub-project GM should be designed to receive GBV/SEA/SH grievances anonymously and ensure they are addressed in a confidential and sensitive manner. Relevant sub-project staff should be trained in order to refer GBV survivors to existing identified service providers and ensure that they are provided services promptly. The CoC for workers will include the prohibition of GBV/SEA/SH. All workers will be given training on avoidance of discrimination and CoC. The trainings given to the employees will be explanatory about the concepts of SEA/SH and GBV. At the same time, through the trainings, it will be ensured that workers learn the GM of the sub-project (explained in detail in the sub-project's SEP document) and the steps to be followed in exercising their legal rights. Access to the GM will be easy and effective. The GM officer designated for the sub-project will be announced to all employees during the trainings to be given before starting work. There will be brochures and posters containing the GM and the contact information of the authorized person in places such as the cafeteria, canteen and service areas used by the employees. Minimum legal labour standards will be met (child/forced labour, anti-discrimination, working hours, minimum wages) as per International Labour Organization (ILO) regulations. Compliance with the LMP of the sub-project and the Contractor's Labour Management Plan, prepared by contractor, and which is subject to approval, will be ensured by the DM and Supervision Consultant. Workers will be provided hygienic and adequate facilities. Workers will be provided access to primary healthcare on site, enabling the provision of prescriptions. Discrimination based on language, race, gender, political thought, philosophical belief, and religion will be avoided in business relations. Workers will be issued a written contract stipulating working hours, wages, rights, and duties etc., and the CoC. 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> Labour Management Plan (based on the TEFWER's LMP) SEP
2	Resource Efficiency and Pollution Prevention and Management					
2.1	Failure to set sustainable and resource	Construction	Local Parties and Settlements within the Aol	<ul style="list-style-type: none"> Resource efficiency and management actions will be taken; use of renewable energy and energy efficiency measures, reducing the carbon footprint, financing for green building, responsible supply chain management and green procurement. 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (implementation) 	<ul style="list-style-type: none"> C-ESMP Environmental and Social Management Report (ESMR)

	efficiency goals ¹³				Supervision Consultant (supervision)	
2.2	Air pollution from construction works (Dust emissions, Exhaust gases from equipment and vehicles)	Construction	Sub-project's Aol	<ul style="list-style-type: none"> ▪ Dust from outdoor sources will be minimized by employing control measures such as covering the piles and increasing the moisture content. ▪ Dust suppression techniques such as the application of water or non-toxic chemicals will be used to minimize dust from vehicle movements. ▪ Close or cover trucks for the transport of materials. Spraying water on the ground where dust is generated, disposing of excess material, and cleaning the location upon the finalization of works. Protective covers or curtains for zone where the largest amounts of dust are generated. ▪ Truck loading and unloading operations will be carried out with due care, and materials will be prevented from scattering around. ▪ Modern equipment and vehicles that can meet the applicable emission standards will be selected for construction works. ▪ All vehicles will have exhaust emission permits, and all vehicles will be regularly maintained. ▪ Exhaust systems and emission levels of machinery and vehicles will be checked by the contractor. ▪ Sub-project GM will be implemented. ▪ In case of any complaints, air quality measurement will be carried out at the nearest sensitive receptors by an authorized environmental laboratory, and the results will be recorded. ▪ Speed limits will be set for construction equipment, and actions will be taken to ensure that such limits are complied with. ▪ During transportation, excavated materials will be covered with nylon canvas or materials with grain size larger than 10 mm. ▪ Any damage caused by inadequate dust suppression measures (i.e. pollution of the surrounding area, transport to a residential area by wind, dust deposits by the wind, etc.) will be compensated by the contractor. ▪ Compliance with the air emission limit values stipulated in national legislation and WBG General EHS Guidelines will be ensured. ▪ Restricting works during daytime if necessary (e.g. 7AM to 5 PM). 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ Construction Site and Traffic and Transport Management Plan ▪ SEP
2.3	Noise from construction works (Increase in noise and vibration levels)	Construction	Sub-project's Aol	<ul style="list-style-type: none"> ▪ Residents living near the sub-project area will be informed during the construction phase. ▪ Construction works will be planned in consultation with local communities, and operations with the highest noise generation potential will be scheduled during the time of the day that will cause minimum disturbance. ▪ Noise control devices, such as temporary noise barriers and deflectors, will be used for operations causing impact as well as exhaust silencers for combustion engines. ▪ Use of roads close to the settlements in transportation activities for the sub-project will be avoided or minimized. ▪ Equipment and vehicles used externally will be regularly maintained. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ Construction Site and Traffic and Transport Management Plan ▪ SEP

¹³ As mentioned in the United Nations Development Cooperation Strategy Türkiye 2016-2020 Government of The Republic of Türkiye and The United Nations System in Türkiye, Sustainable, Inclusive Growth and Development Goals.

				<ul style="list-style-type: none"> ▪ "Low noise" equipment will be used as much as possible during the construction phase. Where construction equipment is provided with impermeable acoustic covers or enclosures, covers will be kept closed while equipment is in operation. ▪ When equipment is not working, they will be turned off or reduced to the minimum level. ▪ Vibration levels will be monitored in case of complaints, and measures will be taken to reduce vibration if standards are exceeded. ▪ Noise measurement will be carried out at the nearest noise sensitive receptors by an authorized environmental laboratory, in case of any complaints. ▪ Compliance with the noise limit values stipulated in national legislation and WBG General EHS Guidelines will be ensured. ▪ Restricting works during daytime if necessary (e.g. 7AM to 5 PM). Establish schedules and/or other forms of specific limitations for works. 		
2.4	Waste management failure, pollution from hazardous waste	Construction	Sub-project's Aol	<ul style="list-style-type: none"> ▪ All non-waste and excavated material generated in the course of construction has to be deposited in the landfill and in a manner that is not harmful to the environment. Stone, soil, and other materials that may be reused shall be utilized during the realization of the sub-project. Materials that cannot be used and hazardous waste should be removed in compliance with entity level regulations. ▪ At each workplace, an assessment will be carried out to identify any Asbestos Containing Materials (ACMs) that may be present. As a first attempt, during renewal of the pipelines, existing pipes of water supply network will be left under the ground in the existing location. If they need to be removed because of new pipe installation requirements, then removal process will be executed, and specific precautions will be determined in line with the Regulation on Health and Safety Measures in Working with Asbestos dated 25.01.2013 (OG No: 28539). Besides, disposal of ACMs as a hazardous waste will be carried out in accordance with the Regulation on Waste Management dated 02.04.2015 (OG No: 29314). In this respect, the Generic Asbestos Management Plan, which is largely compliant with the national legislation, is presented in Appendix-F. Hence, it is recommended that this plan for managing ACMs is developed by the Contractor prior to construction. ▪ Before starting construction or demolition work, an assessment will be carried out to identify any ACMs that may be present. ▪ If ACMs are identified, the relevant authorities will be notified, and approval obtained before starting any work. The approval will specify the type of work that can be carried out and the requirements for safe removal and disposal. ▪ During asbestos removal, measures will be taken to prevent the release of asbestos fibres into the air. This can include wetting down the materials with water to prevent dust, using negative air pressure systems, and using airtight containers to transport the waste. ▪ Workers involved in asbestos removal will be provided with appropriate PPE, including respirators, gloves, and protective clothing. ▪ Asbestos-containing waste will be disposed of at designated facilities that are authorized to handle hazardous waste. The waste will be securely packaged, labelled, and transported to the facility in accordance with the regulations. ▪ The work area will be monitored for asbestos fibres during and after removal to ensure that the work is being carried out safely. Records of the work will be kept, including the type and quantity of ACMs removed, the methods used, and the disposal sites. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ Asbestos Management Plan ▪ Waste Management Plan
2.5	Waste management failure, pollution	Construction	Sub-project's Aol	<ul style="list-style-type: none"> ▪ Any domestic waste generated will be sorted at source (plastic, glass, paper, etc.), and reusable waste will be recycled. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) 	<ul style="list-style-type: none"> ▪ Waste Management Plan

	from domestic waste			<ul style="list-style-type: none"> Unrecyclable waste will be collected in closed sanitary trash bins and will be disposed of by the solid waste collection system of the DM. 	<ul style="list-style-type: none"> Contractor (implementation) Supervision Consultant (supervision) 	
2.6	Waste management failure, pollution from waste oils	Construction	Sub-project's Aol	<ul style="list-style-type: none"> If different categories of oils are generated from the works at the construction site, these oils will be stored separately. Containers where waste oils are stored will be kept closed and protected from rainwater. Waste oils will only be transported by licensed transportation companies and will only be delivered to licensed recycling or disposal facilities. 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> Waste Management Plan Spill Response Plan
2.7	Waste management failure, pollution from waste batteries and accumulators	Construction	Sub-project's Aol	<ul style="list-style-type: none"> Waste batteries will be collected separately from other wastes, delivered to authorized organizations and recycled. Waste batteries and accumulators will be delivered to waste battery and accumulator disposal facilities within the Municipal borders through authorized transportation companies. 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> Waste Management Plan
2.8	Waste management failure, pollution from demolition waste, loss of topsoil	Construction	Sub-project's Aol	<ul style="list-style-type: none"> Consideration will be given to recycling of excavation soil and construction wastes and especially to their reuse as infrastructure material. For a robust recycling and disposal system, waste will be sorted at source. Removal of the excavated material, which will not be used for backfilling, from the site will be performed at regular intervals without waiting. These materials will be transferred to permitted excavation waste storage area by licensed transportation companies. 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> Waste Management Plan Construction Site Traffic and Transport Management Plan
2.9	Wastes of construction works (Transportation management of waste (both hazardous and non-hazardous) to the appropriate landfills/disposal sites)	Construction	Sub-project's Aol	<ul style="list-style-type: none"> Within the scope of the sub-project, a waste management plan covering the management of waste in the hierarchy of waste reduction, reuse, recycling, recovery, and disposal, will be prepared, and the employees will be trained on the plan. During the construction period, any waste will be collected separately at source and stored in the temporary waste storage area. All types of waste shall be transferred to a licensed disposal facility via licensed waste transportation companies following the relevant legislation. Wastes generated should only be temporarily stored on site in the temporary storage area that is maintained/equipped with appropriate precautions according to the type of wastes, when needed, and wastes should be transported to licensed disposal facilities with licensed transport vehicles appropriate to the type of waste. Information related to the operations in this context should be recorded and records should be kept. Impermeability will be provided on the floors of the temporary storage area and a suitable drainage system which is closed and does not reach surface water will be installed. Spill kits will be available at the temporary storage area and necessary precautions will be taken against possible fires such as provision of appropriate firefighting equipment. 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> Waste Management Plan Construction Site Traffic and Transport Management Plan

				<ul style="list-style-type: none"> ▪ Topsoil will be separated from general trash and organic, liquid, and chemical wastes on site, and stored in appropriate containers. ▪ Construction waste will be regularly collected by licensed collectors at the permitted excavation waste storage site of the Municipality. ▪ Waste disposal records will be kept regularly. To keep these records, a waste registry information form will be prepared, which will contain information on the waste code, amount, and transfer and disposal method as presented in the Annex 4 of the Regulation on Waste Management. ▪ Where appropriate, waste can be reused or recycled. ▪ Temporary storage of medical waste will be performed in accordance with Article 14 of the Regulation on Control of Medical Waste. In addition, medical waste will be transported to processing facilities in accordance with Article 15 of the related regulation. 		
2.10	Soil contamination from construction works (Spill outs of fuel, lubricant, antifreeze etc. may result in contamination)	Construction	Sub-project's Aol	<ul style="list-style-type: none"> ▪ Establish safe delivery/storage/handling procedures in accordance with Safety Data Sheets (SDSs). Immediately contain and clean-up any spilled material. ▪ Provisions of the Regulation on the Control of Soil Pollution and Sites Contaminated by Point Sources shall be complied with within the scope of the sub-project. ▪ Periodic examination of the condition of vehicles and other machinery and equipment used in the course of the performance of works. Compliant warehousing of fuel and lubricant, and in case of a spill out, isolation and cleaning of the location. ▪ Wastes and wastewater to be generated during the construction phase of the sub-project will be stored and disposed of in a controlled manner in accordance with the relevant regulations and in line with the management practices described in this report. ▪ Measures such as regular equipment maintenance, providing workers with appropriate training, and ensuring that all equipment and materials are properly stored and handled will be implemented. ▪ A spill response plan covering how to prevent spills, stop the source of a spill, how to contain and clean up a spill, how to dispose of contaminated materials, and how to train personnel to prevent and control future spills will be developed before construction begins to ensure that a timely and effective response can be carried out in the event of a spill or accident. The plan should include procedures for containing and cleaning up spills, as well as identifying the responsible parties and the reporting requirements. Employees will be trained on the plan prior to the construction phase. ▪ Removing contaminated soil, using bioremediation techniques to break down pollutants, and replacing affected soil with clean soil. ▪ After a spill or accident, monitoring of the soil quality will be conducted to ensure that remediation efforts are effective. Additionally, all spills and accidents will be reported to the regulatory agencies. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ Spill Response Plan ▪ Waste Management Plan
2.11	Topsoil loss, Deposit of excavated soil, erosion, landslides, or sedimentation may occur	Construction	Sub-project's Aol	<ul style="list-style-type: none"> ▪ The provisions of the Regulation on the Control of Excavation Soil, Construction and Demolition Wastes shall be complied during the land preparation and construction phase of the sub-project. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ Waste Management Plan
2.12	Pollution from hazardous materials	Construction	Sub-project's Aol	<ul style="list-style-type: none"> ▪ Establish safe delivery/storage/handling procedures in accordance with SDSs. Immediately contain and clean-up any spilled material. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) 	<ul style="list-style-type: none"> ▪ Spill Response Plan ▪ C-ESMP

				<ul style="list-style-type: none"> ▪ If hazardous wastes are stored in the sub-project Area, those wastes will be stored in containers that are strong, leak-proof, safe and in accordance with internationally recognized standards. The containers will bear "hazardous waste" label, with the amount, content, properties, storage conditions and storage date of the stored material indicated on the containers. ▪ Containers containing hazardous materials will be placed in sealed vessels to prevent spills and leaks. ▪ Hazardous wastes will be transported by licensed waste transportation companies and will be disposed of at licensed facilities. ▪ Toxic paints, solvents or lead-based paints will not be used. ▪ Hazardous waste management will be fulfilled in consultation with the DM in accordance with the Regulation on Waste Management. ▪ Hazardous chemicals and wastes likely to be generated at the construction site will be stored not to pose a threat to community health. ▪ Construction activities may pose the potential for accidental release/leakages of petroleum-based products, such as lubricants, hydraulic fluids, or fuels during their storage, transfer, or use in equipment. All chemical storage containers, including diesel fuel, and hazardous liquid waste drums/containers will be placed in secondary containment so as to minimize the risk of soil, surface water and groundwater contamination during construction. ▪ The disposal of hazardous chemicals and wastes that may be generated at the construction site will be carried out at licensed facilities under the supervision of authorized companies and experts. 	<ul style="list-style-type: none"> ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ ESMR
2.13	Wastewater management failure, pollution from wastewater (Water Quality and Domestic wastewater generation)	Construction	Sub-project's Aol	<ul style="list-style-type: none"> ▪ Discharge of wastewater, residues, or other waste into groundwater or into surface water will be avoided. ▪ Wastewater generated during the construction works will be integrated into the existing sewerage, and necessary agreements will be executed with the municipality so that the wastewater sewer system ending with Düzce Wastewater Treatment Plant. ▪ The water to be used for dust suppression will be followed in m³. ▪ Surface runoff due to dust suppression activities will be prevented. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ C-ESMP ▪ ESMR
3	Community Health, Safety, and Security					
3.1	Community health and safety risks	Construction	Sub-project's Stakeholders (See Table 3-20 for population information)	<ul style="list-style-type: none"> ▪ Within the scope of the Regulation on Coordination Centres of Metropolitan Municipalities, Infrastructure Coordination Centre (AYKOME) and Transportation Coordination Centre (UKOME) will continue to use the Infrastructure Information System (AYBIS) to systematically carry out, monitor and control the documentation of all excavation permits (electricity, gas, telephone, etc.) in the sub-project area. Sub-project work areas will not be opened to the public until all checks have been coordinated, approved and completed by the concerned interested parties including especially electricity, gas distribution companies in the sub-project area. A Community Health and Safety Management Plan of the sub-project will be prepared, developed, and implemented to include this coordination. ▪ The construction area should be fenced to prevent trespassing. Necessary signage and lighting equipment shall be established. Traffic safety shall be established through appropriate management measures. Community should be informed about transfer of 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ Community Health and Safety Management Plan ▪ Construction Site Traffic and Transport Management Plan ▪ SEP ▪ EPRP

				<p>large machinery and equipment. If necessary, emergency drills should be implemented with the participation of the emergency authorities in the area.</p> <ul style="list-style-type: none"> ▪ All mitigation measures in this table that may affect communities at the sub-project area's AoI will be strictly adhere to. ▪ Design and the construction work of the sub-project should be in line with the WBG guidelines including the life and fire safety provisions. ▪ Special crossings will be created by taking additional measures for the elderly, pregnant women, people with small children and the disabled. ▪ The sub-project area will be fenced to avoid physical hazards to the communities associated with the sub-project and construction activities will be announced to the affected local people, businesses, and governmental bodies at least two (2) days in advance. ▪ Contractors will take necessary health and safety measures, such as using appropriate warning signs and signboards, arranging time schedule of noisy works (mostly after 9:00 AM before 6 PM), making the regular maintenance of the machinery, replacement or repair of part which cause noise and performing watering in dry seasons, under the management of the DM during site preparation and construction activities so that the public is informed of the construction plan and locations in a timely manner and the construction sites are determined. ▪ Care will be taken to ensure that warning signs are visible at night and in bad weather conditions. ▪ The adequate number of appropriate firefighting equipment will be always kept available at construction sites. ▪ An EPRP will be prepared and implemented in order to be able to take and manage measures to protect public health and safety. Sub-project employees, local people and response teams will be informed about this plan. ▪ Local people will be informed about possible dangers and precautions to be taken with brochures that will be placed on signs and notice boards to be hung in various areas in the neighbourhood. ▪ During the construction period, warning signs and announcements placed for precautionary purposes for community health and safety risks will be translated into the desired language (mostly Arabic and English) in line with the requests of Refugee / Immigrant stakeholders who do not speak Turkish. ▪ Detailed information on the use of the Public GM and contact information on the GM officer will be made available to the public. (Via the sub-project website, information brochures left at the Mukhtars offices, posters, and hand brochures in places such as schools, health centres, hospitals, mosques, which are the common areas used by the community intensively). ▪ Community Health and Safety Management Plan will be prepared by the contractor during the construction period and will be shared with the relevant audience. 		
3.2	Interruptions in Transport and Transport Safety (Direct and indirect threats posed by construction)	Construction	Sub-project's Stakeholders	<ul style="list-style-type: none"> ▪ Construction Site Traffic and Transport Management Plan to be prepared by the Contractor will be implemented and the workers will be trained about the Plan. ▪ Actions will be taken to ensure that any vehicles operating during the construction period obey the set speed limit (30 km/hr). ▪ Traffic and warning signs will be placed around and near the sub-project area. Positioning clear warning and information signs around the construction zone. Imposing time constraints (e.g. 7AM to 5PM) for works. Considering disabled, women, children and people with special needs while locating and marking alternative roads (roundabouts) 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ Construction Site Traffic and Transport Management Plan ▪ Community Health and Safety

	activities against traffic and pedestrians)			<ul style="list-style-type: none"> ▪ The sub-project area will be made visible. ▪ Local people will be informed about potential hazards and risks through brochures and posters left in common areas frequently used by local people such as headman's offices, hospital, health centre, mosque, coffee house and marketplace. ▪ The activities affecting the local traffic will be planned considering the rush hours of the traffic as much as possible. ▪ All drivers involved in the sub-project will be informed about road safety, speed limits, and traffic rules to be followed during the construction sub-project, and requirements to be observed. ▪ The weight of all vehicles will not exceed the legal limits according to Highway Traffic Regulation. ▪ In case of hazardous chemical or waste storage on site, the transfer of these wastes will be performed out by licensed carriers not to pose a threat to community health. ▪ The routes developed in agreement with the competent authorities will be used for special cargos. The designated routes will be programmed to prevent traffic congestion on the roads and will be published in advance to prevent possible disturbance. ▪ The arrangements in traffic will be discussed with the Municipality and planned jointly. ▪ To prevent unauthorized access to the construction site, the construction site will be surrounded by fence/curtain/protection tape, and uncontrolled entrances will be prevented. 		<ul style="list-style-type: none"> ▪ Management Plan ▪ EPRP ▪ SEP
3.3	Damage to road cover	Construction	Sub-project's Stakeholders	<ul style="list-style-type: none"> ▪ Damages that may occur on the road surfaces due to traffic caused by heavy construction machinery during construction works on existing roads will be repaired by the contractor. In case of any damage to infrastructure elements on private lands due to construction activities, mitigation measures will be taken by the contractor. ▪ Public roads and streets will be backfilled and recovered. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ Community Health and Safety Management Plan ▪ Construction Site Traffic and Transport Management Plan ▪ EPRP ▪ SEP
5	Biodiversity Conservation and Sustainable Management of Living Natural Resources					
5.1	Biodiversity conservation	Construction	Sub-project Area	<ul style="list-style-type: none"> ▪ Species encountered during the construction phase should not be killed or collected, and eggs and nests should not be deliberately damaged. Workers working in construction should be made aware. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ C-ESMP ▪ ESMR
5.2	Damage to trees and vegetation may onset in the	Construction	Sub-project Area	<ul style="list-style-type: none"> ▪ Minimizing the areas requiring the removal of vegetation, and upon finalization of works, replace/restore removed vegetation. Special measures if needed to avoid damage to protected trees or species. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) 	<ul style="list-style-type: none"> ▪ C-ESMP ▪ ESMR

	course of construction				<ul style="list-style-type: none"> Supervision Consultant (supervision) 	
6	Cultural Heritage					
6.1	Loss of cultural heritage	Construction	Sub-project Area	<ul style="list-style-type: none"> Any artifacts found during the construction works will be indicated and recorded as “chance finds”. A “Chance Find Procedure” has been prepared for the steps to be followed and will be implemented in case of the chance find (see Appendix-D). Workers/employees will be trained in cultural heritage issues. In case of a chance find, all activities will be stopped, the site will be secured, and the Cultural Assets Conservation Board or Museum Directorate will be informed about the chance finds and site will be secured by the Contractor. The approval of the relevant Conservation Board, who is responsible for the area where the construction site is located, will be required to continue any activity on site. No demolition/construction work will be carried out when awaiting the said approval. Any correspondence on this subject will be updated in accordance with all decisions taken, and all documents will be submitted as annexed to ESMP. 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> Chance Find Procedure
7	Stakeholder Engagement and Information Disclosure					
7.1	Potential community complaints	Construction	Sub-project's Stakeholders (See Table 3-20 for population information)	<ul style="list-style-type: none"> The Contractor will provide training to the site personnel on environmental and social issues. It is the DM's responsibility to ensure that the contractor complies with the determined criteria. The operations to be carried out during construction works will be performed not to restrict / hinder the social and economic life of local people. To avoid any impact on the safety and daily life of communities, safety and information signs will be placed on site before the work. The public, and nearby institutions and organizations, and hospitals and schools will be informed at least two (2) days before starting repair / maintenance works that may cause disturbance temporarily. The construction activities to be performed around or in front of hospitals and/or healthcare providers will be planned not to hinder the public access to these services and the opinions of the relevant stakeholders will be sought in order to determine the common working strategy in this regard. The DM will ensure that contractors establish the CoC and will check that workers will be given training especially on communication with local people of foreign nationality public before starting work, so that local people of foreign nationality will not be adversely affected by external workers. 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> SEP
7.2	Stakeholders' negative opinions about the sub-project due to insufficient information	Construction	Sub-project's Stakeholders	<ul style="list-style-type: none"> Before the start of construction works, the local people and all relevant stakeholders will be informed of the works to be performed and the measures to be taken. The information on the start and finish dates of construction and working periods and the permits obtained from the provincial/district municipality will be shown by the operations owner in a signboard that is easily visible to all personnel at the construction site. 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> SEP C-ESMP ESMR

7.3	Access to common resources or services may be interrupted due to construction works	Construction	Sub-project's Stakeholders	<ul style="list-style-type: none"> Time schedule for all construction works should be communicated with local communities prior to construction. Alternative and secure means to access resources and services should be introduced. To minimize the impact of the traffic activities that are expected to intensify during the construction phase, the working hours will be adjusted according to the peak hours of transportation. 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> Construction Site and Traffic Management Plan SEP
7.4	Damages to adjacent lands and structures	Construction	Sub-project's Stakeholders in Aol	<ul style="list-style-type: none"> Any unintended damages caused to adjacent land and structures during construction will be compensated and repaired by the Contractor. If grievances are received regarding unauthorized use of privately-owned lands, damage to neighbouring lands, etc. through the GM to be established, assessments / investigations will be performed on a case-by-case basis, and corrective actions will be planned and implemented, where necessary. Materials will be stored in closed and protected areas. If it is required to provide an additional space for closed and protected areas, the contractor will fulfil temporary rental formalities or obtain relevant permits. 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> SEP
7.5	Communication problems as a result of lack of open communication with stakeholders	Construction	Sub-project's Stakeholders	<ul style="list-style-type: none"> An adequate timing will be planned for interaction / communication with communities and for engagement. Consultation on risks and adverse impacts of the sub-project and create opportunities to receive affected communities view on sub-project. Establishment of the Public GM to collect and provide timely resolution of affected communities concerns and grievances regarding of the sub-project's environmental and social performance. Transparent public disclosure to inform each phase of the sub-project through website, notice boards, telecommunication tools and public meetings. Establishing well designed and structured public questionnaire to receive feedback from affected communities. Regular consultations will be carried out with the authorities and communities regarding the sub-project management. Comprehensive information on the stakeholder engagement is provided in SEP of the sub-project and the SEP will be updated and implemented throughout the sub-project. 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> SEP
7.6	Grievance issues	Construction	Sub-project's Stakeholders (See Table 3-20 for population information)	<ul style="list-style-type: none"> An efficient GM will be initiated to allow potentially affected individuals to voice their concerns on the sub-project. 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> SEP

Table 4-2. ESMP Operation Phase Matrix Table of the Sub-project

Ref.	Impact Description	Sub-Project Phase	Sensitive Receptor(s)	Management/ Mitigation Measure	Responsibility for Implementation of Mitigation Measures)	Relevant Management Plan or Procedure
1	Labour and Working Conditions					
1.1	Inadequate workers health and safety conditions	Operation	Workers at the sub-project area	<ul style="list-style-type: none"> ▪ The workers shall be informed about job descriptions, responsibilities, and risks about OHS. The workers will be provided working conditions in accordance with the Labour Law (No: 4857 Date: 10.06.2003) (such as wages, working hours, payment for overtime hours, period of rest, social security benefits). The workers will be provided with the necessary personal protective equipment and information on works and occupational safety through regular trainings. Before the operation, a Risk Assessment Report shall be prepared for all works to be carried out and necessary measures shall be taken to avoid related risks EPRPs shall be prepared for a possible accident and emergency, and emergency teams shall be established, and drills and training shall be carried out in line with the emergency scenarios. The workers shall be made aware of the accessible Workers' GM. In this regard, most common OHS risk areas and corresponding general mitigation measures throughout the life of the sub-project are provided in Appendix-E. ▪ Before starting work, employees will be knowledgeable about job descriptions, responsibilities, relationships with the local people, and risks. task related instructions that may threaten occupational health and safety. ▪ Workers will be provided with appropriate induction, health and safety training and information. ▪ All equipment used during the operation phase will be kept in good working condition. ▪ EPRP will be prepared for a potential accident and emergency. Emergency teams will be formed, and drills and training programs will be carried out in line with emergency scenarios. ▪ Employees will have a good command of EPRP, and the grievance will be reported to the authorized teams and resolved, if they require urgent action. ▪ In case of any potential accident involving injury during the operation phase, the equipment for the first aid will be kept available at the rehabilitation centre, taking into account that first aid response may be required before the casualty is referred to the nearest healthcare provider. ▪ The DM formally agrees that all work will be carried out in a safe and disciplined manner and is designed to minimize risks on neighbouring residents and environment. ▪ All activities will be implemented in line with both the Law on Occupational Health and Safety (No:6331 Date:30.06.2012) and its relevant regulations, and the WBG's EHS Guidelines. ▪ The DM will ensure a safe working environment for the workers and supply appropriate PPE. ▪ Guidance, directives, and recommendations of Ministry of Health, Ministry of Labour and Social Services, WHO and the WB shall be followed, and all relevant necessary measures shall be taken, both for occupational health and safety of employees and for workplaces, in case of an outbreak of any other pandemic/communicable disease including COVID-19. ▪ All regulations regarding OHS will be effective for the personnel. ▪ OHS trainings and toolbox talks will be provided to the employees including the CoC. These will include regular trainings to workers on COVID-19 symptoms, how to be protected and what to do when symptoms appear. ▪ Both trainings and incidents (fatalities, lost time incidents, near misses, outbreak of pandemic or communicable diseases, social unrest, etc.) will be recorded. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) 	<ul style="list-style-type: none"> ▪ OHS Management Plan ▪ Emergency Preparedness and Response Plan

				<ul style="list-style-type: none"> The DM will report details of any significant environmental or social incidents (e.g. fatalities, lost time incidents, environmental spills etc.) within 24hours and submit an incident report, including RCA, precautions and compensation measures taken within 30 business days. ILBANK will forward the incident report to the WB immediately upon receipt from the DM. In addition, regular site tours will be conducted, safe situations and behaviours related to OHS will be observed and reported, unsafe behaviours and situations will be corrected by ensuring site discipline. 		
1.2	Improper working conditions Child Labour, forced labour and unregistered employment	Operation	Workers at the sub-project area	<ul style="list-style-type: none"> Workers will be familiar with the GM officer and will have access to and be aware of the GM. Minimum legal labour standards will be met (child/forced labour, anti-discrimination, working hours, minimum wages) as per ILO regulations. At the same time, WB and the national legislation will be complied with in terms of the working conditions. Workers will be issued a written contract stipulating working hours, wages, rights, and duties etc., and the CoC. 	<ul style="list-style-type: none"> DM (performance control and management) 	<ul style="list-style-type: none"> Labour Management Plan (based on the TEFWER's LMP) SEP
2	Resource Efficiency and Pollution Prevention and Management					
2.1	Waste and chemical risks	Operation	Sub-project's Aol	<ul style="list-style-type: none"> Wastes generated should only be temporarily stored on site in the temporary storage area that is maintained/equipped with appropriate precautions according to the type of wastes, when needed, and wastes should be transported to licensed disposal facilities with licensed transport vehicles appropriate to the type of waste. Information related to the operations in this context should be recorded and records should be kept. Waste will be characterized based on their composition, source, types, generation rates or local legal requirements in case of maintenance of the sub-project. In addition to the adoption of waste prevention strategies, putting recycling plans into practice will considerably reduce the total amount of waste. If waste materials are still generated after appropriate waste prevention, reduction, reuse, and recycling measures are put into action, all necessary measures will be taken to avoid potential effects of waste material treatment and disposal on human health and the environment. Establish safe delivery/storage/handling procedures in accordance with SDSs. Immediately contain and clean-up any spilled material. 	<ul style="list-style-type: none"> DM (performance control and management) 	<ul style="list-style-type: none"> Waste Management Plan Spill Response Plan
3	Community Health, Safety and Security					
3.1	Community health and safety risks	Operation	Sub-project's Stakeholders (See Table 3-20 for population information)	<ul style="list-style-type: none"> Within the scope of the Regulation on Coordination Centres of Metropolitan Municipalities, Infrastructure Coordination Centre (AYKOME) and Transportation Coordination Centre (UKOME) will continue to use the Infrastructure Information System (AYBIS) to systematically carry out, monitor and control the documentation of all excavation permits (electricity, gas, telephone, etc.) in the sub-project area during the maintenance and repair works. Sub-project work areas will not be opened to the public until all checks have been coordinated, approved and completed by the concerned interested parties including especially electricity, gas distribution companies in the sub-project area. The existing Community Health and Safety Management Plan of the sub-project will be adapted for the operational phase to include this coordination. The operations should be engaged without posing risk to the community safety. The facility should be physically fenced to prevent trespassing. If necessary, emergency drills should be implemented with the participation of the emergency authorities in the area. 	<ul style="list-style-type: none"> DM (performance control and management) 	<ul style="list-style-type: none"> Community Health and Safety Management Plan Traffic and Transport Management Plan SEP EPRP

				<ul style="list-style-type: none"> ▪ The public, and nearby institutions and organizations, and hospitals and schools will be informed at least two (2) days before starting repair / maintenance works that may cause disturbance temporarily. ▪ The GM officer will be introduced to the local people and updated information about the GM will continue to be provided. In case of an update in the documents, the updated information will be announced to the local people through the relevant headman's office. ▪ Community health and safety management plan will be prepared by the DM during the operation period. 		
5	Biodiversity Conservation and Sustainable Management of Living Natural Resources					
5.1	Biodiversity conservation	Operation	-	<ul style="list-style-type: none"> ▪ No impact expected for the operation phase 	-	-
7	Stakeholder Engagement and Information Disclosure					
7.1	Stakeholders' negative opinions about the sub-project due to insufficient information	Operation	Sub-project's Stakeholders	<ul style="list-style-type: none"> ▪ Before the start of maintenance works, the local people and all relevant stakeholders will be informed of the works to be performed and the measures to be taken. ▪ The information on the start and finish dates of maintenance works periods and the permits obtained from the provincial/district municipality will be shown by the operations owner in a signboard that is easily visible to all employees at the site. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) 	<ul style="list-style-type: none"> ▪ SEP
7.2	Grievance issues	Operation	Sub-project's Stakeholders	<ul style="list-style-type: none"> ▪ An efficient Public GM will be initiated to allow potentially affected persons to voice their concerns on the sub-project and have their grievances adequately addressed in a timely manner. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) 	<ul style="list-style-type: none"> ▪ SEP
7.3	Communication issues with the stakeholders (Community conflict)	Operation	Sub-project's Stakeholders	<ul style="list-style-type: none"> ▪ Interaction / communication will be established with communities, and adequate timing will be planned for engagement activities. Additionally, regular consultations will be carried out with the authorities and communities regarding the sub-project management. ▪ Consultation on risks and adverse impacts of the sub-project and create opportunities to receive affected communities view on sub-project. ▪ Establishment of the Public GM to collect and provide timely resolution of affected communities concerns and grievances regarding of the sub-project's environmental and social performance. ▪ Transparent public disclosure to inform each phase of the sub-project through website, notice boards, telecommunication tools and public meetings. ▪ Establishing well designed and structured public questionnaire to receive feedback from affected communities. 	<ul style="list-style-type: none"> ▪ DM (performance control and management) 	<ul style="list-style-type: none"> ▪ SEP

4.2 MONITORING

Key performance indicators (KPIs) of this procedure will be monitored, verified, and evaluated within the scope of the sub-project monitoring stage. The KPIs for both construction and operation phases of the sub-project are presented in Table 4-3.

The monitoring, review and audit program detailed in Table 4-4 will be implemented during construction and operation to monitor the implementation of the environmental and social commitments of the sub-project's ESMP requirements. The DM will be responsible for ensuring that the contractor comply with applicable national/international regulations and WB's requirements during the construction phase of the sub-project.

Table 4-3. Key Performance Indicators for Both Construction and Operation Phases of the Sub-project

Monitoring Focus	KPI
Documentation	
Following ESMP Project specific plans will be developed and be in place.	Full compliance with Sub-project's ESMP
Air Quality	
Air Quality incidents	Minimization and continued improvement in the number of the reported air quality related incidents.
Non-Compliance with air quality standards	Zero grievances per year
Community grievances	Minimization and continued improvement in the number of air quality related community grievances
Violation on speed limit	Minimization and continued improvement in the number of reported violations on speed limit
Noise	
Noise and Vibration incidents	Minimize and continued improvement in number of reported noise and vibration related incidents
Non-Compliance with Project standards	Zero Non-Compliance Reports (NCRs) per year
Number of noise-related community grievances	Zero grievances per year
Community grievances	Minimization and continued improvement in the number of noise related community grievances
Water / Wastewater	
Spill incident	Minimization and continued improvement in the number of the reported water quality related incidents.
Non-Compliance with Sub-project standards	Zero NCRs per year
Wastewater collection system	Zero grievances per year
Groundwater levels of the community/private wells	No significant adverse impact
Water quality analyses	Meeting set national and international water quality standards for surface and groundwater impacted and/or near the sub-project
Flood incidents	No infrastructure damage and damage to loads/humans
Wastewater and Water loss records in network	Sustainable low wastewater and water loss records
Waste	
Waste Generation	Minimization of total waste generated Decrease in the ratio of hazardous waste generated to total waste (by contamination + by generation)
Waste Disposal	Increase in the ratio of recovered/reused/recycled waste to total waste generated
Soil Quality	
Spill incident	Minimization and continued improvement in the number of the reported soil quality related incidents
Non-Compliance with Sub-project standards	Zero NCRs per year
Soil quality accidents	Zero accident per year
Number of soil-related community grievances	Zero grievances per year
Traffic	
Number of non-compliances against the mitigation controls identified in Traffic and Transport Management Plan	Decreasing number/ continuous improvement in number of reported non-compliances
Number of drivers found to be exceeding speed limits or driving unsafely	Zero exceedance per year
Number of road traffic accidents involving: Accidental injuries and deaths,	Zero accidents per year

Monitoring Focus	KPI
Spillages (such as cargo or fuel), Wildlife-vehicle collisions.	
Number of traffic-related grievances	Zero grievances per year
Health, Safety and Environment	
% of scheduled HSE Inspection	>90
% of attendance at HSE meetings	>90
% of closing of NCRs	100
Reporting safe observations	100%
Reporting unsafe observations	100%
Reporting near misses	100%
Reporting number of incidents	100%
Reporting number of accidents	100%
Reporting day-loss	100%
% of Toolbox attending	>90
% of Risk Assessment compliance	>90
% of Legal Requirements compliance	100%
Results of scheduled audits	>85
HSE training carried out to training matrix > 90% of all training to matrix	>90
% of attendance at scheduled trainings	>90
Engagement in HSE program by individual managers and supervisors	>90
Engagement in HSE program by contractor's	>90
Labour and Working Conditions	
Number of worker grievances closed out within the target timeframe	100% compliance with labour laws and regulations Zero unresolved health and safety incidents within the target timeframe 100% availability of required PPE 90% or higher worker satisfaction rate
Community Health and Safety	
Number of communicable and non-communicable diseases and injuries.	Negative Trend/No significant increase in communicable and non-communicable disease and injury rates per 1,000 residents per annum.
Number of community health safety & security grievances from local communities as recorded in the grievance management system.	Decreasing number/ continuous improvement in number of grievances
Number of reported community health & safety incidents	Zero incidents per year
Number of reported air quality or noise incidents	Zero incidents per year
Direct and indirect threats posed by construction activities against traffic and pedestrians	Zero number of drivers found to be exceeding speed limits or driving unsafely Zero accidental injuries and deaths, Zero traffic-related grievances
Access to the Construction Site - Security Fence/ Protection Tape	Zero Number of unauthorized accesses to the sub-project area
Trainings	
Training records	Trainings on ESMP and SEP documents. Providing all trainings (including GM, GBV, SEA/SH) to all employees. 100% of scheduled training sessions conducted 80% or higher participant satisfaction rate Zero participants without completion certificates if applicable
Disclosure	
Grievance Records, Disclosure meeting participant records, ESMP, SEP, GM will be disclosed at Project web site in two languages (English and Turkish).	All grievances closed-out within the target timeframe ESMP, Project specific SEP and GM will be prepared and disclosed at the sub-project web site
Vulnerable groups:	
Incidents, Grievances, Toolbox talks and trainings, Information/ disclosure	All grievances closed-out within the target timeframe Sufficient information provided to the VGs
Grievance mechanism	
Grievance Records, GM disclosure	All grievances closed-out within the target timeframe GM disclosure to the PAPs, stakeholders GM disclosure at Sub-project web site
Cultural Heritage	
Existence of a Chance Find	Zero Grievance Records

Table 4-4. Environmental & Social Monitoring Table of the Sub-Project

Ref.	Sub-Project Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference	KPI	Responsibility for Monitoring	Cost (If not included in the Sub-project Budget)
1.1	Construction	Grievance Mechanism	<ul style="list-style-type: none"> ▪ Grievance records ▪ Number/Percentage of closed grievances within the targeted timeframe 	<ul style="list-style-type: none"> ▪ Aol 	<ul style="list-style-type: none"> ▪ On-site inspections ▪ Minutes of meetings ▪ GM records 	Monthly	<ul style="list-style-type: none"> ▪ Relevant national legislation ▪ WBG General EHS Guidelines ▪ Sub-project E&S instruments 	<ul style="list-style-type: none"> ▪ All grievances closed-out within the target timeframe ESMP, ▪ Sub-project specific SEP and GM will be prepared and disclosed at the sub-project web site 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant (supervision) 	<ul style="list-style-type: none"> ▪ Included in Sub-project Budget
1.2	Construction	Labour Conditions	<ul style="list-style-type: none"> ▪ Grievance records ▪ Percentage of closed grievances within the targeted timeframe ▪ Site conditions 	<ul style="list-style-type: none"> ▪ Sub-project Area 	<ul style="list-style-type: none"> ▪ Internal and external audits ▪ Grievance records ▪ Accident records ▪ Training records ▪ Sample contracts ▪ Human Resource Policy ▪ Number of the local employees ▪ Legal work permit 	Monthly	<ul style="list-style-type: none"> ▪ Labour Law (No. 4857 Date: 10.06.2003) ▪ Law on Trade Unions and Collective Bargaining Agreements ▪ ILO International Regulations 	<ul style="list-style-type: none"> ▪ 100% compliance with labour laws and regulations ▪ Zero unresolved health and safety incidents within the target timeframe ▪ 100% availability of required PPE ▪ 90% or higher worker satisfaction rate 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (implementation) ▪ Supervision Consultant(supervision) 	<ul style="list-style-type: none"> ▪ Included in Sub-project Budget
1.3	Construction	Occupational Health and Safety	<ul style="list-style-type: none"> ▪ Safe conditions on the construction site ▪ Risk analysis and procedures ▪ Disease ▪ Incident and accident reports ▪ Grievance records ▪ Percentage of closed grievances within the targeted timeframe 	<ul style="list-style-type: none"> ▪ Sub-project Area ▪ Settlements near the sub-project area 	<ul style="list-style-type: none"> ▪ On-site inspections ▪ Interviews with employees ▪ Complaint records ▪ Training and toolbox records ▪ Contract examples ▪ Internal and external audits ▪ Incident/Accident and near miss records ▪ Drill records ▪ Availability of an adequate OHS organizational structure 	Monthly	<ul style="list-style-type: none"> ▪ Occupational Health and Safety Law ▪ Regulation on Health and Safety Measures in Working with Asbestos ▪ Regulation on Health and Safety Requirements for the Use of Work Equipment 	<ul style="list-style-type: none"> ▪ Health and Safety KPIs detailed in Table 4-3. 	<ul style="list-style-type: none"> ▪ DM ▪ Contractor ▪ Supervision Consultant 	<ul style="list-style-type: none"> ▪ Included in Sub-project Budget

Ref.	Sub-Project Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference	KPI	Responsibility for Monitoring	Cost (If not included in the Sub-project Budget)
			<ul style="list-style-type: none"> Toolbox talks and trainings ▪ HSE Inspection ▪ Legal Requirements ▪ EPRP ▪ Drill reports (Number of drills per year) ▪ OHS practices in the field (Use of PPE, daily site OHS reports etc.) 							
1.4	Construction	Community Health & Safety	<ul style="list-style-type: none"> ▪ Safety conditions at the site ▪ Fencing of construction site ▪ Warning signs and flashlights ▪ Grievance records (Public Grievance Mechanism) (Number and nature of grievances) ▪ Percentage of closed grievances within the target timeframe ▪ Incident and accident reports ▪ Construction Site Traffic and Transport 	<ul style="list-style-type: none"> ▪ Sub-project Area ▪ Residential areas around sub-project area 	<ul style="list-style-type: none"> ▪ Records of comments/ suggestions/ grievances ▪ Site Audits ▪ Training records ▪ Review of Construction Site Traffic and Transport Management Plan 	Monthly	<ul style="list-style-type: none"> ▪ Public Health Law ▪ Regulation on Health and Safety Signs 	<ul style="list-style-type: none"> ▪ Negative Trend/No significant increase in communicable and non-communicable disease and injury rates per 1,000 residents per annum. ▪ Decreasing number/ continuous improvement in number of grievances ▪ Zero incidents per year ▪ Zero number of drivers found to be exceeding speed limits or driving unsafely ▪ Zero accidental injuries and deaths, ▪ Zero traffic-related grievances ▪ Zero Number of unauthorized accesses to the sub-project area 	<ul style="list-style-type: none"> ▪ DM (implementation) ▪ Contractor (preparation and implementation) ▪ Supervision Consultant(supervision) 	<ul style="list-style-type: none"> ▪ Included in Sub-project Budget

Ref.	Sub-Project Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference	KPI	Responsibility for Monitoring	Cost (If not included in the Sub-project Budget)
			Management Plan							
1.5	Construction	Documentation	<ul style="list-style-type: none"> Availability of ESMP sub-project specific plans and reports 	<ul style="list-style-type: none"> Sub-project Area 	<ul style="list-style-type: none"> On-site inspection Record control 	<p>During the construction period, the contractor will develop C-ESMP (based on this ESMP) monthly and quarterly report the ESMRs to the DM, the DM to ILBANK quarterly together with the Grievance Register. Moreover, ILBANK, will compile these ESMRs and report them to WB biannually together with the sub-project Project Progress Report.</p>	<ul style="list-style-type: none"> WB ESS1 	<ul style="list-style-type: none"> Full compliance with sub-project's ESMP 	<ul style="list-style-type: none"> DM (implementation) Contractor (preparation and implementation) Supervision Consultant(supervision) 	<ul style="list-style-type: none"> Included in Sub-project Budget
1.6	Construction	Grievance Mechanism	<ul style="list-style-type: none"> Grievance Records (Workers Grievance Mechanism) (number and nature of grievances) Percentage of closed grievances within the targeted timeframe 	<ul style="list-style-type: none"> Sub-project area Settlements near the sub-project area 	<ul style="list-style-type: none"> View/suggestion/ grievance records Grievance database On-site inspection Existence / accessibility of grievance boxes 	<p>Monthly</p>	<ul style="list-style-type: none"> ILBANK TEFWER ESMF 	<ul style="list-style-type: none"> All grievances closed-out within the target timeframe GM disclosure to the PAPs, stakeholders GM disclosure at sub-project web site 	<ul style="list-style-type: none"> DM (performance control and implementation) Contractor (preparation and implementation) Supervision Consultant(supervision) 	<ul style="list-style-type: none"> Included in Sub-project Budget

Ref.	Sub-Project Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference	KPI	Responsibility for Monitoring	Cost (If not included in the Sub-project Budget)
1.7	Construction	Sustainable Development and Resource Efficiency during the construction period	<ul style="list-style-type: none"> Water loss records in network 	<ul style="list-style-type: none"> Settlements near the sub-project area 	<ul style="list-style-type: none"> View/suggestion/grievance records Water loss records On-site inspection 	Monthly	<ul style="list-style-type: none"> WB ESS3 	<ul style="list-style-type: none"> Sustainable/minimum water loss records 	<ul style="list-style-type: none"> DM (performance control and implementation) Contractor(implementation) Supervision Consultant (supervision and implementation) 	<ul style="list-style-type: none"> Included in Sub-project Budget
1.8	Construction	Air Quality	<ul style="list-style-type: none"> Number of air quality-related grievance records Percentage of closed grievances within the target timeframe Air Quality incidents Records of non-compliance with air quality standards Visually, on the basis of irritation of the respiratory system 	<ul style="list-style-type: none"> Sub-project area Settlements, schools, hospitals, and place of worship near the sub-project area 	<ul style="list-style-type: none"> On-site inspections PM_{2.5} and PM₁₀ Measurements to be performed by an authorized environmental laboratory in case of grievance 	In case of grievance Monthly	<ul style="list-style-type: none"> Regulation on Air Quality Assessment and Management WB ESS3 	<ul style="list-style-type: none"> Minimization and continued improvement in the number of the reported air quality related incidents. Zero NCRs per year Zero grievances per year Minimization and continued improvement in the number of air quality related community grievances. 	<ul style="list-style-type: none"> DM (performance control and implementation) Contractor(implementation) Supervision Consultant (supervision and implementation) 	<ul style="list-style-type: none"> Included in Sub-project Budget
1.9	Construction	Noise	<ul style="list-style-type: none"> Number of noise-related grievance records Percentage of closed grievances within the target timeframe Noise and vibration incidents 	<ul style="list-style-type: none"> Sub-project Area Settlements, schools, hospitals, and place of worship near the sub-project area 	<ul style="list-style-type: none"> Monitoring conducted at the nearest sensitive receptors using noise measuring devices On-site inspections Measurements to be performed by an authorized environmental laboratory in case of grievance 	In case of grievance Monthly	<ul style="list-style-type: none"> Regulation on Control of Ambient Noise 	<ul style="list-style-type: none"> Minimize and continued improvement in number of reported noise and vibration related incidents. Zero NCRs per year Zero grievances per year Minimization and continued improvement in the number of noise 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (preparation and implementation) Supervision Consultant(supervision) 	<ul style="list-style-type: none"> Included in Sub-project Budget

Ref.	Sub-Project Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference	KPI	Responsibility for Monitoring	Cost (If not included in the Sub-project Budget)
			<ul style="list-style-type: none"> Records of non-compliance with noise standards 					related community grievances		
1.10	Construction	Soil Quality	<ul style="list-style-type: none"> Soil quality/Spill incident and accidents Records of non-compliance with soil quality standards Incident and accident reports 	<ul style="list-style-type: none"> Sub-project area 	<ul style="list-style-type: none"> On-site inspection 	Daily	<ul style="list-style-type: none"> Regulation on Control of Soil Pollution and Point Source Contaminated Lands Regulation on Waste Management 	<ul style="list-style-type: none"> Minimization and continued improvement in the number of the reported soil quality related incidents Zero NCRs per year Zero accident per year Zero grievances per year 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (preparation and implementation) Supervision Consultant(supervision) 	<ul style="list-style-type: none"> Included in Sub-project Budget
1.11	Construction	Waste Management	<ul style="list-style-type: none"> Temporary waste storage area conditions Total amount of waste generated Recovery / reuse / recycle ratio 	<ul style="list-style-type: none"> Sub-project area 	<ul style="list-style-type: none"> Waste records On-site inspection regarding proper collection and temporary storage of wastes 	Daily	<ul style="list-style-type: none"> Regulation on Waste Management Regulation on Health and Safety Measures in Working with Asbestos 	<ul style="list-style-type: none"> Minimization of total waste generated 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (preparation and implementation) Supervision Consultant (supervision) 	<ul style="list-style-type: none"> Included in Sub-project Budget
1.12	Construction	Domestic Waste	<ul style="list-style-type: none"> Total amount of domestic waste generated Ratio of recovered/reused/ recycled domestic waste to total waste generated Domestic waste storage conditions On-site inspection 	<ul style="list-style-type: none"> Sub-project area 	<ul style="list-style-type: none"> Waste records On-site inspection 	Daily	<ul style="list-style-type: none"> Regulation on Control of Packaging Waste Regulation on Waste Management 	<ul style="list-style-type: none"> Minimization of total waste generated Increase in the ratio of recovered/ reused/ recycled to landfilled 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (preparation and implementation) Supervision Consultant(supervision) 	<ul style="list-style-type: none"> Included in Sub-project Budget

Ref.	Sub-Project Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference	KPI	Responsibility for Monitoring	Cost (If not included in the Sub-project Budget)
1.13	Construction	Waste Oils	<ul style="list-style-type: none"> ▪ Total amount of waste oil generated ▪ Ratio of recovered/reused/ recycled waste oil to total waste generated ▪ Waste oil storage conditions ▪ On-site inspection 	<ul style="list-style-type: none"> ▪ Sub-project area 	<ul style="list-style-type: none"> ▪ Visual observations ▪ Waste records 	Weekly	<ul style="list-style-type: none"> ▪ Regulation on the Management of Waste Oils 	<ul style="list-style-type: none"> ▪ Minimization of total waste generated ▪ Increase in the ratio of recovered/ reused/ recycled waste to total waste generated 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (preparation and implementation) ▪ Supervision Consultant(supervision) 	<ul style="list-style-type: none"> ▪ Included in Sub-project Budget
1.14	Construction	Waste Batteries and Accumulators	<ul style="list-style-type: none"> ▪ Total amount of waste batteries/accumulators generated ▪ Recovery /reuse/ recycle ratio 	<ul style="list-style-type: none"> ▪ Sub-project area 	<ul style="list-style-type: none"> ▪ Waste records 	Monthly	<ul style="list-style-type: none"> ▪ Regulation on the Control of Waste Batteries and Accumulators 	<ul style="list-style-type: none"> ▪ Minimization of total waste generated ▪ Increase in the ratio of recovered/ reused/ recycled waste to total waste generated 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (preparation and implementation) ▪ Supervision Consultant(supervision) 	<ul style="list-style-type: none"> ▪ Included in Sub-project Budget
1.15	Construction	Excavation Soil, Construction and Debris/ Demolition Wastes	<ul style="list-style-type: none"> ▪ Total amount of excavation and demolition waste generated ▪ Excavation and demolition waste transfer records ▪ Soil stripping, excavation, and backfilling activities ▪ Waste storage conditions ▪ Transfer records 	<ul style="list-style-type: none"> ▪ Sub-project area 	<ul style="list-style-type: none"> ▪ On-site inspection 	Daily	<ul style="list-style-type: none"> ▪ Regulation on the Control of Excavation Soil, Construction and Demolition Wastes 	<ul style="list-style-type: none"> ▪ Minimization of total waste generated ▪ Increase in the ratio of recovered/ reused/ recycled waste to total waste generated 	<ul style="list-style-type: none"> ▪ DM (performance control and management) ▪ Contractor (preparation and implementation) ▪ Supervision Consultant(supervision) 	<ul style="list-style-type: none"> ▪ Included in Sub-project Budget

Ref.	Sub-Project Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference	KPI	Responsibility for Monitoring	Cost (If not included in the Sub-project Budget)
			<ul style="list-style-type: none"> Soil stripping, excavation and backfilling activities 							
1.16	Construction	Hazardous Waste Management	<ul style="list-style-type: none"> Total amount of hazardous waste generated Total amount of asbestos waste generated Hazardous waste storage conditions On-site inspection 	<ul style="list-style-type: none"> Sub-project Area 	<ul style="list-style-type: none"> Waste records On-site inspection 	Daily	<ul style="list-style-type: none"> Regulation on Waste Management 	<ul style="list-style-type: none"> Decrease in the ratio of hazardous waste generated to total waste (by contamination + by generation) 	<ul style="list-style-type: none"> DM (performance control and management) Contractor (preparation and implementation) Supervision Consultant(supervision) 	<ul style="list-style-type: none"> Included in Sub-project Budget
1.17	Construction	Cultural Heritage	<ul style="list-style-type: none"> Existence of a Chance Find 	<ul style="list-style-type: none"> Sub-project area Settlements near the sub-project area 	<ul style="list-style-type: none"> On-site inspection Existence of a Chance Find Procedure 	Monthly	<ul style="list-style-type: none"> Law on the Conservation of Cultural and Natural Properties WB ESS8 	<ul style="list-style-type: none"> Zero Grievance Records 	<ul style="list-style-type: none"> DM (performance control) Contractor (preparation and implementation) Supervision Consultant (preparation and implementation) 	<ul style="list-style-type: none"> Included in Sub-project Budget
1.18	Construction	Vulnerable Groups	<ul style="list-style-type: none"> Access to essential services (healthcare, education, social services) Safety and security conditions Communication and information dissemination 	<ul style="list-style-type: none"> Sub-project area Settlements near the sub-project area Designated temporary healthcare facilities 	<ul style="list-style-type: none"> Surveys and interviews with affected populations Review of healthcare and social service access records On-site inspections Coordination with local service providers Tracking of communication efforts and outreach effectiveness 	Monthly	<ul style="list-style-type: none"> ILBANK TEFWER ESMF 	<ul style="list-style-type: none"> All grievances closed-out within the target timeframe Sufficient information provided to the VGs 	<ul style="list-style-type: none"> DM (performance control) Contractor (preparation and implementation) Supervision Consultant (preparation and implementation) Local Health and Social Services Departments 	<ul style="list-style-type: none"> Included in Sub-project Budget

Ref.	Sub-Project Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference	KPI	Responsibility for Monitoring	Cost (If not included in the Sub-project Budget)
1.19	Construction	Trainings	<ul style="list-style-type: none"> ▪ Training Records ▪ Number of participants attending the training sessions ▪ Percentage of participants successfully completing the training ▪ Feedback from participants 	<ul style="list-style-type: none"> ▪ Sub-project area ▪ Training venues ▪ Settlements near the sub-project area 	<ul style="list-style-type: none"> ▪ Review of training attendance sheets ▪ Evaluation forms completed by participants ▪ On-site observation of training sessions ▪ Interviews with trainers and participants 	Monthly	<ul style="list-style-type: none"> ▪ ILBANK ▪ TEFWER ESMF 	<ul style="list-style-type: none"> ▪ Trainings on ESMF and SEP documents. ▪ Providing all trainings (including GM, GBV, SEA/SH) to all employees. ▪ 100% of scheduled training sessions conducted ▪ 80% or higher participant satisfaction rate ▪ Zero participants without completion certificates if applicable 	<ul style="list-style-type: none"> ▪ DM (performance control) ▪ Contractor (preparation and implementation) ▪ Supervision Consultant (preparation and implementation) ▪ Training Providers 	<ul style="list-style-type: none"> ▪ Included in Sub-project Budget
1.20	Construction	Direct and indirect threats posed by construction activities against traffic and pedestrians	<ul style="list-style-type: none"> ▪ Grievance records ▪ Information gathered through Public Consultation ▪ Information on available pedestrian ways ▪ Number of non-compliances against the mitigation controls identified in Traffic and Transport Management Plan ▪ Existence of EPRP ▪ Driver training records ▪ Number of road traffic 	<ul style="list-style-type: none"> ▪ Sub-project area 	<ul style="list-style-type: none"> ▪ On-site inspection 	Daily	<ul style="list-style-type: none"> ▪ Occupational Health and Safety Law 	<ul style="list-style-type: none"> ▪ Zero number of drivers found to be exceeding speed limits or driving unsafely ▪ Zero accidental injuries and deaths, ▪ Zero traffic-related grievances 	<ul style="list-style-type: none"> ▪ DM (performance control) ▪ Contractor (preparation and implementation) ▪ Supervision Consultant (preparation and implementation) 	<ul style="list-style-type: none"> ▪ Included in Sub-project Budget

Ref.	Sub-Project Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference	KPI	Responsibility for Monitoring	Cost (If not included in the Sub-project Budget)
			accidents involving: <ul style="list-style-type: none"> ▪ Existence and number of warning signs properly installed at designated location ▪ Training records for drivers ▪ Installation of warning signs 							
1.21	Construction	Access to the Construction Site - Security Fence/ Protection Tape	<ul style="list-style-type: none"> ▪ Grievance records 	<ul style="list-style-type: none"> ▪ Settlements near the sub-project area 	<ul style="list-style-type: none"> ▪ On-site inspection 	Daily	<ul style="list-style-type: none"> ▪ Occupational Health and Safety Law 	<ul style="list-style-type: none"> ▪ Zero Number of unauthorized accesses to the sub-project area 	<ul style="list-style-type: none"> ▪ DM (performance control) ▪ Contractor (preparation and implementation) ▪ Supervision Consultant(supervision) 	<ul style="list-style-type: none"> ▪ Included in Sub-project Budget
2.1	Operation	Disclosure	<ul style="list-style-type: none"> ▪ Grievance records ▪ Percentage of closed grievances within the targeted timeframe 	<ul style="list-style-type: none"> ▪ Settlements near the sub-project area 	<ul style="list-style-type: none"> ▪ On-site inspections ▪ Minutes of meetings ▪ GM records 	Daily	<ul style="list-style-type: none"> ▪ Regulation on Control of Environmental Noise ▪ Regulation on Air Quality Assessment and Management ▪ WBG General EHS Guidelines 	<ul style="list-style-type: none"> ▪ All grievances closed-out within the targeted timeframe 	<ul style="list-style-type: none"> ▪ DM (performance control and management) 	<ul style="list-style-type: none"> ▪ Included in Sub-project Budget
2.2	Operation	Labour Conditions	<ul style="list-style-type: none"> ▪ Grievance records (number and nature of grievances) ▪ Percentage of closed grievances within the 	<ul style="list-style-type: none"> ▪ Sub-project route and maintenance areas 	<ul style="list-style-type: none"> ▪ Internal and external audits ▪ Grievance records ▪ Accident records ▪ Training records ▪ Sample contracts ▪ Human Resource Policy 	Monthly	<ul style="list-style-type: none"> ▪ Labour Law (No. 4857 Date: 10.06.2003) ▪ Law on Trade Unions and Collective Bargaining Agreements 	<ul style="list-style-type: none"> ▪ All grievances closed-out within the targeted timeframe 	<ul style="list-style-type: none"> ▪ DM (implementation) 	<ul style="list-style-type: none"> ▪ Included in Sub-project Budget

Ref.	Sub-Project Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference	KPI	Responsibility for Monitoring	Cost (If not included in the Sub-project Budget)
			targeted timeframe		<ul style="list-style-type: none"> Number of the local employees Legal work permit 		<ul style="list-style-type: none"> ILO International Regulations 			
2.3	Operation	Occupational Health and Safety	<ul style="list-style-type: none"> Disease Incident and accident records Grievance records (number and nature of grievances) Percentage of closed grievances within the targeted timeframe Trainings HSE Inspection Compliance with EPRP Drill reports (Number of drills per year) OHS practices in the field (Use of PPE, daily site OHS reports etc.) 	<ul style="list-style-type: none"> Sub-project area Settlements near the sub-project area 	<ul style="list-style-type: none"> On-site inspections Interviews with employees Complaint records Training records Contract examples Internal and external audits EPRPs Incident/ Accident records Availability of an adequate OHS organizational structure 	Monthly	<ul style="list-style-type: none"> Occupational Health and Safety Law Regulation on Health and Safety Requirements for the Use of Work Equipment 	<ul style="list-style-type: none"> Health and Safety KPIs detailed in Table 4-3. 	<ul style="list-style-type: none"> DM (supervision) 	<ul style="list-style-type: none"> Included in Sub-project Budget
2.4	Operation	Community Health & Safety	<ul style="list-style-type: none"> Grievances records (Public Grievance Mechanism) Percentage of closed grievances within the targeted timeframe 	<ul style="list-style-type: none"> Sub-project area Residential areas around sub-project area 	<ul style="list-style-type: none"> Records of comments/ suggestions/ grievances Site Audits Training records 	Monthly	<ul style="list-style-type: none"> Public Health Law Regulation on Health and Safety Signs 	<ul style="list-style-type: none"> No significant increase in communicable and non-communicable disease and injury rates per 1,000 residents per annum. Decreasing number/ continuous improvement in number of complaints Zero incidents per year 	<ul style="list-style-type: none"> DM (performance control) 	<ul style="list-style-type: none"> Included in Sub-project Budget

Ref.	Sub-Project Phase	Subject	Parameter to be Monitored	Monitoring Location	Monitoring Method	Monitoring Frequency	Reference	KPI	Responsibility for Monitoring	Cost (If not included in the Sub-project Budget)
			<ul style="list-style-type: none"> Incident and accident reports 							
2.5	Operation	Grievance Mechanism	<ul style="list-style-type: none"> Grievance records (Workers Grievance Mechanism) Percentage of closed grievances within the targeted timeframe GM of the sub-project 	<ul style="list-style-type: none"> Sub-project area Settlements near the sub-project area 	<ul style="list-style-type: none"> View/ suggestion/ grievance records Grievance database On-site inspection Existence / accessibility of grievance boxes 	Monthly	<ul style="list-style-type: none"> TEFWER ESMF TEFWER Sub-project, SEP Sub-project, GM 	<ul style="list-style-type: none"> All grievances closed out within the targeted timeframe 	<ul style="list-style-type: none"> DM (performance control) 	<ul style="list-style-type: none"> Included in Sub-project Budget
2.6	Operation	Waste Management	<ul style="list-style-type: none"> Total amount of waste generated Recovery / reuse / recycle ratio 	<ul style="list-style-type: none"> Sub-project area 	<ul style="list-style-type: none"> Waste records On-site inspection regarding proper collection and temporary storage of wastes 	In case of grievance Daily	<ul style="list-style-type: none"> Regulation on Waste Management Regulation on Control of Packaging Waste Regulation on the Management of Waste Oils Regulation on the Control of Waste Batteries and Accumulators Regulation on Control of Medical Waste 	<ul style="list-style-type: none"> Minimization of total waste generated Decrease in the ratio of hazardous waste generated to total waste (by contamination + by generation) 	<ul style="list-style-type: none"> DM (performance control) 	<ul style="list-style-type: none"> Included in Sub-project Budget
2.7	Operation	Sustainable Development and Resource Efficiency during the operation period	<ul style="list-style-type: none"> Water loss records in network 	<ul style="list-style-type: none"> Sub-project area 	<ul style="list-style-type: none"> On-site inspection 	Daily	<ul style="list-style-type: none"> WB ESS3 WB ESS4 	<ul style="list-style-type: none"> Sustainable/minimum water loss records 	<ul style="list-style-type: none"> DM (performance control) 	<ul style="list-style-type: none"> Included in Sub-project Budget

5 CAPACITY DEVELOPMENT AND TRAINING

5.1 INSTITUTIONAL ARRANGEMENTS

The main actors in the implementation of this ESMP for the sub-project are the WB, ILBANK's Project Management Unit (PMU) and the Düzce Municipality (DM). ESMP implementation and monitoring organigram is presented in Figure 5-1. Detailed roles and responsibilities of these institutions are presented in Table 5-1.

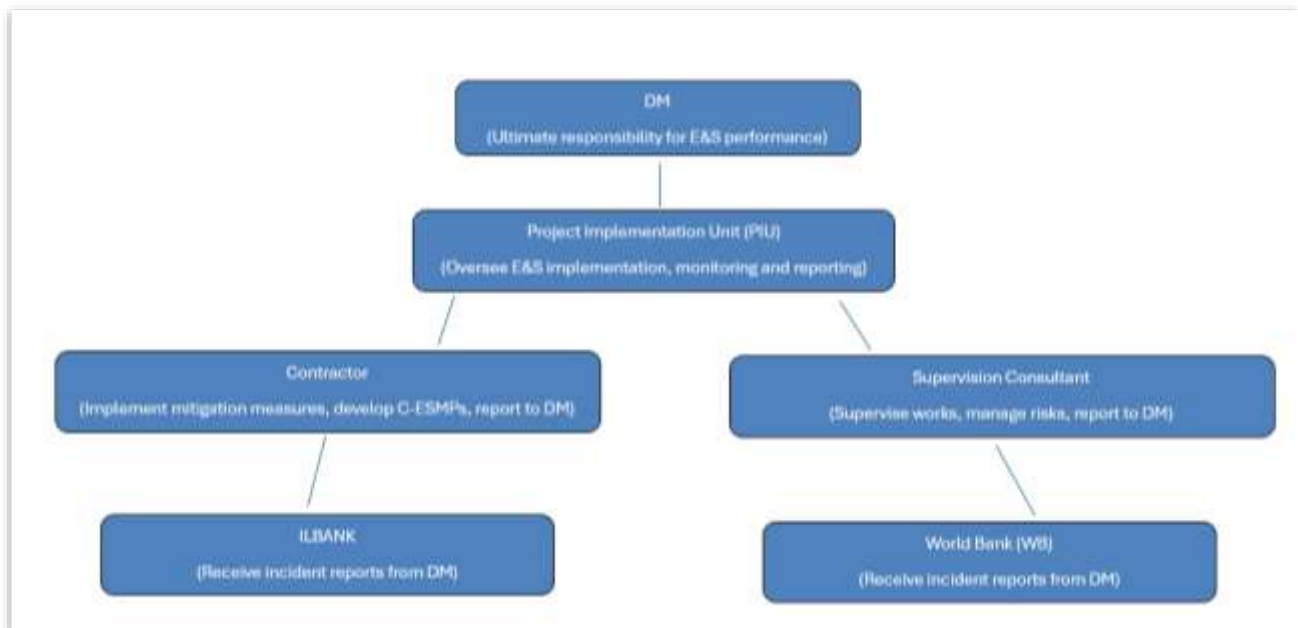


Figure 5-1. ESMP Implementation and Monitoring Organigram

Table 5-1. Roles and Responsibilities

Financial Roles	DM	ILBANK	Contractor	Supervisor Consultant
	Sub-Borrower	Financial Intermediary		
Number of Staff	<ul style="list-style-type: none"> Assign one of each expert/focal point listed; Social Expert, Environmental Expert, and OHS expert. 	<ul style="list-style-type: none"> One environmental specialist, one social specialist and one OHS specialist will be assigned from the present staff of PMU. Individual freelance consultants can also be employed to strength the PMU. 	<ul style="list-style-type: none"> The construction works under the contract packages included in the scope of the ESMP will be carried out by contractors. 	<p>The sub-project owner will appoint a Supervisory Consultant having a range of specialties to inspect the contractor's activities on a daily basis. Apart from the guidance to the given to the sub-project Owner about WB ESSs and also the stakeholder consultation and announcement requirements and the sub-project documents in compliance with WB requirements, the Supervisory Consultant will appoint the personnel given below:</p>
Sub-project Roles	<ul style="list-style-type: none"> Preparation and implementation of ESMP and SEP including management of sub-project level Grievance Mechanisms, Monitor environmental and social performance of the contractors' works on site, in line with the site-specific environmental and social requirements, Review E&S performance reports of contractor's (monthly) and supervision consultant's (quarterly), summarize on E&S compliance issues and report to ILBANK on quarterly basis on E&S compliance and monitoring. 	<ul style="list-style-type: none"> Responsible for reviewing and approving site-specific E&S documents for the sub-project; and for monitoring the implementation of ESMF, ESMP and Grievance process. Reporting to WB on biannual basis on E&S compliance and monitoring. 		
Sub-project Roles	<ul style="list-style-type: none"> The DM's PIU will examine the Contractor's Environmental and Social Management Plan (C-ESMP) of the contractor/s, monthly and quarterly ESMRs and will be responsible for the timely delivery of the Monthly (if requested by ILBANK) and Quarterly ESMRs to ILBANK. Tendering all the sub-project works and consulting services. DM will report details of any significant environmental or social incidents (e.g. fatalities, lost time 	<ul style="list-style-type: none"> The ILBANK's PMU will review the monthly/quarterly reports delivered by the DM during the construction phase. ILBANK will inform the WB by providing regular semi-annual monitoring reports on the Environmental, Social, Health and Safety (ESHS) performance of the sub-project. Supervise and monitor the whole process to ensure the proper application of the WB's ESSs and safeguard policies, TEFWER's ESMF, SEP and Labour Management Plan along with this ESMP. 	<ul style="list-style-type: none"> The construction contractor will develop C-ESMP, which are based on this ESMP, report monthly and quarterly ESMRs and submit to the DM through the Supervision Consultant. The contractor will also prepare Labour Management Plan on the basis of TEFWER LMP, 	<ul style="list-style-type: none"> The Supervision Consultant will review the monthly/quarterly ESMRs and C-ESMP of the contractor/s and will include its own assessments and observations on ESHS aspects and prepare quarterly ESMRs and submit them to the DM. The Supervisory Contract Manager will ensure contractor compliance with ESMP requirements through continuous monitoring, audits,

Financial Roles	DM	ILBANK	Contractor	Supervisor Consultant
	Sub-Borrower	Financial Intermediary		
	<p>incidents, environmental spills etc.) within 24 hours and submit an incident report, including RCA, precautions and compensation measures taken within 30 business days.</p>	<ul style="list-style-type: none"> ILBANK will forward the environmental or social incident reports to the WB immediately upon receipt from the DM. 	<p>which is part of the C-ESMP.</p> <ul style="list-style-type: none"> Contractors must adhere to ESMP guidelines, considering them during bid preparation. The ESMP outlines potential negative project impacts and mitigation measures, along with responsible stakeholders. Contractors will train project personnel on ESMP measures during construction, focusing on environmental, occupational, and community health and safety, and social issues awareness. Environmental, Social, and Occupational Health and Safety (OHS) Experts, included in the sub-project Organizational Chart, will coordinate ESMP measures during construction. They'll ensure actions align with ESMP and implement monitoring plans. 	<p>and inspections. They'll identify and address any non-compliance issues.</p> <ul style="list-style-type: none"> The Environmental Expert will oversee ESMP implementation, reporting regularly to the sub-project owner. They should have relevant education (ideally a master's degree) and proficiency in English and Turkish. The Full time A Class OHS Expert will supervise health and safety measures, holding international safety certifications. Relevant education is preferred. The Social/Human Resources Expert will oversee community health, safety measures, and Social Engagement Plan implementation, reporting regularly. They should have relevant education and language proficiency.

DM

The DM will hold ultimate responsibility for the environmental and social performance of the sub-project, including the performance of its contractors. A Project Implementation Unit (PIU) will be established to carry out operational and administrative tasks to oversee the implementation of the E&S instruments and monitoring progress. The DM will be responsible for the preparation and implementation of ESMP and SEP including management of the sub-project level Public GM and Workers' GM; for the monitoring environmental and social performance of the contractors' works on site, in line with the site-specific environmental and social requirements; for the reporting to ILBANK on quarterly basis on E&S compliance and monitoring as stated in Table 5-1. Roles and Responsibilities

The DM will be responsible for the incident and accident reporting and informing the necessary institutions (WB, ILBANK etc.), as per the provisions explained below:

- The WB and ILBANK will be promptly notified of any incident or accident related to the sub-project which has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public or workers including but not limited to; incidents and accidents encountered during construction works, environmental spills, etc.
- Sufficient detail will be provided regarding the incident or accident, findings of the RCA, indicating immediate measures or corrective actions taken or that are planned to be taken to address it, compensation paid, and any information provided by any contractor and supervision consultant, as appropriate. It will be ensured that the incident report is in line with the WB's Environment and Social Incidence Response Toolkit. Subsequently, as per the Bank's request, a report on the incident or accident and propose any measures to prevent its recurrence will be prepared.
- The DM will report details of any significant environmental or social incidents (e.g. fatalities, lost time incidents, environmental spills etc.) within 48 hours and submit an incident report, including RCA, precautions and compensation measures taken within 30 business days. ILBANK will forward the incident report to the WB immediately upon receipt from the DM.

Contractor

The contractor will carry out the construction activities of the sub-project in line with the approved design documents and will be the responsible body to implement and apply the mitigation measures given in ESMP during construction phase. The construction contractor will develop Contractor's Environmental and Social Management Plan (C-ESMP), which is based on this ESMP, and report monthly and quarterly ESMRs, detailed in Table 5-2. The contractor should adhere to assigned duties and responsibilities as specified in the ESMP to ensure compliance with related national regulations, TEFWER ESMF, and WB's ESSs. The contractor will employ an A class full time OHS specialist and a full time environmental and

social expert who will instruct and consult the workers on workers' GM and implementation of ESMP (including GM and the applicable stakeholder engagement activities detailed in the sub-project SEP). Furthermore, a competent environmental and social expert of contractor will monitor implementation of measures given in the mitigation plan and report to the DM on a monthly basis. The prompt notification of accident and incidents within the scope of construction works in line with the above-described provisions is the responsibility of the contractor. The contractor will keep an incident register at construction site throughout the construction and defects liability period.

During the construction phase, the contractor firm will train its workers on environmental and social aspects (including OHS) as per WB's ESSs and national regulations in order to raise environmental and social awareness. During the defects liability period, the contractor will be responsible for any repairs of the newly constructed facilities, in accordance with legal regulations as of provisional acceptance. Within the liability period, the contractor will implement measures given in the Environmental and Social Mitigation Plan for operation.

Supervision Consultant

Supervision consultant contracted by the DM will include at least one Environmental Expert, one Social Expert and one Occupational Health and Safety Expert. The number of experts will be increased if necessary. Supervision Consultant will provide supervision of construction and/or rehabilitation works and installation of equipment. The experts will identify and manage environmental, social and OHS related risks and initiate corrective actions where necessary. The experts will also monitor and evaluate the performance of services provided by the contractor. In addition, a regular quarterly report regarding to environmental, social and OHS issues of the sub-project during construction phase will be provided by Supervision Consultant to the DM.

ILBANK

ILBANK will oversee the compliance and performance of the sub-project in line with national regulations and WB's ESSs. They will receive quarterly (and monthly if needed) E&S compliance and monitoring reports from the DM and review incident and accident reports forwarded by the DM. ILBANK will ensure that all necessary corrective measures and actions are implemented and will coordinate with the WB and other relevant institutions as needed. They will also facilitate communication and coordination between the DM and the WB to ensure the successful implementation of the sub-project.

5.2 REPORTING

Reporting processes that should be put into action during the implementation phase of the sub-project and the requirements of such processes are presented in Table 5-2.

Table 5-2. Reporting Requirements of Relevant Entities

Responsible Party	Reporting Process Requirements
Construction Contractor	<ul style="list-style-type: none"> The construction contractor will develop C-ESMPs, which are based on this ESMP, and report monthly and quarterly ESMRs and submit to the DM through the Supervision Consultant.
DM's PIU	<ul style="list-style-type: none"> The PIU will examine the monthly and quarterly ESMRs and C-ESMPs of the contractor/s and the Supervision Consultants and will be responsible for the timely delivery of the Monthly (if requested by ILBANK) and Quarterly ESMRs to ILBANK.
Supervision Consultant	<ul style="list-style-type: none"> The Supervision Consultant will review the monthly and quarterly ESMRs and C-ESMPs of the contractor/s and will include its own assessments and observations on ESHS aspects and prepare quarterly ESMRs and submit to the DM. The Supervision Consultant has the responsibility to prepare non-conformity forms in the event of any non-conformity observed during the site inspections and within the reports.
ILBANK's PMU	<ul style="list-style-type: none"> The PMU will review the monthly/quarterly reports delivered by the DM during the construction phase. ILBANK will inform the WB by providing regular semi-annual monitoring reports on the ESHS performance of the sub-project.
WB	<ul style="list-style-type: none"> The WB will review regular semi-annual monitoring reports on the ESHS performance of the sub-project and instruct ILBANK if any non-conformity or non-compliance identified.

For reporting on OHS, E&S incidents, the DM will report details of any significant incidents (e.g. fatalities, lost time incidents, environmental spills etc.) within 48 hours and submit an incident report, including RCA, precautions and compensation measures taken within 30 business days. ILBANK will forward the incident report to the WB immediately upon receipt from the DM.

5.3 TRAINING PROGRAMME

The capacity strengthening of the participating sub-project will be carried out by ILBANK PMU in close collaboration with the WB. In this regard, ILBANK will organize training workshops to familiarize municipalities and their potential consultants with the WB's ESSs and E&S policies. The concerned training programme is presented in Table 5-3.

Table 5-3. Training Programme Including the Sub-Project

Item No	Heading of the Training	Target Group	Timing and Duration
1	Environmental and Social Framework: <ul style="list-style-type: none"> Implementation of TEFWER ESF documents, ESMP, LMP, SEP, and GM 	PIUs of the municipalities	<ul style="list-style-type: none"> Initial training no later than 60 days after formation of the PMU/PIU and before start of the sub-project activities. Refresher trainings at least once a year or as needed, during the sub-project implementation.
2	Environment and Occupational Health Safety <ul style="list-style-type: none"> Workplace risk management Prevention of accidents at work sites Mandatory legal training, Work instructions Trainings (i.e. Working at Height, Confined Space Entry, Material Handling) for the target groups 	PIUs of the municipalities	<ul style="list-style-type: none"> Initial training no later than 60 days after formation of the PMU/PIU and before start of the sub-project activities. Refresher trainings at least once a year or as needed, during the sub-project implementation.

Item No	Heading of the Training	Target Group	Timing and Duration
	<ul style="list-style-type: none"> ▪ Use of Personal Protection Equipment's (PPEs) ▪ Health and safety standards ▪ Hazardous waste and leakage/spillage management ▪ Solid and liquid waste management ▪ Preparedness and response to emergency situation ▪ Root cause analysis for the accidents ▪ Awareness on communicable diseases (i.e. Covid-19, HIV/AIDS etc.) 		
3	<p>Labour and Working Conditions:</p> <ul style="list-style-type: none"> ▪ Implementation of the LMP ▪ Terms and conditions of employment according to national working laws and regulations ▪ Contractor and sub-contractor codes of conduct ▪ Worker's organizations ▪ Child labour and forced labour issues. ▪ Workers' GM 	PIUs of the municipalities	<ul style="list-style-type: none"> ▪ Initial training no later than 60 days after formation of the PMU/PIU and before start of the sub-project activities. ▪ Refresher trainings at least once a year or as needed, during the sub-project implementation.
4	<p>Grievance Mechanism:</p> <ul style="list-style-type: none"> ▪ Implementation of Public GM ▪ Registration and processing procedure ▪ Grievance procedure ▪ Documenting and processing grievances 	PIUs of the municipalities	<ul style="list-style-type: none"> ▪ Initial training no later than 60 days after formation of the PMU/PIU and before start of the sub-project activities. ▪ Refresher trainings at least once a year or as needed, during the sub-project implementation.

6 IMPLEMENTATION SCHEDULE AND COST ESTIMATES

The sub-project's construction works are expected to last 24 months and be completed in the September 2027. Throughout the operation phase, the economic life of the buildings is predicted as 40 years, machinery-equipment economic life of 15 years, and vehicles as 15 years.

In this context, the cost estimates for the implementation of the ESMP including the trainings and meeting of the sub-project is provided below.

Table 6-1. Cost Estimates for the Implementation of the Sub-Project's ESMP

Item No	Heading of the Training / Meeting / Implementation	Target Group	Timing and Duration	Cost**
1	Employment of E&S & OHS Experts Under PIU	DM	<ul style="list-style-type: none"> After signature of sub-loan agreement 	350,000 Euro*
	Employment of E&S & OHS Experts Under Contractor(s), and Supervisor Consultant	PIU of the DM	<ul style="list-style-type: none"> Prior to construction 	750,000 Euro*
2	Preparation and Implementation of E&S Sub-Management Plans	Contractor	<ul style="list-style-type: none"> Prior to construction 	8,000 Euro*
		PIU of the DM	<ul style="list-style-type: none"> Prior to operation 	80,000 Euro*
3	Waste Management, Spill Response and Pollution Prevention Activities	Contractor	<ul style="list-style-type: none"> Throughout the construction 	8,000 Euro*
		PIU of the DM	<ul style="list-style-type: none"> Throughout the operation 	80,000 Euro*
4	Environmental and Social Framework Training: <ul style="list-style-type: none"> Implementation of ESMP, LMP, SEP, and GM 	PIU of the DM	<ul style="list-style-type: none"> Initial training no later than 60 days after formation of the PMU/PIU and before start of the sub-project activities. Refresher trainings at least once a year or as needed, during the sub-project implementation. 	3,500 Euro*
5	Occupational Health and Safety Training: <ul style="list-style-type: none"> Workplace risk management Prevention of accidents at work sites Mandatory legal training, Work instructions Trainings (i.e. Working at Height, Confined Space Entry, Material Handling) for the target groups Use of Personal Protection Equipment's (PPEs) Health and safety standards Hazardous waste management Solid and liquid waste management Preparedness and response to emergency situation Awareness on communicable diseases (i.e. Covid-19, HIV/AIDS etc.) 	PIU of the DM	<ul style="list-style-type: none"> Initial training no later than 60 days after formation of the PMU/PIU and before start of the sub-project activities. Refresher trainings at least once a year or as needed, during the sub-project implementation. 	1,800 Euro*

Item No	Heading of the Training / Meeting / Implementation	Target Group	Timing and Duration	Cost**
6	Labour and Working Conditions Training: <ul style="list-style-type: none"> ▪ Implementation of the LMP ▪ Terms and conditions of employment according to national working laws and regulations ▪ Contractor and sub-contractor codes of conduct ▪ Worker's organizations ▪ Child labour and forced labour issues. ▪ Workers' Grievance Mechanism 	PIU of the DM	<ul style="list-style-type: none"> ▪ Initial training no later than 60 days after formation of the PMU/PIU and before start of the sub-project activities. ▪ Refresher trainings at least once a year or as needed, during the sub-project implementation. 	800 Euro*
7	Grievance Mechanism Training: <ul style="list-style-type: none"> ▪ Implementation of GM ▪ Registration and processing procedure ▪ Grievance procedure ▪ Documenting and processing grievances 	PIU of the DM	<ul style="list-style-type: none"> ▪ Initial training no later than 60 days after formation of the PMU/PIU and before start of the sub-project activities. ▪ Refresher trainings at least once a year or as needed, during the sub-project implementation. 	600 Euro*
8	Stakeholder Consultation Meeting: <ul style="list-style-type: none"> ▪ Presentation by the counsellors about the sub-project ▪ Stakeholders' questions about the sub-project and sub-project impacts are answered ▪ Stakeholders' opinions on the subproject and its impacts are recorded ▪ Stakeholders are informed about the addresses to which they can send their inquiries, suggestions, and complaints about the sub-project 	Affected groups and other relevant/affected stakeholders	<ul style="list-style-type: none"> ▪ After the draft ESMP report is completed. (Stakeholder meetings or any information sharing activities to be notified ten (10) days in advance by the DM through brochures, website announcements and newspaper advertisements (at least one national and one local newspaper)) 	2,000 Euro*
Total:				1,284,700 Euro

*Including transportation and accommodation costs.

**Costs are indicative and for orientation purposes only - at time of preparation of this ESMP.

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APPENDICES

- APPENDIX - A E&S Screening Form of the Sub-Project
- APPENDIX - B Official Application Letter and the Relevant Response Document on Horizontal Drillings Under Highways
- APPENDIX - C Sub-Project Area Photos
- APPENDIX - D Chance Find Procedure
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- APPENDIX - F Generic Asbestos Management Plan

APPENDIX-A
E&S Screening Form of the Sub-Project

Annex 1-A: Environmental and Social Impacts and Risks Screening Template

Sample Environmental Screening Form

Sub-project Information

Sub-project name	DÜZCE (CENTRUM) WATER SUPPLY PROJECT – PHASE 1
Procurement Plan Item No	Proposed to be financed under WB’s “TÜRKIYE EARTHQUAKE, FLOODS AND WILDFIRES EMERGENCY RECONSTRUCTION PROJECT (TEFWER)”
Type of sub-project	Infrastructure (water supply network)
Implementing authority(ies)	Düzce Municipality, Directorate of Water and Sewerage Works
Location of sub-project (Neighborhood(s), District, Province)	Düzce Province, Centrum District
Brief Description of Sub-project activities: (construction and operation/implementation activities)	Construction of water supply network (approximately 87 km)
Geographical coordinates of the Site:	Network will be constructed in Düzce city roads
Area of land that will be used for the sub-project:	In the scope of the Project, various network lines shall be constructed on various open roads.
Current Land use	Network: Open roads that belong to Municipality (Also there will be crossings via horizontal drilling under highways without interrupting traffic)
Land ownership	Düzce Municipality
Access routes to the Site	From opened city roads that belong to Düzce Municipality

Baseline Environmental Conditions

Is the sub-project site located on or adjacent to any of the following (Provide information for all sites and alignment of the project components/sub-components, associated activities; give details, mention distance to these features in km)

No	Environmental Aspects	Yes	No	Details
1.	Sensitive ecosystems		√	<p>This is a linear environmental infrastructure Project (approximately 87 km water supply line) to be conducted at Centrum districts passing through the existing public roads as provided in its PID and this Screening Form.</p> <p>Presence of sensitive ecosystems on or adjacent to the project area have not been observed through the information provided in its PID and any related risk is not anticipated.</p>

No	Environmental Aspects	Yes	No	Details
2.	Natural habitats		√	There are no natural habitats on or adjacent to the project area.
3.	Areas with protection status (cultural /archaeological /natural)		√	<p>Project area is not inside boundaries of any protection area. Nearest protection areas are as the following:</p> <ul style="list-style-type: none"> - Efteni Lake Wildlife Development Area and Wetland (10 km to Düzce centrum) - Konuralp Antique City (2 km to Project Area) - Guzeldere Waterfall Nature Park; 28 km to Düzce centrum - Kurugol Nature Park; 14 km to Düzce centrum - Aydınpınar Waterfalls Nature Park; 12.3 km to Düzce centrum - Geyiklibel Canyon Nature Park; 37 km to Düzce centrum <p>Subproject-specific ESMP is required to identify and as required address potential risks in line with ESS8.</p>
4.	Critical habitats		√	<p>There are no critical habitats on or adjacent to the project area.</p> <p>Subproject-specific ESMP is required to identify and as required address potential risks in line with ESS6.</p>
5.	Describe the soil and vegetation on site			Network lines will be built on existing urban roads, there is no vegetation.

Sensitive Receptors

Are there sensitive receptors in the area of influence of the sub-project, such as:

No	Sensitive receptors	Yes	No	Details
1.	Housing units, schools, hospitals or other sensitive receptors	√		<p>Since the network lines within the scope of the project are in the center of Düzce city, there will be construction near schools, universities, hospitals, mosques and nursing homes.</p> <p>Subproject-specific ESMP and SEP are required to identify and as required address potential risks and mitigations in line with ESS4 and ESS10.</p>
2.	Culturally and/or socially important paths, areas/religious occupancies, burial grounds, tourist or pilgrim congregation areas, etc.	√		<p>There is a cemetery and mosque nearby.</p> <p>Sub-project-specific ESMP and SEP are required to identify and as required address potential risks in line with ESS4 and ESS8.</p>

No	Sensitive receptors	Yes	No	Details
3.	Water sources (groundwater wells, springs, surface water resources)		√	Any significant impact on water sources is not anticipated. Subproject-specific ESMP is required to identify and as required address potential risks and mitigations in line with ESS1 and ESS3.
4.	Areas prone to flooding / landslides	√		As also mentioned in PID Report, there is flood/landslide risk in Düzce Centrum. Risks are assessed in geotechnical studies of the subproject and explained in its PID.
5.	Downstream communities		√	Any risks related with the downstream communities are not anticipated at this stage. Subproject-specific ESMP and SEP are required to identify and as required address potential risks and mitigations in line with ESS4 and ESS10.
6.	Areas affected by landslides		√	Based on the historical data research, no landslides have been recorded in the Subproject site. Geotechnical analysis has been conducted and the relevant information provided in the PID, please refer to “5.2.5 Geotechnical Study” section.
7.	Other sensitive receptors		√	Presence of sensitive receptors on or adjacent to the project site have not been observed through the information provided in its PID and any related risk cannot be assessed at this stage. Subproject-specific ESMP and SEP are required to identify and as required address potential risks and mitigations in line with ESS1, ESS3, ESS4, ESS6, ESS8, ESS10.

Current Environmental Status

No	Sensitive receptors	Yes	No	Details
1.	Is the site in critical / over exploited condition?		√	This is a linear environmental infrastructure Project (approximately 87 km water supply line) to be conducted at Düzce Centrum passing through the existing public roads as provided in its PID. No critical / over exploited condition is observed.
2.	Is the site covered with vegetation?	√		Network pipes will be constructed under city roads (not covered with vegetation).
3.	Is the site disaster-prone? If yes; list all disaster zone categories applicable.	√		The subproject area is located at the city center of Düzce, the list of disaster zone

No	Sensitive receptors	Yes	No	Details
				<p>categories applicable to the sub-project are listed as below:</p> <ul style="list-style-type: none"> - Earthquake - Flood - Landslide <p>Düzce is in the high danger earthquake zone under the influence of the North Anatolian Fault Zone (NAF), Düzce Fault Zone, Hendek Fault Zone and Çilimli Fault Zone.</p> <p>Related information is also provided in its PID, please refer to “2.8 History and Potential of Natural Disasters” section.</p> <p>Subproject-specific ESMP is required to identify and as required address potential risks and mitigations in line with ESS1.</p>
4.	Is the site suitable for proposed development?	√		New water lines will be constructed in the areas where the existing networks are already located.
5.	Describe existing pollution or degradation in the site(s)		√	Network pipes will be laid on existing roads (asphalt, stabilized, paving stone, etc.), there is no natural area.
6.	Any other remarks on baseline condition?		√	There are no any other remarks on baseline condition at this stage.
7.	Is there a possibility for Asbestos Containing Materials at the site(s)?	√		During renewal of the network, existing asbestos pipes will be left under the ground in the existing location. If they need to be removed because of new pipe installation requirements, then removal process will be executed ensuring the requirements of “Regulation on Health and Safety Measures in Working with Asbestos” dated 25.01.2013 (OG nr: 28539) and Asbestos Management Plan. Contractor will prepare asbestos management plan. It will be ensured that the relevant regulations and relevant sub-management plan (please refer to Appendix-F) are followed during the removal, transportation and disposal of such pipes.

Anticipated Environmental Impacts: Impacts on Land, Geology and Soils

Will the proposed sub-project cause the following on land / soil?

Item	Impacts	Yes / Maybe	No	Details
1.	substantial removal of top soil (indicate in sqm)		√	Network pipes will be constructed under asphalt municipal roads. Natural soil will

Item	Impacts	Yes / Maybe	No	Details
				not be disturbed. Excavated soil will be backfilled.
2.	degradation of land		√	Since the soil removed after excavation will be restored by backfilling, degradation is not anticipated.
3.	loss or impacts on cultural/heritage properties		√	There is no known cultural heritage site or cultural resources on the route of the excavation works. During renewal of existing lines and construction of new network lines, there is a lower probability of encountering any findings during works, since all network pipes will be constructed on already opened Municipality roads. However, if any cultural assets are encountered, a "Chance Find Procedure" (please refer to Appendix- D) will be applied.
4.	physical changes in the project area (i.e. changes to the topography) due to cutting and filling, excavation, earthwork or any other activity		√	Excavation/filling works will be carried out during the warehouse construction and network renewal process, significant physical changes are not anticipated. Subproject area will be restored after subproject activities.
5.	contamination or pollution of the Land? (indicate possible risks)	√		The Contractor will carry out the necessary work in accordance with the environmental and social (ES) study requirements regarding the prevention and monitoring of excavation wastes, possible gas emissions from work machines, liquid wastes (oil/fuel) spills during construction activities, and the management of these harmful wastes. Subproject-specific ESMP is required to identify and as required address potential risks in line with ESS3.

Impacts on Water Environment

Will the sub-project or its components cause any of the following impacts on quantity or quality of water sources?

Item	Impacts	Yes / Maybe	No	Details
1.	Will the sub-project involve dredging in the river environment?		√	Since this is a linear project (approximately 87 km water supply line) dredging is not anticipated.
2.	Impacts on availability and access to water resources		√	Proposed Subproject will have positive impact and increase access to safe water sources, since the project includes measures for renewal of water supply

Item	Impacts	Yes / Maybe	No	Details
				network that suffer from high water losses and hydraulic problems.
3.	Pollution of water bodies/ground water nearby or downstream		√	<p>Pollution of water bodies/ground water on or adjacent to the Subproject site is not anticipated. In order to prevent contamination of water resources near the project area, the ends of uninstalled pipes will be closed. Surface flow resulting from rain/stormwater or wastewater generation due to dust suppression activities will be managed properly.</p> <p>Subproject-specific ESMP is required to identify and as required address potential risks and mitigations in line with ESS1 and ESS3.</p>
4.	Impacts on river flow patterns		√	Impacts on river flow patterns are not anticipated.
5.	Will the project result in stagnation of water flow or pondage?		√	Stagnation of water flows or pondage is not anticipated.

Impacts on Biodiversity

Will the sub-project or its components cause any of the following impacts on biodiversity?

Item	Environmental Impacts	Yes / Maybe	No	Details
1.	cutting of trees or clearing of vegetation?		√	Since network pipes will be constructed on existing urban roads, there will be no tree cutting.
2.	habitat fragmentation due to the clearing activities? (i.e. hindrance to the local biodiversity like disturbing the migratory path of fish, birds, mammals, etc.)		√	Since construction activities will take place on existing urban roads in Düzce Centrum for network scope of the Project, such an impact is not expected.
3.	potential nuisance of noise and light pollution or any disturbance on surrounding habitats		√	Not anticipated.

Impacts on Communities

Will the sub-project or its components cause any of the following impacts on nearby communities?

Item	Environmental Impacts	Yes / Maybe	No	Details
1.	Health & Safety risks in nearby communities (major accident risks such as explosions, fires, toxic releases, etc.)		√	The presence of other infrastructure (gas and electricity lines) on network routes may generate these risks. During the project, Düzce Municipality and supervisory control organization (TA)

Item	Environmental Impacts	Yes / Maybe	No	Details
				will ensure coordination with other institutions (like gas and electricity company) and guide the Contractor appropriately.
2.	Potential noise/vibration to nearby communities	√		<p>Since network lines shall be constructed on the routes of roads in the city, noise/vibration generation from the construction activities are possible. Mitigation measures shall be taken according to requirements of ES studies.</p> <p>Sub-project-specific ESMP is required to identify and as required address potential risks and mitigations in line with ESS1 and ESS3.</p>
3.	Potential damages to common property, roads, etc.	√		<p>Since network lines shall be constructed on the routes of roads in the city, potential damages to roads are possible. Mitigation measures shall be taken according to requirements of ES studies.</p> <p>Sub-project-specific ESMP is required to identify and as required address potential risks and mitigations in line with ESS1 and ESS3.</p>
4.	Potential risks of traffic accidents	√		<p>Since network lines shall be constructed on the routes of roads in the city, potential risks of traffic accidents are possible. Mitigation measures shall be taken according to requirements of ES studies.</p> <p>Sub-project-specific ESMP is required to identify and as required address potential risks and mitigations in line with ESS1 and ESS3.</p>

Impacts due to Storage and Wastes: Pollution and Hazards

Will the sub-project or its components cause any impact due to storage of materials, wastes or pollution due to releases during various project activities?

Item	Type	Yes	No	Details
1.	Does the project include use or storage of dangerous substances (e.g., large quantities of hazardous chemicals/materials like Chlorine, Diesel, Petroleum products; any other?		√	<p>All hazardous chemicals (vehicle fuels, etc.) will be supplied externally. If storage is deemed necessary, aboveground storage will be preferred and it will be stored by taking mitigation measures to be defined in the ES studies.</p> <p>Subproject-specific ESMP is required to identify and as required address</p>

Item	Type	Yes	No	Details
				potential risks and mitigations in line with ESS1 and ESS3.
2.	Will the project produce solid or liquid wastes; including construction/demolition wastes (including dredging, de-weeding wastes, muck/silt, dust); polluted liquids?	√		<p>Municipal waste production by construction workforce is foreseen.</p> <p>Construction activities will cause excavation and demolition waste. Excavation material resulting from excavation activities during construction will be evaluated for backfilling or other activities, taking into account the geotechnical reports, if deemed appropriate by the Consultant and Control Organization (TA).</p> <p>If any other hazardous and non-hazardous liquid and solid waste is occurred, they will be collected separately and stored temporarily under the conditions specified in the required ES studies; They will be subject to recycling/recovery/disposal in order of priority.</p> <p>Subproject-specific ESMP is required to identify and as required address potential risks and mitigations in line with ESS1 and ESS3.</p>

Environmental Pollution

Will the process cause or increase the following?

Item	Type	Yes	No	Details
1.	Air pollution	√		<p>The risk and impact of temporary and short-term air pollution emitted by construction machinery like excavator, truck etc. will be observed.</p> <p>Access to the construction site will be blocked, modern equipment and vehicles will be selected that can meet the relevant emission standards in construction activities, etc.</p> <p>Subproject-specific ESMP is required to identify and as required address potential risks and mitigations in line with ESS1 and ESS3.</p>
2.	Odor nuisance		√	Odor Nuisance is not anticipated.
3.	Environmental noise	√		The risk and impact of temporary and short-term noise pollution caused by construction machines such as excavators, trucks etc. will be observed.

Item	Type	Yes	No	Details
				Site specific ESMP is required to identify and as required address potential risks and mitigations in line with ESS1 and ESS3.
4.	Visual blight or light pollution		√	Visual blight or light pollution is not anticipated.
5.	Water pollution (surface waters, groundwater)		√	For the construction phase domestic wastewater will be produced by construction workforce which will be discharged to the existing sewerage system operated by Düzce Municipality. In order to prevent contamination of water resources near the project area, the ends of uninstalled pipes will be closed. Surface flow resulting from rain/stormwater or wastewater generation due to dust suppression activities will be managed properly. Subproject-specific ESMP is required to identify and as required address potential risks and mitigations in line.
6.	Soil contamination		√	There is a risk of soil contamination caused by spills and scattering that may occur during the construction phase of the project. Site specific ESMP is required to identify and as required address potential risks and mitigations in line with ESS1 and ESS3.
7.	Other types of impacts on the ambient environment		√	No other impact on the ambient environment is expected.
8.	Expose to the hazardous materials (such as asbestos)	√		During renewal of the network, existing asbestos pipes will be left under the ground in the existing location. If they need to be removed because of new pipe installation requirements, then removal process will be executed ensuring the requirements of "Regulation on Health and Safety Measures in Working with Asbestos" dated 25.01.2013 (OG nr: 28539) and Asbestos Management Plan. It will be ensured that the relevant regulations and relevant sub-management plan (please refer to Appendix-F) are followed during the removal, transportation and disposal of such pipes.

Suggested Environmental Enhancement Measures

Has the sub-project design considered the following enhancement measures?

Item	Enhancement Measures	Yes	No	Details
1.	Energy conservation measures/ energy recovery options incorporated in sub-project design	√		<p>Proposed project includes a new water supply network suitable for the hydraulic needs of the entire city. High water losses ratios will be reduced and the city will have hydraulically suitable drinking water.</p> <p>Reducing water losses will contribute to energy efficiency during water supply (at WTP and intermediate pump stations) and will also increase Düzce's resilience to drought.</p>
2.	Waste minimization or waste reuse/recycle options	√		<p>Waste generation will be observed during the construction phase due to the nature of the activities. The wastes to be generated will be managed in accordance with the waste management regulation and related sub-management plan (which will be prepared by its contractor).</p> <p>Site specific ESMP is required to identify and as required address potential risks and mitigations in line with ESS1 and ESS3.</p>
3.	Rainwater harvesting, water recycling and other water resource enhancement measures		√	No rainwater harvesting, water recycling and other water resource enhancement measures are designated.
4.	Mitigations against extreme events, drought, flood, other natural disasters	√		<p>The extreme events are assessed at the design stage of the subproject and explained in its PID.</p> <p>Reducing water losses with the support of the proposed Subproject will contribute to water efficiency and increase Düzce's resilience to drought.</p>
5.	License for water withdrawal from surface water source	NA	NA	Within the scope of the project, water will not be drawn from surface water sources.
6.	Dredging permits	NA	NA	Dredging will not be performed within the scope of the project.

7.	License for transportation and storage of diesel, oil and lubricants, etc.	√		Diesel, oil and lubricants will not be stored within the scope of the project. In case it is required to transport diesel for refuelling of construction equipment, such services will be obtained from licensed companies.
8.	License for transportation of hazardous wastes	√		Small amount of hazardous waste that may be generated during construction activities will be sent to companies that have hazardous waste transportation permits and licence. Hazardous wastes will be hauled with licensed and authorized vehicles in accordance with the regulations.

SUMMARY OF ENVIRONMENTAL SCREENING

Project Categorization and Need for ESF Instruments, Oversight

Project Category	<input type="checkbox"/> Low <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Substantial <input type="checkbox"/> High
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<p>Key Reasons</p>	<p>The main E&S risks due to the activities planned within the scope of the Subproject are related with the construction of water supply line on the existing public roads listed as in below.</p> <ul style="list-style-type: none"> • Subproject may involve or lead to general and sector-specific OHS risks that need to be managed in accordance with national legislation and good international industry practices (e.g. WB Group Environmental, Health and Safety Guidelines) throughout the construction phase mainly. Subproject-specific E&S assessment and management documentation is required to address the risks adequately. Contractors are required to prepare and implement subproject specific OHS management plans and procedures addressing the identified OHS risks. • Subproject may involve or lead to pollution/release of pollutants to air, water, land/soil due to routine, non-routine and accidental circumstances during construction and operation phases. Subproject-specific E&S assessment and management documentation is required to address the risks adequately. • Subproject will lead to increased risk of traffic related accidents and road safety issues on the provincial roads/motorways and village roads during the construction phase. Subproject-specific E&S assessment and management documentation is required to address the risks adequately. • Subproject may involve risk of managing stakeholder expectations, reactions, grievances, feedback, etc. A SEP, including grievance mechanism for public, is required to be prepared in line with ESS10. SEP must cover any vulnerable/ disadvantaged groups etc. if any. <p>The identified risks and their impacts will have medium magnitude, will be limited in scale (site-specific) and will be temporary, can be avoided, managed and/or mitigated with relatively uncomplicated accepted measures which will be defined in ES assessment documents (ESMP, SEP, OHS Management Plan, etc.). So, the risk rating has been defined as “Moderate”.</p>
<p>Safeguards Instruments Required</p>	<p><input type="checkbox"/> ESIA and ESMP</p> <p><input checked="" type="checkbox"/> ESMP</p> <p><input checked="" type="checkbox"/> SEP</p> <p><input type="checkbox"/> RP</p> <p><input type="checkbox"/> Ex-Post Social Audit Report</p>

Status		Name, Signature with Date
Prepared by	Arısu Mühendislik Mimarlık Müşavirlik Ltd. Şti.	
Checked and categorized as (low, moderate, substantial, high) by	Moderate	
Reviewed and approved by		

Annex 1-B: Sample Social Screening Form

Land Acquisition and Livelihoods

Land Acquisition	Yes	No	Details
Does the sub-project require private land acquisition?		√	All of the works planned to be carried out within the scope of the project will pass through the planned zoning roads. Additional land acquisition or expropriation will not be required.
Was the land required for sub-project already acquired?	√		Network routes are on public routes that belong to Düzce Municipality
Has the acquired lands been duly transferred and are there any litigation/legacy (pending for title transfer, compensation payment, ownership disputes etc) issues?	√		The acquired lands have been duly transferred. There are no litigation/inheritance issues.
Are there any complaints/unresolved cases of already acquired lands?		√	There are no complaints or unresolved cases of already acquired lands.
Is it possible to purchase privately owned through a Willing Buyer–Willing Seller agreement?	NA	NA	n.a.
Does the sub-project cause any access restriction to the commuters/pedestrians/ business and trades?	√		There may be temporary access restrictions for springs/workplaces and tradesmen during construction works. Alternative safe passage routes will be created with the planning to be made. Site specific ESMP and SEP are required to identify and as required address potential risks and mitigations in line with ESS4.
Is land for material mobilization or transport for the civil work available within the existing plot/Right of Way?	√		The land which is previously allocated for treatment facilities of the existing treatment plant is available for material mobilization or transport for construction works.
Are there any formal / informal users or non-titled people who are utilizing (inhabiting/doing business or using for other purposes etc.) the proposed site/project locations that will be used for civil works? If yes, please provide how many and for what purposes.		√	It is not currently used. It remains within the area previously allocated for the existing treatment plant. This is a linear environmental infrastructure Project (approximately 87 km water supply line) to be conducted at the districts of the city center of passing through the existing public roads as provided in its PID and this Screening Form. There will not be any other lands apart from the public roads to be utilized, and there are not any informal users.
Is any temporary impact likely on livelihoods of persons living on the land to be acquired?		√	No lands to be acquired.

Is there any possibility to move out, close of business/commercial/livelihood activities of persons during construction?		√	The impact of the project on business/commercial/livelihood activities in the work areas will be local and temporary. Temporary access routes will be provided for affected workplaces during the work. Therefore, there will be no possibility to move out or close of business. Site specific ESMP and SEP are required to identify and as required address potential risks and mitigations.
Is there any case of temporary or permanent physical displacement of persons due to sub-project works?		√	There will not be any temporary or permanent physical displacement within the scope of the Sub-project.
Does this project involve resettlement (physical displacement) of any persons? If yes, give details.		√	There will not be any resettlement of any persons within the scope of the Sub-project.
Will there be loss of/damage to productive trees, fruit plants or crops that generate livelihood income for the households?		√	There will be no loss of productive trees, fruit plants or crops that generate livelihood income for the households.
Will there be loss of incomes and livelihoods for anyone due to project intervention?		√	The impact of the project on business/commercial/livelihood activities in the work areas will be local and temporary. Temporary access routes will be provided for affected workplaces during the work. Therefore, there will be no loss of incomes and livelihoods. Site specific ESMP and SEP are required to identify and as required address potential risks and mitigations.
Will people permanently or temporarily lose access to facilities, services, or natural resources?		√	Temporary access routes will be provided for affected people during the work. Therefore, there will be no permanently or temporarily loss of access to facilities, services, or natural resources. Site specific ESMP and SEP are required to identify and as required address potential risks and mitigations.

Labor

Labor issues	Yes	No	Details
Will project cause loss of employments/jobs?		√	No loss of employments/jobs are anticipated due to the works within the scope of the Sub-project.
Will project generate excessive labor influx as a result of new constructions?		√	Due to the nature of the project, the required workforce will be limited.

			<p>Therefore, there will be no excessive labour influx as a result of the project.</p> <p>The number of personnel to work on site during the construction phase is approximately 50 people.</p>
Does construction activities require additional/skilled labor from outside the locality?		√	Since the project will take place in Düzce city center, it does not require additional external labor force from other cities.
Will sub-project/construction activities cause destruction/disturbance to host community living?	√		<p>The construction activities might cause disturbance to host community living such as dust, noise, and traffic. But these affects will be local and temporary.</p> <p>Site specific ESMP and SEP are required to identify and as required address potential risks and mitigations.</p>
Will construction of new buildings, drainage lines, powerlines create any degradation/disturbances for public buildings/resources/ adjacent houses, wells, lands, burial places, children parks, schools etc.?		√	The water supply networks will be constructed on the already existing paved roads within the scope of the Sub-project. Any disturbances for public buildings/resources/ adjacent houses, wells, lands, burial places, children parks, schools etc. will be mitigated in accordance with the site specific ESMP and SEP which are required to be prepared.
Will this intervention generate downsize in current labor force (retrenchments) of the agency?		√	No generation of downsize in current labor force (retrenchments) of the agency is anticipated.
Are there are GBV/SEA/SH risks for workers?	√		There are always such risks for workers, regardless of project activities. Trainings will be given to the workers for GBV/SEA/SH risks. Any complaint about these issues will be handled strictly confidential
Is there a grievance mechanism for the workers? Is it functioning?	√		<p>Any complaints from workers or citizens regarding the proposed project will first be registered at the municipality/administration level and will be satisfactorily addressed by the municipal Project Implementation Unit (PIU) within a certain period of time. In order to convey complaints, there is a toll-free number (153) through the 'White Desk' system of Düzce Municipality.</p> <p>Apart from these complaint channels, a project-specific Grievance Mechanism will be established.</p>

Vulnerable Groups

Vulnerability issues	Yes	No	Details
Are there any vulnerable groups who may be affected adversely due to the sub-project?		√	Site specific ESMP and SEP are required to identify and as required address potential risks and mitigations.

SUMMARY OF SOCIAL SCREENING

Project Categorization and Need for Safeguards Instruments, Oversight

Project Category	<input type="checkbox"/> Low <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Substantial <input type="checkbox"/> High
Key Reasons	<p>The main E&S risks due to the activities planned within the scope of the Subproject are related with the construction of water supply line on the existing public roads listed as in below.</p> <ul style="list-style-type: none"> • Subproject may involve or lead to general and sector-specific OHS risks that need to be managed in accordance with national legislation and good international industry practices (e.g. WB Group Environmental, Health and Safety Guidelines) throughout the construction phase mainly. Subproject-specific E&S assessment and management documentation is required to address the risks adequately. Contractors are required to prepare and implement subproject specific OHS management plans and procedures addressing the identified OHS risks. • Subproject may involve or lead to pollution/release of pollutants to air, water, land/soil due to routine, non-routine and accidental circumstances during construction and operation phases. Subproject-specific E&S assessment and management documentation is required to address the risks adequately. • Subproject will lead to increased risk of traffic related accidents and road safety issues on the provincial roads/motorways and village roads during the construction phase. Subproject-specific E&S assessment and management documentation is required to address the risks adequately. • Subproject may involve risk of managing stakeholder expectations, reactions, grievances, feedback, etc. A SEP, including grievance mechanism for public, is required to be prepared in line with ESS10. SEP must cover any vulnerable/disadvantaged groups etc. if any. <p>The identified risks and their impacts will have medium magnitude, will be limited in scale (site-specific) and will be temporary, can be avoided, managed and/or mitigated with relatively uncomplicated accepted measures which will be defined in ES assessment documents (ESMP, SEP, OHS Management Plan, etc.). So, the risk rating has been defined as “Moderate”.</p>

Safeguards Instruments Required	<input type="checkbox"/> ESIA and ESMP <input checked="" type="checkbox"/> ESMP <input checked="" type="checkbox"/> SEP <input type="checkbox"/> RP <input type="checkbox"/> Ex-Post Social Audit Report
---------------------------------	--

Status	Agency / Official	Name, Signature with Date
Prepared by	Arısu Mühendislik Mimarlık Müşavirlik Ltd. Şti.	
Checked and Categorized as (low, moderate, substantial, high) by		
Reviewed and accepted by		

APPENDIX-B

Official Application Letter and the Relevant Response Document on Horizontal Drillings Under Highways



T.C.
DÜZCE BELEDİYE BAŞKANLIĞI
Su ve Kanalizasyon Müdürlüğü



Sayı : E-15515931-030.03-108455
Konu : Protokol İşlemleri HK.

17.11.2023

KARAYOLLARI 4. BÖLGE MÜDÜRLÜĞÜNE

Belediye Başkanlığımız tarafından 2024 yılı içerisinde inşaatına başlanılması planlanan "Düzce Merkez İçme Suyu Şebekesi Yenileme İşİ" kapsamında gerekli noktalarda yapılması planlanan karayolu geçişleri (Yatay Sondaj) için gerekli protokol işlemlerinin başlatılması hususunda; Gereğini bilgilerinize arz/rica ederim.

Caner Okan KALTU
Belediye Başkan Yardımcısı

Ek: İçme Suyu Kesin Projesi Karayolu Geçiş Detayı

Bu belge, güvenli elektronik imza ile imzalanmıştır.


Doğrulama Kodu: mJH1IV-o64s12-vKbM0m-cAfrqT-qCdeGSC7 Doğrulama Linki: <https://www.turkiye.gov.tr/icisleri-belediye-ebys>

Ceddiye Mahallesi İstanbul Caddesi, Merkez, Düzce
Telefon No: (380)524 58 21 Faks No: (380)524 58 25
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Kep Adresi: duzcebelediyesi@hs01.kep.tr, duzcebelediyesi@hs03.kep.tr


Bilgi için: Duygu ÖZGÖNÜL
Bilgisayar İşletmeni
Telefon No:



1



T.C.
KARAYOLLARI GENEL MÜDÜRLÜĞÜ
4. Bölge Müdürlüğü



25.01.2024

Sayı : E.53712862- 170.08 / 1438625
Konu : İçme suyu boru hattı hk.

DÜZCE BELEDİYE BAŞKANLIĞINA
(Su ve Kanalizasyon Müdürlüğü)
Cedidiye Mah. İstanbul Cad.
Merkez / DÜZCE

İlgi: 17.11.2023 tarih ve 15515931-108455 sayılı yazınız.

İlgi yazıdaki talebiniz incelenmiştir. Hattınızın geçtiği güzergâh, (655-01) K.K.No'lu Düzce – Akçakoca devlet yolunun muhtelif km'ler arasında paralel devam eden hattın uygulama projesi ve kesitlerinin olmaması, (100-11) K.K.No'lu İstanbul – Düzce – Bolu devlet yolunun 21+600 km'sinden geçirilmek istenen, enine yatay sondaj metodu ile içme suyu boru hattının farklı seviyeli kavşaktan geçirilmek istenmesi, ayrıca menfezden geçiş ile ilgili talebiniz anlaşılabilir olması ve mevcut menfezlerin yüzey suları, yağmur suyu drenajı için yapılmış olan hidrolik amaçlı sanat yapısı olması nedeniyle bu güzergahtaki talebiniz uygun görülmemiştir.

(100-11) K.K. No'lu İstanbul – Düzce – Bolu devlet yolunun 24+850 km'sinden karayolları kamulaştırma sahası içerisinde, yeraltından, enine, yatay sondaj metodu ile, (81-03) K.K. No'lu Beyköy – Bahçeşehir il yolunun 4+000 km'sinden karayolları kamulaştırma sahası içerisinde, yeraltından, enine, yatay sondaj metodu ile ve (81-25) K.K. No'lu Düzce – Beyköy il yolunun 1+100 km'sinden karayolları kamulaştırma sahası içerisinde, yeraltından, enine, yatay sondaj metodu ile içme suyu boru hattı geçişi işi için düzenlenen protokoller yazı ekinde gönderilmektedir.

Protokollerin 1,2,3. Sayfalarının yetkililerce paraf edilmesi, 4. sayfalarının da imzalanıp mühürlendikten sonra, protokollerin onaylanmak üzere Genel Müdürlüğümüze gönderilebilmesi için 2024 yılı keşif ve arazi kullanım bedelinin %0,948'i olan 8.259 TL' lik Damga Vergisi ile 2024 yılı keşif ve arazi kullanım bedeline göre düzenlenen protokol bedeli olan 1.045.368 TL'nin, Maltepe Vergi Dairesi 8150724398 vergi nolu Karayolları 4. ANKARA Bölge Müdürlüğü'nün Ziraat Bankası / Ankara - Kamu Kurumsal Şubesinin TR330001001745108906155021 İBAN No' lu hesabına, işin ismi ve geçiş yerinin açıklama kısmında belirtilerek, protokol bedelinin yatırılması ve bankadan alınacak olan banka makbuzlarının asılları ile birlikte protokolün aslının imzalanarak Bölge Müdürlüğümüze gönderilmesi hususunda;

Gereğini arz/rica ederim.

T.C.
BELEDİYE BAŞKANLIĞI
Yazı İşleri Müdürlüğü
Aziz Fırat GEYLANI
Bölge Müdürü a.
Bölge Müdür Yardımcısı

Rajist Sayısı	4506
Rajist Tarihi	29.01.2024
Rajist Saati	

HAVALE EDİLECEK YER

Su ve Kanal. Müdür.


EKLER:
1. Protokol (3x4 sayfa)


"Bu belge, güvenli elektronik imza ile imzalanmıştır."

Belge Doğrulama Kodu: "mjgh944645E" Belge Doğrulama Adresi: "https://www.turkiye.gov.tr/kgm-ehys"


Zübeyde Hanım Mah.Etibik Cad. No:19 06070 Altındağ/ ANKARA Bilgi İçin : METİN GÖKDEMİR
VİHKİ (Büro Memuru)

Telefon No : 312 5506000 Faks: 312 5506074 Telefon : 312 5506000
İnternet Adresi : www.kgm.gov.tr KEP: kgm4bolge@hs01.kep.tr e-posta : mgokdemir1@kgm.gov.tr
İlgili Birim : Tezisler ve Bakan Başmühendisliği -




T.C.
KARAYOLLARI GENEL MÜDÜRLÜĞÜ
4. Bölge Müdürlüğü





2. Keşif Özeti (3 sayfa)
3. Kullanım İzin Bedeli F. (3 sayfa)


DAĞITIM:
Gereği:
Düzce Belediye Başkanlığı

Bilgi:
Muhasebe Şubesi Müdürlüğü

1E4-A2A-20

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Zübeyde Hanım Mah. Etlik Cad. No:19 06070 Altındağ/ ANKARA

Telefon No : 312 5506000 Faks: 312 5506074 Bilgi için : METİN GÖKDEMİR
İnternet Adresi : www.kgm.gov.tr KEP: kgm4bolge@bs01.kep.tr Telefon : 312 5506000
İlgili Birim : Tesisler ve Bakım Başmühendisi e-posta : mgokdemir1@kgm.gov.tr



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APPENDIX-C
Sub-Project Area Photos



Düzce Water Treatment Plant (DWTP)



Remote View of the City Centre from the DWTP Area #1



Remote View of the City Centre from the DWTP Area #2



Remote View of the City Centre from the DWTP Area #3



Remote View of the City Centre from the DWTP Area #4

APPENDIX-D
Chance Find Procedure

INTRODUCTION

This document is intended to avoid potential impacts of the sub-project on any cultural heritage during land preparation works, including excavation. At the baseline studies, field survey and literature review were conducted for the sub-project and its vicinity to identify potential archaeological and immovable cultural properties. No archaeological or immovable cultural property was encountered during the study.

This Procedure is a part of the general package as an appendix to the Environmental and Social Management Plan (ESMP) developed for the sub-project.

SCOPE

Types of Cultural Heritage Covered by This Procedure

Tangible Cultural Heritage

Tangible (physical) cultural heritage refers to movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance.

ROLES AND RESPONSIBILITIES

Roles	Responsibilities
Contractors	<ul style="list-style-type: none"> ▪ Compliance with the Chance Find Procedure provided in contractor agreements, ▪ Provide appropriate training and information to the worksite personnel who work in the sub-projects and who may disturb the cultural heritage so that they understand their responsibilities for cultural heritage.
Sub-project Owner (DM)	<ul style="list-style-type: none"> ▪ Ensure compliance of the sub-project with the sub-project Standards and other requirements given in this Plan, ▪ General responsibility for the scope and implementation of the Plan, ▪ Development, monitoring, and revision of this Plan, ▪ Fulfilment of cultural heritage evaluation processes, ▪ Ensure that the operations do not disturb cultural properties and sites without the approval of the relevant authority, ▪ Investigation, reporting and monitoring of unauthorized damages to the worksite as well as of procedure violations, ▪ Management of amendments to laws or policies, ▪ Coordination with the organizations involved in the implementation and other stakeholders.
All Workers	<ul style="list-style-type: none"> ▪ Learn about the Chance Find Procedure through induction training and any other training provided.

SUB-PROJECT STANDARDS

- Law on the Conservation of Cultural and Natural Properties (LCCNP) (No: 2,863),
- World Bank Protection Policy on Physical Cultural Resources (ESS-8),
- Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention).

CHANCE FIND PROCEDURE

Initial Approach Adopted by the Contractor

- Action 1: Immediately stop all construction works in the vicinity of the chance find, in case of discovery of archaeological finds,
- Action 2: Immediately notify the sub-project manager and/or environmental department,
- Action 3: Take photographs or make technical drawings,
- Action 4: Record the location of the location by keeping all remains in their position (without moving them),
- Action 5: Prevent damage to or loss of movable objects by encircling the area,
- Action 6: Contact an archaeologist from a local university for guidance,
- Action 7: Prepare the Chance Find Form.

Approach Adopted by the Archaeologist

Based on the description of the find, the archaeologist will make recommendations on actions to be taken by phone/e-mail or visit. The sub-project team will take into account the following possible strategies, if the archaeologist(s) confirm(s) the presence of archaeological finds/remains/sites:

Strategy 1: Avoidance by partial or full sub-project redesign or relocation

In case of any archaeological find or discovery, the DM will provide the relevant information to authorities. This responsibility will apply even if the sub-project is redesigned or relocated. In any case, the relevant governmental body will be informed of the archaeological find or discovery.

Strategy 2: Implementation of worksite protection measures

This option includes the implementation of site protection measures such as fencing or blockage. As per LCCNP No. 2,863, any archaeological find is the property of the Republic of Türkiye, and governmental bodies will decide on the geographical scope and implementation of site protection measures.

Strategy 3: Rescue or emergency excavation

If the DM fails to relocate or redesign the sub-project, this may require rescue or emergency excavation works. If notification is stipulated by LCCNP, an application will be lodged to governmental bodies. If an official application is lodged, the relevant Regional Board will be allowed to make a decision.

After the permit is obtained, archaeological excavations will be performed with the attendance of scientific consultants from the archaeological departments of universities. Following the

completion of archaeological excavations, the results will be submitted to relevant governmental bodies for the final decision to be taken for the progress of the sub-project.

Procedure for the Discovery of Potential Human Remains

Identification of human remains is very clear in terms of graves or burial sites. If a grave or burial site is found, the procedures to be followed are not different from the procedure applicable to archaeological finds as per Article 6 of LCCNP. Modern burials or forensic human remains will not be addressed within the scope of LCCNP.

KEY PERFORMANCE INDICATORS

The key performance indicators to be used during the implementation of this Procedure are set out below.

Key Performance Indicators (KPIs)

No	KPIs	Target	Monitoring Measure
1	Non-conformities reported during the year with respect to key management controls identified in this Plan	Minimization of reported non-conformities, aiming at zero	Database Reporting Inspection Reports
2	Number of complaints lodged by local communities during the year regarding cultural heritages	Investigation of complaints about cultural heritage (disrespect, destruction, removal, sale of artefacts) and fulfilment of relevant actions. <ul style="list-style-type: none"> Provision of prompt response to complaints from local communities regarding the misbehaviour of personnel regarding cultural properties 	Database Grievance Mechanism Records Reporting

REPORTING

Contractor will comply with reporting requirements including chance finds defined in site-specific ESMP (contractor will develop monthly and quarterly monitoring reports and submit to the Düzce Municipality (DM) through supervision consultant; DM will examine submit the reports to ILBANK quarterly (and monthly if requested by ILBANK); ILBANK will inform the World Bank by providing regular semi-annual monitoring reports.

ANNEX – 1 Sample Chance Find Form

Place:	Chance Find No:	Date:
Location Data: Coordination: Elevation: Brief Area Description:		
Chance Type:	<input type="checkbox"/>]Archaeological Items <input type="checkbox"/>]Metal Finds <input type="checkbox"/>]Terracotta Finds <input type="checkbox"/>]Pottery Shards <input type="checkbox"/>]Glass Finds	<input type="checkbox"/>]Sculpture etc. <input type="checkbox"/>]Human / Animal Bone <input type="checkbox"/>]Unidentified
Temporary Measures		
Photograph		
Discoverer's Name-Last Name:		
Signature:		

APPENDIX-E

Common OHS Risks and General Mitigation Measures

Risk Area	General Mitigation Measure
<p><u>EXISTING ASBESTOS PIPELINE AREAS OF WATER SUPPLY NETWORK</u></p>	<ul style="list-style-type: none"> ▪ At each workplace, an assessment will be carried out to identify any Asbestos Containing Materials (ACMs) that may be present. As a first attempt, during renewal of the pipelines, existing pipelines of water supply network will be left under the ground in the existing location. If they need to be removed because of new pipe installation requirements, then removal process will be executed, and specific precautions will be determined in line with the Regulation on Health and Safety Measures in Working with Asbestos dated 25.01.2013 (OG No: 28539). In this respect, the Generic Asbestos Management Plan, which is largely compliant with the national legislation, is presented in Appendix-F. Hence, it is recommended that this plan for managing ACMs is developed by the Contractor prior to construction. The relevant impact mitigation measures to be taken for the OHS are given in Table 4-1.
<p><u>WORKING AT HEIGHTS</u> Working from heights is the most common cause of fatal injuries to workers.</p>	<ul style="list-style-type: none"> ▪ All employees who have received a certificate from the workplace physician that they can work at height need suitable training in working on different pieces of equipment, and such work must be planned appropriately. Safety approaches and precautions should be adopted, such as: Where practical, avoid the need to work at height. ▪ Put collective measures and implement a "Working at Height Permit System where working at height can't be avoided to prevent falls. Such as the use of equipment to provide an extra level of safety to reduce the risk of a fall – according to "Occupational Health and Safety Regulation in Construction Works", a scaffold with a double guard-rail or edge protection is needed. Minimize the consequences of a fall by providing a safety net. ▪ Wear the necessary Personal Protective Equipment (PPE) such as a safety harness.
<p><u>MOVING OBJECTS</u> A construction site is an ever-changing environment, with many objects moving around, often on uneven terrain. Delivery vehicles, heavy plant machinery and overhead lifting equipment pose a hazard to site workers and operators.</p>	<ul style="list-style-type: none"> ▪ Sites should always be planned to manage plant and pedestrian interface where physical barriers and suitable segregation is in place. ▪ To reduce risks, workers should: <ul style="list-style-type: none"> ▪ Never stand behind large operating plant machinery (sweeping area) and never stand under suspended loads. ▪ If they do not have lights or sound warnings, they should not be allowed to work in the sub-project area. Periodic checks of the construction machines should be up to date. ▪ Always ensure you have a banksman to guide plant vehicles when reversing or manoeuvring on a public road. ▪ Always wear PPE such as a hard hat and high visibility jacket to ensure he/she is seen.
<p><u>SLIPS, TRIPS, AND FALLS</u> Slips, trips, and falls can happen in almost any environment, and, in construction, there are more common incidents of these kinds of injuries than in other industries. The HSE reports that around a</p>	<p>Managers and Site supervisor on construction sites must effectively manage the site so that workers can move around it safely. Risks should always be reported and sorted to reduce the chances of injury. To reduce harm due to Slips, Trips and Falls;</p>

Risk Area	General Mitigation Measure
<p>quarter of injuries reported are due to Slips, Trips and Falls. As construction sites often have uneven terrain and the topography is forever changing, it is unsurprising that slips, trips, and falls are a common hazard.</p> <p>HSE reports that several thousand construction workers are injured every year following a slip or trip. Most of these could be avoided by effectively managing working areas and access routes, such as excavations and footpaths.</p>	<ul style="list-style-type: none"> ▪ Keep work and storage areas tidy and designate specific areas for waste collection. ▪ Where surfaces are slippery with mud, they should be treated with gravel. ▪ Where surfaces are slippery with ice, they should be treated with grit. ▪ All slippery areas should be signposted, and footwear with a good grip should be worn.
<p><u>NOISE</u></p> <p>Working around loud, excessive, and repetitive noise can cause long term hearing problems, such as deafness. Noise can also be a dangerous distraction and may distract the worker from the task at hand, which can cause accidents.</p>	<p>A comprehensive noise risk assessment should be carried out where the risk assessment has highlighted a noise hazard with the works to be undertaken.</p>
<p><u>HAND ARM VIBRATION SYNDROME</u></p> <p>HAVS (Hand Arm Vibration Syndrome) is a debilitating and painful disease of the blood vessels, nerves, and joints. It is typically caused by the continued use of hand-held power tools, including vibratory power tools and ground working equipment.</p> <p>Some of the workers at risk of developing HAVS, resulting in the inability to do fine work, and cold temperatures can trigger painful attacks on the fingers. Once the damage is done, it is permanent.</p>	<p>HAVS is preventable if construction works are correctly planned to minimize exposure to vibration during work and workers are monitored are given appropriate protection when using vibrating tools and equipment.</p>
<p><u>MATERIAL HANDLING – MANUAL AND BY EQUIPMENT</u></p> <p>Materials and equipment are constantly being lifted and moved around construction sites, whether manually or by equipment. Either way, handling carries a degree of risk.</p>	<ul style="list-style-type: none"> ▪ For manual handling, training must be provided to ensure employees can lift and carry materials safely. ▪ For lifting equipment handling, there are lots of risks, especially when operating lifting equipment on uneven ground. If an employee is required to use lifting equipment, they must be trained to operate the equipment safely, and a regular test should be taken to check their ability to use the equipment. Always check your plant is fit for use and that it's certificated and inspected before use.
<p><u>EXCAVATIONS</u></p> <p>Incidents commonly occur within excavations on construction sites, such as an unsupported excavation collapsing with workers inside.</p>	<p>Common safety measures that need to be put in place according to "Occupational Health and Safety Regulation in Construction Works" to prevent excavations from collapse and to reduce the risk of operatives falling into excavations:</p> <ul style="list-style-type: none"> ▪ Never work in an unsupported excavation. ▪ Shoring or terracing application will also be used. ▪ Ensure an excavation is supported and fully secure. ▪ Regularly inspect the excavation both before and during the work shift. ▪ Always check that the edge protection of an excavation is 100% intact before you enter it. ▪ Always maintain a safe distance from the edge of all deep excavations.
<p><u>ELECTRICITY</u></p>	<p>In civil engineering, strikes to services are common. The strikes happen when excavation is undertaken</p>

Risk Area	General Mitigation Measure
<p>Most of the accidents arise from contact with overhead or underground power cables and electrical equipment/machinery.</p>	<p>without adequately checking the ground for existing services. Consequently, incidents can easily be avoided by using technology such as CAT and Genny scanning equipment to scan an area and foresee potential services and prevent service strikes.</p>
<p>AIRBORNE FIBRES AND MATERIALS Construction dust is often an invisible, fine, and toxic mixture of hazardous materials and fibres. This can damage the lungs and lead to chronic obstructive pulmonary disease, asthma, silicosis, and other such diseases.</p>	<p>All employers have to ensure suitably chosen protective equipment is used.</p>
<p>SITE SECURITY Having inadequate security around a construction site may danger the public and lead to an unnecessary incident</p>	<p>Always make sure that boundary safety fencing is 100% secure and there are no openings for the public to access.</p>
<p>FIRE PROTECTION RISK Despite the presence of firefighting equipment, safe storage of chemicals, personnel training, controlled ignition, regular cleaning, and inspection measures, the risk of fire can increase if proper protection is not ensured.</p>	<ul style="list-style-type: none"> ▪ Fire-fighting equipment will be available on site (including but not limited to, rubber beaters when working in grass/bush areas, at least one fire extinguisher of the appropriate type when welding or other 'hot' activities are undertaken); ▪ Surplus chemicals/flammable materials needed in the sub-project area will not be stacked and these chemicals will be stored in safe warehouses. Uncontrolled storage of chemicals increases the danger of fire and sabotage. ▪ All employees will be trained about the fire risks and how to deal with any fires in case occurs. Fires won't be lit for any reason. ▪ Debris will be cleaned regularly. ▪ Work areas and buildings will be inspected regularly to detect and eliminate potential fire sources. <p>Smoking will be allowed only in designated smoking areas. Cigarette butts will not be thrown to the ground.</p>

APPENDIX-F
Generic Asbestos Management Plan

DÜZCE MUNICIPALITY DIRECTORATE OF WATER AND SEWERAGE

DÜZCE (CENTRUM) WATER SUPPLY PROJECT - PHASE 1



GENERIC ASBESTOS MANAGEMENT PLAN



NOVEMBER 2024

ANKARA



ABBREVIATIONS

AMP	Asbestos Management Plan
Employee	Licensed employee within licensed and authorized companies that carry out all asbestos-related works
Employer	Asbestos-related works' Subcontractor
DM	Düzce Municipality
PPE	Personal protective equipment required for asbestos-related work
Specialist	Licensed specialist within licensed and authorized companies that carry out all asbestos-related works
Sub-project	Düzce (Centrum) Water Supply Project - Phase 1
Worker	Licensed worker within licensed and authorized companies that carry out all asbestos-related works

1. Introduction

The Düzce Municipality (hereinafter "DM") is responsible for avoiding, mitigating, or compensating any potential impacts of the " Düzce (Centrum) Water Supply Project - Phase 1" (hereinafter "the sub-project") activities on the workers/employees and other stakeholders. There is no planned work for asbestos pipes to be carried out within the scope of the sub-project. However, during the implementation of the sub-project, in case of the DM decides to carry out any repair, dismantling, demolition, maintenance, and removal activities for asbestos pipes or in case of accidental breaking of encountered asbestos pipes, this Asbestos Management Plan (AMP) will be applied that has been developed in accordance with the Regulation on Health and Safety Measures in Working with Asbestos (dated 25.01.2013 and numbered 28539) to guide the DM.

2. Roles and Responsibilities

According to the Regulation on Health and Safety Precautions in Working with Asbestos, all asbestos-related works must be carried out only by licensed and authorized companies and licensed specialists/workers/employees. Therefore, any asbestos-related work shall be contracted by the DM with a subcontractor (asbestos-related works' subcontractor is the Employer of this AMP) with the specified qualifications. In this regard, the Employer (asbestos-related works' subcontractor is the Employer of this AMP) would train all workers/employees involved in supervision and construction works regarding the procedure in case of any planned or unplanned work (including accidental asbestos pipe breakings) on asbestos pipes, and necessary personal protective equipment (PPE) will be available for use when needed. The DM and all the contractors are to comply with the procedure during the sub-project construction activities. No financial burden can be imposed on the workers/employees for the trainings carried out and the mitigation/remediation measures applied to the PPEs provided.

3. Asbestos Management Process and Procedure

The step-by-step process and procedure to be followed are provided below:

- a) Risk Assessment: The Employer is obliged to carry out a risk assessment, taking into account the type and physical properties of asbestos and the degree of exposure of the workers/employees where there is a risk of exposure to asbestos dust. Where there is a risk of exposure to asbestos dust, the employer is obliged to carry out a risk assessment before work commences, taking into account the type and physical characteristics of asbestos and the degree of exposure of workers/employees. The views of workers/employees or their representatives shall be taken during the risk assessment.
- b) Notification with Work Plan: The Employer is obliged to prepare a work plan before starting these works and notify the related Provincial Directorate of Labour and Employment Institution of the work plan. The notification includes the following:

- Commercial name and address of the workplace,
- The type and amount of asbestos to be removed,
- Works to be done and procedures/processes to be applied during works,
- Number of workers/employees,
- Starting date and the estimated duration of work,
- Asbestos removal specialist certificate,
- Asbestos removal worker/employee certificate.

The work plan specifies the measures to be taken in the working area within the scope of the risk assessment of the health and safety of the workers/employees. The working plan includes the following:

- Type of work and estimated duration and place of the work,
- The method to be used for the removal of asbestos-containing materials,
- Features of equipment used in asbestos dismantle, repair, maintenance, and removal work,
- Protection of workers/employees from asbestos materials,
- Protection measures of other persons in or near the working environment during the work,
- Removal of asbestos and/or asbestos-containing materials from buildings and facilities prior to demolition, except where the retention of asbestos and/or asbestos-containing materials does not pose a greater risk.

c) Dismantling, Repair, Maintenance, and Removal Works: Before starting the mentioned works, the Employer inspects the sub-project area, existing structures, and infrastructure plans to identify asbestos-containing material locations.

- Asbestos-related works are carried out by the asbestos removal workers/employees, under the supervision of an asbestos removal specialist. An asbestos removal worker/employee defines as a worker/employee having vocational training certificate for asbestos dismantling, repair, maintenance, and removal works or who has completed the training program established by the commission established by the Ministry of Labour and Social Security and has received a course completion certificate. An asbestos removal specialist defines as the person given responsibility by the Employer during the implementation of the procedures specified in the Regulation on Health and Safety Measures in Working with Asbestos (dated 25/01/2013 and numbered 28539), who has completed the training program established by the commission established by the Ministry of Labour and Social Security, and who has received a course completion certificate after being successful in the exam.
- Asbestos measurement and sampling are carried out by accredited and authorized laboratories. While determining the sampling places, the opinions of the workers/employees or their representatives are also taken. The sampling time is

regulated to determine the worker's/employee's exposure over eight (8) hours of work (one (1) shift) by measurement or time-weighted calculation. The Employer ensures that the asbestos concentration in the air the workers/employees are exposed to during the work does not exceed 0.1 fibre/cm³ of the eight-hour time-weighted average value.

- d) End of Work Notification: When the asbestos dismantling, repair, maintenance, and removal works are completed, the Employer or its representatives shall provide a document containing the measurement results indicating that there is no risk of exposure to asbestos dust in the workplace.

The report containing the documents and measurement results prepared by accredited and authorized laboratories will be submitted to the Provincial Directorate of Labour and Employment Agency by the Employer or its representatives.

4. Asbestos Exposure Mitigation Measures and Over-exposure Action Plan

- a) Asbestos Exposure Mitigation Measures: The following measures should be taken to minimize the exposure of workers/employees to dust from asbestos materials:
- Necessary markings should be made in the working areas and warning signs should be placed.
 - Unauthorized workers/employees should be prevented from entering the work area.
 - Smoking-prohibited areas should be determined.
 - The places reserved for eating and drinking should be chosen outside the places where there is a risk of contamination with asbestos dust.
 - Workers/employees should be provided with appropriate personal protective equipment (PPE) such as protective clothing, disposable clothing, gloves, safety glasses, respirators and their appropriate use must be strictly supervised.
 - PPE should not be taken out of the workplace. Protective clothing should be cleaned in the workplace or where cleaning work is carried out and removed from the workplace only in closed containers.
 - Protective clothing and workers'/employees' own clothing should be kept in separate places.
 - Hand and face washing, and shower places should be provided for workers/employees in dusty work.
 - PPE used should be stored in specially designated places, checked, and cleaned after each use, repaired and maintained.
 - Work should be carried out with as few workers/employees as possible.
 - The working area should be isolated so as not to produce asbestos dust. If this is not possible, it should be designed in such a way as to prevent the spread of dust to the environment. In order to prevent formation of asbestos dust or mixing of dust into air, the working area should be sprayed with water at regular intervals.

- Cleaning and maintenance of the equipment used in places having a risk of asbestos exposure should be to be carried out regularly and effectively.
 - Asbestos materials should be transported in suitable sealed packages and stored separately from other materials.
 - Wastes containing asbestos should be collected immediately, labelled using appropriately and removed from the workplace as soon as possible in sealed packages and disposed of in accordance with the relevant legislation.
 - During dismantling, demolition and removal works, people living in the vicinity should be warned against asbestos risk, removed from the work area and/or protective equipment should be provided.
 - Storage areas for asbestos disposal should be determined by modelling that takes into account the prevailing winds in the city and excludes residential areas from the impact area of possible dusting and fibre transport.
 - Contaminated clothing and protective equipment should be disposed of in the same way as other asbestos-containing materials. Worksites should be provided for washing of workers/employees.
 - Ensure that they are aware of the need to wash before eating, drinking, or smoking and before returning home to minimise the risk of spreading asbestos fibres outside the worksite.
 - Access to areas with piles of construction rubble, demolition sites and waste sites should be restricted. Children in particular should be kept away from these areas.
- b) Over-exposure Action Plan: The following measures are taken in case of a limit value breach:
- The reasons for exceeding the limit value are determined and the necessary measures are taken immediately to reduce the asbestos concentration below 0.1 fibre/cm³. Work cannot be carried out in the affected area until appropriate measures are taken to protect workers/employees.
 - Whether the measures taken are sufficient or not is determined by ambient air asbestos concentration measurements.
 - In cases where it is not possible to reduce the exposure with other measures and it is only possible to comply with the limit value by using respiratory system protection, the workers/employees with the protector cannot work continuously. The maximum time each worker/employee will work is determined in advance and cannot be exceeded.
 - Appropriate rest breaks are given during the work using protective equipment, considering the physical conditions, climatic conditions, and the views of the workers/employees or their representatives.

5. Health Surveillance

An occupational physician / a workplace doctor will be appointed to provide health services at the workplace to protect and improve the health of workers/employees and to provide diagnosis and treatment services quickly in case of possible occupational diseases in line with the national legislation. His or her duties are listed below.

- Performs general examinations and tests, especially respiratory system examinations, and repeats lung radiographs at appropriate intervals if necessary.
- Makes recommendations to the employer on protective and preventive measures according to the results of the examinations and tests.
- Provides information to workers/employees about health assessments that should be carried out after the end of exposure.

6. Record Keeping

The employer performing the asbestos dismantling, repairing, maintaining, or removal work or subcontracts the work; keeps and maintains records indicating the work performed by those involved in the work, the duration of the work, and the level of exposure. Any health personnel, health institution, or health organization can examine these records upon request. Workers/employees can get a copy of their records. Workers/employees or their representatives may receive general information about records anonymously. Records are retained for at least 40 years after exposure to asbestos dust ceases. In case of transfer of the workplace with its workers/employees, the records are delivered to the transferred business. In case of closure of the workplace, the records shall be delivered to the Provincial Directorate of Social Security Institution.

7. Reporting

DM will report details of any significant incidents involving asbestos within 48 hours and submit an incident report to ILBANK, including RCA, precautions and compensation measures taken within 30 business days. ILBANK will forward the incident report to the WB immediately upon receipt from the DM.