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# SUSTAINABLE CITIES PROJECT- II Additional Financing

## NİKSAR (TOKAT) CENTRUM DRINKING WATER NETWORK PROJECT

## ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Revision : REV.06 Submission : January 2023





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	Niksar (Tokat) Centrum Drinking Water Network Project
	Environmental and Social Management Plan (ESMP)
Project Owner	Niksar Municipality
Client	İLBANK A.Ş.
Prepared by	MGS Project Consultancy Engineering Trade Co. Ltd. (MGS) & REA Consultancy Co. Ltd. (REA) Joint Venture

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#### List of Abbreviations

Φ	Diameter
AF	Additional Financing
AFAD	Disaster and Emergency Management Presidency
Aol	Area of Influence
Consultant	MGS Proje Müşavirlik Mühendislik Ticaret Ltd. Şti. (MGS) and REA Danışmanlık Ltd. Şti. (REA) Joint Venture
da	Decare
dBC	Decibels relative to the carrier
DLP	Defects Liability Period
DMA	District Metered Area
DSI	General Directorate of State Hydraulic Works
E	East
E&S	Environmental and Social
EBRD	European Bank for Reconstruction and Development
EEC	European Economic Community
EHS	Environment Health and Safety
EIA	Environmental Impact Assessment
EPR	Emergency Preparedness and Response
ESF	Environmental and Social Framework
ESHS	Environmental, Social and Health and Safety
ESMF	Environmental and Social Management Framework
ESMIP	
ESMS	Environmental and Social Management System
EU	European Union
EU-SI	
FIDIC	International Federation of Consulting Engineers
g	Gravity
GBV	Gender-Based Violence
GHG	Greenhouse Gas
GOP	Gazi Osman Paşa
GWh	Gigawatt hours
	Human Resources
	ILBANK A.Ş.
	Instrument for Pre-Accession Assistance
	Irano-Iuranian
IUCN	International Union for Conservation of Nature



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IWP	Integrated Water Project
JV	Joint Venture
KBA	Key Biodiversity Area
km	Kilometer
km²	Kilometer square
LRP	Livelihood Restoration Plan
m	meter
m³/day	cubic meter per day
m³/sec	cubic meter per second
MED	Mediterranean
MGS&REA JV	MGS Project Consultancy Engineering Trade Co. Ltd. (MGS) & REA Consultancy Co. Ltd. (REA) Joint Venture
MoEUCC	Ministry of Environment, Urbanization and Climate Change
MW	Megawatt
N	North
NDE	Number of Days Exceeded
NGO	Non-Governmental Organization
NO <sub>2</sub>	Nitrogen Dioxide
OG	Official Gazette
OHS	Occupational Health and Safety
OP	Operational Policy
pcs.	pieces
PGA	Peak Ground Acceleration
PIF	Project Information File
PIU	Project Implementation Unit
PPE	Personal Protective Equipment
PRV	Pressure Reducing Valve
PS	Performance Standard
PVC	Polyvinyl Chloride
qty	Quantity
R.C	Reinforced Concrete
RAP	Resettlement Action Plan
Q&A	Question and Answer
SCP	Sustainable Cities Project
SCP-II AF	Sustainable Cities Project – II Additional Financing
SEA/SH	Sexual Exploitation and Abuse/Sexual Harassment
SEP	Stakeholder Engagement Plan
SER	Service
DSI	General Directorate of State Hydraulic Works
SO <sub>2</sub>	Sulfur Dioxide



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TADPORTAL	Agricultural Land Evaluation and Management Automation
ТАР	Union of Transportable Battery Manufacturers
The Bank	World Bank
The Project	Niksar (Tokat) Centrum Drinking Water Network Project
TMP	Traffic Management Plan
TurkStat	Turkish Statistical Institute
UNESCO	United Nations Educational, Scientific and Cultural Organization
WB	World Bank
WBG	World Bank Group
WHO	World Health Organization
WWTP	Wastewater Treatment Plant





#### **EXECUTIVE SUMMARY**

ILBANK A.Ş. (ILBANK) is implementing the Sustainable Cities Project (SCP) as a Series of Projects and SCP I and II are already in implementation; with technical and financial support from the World Bank (WB) and European Union (EU). The SCP aims to improve the infrastructure service needs of participating municipalities and utilities. The investments to be made within the scope of SCP will follow environmental legislation of Republic of Turkiye as well as World Bank Operational Policies and standards.

SCP I, II and II Additional Finance (AF) are the next generation operation which will provide a more dedicated focus to urban planning systems and broadening the program to broader sectors, such as urban transport; zero waste; energy efficiency, renewable energy, municipal social services, disaster recovery, urban renovation and restoration sectors.

Niksar City Centrum had serious problems in infrastructure. In year 2014, to meet infrastructural requirements of Niksar city centrum "Niksar Integrated Water Project (IWP)" was planned to be co-financed from Instrument for Pre-Accession Assistance (IPA) transferred by the European Union (EU) to the environmental sector in Turkiye.

After the financing application, it was decided to construct two short-term priority investment in lots; "Niksar IWP - Lot-1 Wastewater Treatment Plant" and "Niksar IWP - Lot-2 Water Supply and Wastewater Collection Project". From the whole infrastructural requirements of Niksar Centrum only drinking water network component was excluded from IPA II Project because of the budget limitation. The Municipality of Niksar is expected to undertake construction of "Niksar Drinking Water Network" urgently by itself in order to prevent drinking water problems and to protect the integrity of the whole IPA II Niksar Integrated Water Project.

Among whole short-and long-term infrastructural needs of Niksar Centrum, "Construction of Niksar (Tokat) Centrum Drinking Water Network Project" is found as urgent, eligible and planned to be included for World Bank funding. The general objective of the proposed project is to support Niksar Municipality to address the current insufficient infrastructure and to better respond to the significant increase in demands for municipal services that has risen from the increasing population.

The proposed 1<sup>st</sup> stage (Component 1) network pipes cover built-up areas and areas with constructed streets (locally named as "open roads"). Pipes on the planned streets (locally named "closed roads") of the urban development plan are included in the 2<sup>nd</sup> stage (Component 2). These 2<sup>nd</sup> stage pipes shall be constructed in parallel with the development of the settlement in the future when required. Main collector lines are passed through the widest roads around, considering the construction conditions and the topographical situation.

Considering the current situation of the infrastructural requirements and on-going IPA Project, only renewal of the water supply network (Component 1) is proposed to be financed from World Bank's SCP-II-AF.

Component 1 covers measures for renewal of water distribution system i.e., renewal of water network pipes (193,633 m high-density polyethylene (HDPE) pipes with diameters between 90 and 355 mm) including house connections (6,041 pcs.) and other auxiliary structures (like fire hydrants, District Metered Area (DMA) chambers, Pressure Reducing Valve (PRV) chambers, washout and air relief chambers, flowmeter chambers, residual chlorine measurement chambers).





Specific objectives of Component 1 are;

- Ensure effective operation of the whole water supply system till design horizon and increase service quality levels in terms of hydraulic requirements,
- Renewal of existing network which is hydraulically insufficient and contains asbestos and PVC pipes that have already exceeded economic lifetime,
- Minimization of water losses and non-revenue water ratios that have currently reached to approximately 73% of non-revenue water and compliance with Turkiye's "Regulation on Control of Water Loss in Water Supply and Distribution Systems (May 2014)".

One of the tasks under the scope of the Project is the preparation of an Environmental and Social Management Plan (ESMP) in accordance with WB Safeguard Policies, ILBANK's Environmental and Social Management Framework (ESMF) and the national legislation in force in Turkiye. This ESMP is therefore prepared to set out site specific mitigation, monitoring and institutional measures to be taken during pre-construction, land preparation and construction, and operation phases of the above-mentioned drinking water network project to eliminate adverse environmental and social impacts, offset or reduce them to acceptable levels. Moreover, A Stakeholder Engagement Plan (SEP) is also prepared for the Project.

This ESMP has been prepared by MGS Project Consultancy Engineering Trade Co. Ltd. (MGS) & REA Consultancy Co. Ltd. (REA) Joint Venture in the scope of the environmental and social impact and risk assessment studies conducted for Niksar (Tokat) Centrum Drinking Water Network Project (the Project).

The Project will be carried out within the urban area in Niksar District Centrum of Tokat Province. The construction of drinking water networks does not require expropriation of any private land. The routes of the proposed drinking water network lines will pass under the public roads, which are under the responsibility of Niksar Municipality, and therefore neither land acquisition nor resettlement will be needed for the construction of the proposed network lines.

The Project is categorized as Category B as per WB Operational Policy Environmental Assessment (OP 4.01) and it is excluded from the environmental impact assessment (EIA) procedure as per the national EIA Regulation.

Niksar District is located in the 1<sup>st</sup> degree seismic zone. Therefore, earthquake risk has to be taken into consideration in each step of the Project. The district located in inner south part of Black Sea Region of Turkiye is surrounded with Ordu Province on the north, Erbaa district on the west, Tokat centrum and Almus district in the south, Başçiftlik and Reşadiye districts in the east. The district is rich in water resources. These water resources meet the water demand for irrigation of the lands on which various crops are harvested throughout the year.

Although the economic life in the district is largely based on agriculture, significant progress has been made in the industry in recent years. The Niksar plain, irrigated by the Kelkit River, is entirely devoted to agriculture. In addition, the climatic conditions in the district, which is in a transition region between the Black Sea and Central Anatolia, create an environment suitable for agricultural production.

There are 163 registered assets such as civil architecture structures, mosques, fountains, bridges and tombs in Niksar District. At the same time, Niksar District is on the UNESCO World Cultural Heritage tentative list. Niksar Castle and Melikgazi Tomb are the structures registered as 1<sup>st</sup> degree archaeological sites in Niksar District Center. The area with civil architecture

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around Niksar Castle has been registered as a 3<sup>rd</sup> degree archaeological site. The project activities will be carried out within the residential area therefore, the anthropogenic effect in the project area is quite high.

The network lines shall be constructed on streets of built-up areas within urban areas of settlements therefore the projects do not involve any protected and sensitive ecosystems or species. The project will not cause any economic displacement. The impact on local business during construction of the network will only be temporary and not significant.

The population of Niksar District in 2020 is 61,119 and of this population, 30,174 are men and 30,945 are women.<sup>1</sup> Although the population of the district fluctuates over time, the general trend is a decrease.

The Project is planned to be implemented in the period from January 2022 till July 2025, including selection of Technical Assistant Consultant, design review, tendering, construction and 12 months defects liability period (DLP).

Directorate of Water and Sewerage Works in Niksar Municipality will be the owner of the proposed drinking water network project components after construction. Niksar Municipality will be responsible for operation, repairs and maintenance of the whole system. During the 12 months defects liability period, the Works Contractor will be responsible for any repairs of the newly constructed facilities, in accordance with legal regulations as of provisional acceptance.

During operation, the operator team assigned by Niksar Municipality will ensure that drinking water parameters comply with Regulations. Ministry of Health, General Directorate of Public Sanitation will regularly control water parameters in the network and in the reservoirs.

The ESMP has identified mitigation measures and monitoring activities to reduce and avoid impacts associated with the project. A summary of the mitigation measures is given in Table 1 below.

Торіс	Mitigation Measures			
Soil Environment	Prevention of topsoil loss and soil contamination			
	Erosion control measures			
Water Peseurces	Stormwater and Sediment Control			
Water Resources	Water Quality and Supply System Protection			
	Adequate waste disposal facilities			
Waste Generation	Designation of temporary storage areas			
	Principle of "reduction at the source"			
Air Environment	Reduction of formation of particulate matter and dust			
	Exhaust emissions management			
Noise and Vibration	Regular maintenance of the construction machinery, equipment and vehicles			
	Establishment of a grievance redress mechanism			

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Table 1. Summary of Mitigation Measures

<sup>1</sup> TurkStat Address Based Population Registration System Results for 2020



This project is co-funded by the European Union, the Republic of Turkey and the World Bank Bu Proje Avrupa Birliği, Türkiye Cumhuriyeti ve Dünya Bankası tarafından ortaklaşa finanse edilmektedi

Торіс	Mitigation Measures				
Biodiversity and Natural	Procedures for unexpected threatened species finds and fauna handling				
Habitats	Measures to further avoid and minimize the construction footprint				
	Pre-Construction Surveys				
Cultural Heritage	Training on Cultural Heritage				
	Chance Find Procedure				
	Traffic Control and Scheduling				
	Preparation of a Traffic Management Plan				
Troffic Circulation and	Safe driving by Project personnel				
Safety	Usage of appropriate traffic signage				
ounty	Traffic safety and minimum traffic flow disruptions				
	Prevention storage of construction materials, equipment and machinery on traffic lanes				
	A grievance redress mechanism				
	Non-discrimination and equal opportunity				
	Preparation of information materials				
Labor Force	Managing and monitoring the performance of contractors/sub-contractors in relation to the requirements of child labor, unregistered employment and forced labor				
	Proper adaptation of human rights policy and labor rights				
	Preparation of a Health and Safety Management Plan				
	The Occupational Health and Safety training				
Community and	Ensuring usage of personal protective equipment				
Occupational Health and	Emergency Preparedness and Response Plan				
Safety	Necessary health and safety signs and traffic signs				
	First aid and emergency response equipment				
	Adequate OHS organizational structure				
	Optimal utilization of the available construction equipment and materials				
Climate Change	Regular maintenance of construction vehicles and equipment				
	Training for personnel regarding energy efficiency				
	Establishment and management a grievance redress mechanism				
	Disclosure of all project-related documents (ESMP, SEP, etc.) prepared and other relevant information				
Stakenolder Engagement	Preparation of communication materials				
	Ensure regular consultations with the project stakeholders (including local authorities, communities, workers, etc.)				

In general, "Niksar (Tokat) Centrum Drinking Water Network Project" will have significant positive impacts to the area. The purpose of the components of the Project under consideration is to provide environmental health for the city, and all people living there will take advantage of the project and there will be a positive impact on vulnerable/disadvantaged individuals/groups as well. Construction of "Niksar (Tokat) Centrum Drinking Water Network Project" including the new water network, and proper monitoring of the whole system will significantly reduce water loses, and all residents will have hydraulically sufficient supply

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without interruptions. Reduction in water losses will contribute energy efficiency during water production and also will increase the resilience of Niksar to drought.





### **1 INTRODUCTION**

ILBANK A.Ş. (ILBANK) is implementing the Sustainable Cities Project (SCP) as a Series of Projects and SCP I and II are already under implementation; with technical and financial support from the World Bank (WB) and European Union (EU). The SCP aims to improve the infrastructure service needs of participating municipalities and utilities.

SCP II - Additional Financing (AF) aims to establish an additional support mechanism for meeting the increasing demand from municipalities for investments in sustainable urban development: respond to current and increasing demands for urban services; plan for future infrastructure service needs in a sustainable manner; mobilize financing to fund priority investment; and adhere to new spatial planning mandates and infrastructure service requirements as prescribed by the amended Metropolitan Municipality Law No 6360 from December 2012. SCP I, and II and II-AF are the next generation operation which will provide a more dedicated focus to urban planning systems and broadening the program to broader sectors, such as urban transport; zero waste; energy efficiency, renewable energy, municipal social services, disaster recovery, urban renovation and restoration sectors.

"Niksar (Tokat) Centrum Drinking Water Network Project" is included in SCP II - AF. The general objective of the proposed project is providing support to Niksar Municipality to better respond to current insufficient infrastructure and the significant increase in demands for municipal services that has risen from the increasing population.

#### 1.1 **Objectives**

Within the scope of the WB Operational Policies concerning Environmental Assessment (OP 4.01), projects are classified under the categories of A, B, C by the degree of their impacts on the environment. The defined classification is based on the type, location, sensitivity, scale of the project, the structure, and aspects of its potential impacts.

After the screening process based on Turkish Environmental Impact Assessment (EIA) Regulation (Official Gazette dated 25.11.2014 and numbered 29186), EU EIA Directive (85/337/EEC), and the Environmental and Social Safeguard Policies of the World Bank, the "Niksar (Tokat) Centrum Drinking Water Network Project" have been defined as **Category B Project** where the potential impacts are mostly reversible, site-specific and have a range of potential mitigation measures, and also excluded from the environmental impact assessment (EIA) procedure as per the national EIA Regulation (see Annex-E).

In order to support the implementation of this Category B project, this Environmental and Social Management Plan (ESMP) has been prepared to ensure that all positive and adverse impacts during construction and operation phases are considered and the appropriate mitigation measures are proposed as required by the relevant national laws and regulations and the World Bank's Safeguard Policies.

The purpose of this ESMP is to provide a general framework for the Environmental and Social Management System (ESMS) planned to be implemented throughout the life of the Project and to provide the necessary management tools to ensure compliance with the Project standards in achieving the environmental and social objectives.

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The main objectives of this ESMP are as follows:

- To outline the environmental and social goals of the Project,
- To present an overview of the Environmental and Social Management System (ESMS) that will be implemented to ensure systematic and effective execution of the environmental and social commitments relevant to the construction and operational phases of the Project,
- To identify possible environmental and social impacts/risks and relevant mitigation measures, which are reflected in the monitoring program,
- To determine the roles and responsibilities of Niksar Municipality and its Contractors/Sub-contractors,
- To establish programs to meet the objectives and targets, oriented to continuous improvement,
- To ensure the awareness and competence of municipality, contractor and subcontractor personnel regarding policies, objectives, and targets,
- To provide a mitigation plan and monitoring program, comprising periodic internal and external audits and inspection,
- To review the progress in achieving the environmental and social objectives and targets, and to make improvements.

This document, which presents the ESMP for the Niksar (Tokat) Centrum Drinking Water Network Project (the Project) was prepared by MGS and REA JV. MGS and REA JV were appointed by ILBANK to undertake Environmental and Social (E&S) assessments for Group 1 Projects, in which Niksar Municipality was involved, according to Turkish environmental and social legislation and WB's Operational Policies including its safeguards policies.

#### 1.2 Scope

This ESMP provides instructions, responsibilities, and guidelines to the responsible parties with a set of mitigations, monitoring, and institutional measures to be taken during the implementation and operation of the Project to avoid adverse environmental and social impacts or reduce to acceptable levels. For all monitoring requirements, the technical parameters are defined along with the appropriate responsibilities and reporting procedures. Moreover, a grievance redress mechanism for receiving and addressing all grievances, complaints, and comments related to the Project is set out in this ESMP.

The ESMP is structured as follows:

- *Introduction:* The basis, scope, objectives of the ESMP and the implementation arrangements of the Project
- **Project Description:** The summary information on the scope of the Project, the location, and the characteristics of the project. Determination of the area of influence and its socio-economic status.
- **Legal Framework:** The description of the national and international legislation and standards to be followed by and applicable to the Project.
- *Mitigation Plan:* The description of the steps to be taken to mitigate the major adverse potential impacts on land, water, air, and other aspects as well as possible socio-economic impacts during the pre-construction, construction, and operation phases.



- Monitoring Plan: The description of the key parameters to be monitored to ensure that all phases of the Project are in conformance with Turkish legislation and relevant international norms and standards including WB Environmental and Social Safeguard Policies.
- **Institutional Arrangements:** The determination of roles and responsibilities for the implementation of the ESMP including analyzing the data obtained and reporting, description of how to collect monitoring data and how to use for sound environmental and social performance, and responsibilities of authorities.
- **Consultations:** The summary of the stakeholder engagements, consultation meetings, findings, and outcomes.

#### 1.3 **Project Background and Rationale**

The proposed sub-project investments of municipalities defined under the "Sustainable Cities Project II - Additional Financing (SCP-II AF)" are subject to environmental and social impact and risk assessment studies undertaken by consultancy services. Depending on the type of project and the nature and magnitude of the impacts and risks, an Environmental and Social Management Plan (ESMP) will be prepared for the projects to be financed as defined in the Environmental and Social Management Framework (ESMF) of SCP-II AF prepared by ILBANK A.Ş.<sup>2</sup>

"Niksar (Tokat) Centrum Drinking Water Project" will be financed within the scope of SCP-II-AF under Group-1 for the "Water Network Project". In the current situation the existing water network of Niksar Municipality is aged and mainly includes asbestos pipes. More importantly, loss and leakages in the existing water network are over 73% according to feasibility studies carried out within the scope of the Environment Operational Programme for Community Assistance from the Instrument for Pre-Accession Assistance (IPA) for the Regional Development Component in Turkiye. The project aims mainly to replace network pipelines as well as provide uninterrupted water service to the public by reducing the loss and leakages.

Niksar City Centrum has serious infrastructure problems. In year 2014, to meet infrastructural requirements of Niksar city centrum for design horizon of 35 years, "Niksar Integrated Water Project" was planned to be co-financed from "Instrument for Pre-Accession Assistance (IPA)" transferred by the European Union (EU) to the environmental sector in Turkiye. Under the scope of IPAII Project (EuropeAid/128134/D/SER/TR) Niksar Integrated Project, Master Plan, Feasibility Studies and Design Reports were prepared by CDM Smith IWP2 Consortium. After the financing application, it was decided to construct the following short-term priority investments:

- IPA II Niksar Integrated Water Project Lot-1 Wastewater Treatment Plant (FIDIC Yellow Book)
- IPA II Niksar Integrated Water Project Lot-2 Water Supply and Wastewater Collection Project (FIDIC Red Book)

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<sup>&</sup>lt;sup>2</sup> ILBANK A.Ş. (2019). Turkiye Sustainable Cities Project – II Additional Financing (P170612). Environmental and Social Management Framework. Retrieved from https://documente1.worldhank.org/curated/u/021361554008772741/pdf/Environmental and Social Management Framework.

https://documents1.worldbank.org/curated/ru/921361554098772741/pdf/Environmental-and-Social-Management-Framework.pdf



Within the scope of "IPA II – Niksar Integrated Water Project - Lot-1 Wastewater Treatment Plant (FIDIC Yellow Book)", design and construction of Niksar Wastewater Treatment Plant was initiated in April 2021. The planned Niksar WWTP is designed with 11,132 m<sup>3</sup>/day capacity for year 2032 and 12,177 m<sup>3</sup>/day for year 2047. It has a typical extended activated sludge process.

"IPA II – Niksar Integrated Water Project - Lot-2 Water Supply and Wastewater Collection Project" includes construction of sewerage system components including; 85 km sewerage network, connection parcels, manholes and construction of water supply project components including; 55 km transmission lines, four (4) new water reservoirs, two (2) new pump stations, service roads, spring catchments, water collection chambers etc. are started in May 2020 and almost 50% of construction works are finalized.

From the whole infrastructural requirements of Niksar Centrum only drinking water network component is excluded from IPA II Project because of the budget limitation. Its design was prepared and approved during IPA II studies and Municipality of Niksar is expected to undertake construction of "Niksar (Tokat) Centrum Drinking Water Network" by itself in order to prevent drinking water problems and to protect the integrity of the whole IPA II Niksar Integrated Water Project.

In order to decrease high ratios of non-revenue water (up to 73%) to regulation requirements, firstly it's necessary to reduce high ratios of physical losses. Replacement of the network pipes and establishment of auxiliary structures (isolation valves, flowmeters etc.) will significantly contribute to the reduction of physical losses and provide benefits for the efficient operation of the whole network afterwards.

One option regarding the whole water supply system was partial or full replacement of the network. Partial replacement of the network, i.e., renewal of only the most problematic lines could be considered as an option for some settlements. According to the operation network plans, most problematic lines where cracks are frequently observed, or hydraulically insufficient pipes are installed, municipalities will undertake routine partial replacements. However, currently in Niksar, this is not applicable. The main skeleton of the network is not hydraulically appropriate considering the increasing population after year 1987 (first design) and development of the centrum. Also, effective repair of existing AC pipes in case of breakdowns is not possible since these pipes are no longer manufactured in Turkiye. So partial replacement option is not applicable.

Some rehabilitation works are being executed in the existing drinking water supply structures (i.e., storage reservoirs, pump stations etc.) within the scope of IPA II Project. In the long term, all structures will have general maintenance requirements until project horizon, and will be regularly maintained and renewed by the Municipality.

Considering the current situation explained above, the components below are considered as urgent, eligible and planned to be included in World Bank funding. All other requirements shall be planned and financed by Niksar Municipality as short- and long-term investments.

- Renewal of the water distribution network,
- Construction of miscellaneous network structures (house connections, washout valve chambers, hydrants, DMA chambers, pressure break valve chambers, chlorine dosing chamber and residual chlorine measurement chamber)





The general objective of the proposed project is to support of Niksar Municipality to better respond to the current insufficient infrastructure and the significant increase in demands for municipal services that has risen from the increasing population.

Proposed 1st stage (Component 1) network pipes cover built-up areas and areas with constructed streets (locally named as "open roads"). Pipes on the planned streets (locally named "closed roads") of the urban development plan are included in the 2<sup>nd</sup> stage (Component 2). These 2<sup>nd</sup> stage pipes shall be constructed in parallel with the development of the settlement in the future when required. Main collector lines are passed through the widest roads around, considering the construction conditions and the topographical situation. The existing main/secondary lines and the planned infrastructures for the drinking water networks are considered in design works.

Component 1 covers measures for renewal of water distribution system i.e., renewal of water network pipes (193,633 m HDPE pipes with diameters between 90 mm and 355mm) including house connections (6,041 pcs.) and other auxiliary structures (like fire hydrants, DMA chambers, PRV chambers, washout and air relief chambers, flowmeter chambers, residual chlorine measurement chambers).

Specific objectives of Component 1 are;

- 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 network which is hydraulically insufficient and consists of asbestos and PVC pipes that have already exceeded economic lifetime,
- Minimization of water losses and non-revenue water ratios that has currently reached to approximately 73% of non-revenue water and compliance with Turkiye's "Regulation on Control of Water Loss in Water Supply and Distribution Systems (published in the Official Gazette dated 08.05.2014 and numbered 28994)".

Water supply sources of Niksar Centrum will be enough until the Project horizon after decreasing the water losses in the water supply system with the help of the IPA Project measures (establishment of SCADA system, renewal of catchments, transmission lines, reservoirs etc.) and the proposed Niksar drinking water network project.

This document, which presents the ESMP for the Niksar (Tokat) Centrum Drinking Water Network Project (the Project) was prepared by MGS and REA JV. MGS and REA JV, appointed by ILBANK to undertake Environmental and Social (E&S) assessments for Group 1 Projects, in which Niksar Municipality was involved, according to Turkish environmental and social legislation and WB's Operational Policies including its safeguards policies.

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### 2 LEGAL FRAMEWORK

#### 2.1 Institutional and Legal Framework in Turkiye

In Turkiye, institutional framework consists of central and local administrations. Turkiye is structured by provinces according to economical and geographical conditions. Each province is managed by local administrations consisting of municipalities, villages/neighborhoods. Representatives of the administrative structure of municipalities and villages/neighborhoods are mayors and mukhtar, respectively. Ministries, which are central administrative units, provide services to local areas through their local branches including provincial organizations affiliated to governor and district organizations affiliated to district governors.

Environmental impacts, permits, management and inspection of the project is under the scope of authority of Ministry of Environment, Urbanization and Climate Change (MoEUCC), Ministry of Agriculture and Forestry, Ministry of Culture and Tourism, Ministry of Labor and Social Security and Ministry of Health. MoEUCC is the key authority regulating policies and procedures related to conservation and protection of natural environment, management of natural resources and settlements by its general directorates. Those principally related to the Project are given as follows:

- **7** General Directorate of Environmental Impact Assessment, Permit, and Inspection
- General Directorate of Environmental Management
- Ø General Directorate of Protection of Natural Assets
- Ø General Directorate of Infrastructure and Urban Transformation Services
- General Directorate of Spatial Planning
- Ø General Directorate of Land Registry and Cadastral

Administrations at provincial, regional and district levels are field organizations of ministries and related institutions. The project is within the scope of Tokat Governorate, Niksar District Governorate, Tokat Provincial Directorate of Environment, Urbanization and Climate Change, Tokat Provincial Directorate of Agriculture and Forestry, Tokat Provincial Directorate of Culture and Tourism, Tokat Cultural Heritage Preservation Regional Board Directorate, 7<sup>th</sup> Regional Directorate of State Hydraulic Works (DSI), Amasya Forestry Regional Directorate, Niksar Agriculture and Forestry District Directorate, Niksar Forestry Management Directorate and Tokat Provincial Special Administration. For the Project, related neighborhood administrations are considered associated as local administrations.

#### 2.2 National and International Legislation

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#### 2.2.1 National Legislation on Environmental, Social, Labor and Health and Safety

The National Legislation applicable to the management of environmental, social, health and safety aspects of the proposed Project has been identified under this section.

The Environmental Law No: 2872 published in the Official Gazette No. 18132 dated 11.08.1983 and later revised in the Official Gazette No. 28661 and dated 29.05.2013 (Law No. 6486) constitutes the basic legal framework of the environmental legislation in Turkiye.

This law is supported by numerous regulations. Article 10 of Environmental Law forms the main framework of the Environmental Impact Assessment (EIA Regulation) published in the Official Gazette No. 29186 dated 25.11.2014. As per the EIA Regulation, applications are

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carried out for identifying the positive and negative impacts of the projects planned to be implemented, for assessing the precautions to be taken to prevent negative impacts or minimize them in a way that will not harm the environment by determining the location and the alternative technologies and for monitoring and checking the implementation of the projects. The EIA process defines the process that includes the application, and the preconstruction, construction, operation, and post-operation works for performing the environmental impact assessment of the planned project. EIA is the process that starts with the presentation of the reports in which all the specified aspects of the projects are expressed and ends with the decision of the MoEUCC.

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

According to the EIA Regulation, it is not necessary to carry out a full Environmental Impact Assessment Study for the water network projects. Beside, in the scope of "Niksar Integrated Water Project - Lot-2 Water Supply and Wastewater Collection Project (FIDIC Red Book)" executed under IPA II, opinion of Tokat Provincial Directorate of Environment, Urbanization and Climate Change was requested for the water supply and sewerage systems components to be constructed and "Out of EIA Regulation Scope" decision was given on 10.02.2017 for the construction of infrastructure facilities proposed within the scope of Niksar IPA Project (Annex-E). Therefore, EIA Study was not conducted for the Niksar (Tokat) Centrum Drinking Water Network Project.

In addition to Environmental Law No: 2872, several associated laws are complementary regarding the protection and sustainability of the environment as well as the protection of health and safety rights of people. Those laws which would be applicable to the proposed Project are listed below:

- Environmental Law No. 2872 (OG No:18132, dated 11.08.1983)
- **Z** Expropriation Law No. 2942 (OG No:18215, dated 08.11.1983)
- Forestry Law No. 6831 (OG No:9402, dated 08.09.1956)
- **7** Groundwater Law No. 167 (OG No:10688, dated 23.12.1960)
- National Parks Law No. 2873 (OG No:18132, dated 11.08.1983)
- Conservation of Cultural and Natural Assets Law No. 2863 (OG No:18113, dated 23.07.1983)
- Highways Traffic Law No. 2918 (OG No:18195, dated 13.10.1983)
- Soil Conservation and Land Use Law No. 5403 (OG No:25880, dated 19.07.2005)
- Terrestrial Hunting Law No. 4915 (OG No:25165, dated 11.07.2003)
- Animal Protection Law No. 5199 (OG No:25509, dated 01.07.2004)
- Z Labor Law No. 4857 (OG No:25134, dated 10.06.2003)

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Occupational Health and Safety Law No. 6331 (OG No:28339, dated 30.096.2012)

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The regulations developed under the Environmental Law aim to specify and identify the procedures and principles of the management of environmental aspects. Under the relevant laws, several regulations or communiques are summarized in Table 2-1.

Table 2-1. Regulations and/or Communiques regarding Environmental, Social, Labor, Health and Safety Aspects

Regulations / Communiques	OG Number	OG Date	Relevance/Implication for the Project
Environmental Permit and Licens	es		
Regulation on Environmental Impact Assessment	29186	25.11.2014	Scoping the Project and evaluating impacts during pre-construction, construction, and operation phases of the project.
Regulation on Environmental Permits and Licensing	29115	10.09.2014	Determination of required environmental permits and licenses at all phases of the Project.
Regulation on Environmental Auditing	27061	21.11.2008	Environmental audits performed by either Project Owner or governmental authorities during construction and operation stages.
Regulation on the Implementation of the Law Concerning Private Security Services	25606	07.10.2004	During the construction phase for camp site security (in case of any) and during the operation phase for safety purposes for reservoirs (in case of any planning).
Air Quality Control and Greenhou	se Gas (GHG)	Emissions	
Air Quality Assessment and Management Regulation	26898	06.06.2008	Emissions during operation stage.
Industrial Air Pollution Control Regulation	27277	03.07.2009	During the construction phase, dust emissions.
Regulation on the Control of Odor Causing Emissions	28712	19.07.2013	Possible odorous emissions generated during operation stage.
Exhaust Gas Emission Control Regulation	30004	11.03.2017	Operation of Project vehicles, machinery, and equipment at all phases of the Project.
Regulation on the Control of Air Pollution from Heating	25699	13.01.2005	Heating of the operational buildings during operation phase.
Biodiversity Conservation and Pr	otection of Nat	ure	
Regulation on the Protection of Wetlands	25818	17.05.2005	Measures to be taken for wetland protection near to the Project area during the planning phase of the Project.
Law on Natural Parks	18132	11.08.1983	Measures to be taken for natural parks protection near to the Project area during the planning phase of the Project.
Regulation on Aquaculture	22223	10.03.1995	Determination measures to be taken for the construction and operation phases.
Regulation on Protection of Wildlife and Wildlife Development Area	259637	08.11.2004	Measures to be taken for wildlife protection near to the Project area during the planning phase of the Project.



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Regulations / Communiques	OG Number	OG Date	Relevance/Implication for the Project		
Chemicals and Other Dangerous	Substances				
Regulation on Classification, Labelling, and Package of the Materials and Mixtures	28848	11.12.2013	Taking measures for chemicals and mixtures to be used during construction and operation phases.		
Regulation on Registration, Evaluation, Authorization and Restriction of Chemicals	30105	23.06.2017	Determination of chemicals to be used during the operation phase.		
Regulation on Persistent Organic Pollutants	30595	14.11.2018	Determination of chemicals to be used during the operation phase.		
Regulation on the Control of Polychlorinated Biphenyls (PCBs) and Polychlorinated Terphenyls (PCTs)	26739	27.12.2007	Usage of transformers, capacitors, electrical equipment including voltage regulators, switches, oil used in motors, old electrical devices or appliances containing PCB capacitors, fluorescent light ballasts during the operational phase.		
Noise					
Regulation on Assessment and Management of Environmental Noise	27601	04.06.2010	Determination of noise emissions and measures to be taken at construction and operation phases.		
Regulation on the Environmental Noise Emissions Caused by Equipment Used Outdoors	26392	30.12.2006	Regulating the noise levels caused by noise sources within the Project site at the construction and operation phases.		
Regulation on the Protection of Employees from Risks About Noise	28721	28.07.2013	Minimum requirements to protect workers from the health and safety risks that may arise from exposure to noise, especially hearing-related risks during the construction phase.		
Soil and Land Use					
Regulation on the Control of Soil Pollution and Lands Contaminated by Point Sources	27605	08.06.2010	Determination of risks of soil contamination at construction and operation phases.		
Regulation on Control of Excavated Soil, Construction and Demolition Wastes	25406	18.03.2004	Management of excavated soil and construction and demolition wastes at the source.		
Regulation on Protection, Use, and Planning of Agricultural Lands	30265	09.12.2017	Management of change in the land use during the planning phase of the Project.		
Waste					
Regulation on Waste Management	29314	02.04.2015	Management of waste from generation to disposal without harming the environment and human health during construction and operation phases.		



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Regulations / Communiques	OG Number	OG Date	Relevance/Implication for the Project
Zero Waste Regulation	30829	12.07.2019	General principles regarding the establishment, development, monitoring, financing, recording and certification of the zero waste management system in line with sustainable development goals during construction and operation phases.
Regulation on Packaging Waste Control	30283	27.12.2017	Preventing the formation of packaging waste, reducing the amount of unavoidable packaging waste to be disposed of using reuse, recycling and recovery methods in construction and operation phases.
Regulation on Waste Oil Management	30985	21.12.2019	Waste oils included in the definition of waste oil and the management, recovery, disposal of these wastes, precautions to be taken and notifications to be made
Regulation on Medical Waste Control	29959	25.01.2017	Collection of medical waste in the places where it is produced, temporary storage, transportation to the medical waste processing facilities and disposal
Circular on COVID-19 Measures in the Management of Personal Hygiene Material Wastes such as Disposable Masks, Gloves (2020/12)	(Published on MoEUCC website)	07.04.2020	Measures and management of waste disposable masks, gloves and similar personal hygiene material wastes during the construction and operation phases.
Regulation on Control of Waste Electrical and Electronic Equipment	28300	22.05.2012	Management of electrical and electronic equipment wastes during construction and operation phases.
Regulation on Control of Waste Batteries and Accumulators	25569	31.08.2004	Establishment of a collection system and management for the recovery or final disposal of waste batteries and accumulators.
Regulation on Control of End-of- life Tires	26357	25.11.2006	Establishing a collection and management system for ensuring the necessary regulations and standards in the management of end-of-life tires during the construction and operation phases.
Water and Wastewater			
Regulation on Management of Surface Water Quality	28483	30.11.2012	Regulating discharge of treated effluent and monitoring of water quality at receiving body during operation phase.
Regulation on the Monitoring of Surface Waters and Groundwater	28910	11.02.2014	Monitoring of water quality at receiving body during operation phase.
Regulation on Water Pollution Control	25687	31.12.2004	Discharge of treated effluent during operation phase of the Project.
Regulation on the Protection of Ground Waters against Pollution and Deterioration	28257	07.04.2012	Protection of groundwater sources against pollution during construction and operation phases.
	Hand		
SURDURULEBILIR ŞEHIRLER	TÜRRYE CUMHURIYETI CEVRE ŞEHİRCÜK VE İKLIM DEÇİŞIKLİĞI BAKAMLĞI		









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Regulations / Communiques	OG Number	OG Date	Relevance/Implication for the Project		
Regulation on the Control of Pollution Caused by Hazardous Substances in and around Water Environment	26005	26.11.2005	Management of hazardous substances during construction and operation phases.		
Regulation on Water Intended for Human Consumption	25730	17.02.2005	Management of drinking water supplied during construction and operation stages.		
Regulation on Quality and Treatment of Potable Water to be Supplied	30823	06.07.2019	Determination and monitoring of quality of water to be supplied during the operation phase.		
Regulation on Wastewater Collection and Remote Systems	29940	06.01.2017	Procedures and principles regarding the planning, design and project design, construction and operation of wastewater collection and removal systems.		
Regulation on Control of Water Loss in Water Supply and Distribution Systems	28994	08.05.2014	Procedures and principles regarding the duties and responsibilities of water administration for reducing water losses in water supply, storage, transmission, distribution and consumption.		
Regulation on the Procedures and Principles to Be Followed in the Determination of Wastewater Infrastructure and Domestic Solid Waste Disposal Plant	27742	27.10.2010	Establishment, maintenance, repair, operation, closure and monitoring of wastewater infrastructure facilities, determination of full cost-based tariffs that can cover all services, adjustment and implementation of wastewater infrastructure management by metropolitan municipalities and municipalities		
Structural Safety					
Regulation on Structures to be Built in Natural Disaster Areas	26582	14.07.2007	Management of construction works within the scope of the Project.		
Regulation on Building Constructions in Earthquake Zones	26454	06.03.2007	Management of construction works within the scope of the Project.		
Regulation on Building Earthquake of Turkiye	30364	18.03.2018	Measures to be taken for the design and construction works under the impact of earthquakes and the evaluation of the performance of existing buildings under the impact of earthquakes.		
Regulation on the Protection of Buildings from Fire	26735	19.12.2007	Measures to be taken for fire protection during construction and operation phases.		
Traffic					
Regulation on the Road Transportation of Hazardous Goods	28801	24.10.2013	Hazardous goods to be transported during construction and operation phase.		
Regulation on Highway Traffic	23053	18.07.1997	Regulating speed limits of vehicles and machinery used during construction and operation phases.		



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Regulations / Communiques	OG Number	OG Date	Relevance/Implication for the Project		
Health and Safety and Labor					
Regulation on Emergency Situations in Workplaces	28681	18.06.2013	Preparation of emergency plans, prevention, protection, evacuation, firefighting, first aid and similar studies in workplaces.		
Regulation on Health and Safety at Construction Works	28786	05.10.2013	Measures to be taken during construction phase.		
Regulation on Health and Safety Conditions Regarding Use of Work Equipment	28628	25.04.2013	Measures to be taken during construction phase related to use of equipment.		
Regulation on Health and Safety Precautions Regarding Working with Chemicals	28733	12.08.2013	Measures to be taken during construction and operation phase related to use of chemicals.		
Regulation on Health and Safety Regarding Temporary and Time- Limited Works	28744	23.08.2013	Protection of employees with a temporary or fixed-term employment contract at the same level as other employees in the workplace in terms of health and safety.		
Regulation on Health and Safety Signs	28762	11.09.2013	Measures to be taken during construction and operation phases.		
Regulation on Management of Dust	289812	05.11.2013	Measures to be taken to combat dust in terms of occupational health and safety to prevent the risks that may arise from dust in the workplaces and to ensure that the workers are protected from the effects of dust.		
Regulation on Material Safety Data Sheets on Hazardous Materials and Mixtures	29204	13.12.2014	Preparation of safety data sheets to ensure effective control and surveillance against the negative effects of harmful substances and mixtures on human health and the environment during construction and operation phases.		
Regulation on Occupational Health and Safety	25311	09.12.2003	Measures to be taken during construction and operation phases to ensure the health and safety of employees.		
Regulation on Personal Protective Equipment	30761	01.05.2019	Measures to be taken during construction and operation phases to ensure the health and safety of employees.		
Regulation on Protection of Workers from Risks Created by Noise	28721	28.07.2013	Measures to be taken during construction and operation phases to ensure the health and safety of employees.		
Regulation on Risk Assessment for Occupational Health and Safety	28512	29.12.2012	Determination of occupational health and safety risks occurring during construction and operation phases.		
Regulation on Sub-contractors	27010	27.09.2008	Management of contactors/sub-contractors during construction and operation phases.		



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Regulations / Communiques	OG Number	OG Date	Relevance/Implication for the Project		
Regulation on Use of Personal Protective Equipment in Workplaces	28695	02.07.2013	Measures to be taken during construction and operation phases to ensure the health and safety of employees.		
Regulation on Vocational Training of the Employees Working in Dangerous and Highly Dangerous Workplaces	28706	13.07.2013	Measures to be taken during construction and operation phases to ensure the health and safety of employees.		
Regulation on the Procedures and Principles of Employee Health and Safety Training	28648	15.05.2013	Measures to be taken during construction and operation phases to ensure the health and safety of employees.		
Regulation on Health and Safety Measures in Working with Asbestos	28539	25.01.2013	Prevention of exposure of employees to asbestos dust in asbestos removal, demolition, repair, maintenance, and removal works and protection from health risks arising from this exposure, determination of special precautions		
Communiqué on Educational Programs on Asbestos Removal	28692	29.06.2013	Qualifications, training, training programs of asbestos removal specialists		
Cultural Heritage					
Law on Protection of Cultural and Natural Assets	18113	23.07.1983	During chance finds at the construction phase, determination of measures to be taken.		

#### 2.2.2 International Standards and World Bank Safeguard Policies

WB's environmental and social assessment procedures and Turkish legislation, and key gaps and ways to close these gaps are presented in the ESMF of SCP-II AF<sup>2</sup>. Under the ESMF, the processes of WB OP 4.01 and Turkish EIA Regulation are separately discussed in terms of screening, environmental assessment, public consultation, scoping, review of environmental and social impact assessment, disclosure, monitoring and inspection.

The Turkish EIA procedures are, with some exceptions, in line with the WB's EA policies. The primary exceptions are in project categorization, content of EA and public consultation. Some projects covered by Turkish Annex-II fall within the WB Category A. For example, where a significant new wastewater treatment plant (WWTP) is proposed for financing which, as a Category A project for the WB requires an ESIA, but under the Turkish EIA Regulation is identified as Annex-II requiring a Project Information File (PIF), which after review and decision by MoEUCC may or may not require an EIA. Some projects that are not listed in either Annex-I or Annex-II of the Turkish EIA Regulation, such as a new WWTP servicing a population of less than 150,000 may under the WB policy be classified as Category B or even Category A project.

Environmental Assessment (EA) content of WB for a Category A project and the general format of a Turkish EIA indicate several differences. These include notably the absence of an executive summary and information on the policy, legal and administrative framework, as well as possible discrepancies regarding the level at which the project's environmental and social impacts, its alternatives, and mitigation measures for the impacts are discussed. A key gap is

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the absence of an ESMP with clear specification of actions and delineation of responsibilities. Nevertheless, the project specific format for EIA may require more details under some of these headings than indicated in the general format for PIF. Consequently, a case-by-case review of the Turkish EIAs is necessary to identify gaps with WB requirements.

The content of the EA required by WB for a Category B project depends on the special circumstance. In all cases, an ESMP is required which is only partially covered in a Turkish EIA. The WB also requires partial EA or partial ESIA for Category High B projects, on the other hand, Turkish EIA does not cover in between categorization as Category High B, nor requires any other project documents in this regard.

There are some differences in terms of public consultation and disclosure. The "pre-scoping" consultation which is required by Turkish EIA Regulation for projects requiring an EIA is largely equivalent to the first consultation required by WB for Category A projects. However, WB requires a consultation on draft EA for both Category A and Category B projects; there is no equivalent provision for Category B projects in the Turkish EIA Regulation. For disclosure activities, the Turkish EIA Regulation only requires announcement of the evaluation result together with the justification. On the other hand, WB has different consultation requirements for Category A and Category B projects. In line with the WB policies Category A projects require two public consultations, one at the scoping stage (where typically the public will have the opportunity to comment on the TORs for the ESIA) and the second at the draft EA stage. For the Category B projects, in line with OP 4.01, the draft EA should be made available to local Non-Governmental Organizations (NGOs) and project affected groups. For Category B subprojects, the final ESMP report must be published on WB's website. For Category A projects, WB requires that the final ESIA report be made available to the public locally in addition to being published on WB's external website and submitted to the WB Board.

The WB has a Policies and Procedures Framework which provides a structure by developing and managing policy, procedure, directives, and guidance type documents aiming to achieve more efficient documentation, communication, and project management.

In addition to WB E&S Safeguard Policies, the EHS Guidelines of WBG constitute technical reference resources that include general and sector-specific examples of international good industry practices. The guidance documents for the evaluation and management of the environmental and social impacts of the project are listed below:

- WBG General EHS Guidelines
- WBG EHS Guidelines, Industry Sector Guidelines for Infrastructure Water and Sanitation
- WBG EHS Guidelines, Industry Sector Guidelines for General Manufacturing Construction Materials Extraction
- Stakeholder Engagement Handbook
- Introduction to Health Impact Assessment
- Workers' Accommodation: Processes and Standards A guidance note by International Finance Corporation (IFC) and the European Bank for Reconstruction and Development (EBRD),
- Cumulative Impact Assessment and Management Good Practice Guide,
- Environmental and Social Management System Implementation Manual: Construction,

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• Environmental and Social Management System Implementation Manual: General Contractor's Environmental and Social Performance Management Good Practice Rating.

The activities planned under the proposed project will be followed and will comply with the applicable national legislation and international standards. In case those differ, the most stringent requirement/standards will be met. Moreover, the most up-to-date legislation will be considered. The Environmental and Social Safeguard Policies of WB are designed to avoid, mitigate, or minimize adverse environmental and social impacts of projects supported by the Bank. The Bank encourages its borrowing member countries to adopt and implement systems that meet these objectives while ensuring that development resources are used transparently and efficiently to achieve desired outcomes. The Bank policies and operational principles are summarized under eight main aspects as given in Table 2-2.

Safeguard Policy	Requirement	Policy Triggered	Applicability / Compliance
Environmental Assessment (OP 4.01)	The Bank requires environmental assessment of projects proposed for financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making.	Yes	Activities performed within the scope of basic construction works create environmental and social impacts. After the screening process, the "Drinking Water Network Project" of Niksar Municipality have been defined as Category B Project where the potential impacts are mostly reversible, site-specific, and have a range of potential mitigation measures. Therefore, this ESMP has been prepared and the mitigation measures for negative impacts that may arise during the construction of the Project are involved.
Natural Habitats (OP 4.04)	The Bank required borrowers to incorporate into their development and environmental strategies analysis of any major natural habitat issues, including identification important natural habitat sites, the ecological functions they perform, the degrees of threat to the sites, priorities for conservation, and associated recurrent- funding and capacity-building needs.	No	Niksar District has eco-tourism features with its traditional rural life environment with a superior nature such as vegetation, wildlife resources, lakes, waterfalls and canyons. Çamiçi Plateau, which appeals to plateau tourism in the district, is one of the important plateaus of Turkiye. There are no sensitive areas such as important environmental protection zones, critical natural habitats, natural habitats, etc. in the neighborhoods within the scope of the project to be implemented in the residential areas in the district center.

#### Table 2-2. World Bank's Environmental and Social Safeguard Policies



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Safeguard Policy	Requirement	Policy Triggered	Applicability / Compliance	
Pest Management (OP 4.09)	In appraising a project that will involve pest management, the Bank assesses the capacity of the country's regulatory framework and institutions to promote and support safe, effective, and environmentally sound pest management. As necessary, the Bank and the borrower incorporate in the project components to strengthen such capacity.	No	The proposed Project would not require the use of pesticide; therefore, no action will be taken to require pest management within the scope of the project.	
Indigenous People (OP 4.10)	The Bank recognizes that the identities and cultures of Indigenous People are inextricably linked to the lands on which they live and the natural resources on which they depend. Hence, a project proposed for Bank financing must be screened for the presence of indigenous people.	No	This policy is not triggered as there are no people in Turkiye meeting the criteria in OP4.10 for indigenous people.	
Physical Cultural Resources (OP 4.11)	The proponent needs to address impacts on physical cultural resources in projects proposed for Bank financing, as an integral part of the environmental assessment (EA) process.	Yes	There are 163 registered assets such as civil architecture structures, mosques, fountains, bridges and tombs in Niksar District. At the same time, the Niksar district is in the UNESCO World Cultural Heritage tentative list. There are cultural assets within the boundaries of the area determined as the Area of Influence (AoI) (see Section 5.1); however, all the excavation works will be carried out on the existing roads and no cultural asset is expected to be encountered except for chance finds, for which Chance Find Procedure and Regulation on Researches, Drillings and Excavations in Relation to the Cultural and Natural Assets (published in the Official Gazette No. 18485 and dated 10.08.1994) will be complied. As for the cultural assets	
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Safeguard Policy	Requirement	Policy Triggered	Applicability / Compliance
			near the excavations, the opinion of Sivas Cultural Heritage Preservation Regional Directorate was enquired, and the related official letter is presented in Annex-F (see Section 4.1.11 for details).
Involuntary Settlement (OP 4.12)	The Bank recognizes that involuntary settlement may cause severe long-term hardship, impoverishment, and environmental damage unless appropriate measures are carefully planned and implemented.	No	No land acquisition nor involuntary resettlement are required in the scope of the project.
Forests (OP 4.36)	If a project involves significant conversion or degradation of natural forests or related natural habitats that the Bank determines that are not critical, and the Bank determines that there are no feasible alternatives to the project and its siting, and comprehensive analysis demonstrates that overall benefits from the project substantially outweigh the environmental costs; the Bank may finance the project if it incorporates appropriate mitigation measures.	No	The proposed Project area is not located within boundaries of the forested area.
Safety of Dams (OP 4.37)	When the Bank finances a project that includes the construction of a new dam, it requires that the dam be designed, and its construction supervised by experienced and competent professionals.	No	No dam or dam-like structure will be constructed, nor the project will rely on the performance of an existing dam or a dam under construction within the scope of the Project.



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Safeguard Policy	Requirement	Policy Triggered	Applicability / Compliance
Project on International Waterways (OP 7.50)	The Bank recognizes that the cooperation and goodwill of riparian's is essential for the efficient use and protection of the waterway. Therefore, it attaches great importance to riparian's making appropriate agreements or arrangements for these purposes for the entire waterway or any part thereof.	No	The project area is located within Yeşilırmak Basin, where Yeşilırmak is a national waterway, thus the Project does not trigger OP 7.50.

The international agreements, and conventions, that Turkiye ratified, are given within the proposed Project:

- Paris Agreement (2021),
- UN Framework Convention on Climate Change (UNFCCC) (2004),
- Rio Declaration on Environment and Development and Statement on Forest Principles (1992),
- Convention on Biological Diversity (Rio Convention) (1992),
- Paris Convention on the Protection of the World Cultural and Natural Heritage (1975),
- Barcelona Convention on the Protection of the Mediterranean Sea Against Pollution (1976),
- The Convention for the Protection of Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention) (1981),
- Bern Convention on Protection of Europe's Wildlife and Living Environment (1982),
- Vienna Convention for the Protection of the Ozone Layer (1988),
- Montreal Protocol on Substances Depleting the Ozone Layer (1990),
- Convention on Wetlands of International Importance, Especially as Waterfowl Habitat (1994),
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (1996),
- UN Convention to Combat Desertification (1998),
- United Nations Europe Economic Commission Convention on Transboundary Effects of Industrial Accidents (2000),
- Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention) (2001),
- Stockholm Convention on Persistent Organic Pollutant (2010),
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) (1972),
- Mediterranean Sea Protocol Concerning Specially Protected Areas and Biodiversity (1988), including related protocols,
- International Labour Organization (ILO) Convention on Forced Labor (1930),

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





# **3 DESCRIPTION OF THE PROPOSED PROJECT**

"Niksar (Tokat) Centrum Drinking Water Project" will be financed by WB within the scope of SCP-II-AF under Group-1 for the "Water Network Project". ILBANK is the Borrower of the Ioan and the project implementing agency, serving as a Financial Intermediary to Niksar Municipality, who is the Project Owner.

The Project will be carried out within the urban area in Niksar District Centrum of Tokat Province. The construction of drinking water networks will be carried out in the built-up areas and areas with constructed streets; therefore, it does not require expropriation of any private land. The Project covers the renewal of water distribution system i.e., renewal of water network pipes (193,633 m HDPE pipes with diameters between 90 mm and 355 mm) including house connections (6,041 pcs.) and other auxiliary structures (like fire hydrants, DMA chambers, PRV chambers, washout and air relief chambers, flowmeter chambers, residual chlorine measurement chambers).

The Project is categorized as Category B as per WB OP 4.01 and it is excluded from EIA procedure as per the national EIA Regulation.

Niksar District is on the UNESCO World Cultural Heritage tentative list. Niksar Castle and Melikgazi Tomb are registered as 1st degree archaeological sites in Niksar District Center. There are also 163 registered assets such as civil architecture structures, mosques, fountains, bridges and tombs in Niksar District. Considering the areas that are of particular interest in terms of the Project, no natural assets were encountered on the drinking water network route, although, there are two monumental trees within the boundaries of the project. The closest natural asset is the Erkilet Valley, which is approximately 9 km away. The Project area remains within the Kelkit Valley, and its Key Biodiversity Area (KBA) status is expressed as "regional".

# 3.1 Project Location

The project area is located in the Niksar District Centrum of Tokat Province. The district is located in inner south part of Black Sea Region of Turkiye. The district is surrounded with Ordu Province on the north, Erbaa District on the west, Tokat Centrum and Almus District in the south, Başçiftlik and Reşadiye districts in the east. The district is 54.6 km to Tokat city centrum, 57 km from Reşadiye, 43 km from Erbaa and 108 km from Ünye. Total area of the district is 955 km<sup>2</sup>. Location of Tokat Province and Niksar District is shown in Figure 3-1.











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Figure 3-1 Location of Tokat Province and Niksar District (Sub-province)

Niksar District is connected to the city center by the road facing southwest, following Yeşilırmak Valley. On the other hand, it reaches Iran over Reşadiye, Erzincan and Erzurum by a road reaching in the southeast direction following Kelkit Valley. A state road in western direction of Niksar enables transportation to Samsun over Erbaa and Taşova while another state road in northern direction travels to Ünye.

The Project will be carried out within the urban area in Niksar District Centrum. The construction of drinking water networks does not require expropriation of any private land. The routes of the proposed drinking water network lines will pass under the public roads, which are under the responsibility of Niksar Municipality, and therefore neither land acquisition nor resettlement will be needed for the construction of network lines.

Within the scope of the project, the routes of the network lines are exclusively on public roads and no new roads are planned to be opened. The plan is to use the existing roads in the district center.

Moreover, considering the location of the project area, opinion was received from the Ministry of Culture and Tourism, Sivas Cultural Heritage Preservation Regional Board. In the decision of the Board, it was stated that the excavations in the 1<sup>st</sup> degree archaeological site should be carried out manually without the use of construction equipment, and in the 3<sup>rd</sup> degree archaeological sites, light tonnage construction machines with rubber wheels should be used.







# 3.2 **Project Population**

During Master Plan studies under IPA Project (Niksar Municipality Water and Wastewater Master Plan, "Technical Assistance for Preparation of Integrated Water Projects – Lot 2" (EuropeAid/128134/D/SER/TR)), Design Consultant (CDM Smith – IWP2 Consortium) has prepared a population projection utilizing 15 methods and calculating Niksar centrum population as 42,865 (for year 2032) and 50,708 (for year 2047), and including some neighborhoods, the total project population was estimated as 51,630 capita. In 2017, Design Consultant revised the population projections and calculated Niksar centrum population as 48,359 (for year 2032) and 53,945 (for year 2047), and including some neighborhoods, the total project population as 48,359 (for year 2032) and 53,945 (for year 2047), and including some neighborhoods, the total project population as 54,634 capita.

Afterwards, SUEZ has been assigned for "Technical Assistance and Supervision for Niksar Water and Wastewater Project" (EuropeAid/139814/IH/SER/TR)" and in the scope of "Hydraulic Analysis of Current Water Distribution Network and Hydraulic Modelling for Target Year 2051", network modelling has been achieved and population projections have been updated using same methods for the on-going IPA II Project.

Population projections and averages resulting from the statistical patterns and other alternative projections are calculated in both studies. It is assumed that the population growth rate will gradually decrease in the future. Population growth rate of Niksar was calculated by proportioning it both with individual population growth tendency of Niksar and of Turkiye.

For Tokat, Niksar Centrum, "Decreasing Population Growth Rate Option" was used. Rationales of this method were as follows:

- 1. Although the population of Niksar increased between the years 1970-2000, the growth rate decreased between 2000 and 2014.
- 2. Population growth rate of Turkiye has a gradually decreasing trend between 1982 and 2012. TurkStat's statistics and population projections prove tendency.
- 3. Niksar does not show a higher population growth rate than the average for Turkiye. It is situated in a region experiencing emigration and thus loosing population especially since year 2000.
- 4. It is assumed that Niksar's population growth is going to be similar to that of Turkiye.
- 5. It is also assumed that the rural settlements around Tokat Niksar will have similar population growth rates.

According to all these assumptions and as a result of calculations, the populations are calculated as in Table 3-1. By SUEZ, the population of Niksar project area was revised as 43,455 and 49,197capita in 2032 and 2051, respectively. The population of the whole project area (for sewerage and WWTP Project purposes) consisting of Niksar and its close surroundings was estimated approximately as 44,013 capita and 49,945 capita in 2032 and 2051, respectively (see Table 3-1).

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Year	Niksar Centrum (Population Projections by CDM Smith – IWP2 Consortium, Feasibility Study, 2017)	Niksar Centrum (Revision of the Projections by SUEZ, Technical Assistance Project, 2021)
2020	40,759	36,321
2025	44,325	40,000
2030	47,314	42,561
2032	48,359	43,455
2035	49,778	44,666
2040	51,781	46,373
2045	53,394	47,746
2046	53,676	47,985
2047	53,945	48,225
2048	-	48,467
2049	-	48,709
2050	-	48,952
2051	-	49,197

#### Table 3-1: Population Projections Executed for the proposed Niksar Water Supply Project

Although SUEZ have updated population projections for the IPA Project, since the volumes of the reservoirs and transmission lines are under construction, original CDM flows are used for modelling of the network.<sup>3</sup>

# 3.3 Water Demand Analysis

Water supply sources of Niksar Centrum will be enough till the Project horizon after decreasing the water losses in the water supply system with the help of the IPA Project measures (establishment of SCADA system, renewal of catchments, transmission lines, reservoirs etc.) and also the proposed Niksar drinking water network project.

The water authorities are required to reduce the level of water losses down to specified levels as per the *Regulation for the Control of Water Losses in Drinking Water Supply and Distribution Systems.* The target levels for the metropolitan municipalities and municipalities of the cities are 30% max. over 5 years from the date of announcement of the Regulation (i.e., by 2019), and further down to 25% max. over the following 4 years (i.e., by 2023).

Accordingly, Niksar Municipality will be taking measures to decrease water losses. Because of the current situation of the existing water supply system, measures like renewal are required to achieve the specified loss levels in the Regulation and to operate the whole water supply system more efficiently. With the on-going IPA Project in water supply system and also proposed "Niksar Drinking Water Network Project" it will be a reachable target.

The expected water demand projection as a result of the Niksar (Tokat) Centrum Drinking Water Network Project was created by the PID consultant and is given in Table 3-2.

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<sup>&</sup>lt;sup>3</sup> Niksar (Tokat) Centrum Drinking Water Network Project, Project Identification Report, PRO-SEDES JV, 2021.









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#### Table 3-2: Water Demand Projections (by PID Consultant)

				BILLED	AUTHORISE		ION			TOTAL NOM	OTAL NON-REVENUE WATER					
Years	Estimated Population	Domestic	Cons.	Comm. Cons. (8- 10% of domestic)	Institutional Cons. (7- 10% of domestic)	Const. And Industrial Cons. (3% of domestic)	Total Billed Cons.	Total Net Per Capita Cons.	Total N	lon-revenue Water	Water Losses	Physic	cal Losses	Total Water Production		
	capita	m³/y	lcd	m³/y	m³/y	m³/y	m³/y	lcd	%	m³/y	%	%	m³/y	m³/y		
2020	36,321	1,306,027	99	104,161	86,979	34,519	1,531,686	116	73	4,141,225	66	62	3,517,205	5,672,911		
2021	36,965	1,349,223	100	107,938	94,446	40,477	1,592,083	118	73	4,304,519	66	62	3,655,893	5,896,602		
2022	37,588	1,371,962	100	109,757	96,037	41,159	1,618,915	118	72	4,162,925	65	60	3,469,104	5,781,840		
2023	38,223	1,395,140	100	111,611	97,660	41,854	1,646,265	118	67	3,342,416	60	55	2,743,774	4,988,681		
2024	39,428	1,439,122	100	115,130	100,739	43,174	1,698,164	118	62	2,770,689	55	50	2,234,426	4,468,853		
2025	40,000	1,606,000	110	128,480	112,420	48,180	1,895,080	130	32	891,802	25	22	613,114	2,786,882		
2026	40,552	1,628,163	110	130,253	113,971	48,845	1,921,232	130	32	904,109	25	22	621,575	2,825,341		
2027	41,083	1,649,482	110	131,959	115,464	49,484	1,946,389	130	32	915,948	25	22	629,714	2,862,337		
2028	41,595	1,670,039	110	133,603	116,903	50,101	1,970,646	130	32	927,363	25	22	637,562	2,898,009		
2029	42,087	1,689,793	110	135,183	118,286	50,694	1,993,956	130	32	938,332	25	22	645,103	2,932,288		
2030	42,561	1,708,824	110	136,706	119,618	51,265	2,016,412	130	32	948,900	25	22	652,369	2,965,312		
2031	43,017	1,727,133	110	138,171	120,899	51,814	2,038,016	130	32	959,067	25	22	659,358	2,997,083		
2032	43,455	1,903,329	120	190,333	190,333	57,100	2,341,095	148	32	1,101,692	25	22	757,413	3,442,786		
2033	43,875	1,921,725	120	192,173	192,173	57,652	2,363,722	148	32	1,112,340	25	22	764,734	3,476,061		
2034	44,278	1,939,376	120	193,938	193,938	58,181	2,385,433	148	32	1,122,557	25	22	771,758	3,507,990		
2035	44,666	1,956,371	120	195,637	195,637	58,691	2,406,336	148	32	1,132,393	25	22	778,520	3,538,730		
2036	45,037	1,972,621	120	197,262	197,262	59,179	2,426,323	148	32	1,141,799	25	22	784,987	3,568,123		



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				BILLED	AUTHORISE	D CONSUMPT	ION			R				
Years	Estimated Population	Domestic	Cons.	Comm. Cons. (8- 10% of domestic)	Institutional Cons. (7- 10% of domestic)	Const. And Industrial Cons. (3% of domestic)	Total Billed Cons.	Total Net Per Capita Cons.	Total N	lon-revenue Water	Water Losses	Physic	cal Losses	Total Water Production
2037	45,393	1,988,213	120	198,821	198,821	59,646	2,445,502	148	32	1,150,825	25	22	791,192	3,596,327
2038	45,734	2,003,149	120	200,315	200,315	60,094	2,463,874	148	32	1,159,470	25	22	797,136	3,623,343
2039	46,060	2,017,428	120	201,743	201,743	60,523	2,481,436	148	32	1,167,735	25	22	802,818	3,649,171
2040	46,373	2,031,137	120	203,114	203,114	60,934	2,498,299	148	32	1,175,670	25	22	808,273	3,673,969
2041	46,673	2,044,277	120	204,428	204,428	61,328	2,514,461	148	32	1,183,276	25	22	813,502	3,697,737
2042	46,960	2,056,848	120	205,685	205,685	61,705	2,529,923	148	32	1,190,552	25	22	818,505	3,720,475
2043	47,234	2,068,849	120	206,885	206,885	62,065	2,544,685	148	32	1,197,499	25	22	823,280	3,742,183
2044	47,495	2,080,281	120	208,028	208,028	62,408	2,558,746	148	32	1,204,116	25	22	827,829	3,762,861
2045	47,746	2,091,275	120	209,127	209,127	62,738	2,572,268	148	32	1,210,479	25	22	832,204	3,782,747
2046	47,985	2,101,743	120	210,174	210,174	63,052	2,585,144	148	32	1,216,538	25	22	836,370	3,801,682
2047	48,225	2,112,255	120	211,226	211,226	63,368	2,598,074	148	32	1,222,623	25	22	840,553	3,820,697
2048	48,467	2,122,855	120	212,285	212,285	63,686	2,611,111	148	32	1,228,758	25	22	844,771	3,839,869
2049	48,709	2,133,454	120	213,345	213,345	64,004	2,624,149	148	32	1,234,893	25	22	848,989	3,859,042
2050	48,952	2,144,098	120	214,410	214,410	64,323	2,637,240	148	32	1,241,054	25	22	853,225	3,878,294
2051	49,197	2,154,829	120	215,483	215,483	64,645	2,650,439	148	32	1,247,265	25	22	857,495	3,897,705





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# 3.4 Technical Characteristics of the Project (Component 1)

Component 1 covers renewal of water distribution system, i.e., renewal of water network pipes (193,633 m HDPE pipes with diameters between 90 - 355 mm) including house connections (6,041 pcs.) and other auxiliary structures (like fire hydrants, DMA chambers, PRV chambers, washout and air relief chambers, flowmeter chambers, residual chlorine measurement chambers).

Feasibility studies carried out within the scope of the Environment Operational Programme for Community Assistance from the Instrument for Pre-Accession Assistance (IPA) for the Regional Development Component in Turkiye, 2007-2013 show that the total water losses (Non-Revenue Water) for Niksar were estimated as 73%. Unplanned use of resources and water reservoirs brings pressure problems in the network and network pipes replaced by the municipality are very old, out of use standards. In the current situation, construction works of the water transmission line and reservoirs within the scope of this project are ongoing and 94% have been completed.

Hydraulic designs of the network lines are prepared based on the population and flow rates determined as a result of the evaluations during the Feasibility and Master Plan stages. Design is made according to the projections for the year 2047 and the system designed according to the projections for the year 2047.

Considering the development areas in Figure 3-2, 290 km of water network will have to be established. Within the scope of the SCP II-AF, **194 km** of water network has been planned considering the existing settlement areas, the boundaries of which are indicated by the red line.

The map given in Figure 3-2 is taken from the Draft Feasibility Report, which was prepared for the "Niksar IWP - Lot-2 Water Supply and Wastewater Collection Project" within the IPA-II Project.





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Figure 3-2 Niksar District Development Plan

During design of the network, firstly pressure zones are identified according to the elevations of the settlements inside borders of Niksar Centrum (see Figure 3-3). Then population density zones are identified. Accordingly, population and design flow requirements are calculated by Design Consultant.

Reservoir service population and water demand are determined by using area and populations determined in reservoir service areas and water demand forecasts presented. In the determination of reservoir demand, domestic, institutional, commercial and unbilled water consumptions are distributed in proportion to population calculated with gross density. Domestic water demands were calculated by taking into account a total population of 53,945 people.

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Figure 3-3 Population Density Map and Pressure Zones Map used by Design Consultants (CDM and SUEZ)





Proposed 1<sup>st</sup> and 2<sup>nd</sup> Stage network main pipes are shown in Figure 3-4 on Google Earth map. The network line shown in red on the map represents the 1<sup>st</sup> stage with a length of 193.7 km, and the network line shown in blue represents the 2<sup>nd</sup> stage with a length of 96.4 km.

1/5,000 scaled general layout drawing showing network zones, transmission lines, existing and proposed reservoirs, pump stations and other auxiliary structures are given in Annex-D.



Figure 3-4 1<sup>st</sup> and 2<sup>nd</sup> Stage of Water Network to be Renewed within the Scope of the Project





Drinking water network is designed to serve population till design horizon, i.e. reservoir main pipes, reservoir volumes, main and lateral pipe diameters are all chosen considering design horizon (year 2051) demands.

Proposed 1<sup>st</sup> stage network pipes cover built-up areas and areas with constructed streets (locally named as "open roads"). Pipes on the planned streets (locally named "closed roads") of the urban development plan are included in the 2<sup>nd</sup> stage. These 2<sup>nd</sup> stage pipes shall be constructed in parallel with the development of the settlement in the future when required. Main collector lines are passed through the widest roads around, considering the construction conditions and the topographical situation. The existing main/secondary lines and the planned infrastructures for the drinking water networks are considered in design works.

In this direction, the lengths to be used in the network according to the materials and pipe diameters to be used are given in Table 3-3.

Nominal Diameter	1 <sup>st</sup> Stage (m)	2 <sup>nd</sup> Stage (m)							
Ø 90, PN10, PE100	52,879	38,475							
Ø 110, PN10, PE100	67,372	49,705							
Ø 140, PN10, PE100	20,245	1,428							
Ø 160, PN10, PE100	33,618	6,748							
Ø 180, PN10, PE100	11,435								
Ø225, PN10, PE100	4,252								
Ø280, PN10, PE100	2,575								
Ø 315, PN10, PE100	162								
Ø 355, PN10, PE100	1,095								
Total	193,633	96,356							
Total	289,989								

Table 3-3: Length and Materials of Proposed Network

Another infrastructural need in water supply sector to be implemented by Niksar Municipality in short term is the water supply system of Çamiçi Plateau (around 15 km to Niksar centrum). It is a nearby countryside of Niksar (outside the development plan) where residents have summer houses. Currently, there is no proper water supply system in the neighborhood. A water supply system is designed including 30.3 km network and a service reservoir, by Özçelik Ltd. and approved by ILBANK. Water supply via treatment from a dam reservoir is also under planning. Çamiçi Plateau Water Supply Project including network, service reservoir, booster pump sets and (Packaged) Water Treatment Plant via Çamiçi Dam Reservoir will be implemented by Niksar Municipality in short term through other funding possibilities (see Figure 3-5).



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Figure 3-5 Location of Packaged Water Treatment Plant

In the scope of the proposed project, the following auxiliary structures shall be used:

- 🔰 369 qty. Ф80mm hydrants,
- 6,041 qty. Φ40mm house connections,
- Washout structures (Type 1; 2 qty. Type 2; 2 qty. and 68 m washout line)
- 25 qty. network air relief structure, 7 qty. Type V-A-1 and Type V-C-1 air relief chamber structure
- 5 qty. DMA (District Measurement Area) Chamber
- 6 qty. Flowmeter Chambers (Type 1 and Type 2))
- 1 qty pressure break reservoir
- 6 qty. pressure break chamber (type 1 and Type 2)
- 7 16 qty residual chlorine chamber
- Misc. crossings (610 m river/channel crossing, 275 m bridge/channel crossing)

It was notified by the authorities that the water network construction works should be started before the European Union co-financed water reservoir and main transmission lines project is completed. Since the water network project is integrated with the transmission line and water reservoirs, the efficient use of the entire system will depend on the completion of both projects.

It has been emphasized that the ongoing water reservoirs and transmission line project within the scope of the European Union will cause changes to the existing drinking water system, and the existing water network, which is already in poor condition, will become inoperable due to these changes. It has been stated that the fulfillment of the duties of the improvements made in the infrastructure is only possible with a healthy water network and that the work on the drinking water network project should be started immediately.

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According to the intensity of the work during the construction process of the project, it is planned to employ 20 personnel at a minimum and 70 personnel at a maximum by the contractor. During the operation phase, the maintenance and repair works of the network will be carried out by the existing municipality personnel. In addition, environmental experts, social experts and OHS experts can be employed to work in the Project Implementation Unit, if deemed necessary.

For IPA II – Niksar Integrated Water Project, which is still under construction, a camp site was established by the contractor on the municipality's land in Hadımköy Neighborhood. In parallel with this situation, within the scope of Niksar (Tokat) Central Drinking Water Network Project, it is planned to establish a camp site on the land or lands owned by the Niksar Municipality. The facilities in the camp will be sufficient to meet the daily needs in terms of health and hygiene.

The Contractor shall provide the necessary documents related to quality, manufacturing and tests of the equipment and materials to be used within the scope of the project from the manufacturer and submit the copies to the Niksar Municipality. Records of the relevant standards and test results of the manufacturers of the equipment and materials procured under the project should be kept. It should perform all the tests necessary to verify the qualities and specifications of the material, its dimensional tolerances. Documents containing test results should be prepared at the intervals specified in the standards. If there is a conflict in the test results, the test can be repeated by a different testing organization deemed appropriate by the Niksar Municipality. It is anticipated that the materials to be used in construction will be procured from local suppliers. It is thought that this will contribute to the local economy.

# 3.5 Time Schedule

The Project is planned to be implemented in the period from January 2022 till July 2025, including selection of Technical Assistance (TA) Consultant, design review, tendering, construction and 12 months defects liability period (DLP) as shown in Table 3-4.

Detailed design of the contract is available and approved by EU and Ministry of Environment, Urbanization and Climate Change under IPA-II Programme. Design shall be reviewed by TA and tender documents will have to be prepared by TA Consultant with the support of Niksar Municipality and ILBANK. This is scheduled to take place in year 2022. Construction of the components is scheduled to last for 18 months.<sup>4</sup>

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<sup>&</sup>lt;sup>4</sup> Niksar (Tokat) Centrum Drinking Water Network Project, Project Identification Report, PRO-SEDES JV, 2021.



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#### Table 3-4: Time Schedule

No	Year					2	02	2									20	)23	3									20	24									20	02	5						1	202	26		
NO	Item / Month	1	2	3	4 !	5 6	7	8	9	10	11	12	1	2 3	4	5	6	7	8	9	10	11	12	1	2 3	4	5	6	7	8	9 1	0 11	12	1	2	3	4 5	5 6	; 7	8	9	10	11	12	1	2	3	4	5 6	6
	Construction of Niksar Drinking Water Network Project																																																	
ork Project	Selection of TA Consultant (Design Review and Construction Supervision Consultant)																																														1			
ater Netwi	Design Review and Revisions (by TA Consultant)																																														[]			
Drinking W	Preparation of bidding documents, bidding and bid evaluation (for Construction Company)											un un un un un un un un un un un un un u																													Ī									
/1 - Niksar	Contract signing and Construction																																														1			
5	DLP																																														1			
	Bid advertisement and preparation																																																	]
	Bid evaluation																																																	
	Loan Closing																											_																						





# **4 BASELINE CONDITIONS**

This section contains information about the physical, biological, and socioeconomic environment of the Project area and its immediate surroundings. Descriptions and information provided in this chapter, regarding current conditions of the Project area and its vicinity, are based on data acquired from and reports prepared by related public and private institutions (the Ministry of Agriculture and Forest, the Disaster Emergency Management Presidency, the General Directorate of Meteorology, the Ministry of Environment, Urbanization and Climate Change, Chamber of Industry and Trade, Turkish Plants Data Service, Turkish Statistical Institute, Central Black Sea Development Agency, Provincial Sectoral Action Plans etc.), field studies conducted for identification of physical, biological, and socio-economic environment, Geographical Information Systems (GIS) studies and satellite imagery.

In addition, this section includes the current information on drinking water supply and distribution system, sewerage and stormwater system and solid waste management of Niksar District Center.

## 4.1 Physical Environment

## 4.1.1 Project Area

The project area is located in the Niksar district centrum of Tokat province. The district is located in inner south part of Black Sea Region of Turkiye. The district is surrounded with Ordu province on the north, Erbaa district on the west, Tokat centrum and Almus district in the south, Başçiftlik and Reşadiye district in the east. The district is 54.6 km to Tokat city centrum. Total area of the district is 955 km<sup>2</sup>.

# 4.1.2 Topography

Niksar district was established on the southern piedmonts of the Canik mountains, on the north of the Niksar plain, which Kelkit River drains and on both sides of Çanakçı creek, which feeds the Kelkit River. In residential areas, the elevation is between 268 m and 530 m.

The district is mountainous with the Northern Anatolia Mountain chains. The north of the district is covered by the slopes of the Canik mountains, which extend into the Kelkit valley. Niksar is a closed basin surrounded by mountains at the north and the northeast, the south and the southwest. In the south of the district, the Niksar plain is located with an area of 10,215 hectares. The average elevation of the plain is 290 meters.

The mountains incline towards the plain in the form of sloped lands with slopes ranging between %2-8. The slopes in the plain range between 0-1%.

## 4.1.3 Land use

City Development Plan and topographical maps approved by the relevant Municipality are used to determine the routes of the mains. The mains that will be assessed as 1<sup>st</sup> Stage or 2<sup>nd</sup> Stage (depending on the future development) are decided according to the existing residential areas and the existing roads which are depicted in the city development plans and topographical plans showing existing situation.

Main collector lines are passed through the widest roads around, considering the construction conditions and the topographical situation,

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- The existing main/secondary lines and the planned infrastructures for the drinking water networks are considered in design works,
- Considering the house connections, the drinking water mains are laid down on either side of the road,
- For streets with a width higher than 20 m, water mains can be laid down on both sides of the street either partially or completely considering the house connections,
- Considering the pipe materials, no house connection is allowed to the mains with diameters higher than 400-450 mm. Instead, a second main is designed for those house connections,
- Direct crossing which allows shortest length and vertical passage for the road, culvert, channel, and creek crossings are paid attention.

The Project will be carried out within the urban area in Niksar District Centrum. The construction of drinking water networks does not require expropriation of any private land. The routes of the proposed drinking water network lines will pass under the public roads, which are under the responsibility of Niksar Municipality, and therefore neither land acquisition nor resettlement will be needed for the construction of the proposed network lines.

# 4.1.4 Geology and Seismicity

Within the boundaries of residential area of Niksar District, soil and rock formations with different properties outcrop. These are represented with Mesozoic aged limestone, Middle Eocene aged clastic rocks, overlain by volcano-sediments, and lava, and tuff type volcanites, Quaternary slope debris, debris cone, and old and young alluviums.

## Mesozoic

**Upper Jura - Lower Cretaceous Limestone:** Consists of white and beige colored, micritic and cherty limestone. It outcrops from the west towards the east, in Kırgızlar neighborhood in the north of Deliktepe, Zindantepe and Madura creeks. Lower levels, which have regular bedding, are medium bedded and partly thick bedded. It is in the form of oyster white, light yellow, beige colored micritic limestone and argillaceous limestone rock. Upper levels have again regular bedding, fine-medium bedded, white colored and cherty. Sometimes there are thin marl levels in between. The limestones are faulted and fissured. Due to tectonic effect, mylonite breccia consists of micritic limestones, which can be easily dispersed sometimes. Cracks are usually calcite-filled. Their colors sometimes become reddish. There are chert and barite lumps and intermediate radiolarite layers in the reddish levels. Upper levels are fine silt stone, limestone, argillaceous limestone and in the form of alternation of these. Its thickness is around 300 m. Compiled fossils have distinctive properties for the Upper Jura - Lower Cretaceous range.

## Cenozoic

**Volcano - Sediments (Sarıboyun formation):** It is discordant on the older units. The formation, which consists of mainly yellow-colored limestones, takes the name of Sarıboyun crest. The unit is dirty yellow, rust-yellow, fine-medium and partly thick bedded. It contains carbonated sandstone and siltstone as intermediate layers. Sorting of the sandstone is good. The unit contains yellowish brown colored, overly decayed andesite-basalt volcanic intermediate layers. The yellow color may be associated with limonization. Nummulite fossils are rarely observed in the hard-textured, medium-thick bedded carbonated sandstone layers.

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Nummulites include characteristic species for Middle Eocene. Towards the top, it consists of sandstone, siltstone, shale and little volcanic content. The surfaces in the east of Ayvaz neighborhood are conformable on the Middle Eocene sandstones. It has typical outcrops between Madura creek and Sarıboyun. The unit consists of greenish grey, fine-medium bedded, medium-poorly bonded partly volcanic intermediate content and more often includes medium-bedded, well-cemented sandstone layers and partly siltstone, claystone and marl alternation consisting of pebble stone pockets. The volcanic inclusions in the unit are the product of an andesitic volcanism. Apparent thickness is around 250m. The unit is named as "Eocene flysch" by some researchers. Nummulite fossils, which are typical for Lower Lutetian, were found in the sandstone sample.

*Vulcanite (Esekciyolu formation):* The formation is mainly composed of basalt, andesite, lava, tuff agglomerate and partly alternating volcanic sandstones and siltstones. Its outcrops are observed in the southern slope of Sarımıstık hill - Ilıcak hill extension in the west and east of Zindantepe, in Osmanpasa neighborhood, Niksar castle, in the east of Madura creek, Esekci road, Gaziahmet neighborhood, Düztepe, Kayabaşı neighborhood and in further east in the southern slopes of Çanakçı creek. Vulcanite covers the widest part of the zoning area. The unit consists of lava, tuff and agglomerate, which derive from basalt andesite magma that is alternated with olive green, greenish light grey, medium-thick bedded, fault-rich and loose textured volcanic sandstone and siltstone. While units with sediment characteristics are observed in the lower levels, volcanic levels are more dominant in the upper levels. Olivines are completely serpentinized in the samples taken. Plagioclase augite, altered olivine, opaque mineral slightly glassy material was observed in the groundmass. Vulcanite is fissured and fractured and the cracks are filled with the deposits of the hydrothermal solutions. The thickness of the unit is over 1,000 m. Nummulite fossils that are typical for Lower and Middle Lutetian were found in the clastic sediment rocks of the unit. The unit is a submarine fan sediment where intense volcanic activity is observed.

**Ilicak Hill Vulcanite:** It mainly consists of basaltic lava, tuff and is formed as a result of the accumulation of their oversized fragmentation with debris flow. The unit takes the name of Ilicak hill, which is in the northwest of Niksar. The unit is observed everywhere over Eşekçiyolu formation. Ilicak hill vulcanite has pink, beige and greenish colors. It spreads towards a large area, between Şakşak cemetery and Ilicak hill and the Old Erbaa road, between Hospital and Harmancık, from Harmancık to the east and towards Kaşıbağ neighborhood. These have come in the form of overthrust due to tectonic activity and have settled on these locations. The unit is segmented and has broken into pieces in the size of pebble thinner than a block size with a few meters of length and even in the size of sand. The pieces are in the form of loose debris pile. Hard-textured crystalline tuff pieces and blocks of Ilicak hill vulcanite have met the building block need of Niksar for many years. The samples taken have a holocrystalline porphyritic texture in their microscopic identification. Opaque minerals augite and labradorite phenocrystals are found in the groundmass. The thickness of Ilicak hill vulcanite is 50-70 m. based on comparison, its age is considered as Upper Lutetian.

#### Quaternary

Alluvium, talus and debris cone are found within the development boundaries of Niksar.

*Alluvium:* Alluviums, most of which are composed of fine clasts, are found in the parts where the development area connects to the plain. Alluvium is interlocked with the debris cones





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formed by the permanent and seasonal streams towards the current alluvium and river mouth in the stream beds. Alluvium is mixed with slope debris where the topography is flat. Young sediments are formed in Niksar with the materials carried by creeks such as Çanakçı creek, Ilıcak creek, Madura creek, Kuru creek, Kargalı creek etc. from the southern slopes of the Canik mountains. The old and new alluviums are mixed in this location. The new alluvium is composed of clasts in block, pebble and sand size, which are observed in the current stream beds of the creeks and streams.

*Talus:* These are formed by the deposition of the separated pieces from the altered surface of the bedrock in the lower elevations based on the slope of the hillside. Their thickness is not much. Sometimes large blocks are found, which come from Ilicak hill vulcanite.

Debris Cone: Debris cone has effectively been accumulated in large areas in the west of Niksar development boundary, from Kargalı creek to the eastern boundary. Kargalı creek, Car creek, Tekeli creek, Ilicak creek, Kuru creek and Çanakçı stream and its tributaries have left the clasts of various size, which they take from the Canik Mountains during their energetic flows and overflow, in a location where they reach the Niksar plain, due to the decrease in the topographic slope and opportunity to spread. The thickness of the material in various sizes, which has been accumulated by Çanakçı stream to the large block of sand around the lime bridge in the last 50 years is over 6-7 m according to the witnesses. These cones are mixed with the alluviums of the Kelkit river in the west. The locations of the creeks which flow from further south than Çanakçı stream into the plain are the same. Most of the clasts are constituted of rocks with volcanic origin. Rain-wash easily takes pieces away from the altered rock and carries these towards the plain together with the pieces previously taken away. The material moved ranges from very large block size to sand size. The size of silt and clay is smaller. Since the debris cones are very permeable, groundwater table is guite deep. The groundwater table is deeper than 20 m in the wells drilled from the debris cone of Çanakçı creek.5

The 1/15,000 scaled geological map showing the project area is shown in Figure 4-1.

<sup>5</sup> Niksar (Tokat) Centrum Drinking Water Network Project, Project Identification Report, PRO-SEDES JV, 2021.

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Figure 4-1 Geology Map of the Project Area

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The project area was examined on the Turkiye Earthquake Risk Maps Interactive Web Application published by AFAD. It was determined that the peak ground acceleration (PGA 475) for the 475-year recurrence period was 0.669 g and it is located in the 1st degree earthquake zone. A screenshot taken from the application is given in Figure 4-2.



Figure 4-2 Turkiye Earthquake Risk Map of Niksar

The most active tectonic structure of the Yeşilırmak Basin, where Niksar District is located, stretches from Havza District to Erzincan Province. 1939 Erzincan earthquake created a surface rupture that came out of the Kelkit Valley and entered the Deliçay Valley over the Boğalı Massive, and the 1942 Erbaa and 1943 Ladik earthquakes created a separate surface rupture that started in Niksar District and went to the Ladik Plain over Erbaa District.

The new earthquake surface rupture is seen in two lines, in the north - west and south - east directions. One of them continues in the direction of Buzköy - Niksar, and the other continues in the direction of Kırtanos Fatlı Bridge. Active fault lines within the boundaries of Niksar are shown in Figure 4-3 using the Geosciences Map Viewer and Drawing Editor of the General Directorate of Mineral Research and Exploration.



Figure 4-3 Active fault lines within the boundaries of Niksar District





## 4.1.5 Natural Disasters

Possible Natural Disaster Risks that may occur in the project area have been evaluated. The maps of "Disaster Incidents and Damages by Provinces" published by the Disaster and Emergency Management Presidency were used.

To reveal the spatial and statistical distribution of disaster events in Turkiye, to create a reference source covering disaster events that have occurred in Turkiye since the 1950s, to facilitate technical staff in office and field investigations, to form a basis for disaster hazard studies of all types and scales, "Disaster Information Inventory Project" (DIIP) was carried out in order to make retrospective analyzes and to reveal the material and moral damages of disasters.

In the evaluation made according to the number of natural disasters that occurred between 1950-2019, the Natural Disaster situation in Tokat Province, where the project area is located, is given Figure 4-4, Figure 4-5 and Figure  $4-6.^{6}$ 





**Landslides**: Landslides are observed in specific areas of Niksar. There might be surface flows in the weathering zones on the high slope volcanics. Within the project area, due to the landslides that occurred in some neighborhoods (especially in İsmetpaşa neighborhood), the decision of "Region Exposed to Disaster" is indicated on development plants and maps. Stability problems may be encountered in excavation slopes in these weathering zones and talus. The fact that Niksar District is under the influence of surface and environmental water, receives abundant rainfall, earthquake effect and excess weathering zones will increase the possible landslide risk.

**Rockfall:** In the areas where the slope is >45%, including the section operated as a quarry in a narrow area in the northwest of the centrum, the risk of rockfall is expected considering the excess slope and the fractured cracks of the volcanic units.

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<sup>&</sup>lt;sup>6</sup> T.R. Ministry of Internal Affairs, Disaster and Emergency Management Presidency, 2019 Overview of Disaster Management and Statistics of Natural Events, 2020.



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Figure 4-5 Number of floods and inundations between 1950-2019

*Flood Risk:* The most important streams that pass through the southwest of the district and show continuous flow are the Çanakçı and Moduru Streams. DSI has conducted flume structures for these streams. For the main and secondary streams in Niksar District, DSI's opinion should be obtained before planning. Especially in Dereçay neighborhood (Gaziahmet) flood is observed in 2005.



Figure 4-6 Number of avalanches between 1950 and 2019

**Avalanche Risk:** According to the Disaster Information Inventory, there has been no avalanche case in Tokat Province so far.

*Earthquakes:* Earthquakes with a magnitude of 5 and above on the Richter scale experienced between 1900 and 2021 in the area with a radius of 50 km, which considers the project area as the center, are given in Figure 4-7. The earthquake with the highest magnitude that has occurred between the specified years has a magnitude of 7.1 in 1916.

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Figure 4-7 Earthquakes Between 1900 and 20227

#### 4.1.6 Hydrology and Hydrogeology

Kelkit is the biggest river near the district of Niksar. In addition, within the boundaries of the Municipality, Çanakçı and Kazancı (Maduru) creeks pass through, and these two creeks join and flow into the Kelkit River.

**Kelkit River:** The annual average flow rate of Kelkit River is 70 m<sup>3</sup>/sec. Kelkit River is formed by the merging of small creeks which rise from Sipikör, Pülür, Otlukbeli, Sarhan, Balaban mountains in the north of Erzincan near Kelkit town. The spring elevation is 1,460m. After passing 4,000-hectare Kelkit Plain, it flows within a narrow and steep valley extending towards south-west direction, joins the Suşehri stream on the right and flows into 5,317-hectare Niksar Plain. Then it flows again within the narrow and steep valley and flows into Niksar Plain in Fatlı locality. After Niksar Plain, Kelkit River passes 14,989-hectare Erbaa Plain and joins Yeşilırmak. Its length is 245.5 km and its drainage area is 11,445 km<sup>2</sup>. Two dams were constructed on Kelkit. Kılıçkaya Dam was taken into service in 1993 and Çamlıgöze Dam was put into service in 2000.

**Çanakçı Creek:** Çanakçı creek is one of the tributary creeks located in Niksar Plain. The creek passes through the district center and has a particular importance. It flows from the east towards west and flows into Niksar Plain. Limiting the elevation area extending towards Niksar District Center, Çanakçı Creek passes to high areas. This creek rises from the Canik Mountains. Çanakçı Creek does not have a regular flow and floods are observed frequently which damage the environment. DSİ constructed a Flood Protection control facility on Çanakçı Creek. In addition, a regulator was constructed on the creek and its water is used for irrigation purposes on agricultural lands.

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<sup>&</sup>lt;sup>7</sup> https://deprem.afad.gov.tr/depremkatalogu#



There is a 90 MW Köklüce Dam and Hydroelectric Power Plant installed on Yeşilırmak in Niksar District. This power plant is one of the most efficient power plants in Turkiye with a net head of 400 m and produces around 584 GWh of electrical energy per year.<sup>8</sup>

**Groundwater:** Geotechnical drilling wells were drilled within the scope of the Microzonation Study Report based on the development plan of the 413.97-hectare area in the center of Niksar District. In the study area, groundwater was observed in some wells drilled in the talus and alluvial unit. Groundwater levels are in the range of 9.80-11.90 m. No groundwater was observed in other formations. Boreholes where groundwater is observed are given in Figure 4-8. Although the excavations within the scope of the project will not be carried out at the observed groundwater levels, care should be taken not to affect the groundwater quality while working in this area.



Figure 4-8 Groundwater Levels Obtained within the scope of Microzonation Survey Report Studies based on the Zoning Plan

The 1/25,000 scale hydrogeological map showing the project area is presented in Figure 4-9.

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<sup>&</sup>lt;sup>8</sup> Tokat Province Environmental Status Report, 2020





Figure 4-9 Hydrogeology Map of the Project Area



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SÜRDÜRÜLEBİLIR ŞEHIRLER







# 4.1.7 Climate, Meteorology and Vegetation

Niksar District is under the influence of the Black Sea climate. However, the mild winters, moderately hot summers and the humid climate in all seasons seen in the Black Sea coastline changes in Niksar territories and becomes terrestrial. The region is isolated from the Black Sea by Canik Mountain chain in the northeast of Anatolia and bordered in the south by Central Anatolia Mountains which run parallel to the Canik Mountains.

Monthly and annual average, maximum and minimum temperature values for Tokat Province are given in Table 4-1 as per the long-term meteorological data obtained from Turkish State Meteorological Service for the years between 1991 and 2020.

LONG TERM TOKAT WEATHER STATION DATA														
						MON	ГН						_	
Parameter	1	2	3	4	5	6	7	8	9	10	11	12	ANNUA	
Average Temperature (°C)	2.1	3.6	7.8	12.6	16.6	20.1	22.9	23.3	19.6	14.6	7.6	3.7	12.9	
Average Maximum Temperature (°C)	6.5	8.8	13.8	19.4	24.1	27.6	30.2	30.9	27.4	21.5	13.6	8.0	19.3	
Average Lowest Temperature(°C)	-1.4	-0.6	2.9	6.6	10.3	13.7	16.3	16.7	13.0	9.0	3.0	0.4	7.5	
Average Insolation Time (hours)	2.7	3.7	4.6	6.2	7.3	7.9	8.7	9.1	8.1	5.9	4.3	2.5	5.9	
Average Number of Rainy Days	13.50	12.57	15.67	15.17	15.70	10.63	4.40	3.87	6.83	10.10	10.37	13.87	132.7	
Average Monthly Total Rainfall (mm)	41.1	33.8	45.8	52.5	61.7	40.4	12.7	10.1	18.2	41.4	43.1	42.1	442.9	

#### Table 4-1. Meteorological Data of Tokat Province<sup>9</sup>

Forest areas cover the major part of Niksar District. Tree species such as larch, Scotch pine, fir, hornbeam and cedar are the most common. Among these tree species, species such as hazelnut, cranberry, wild plum, apple, pear, hawthorn are also found. Willow and poplar predominate in the plains and valley floors.

## 4.1.8 Soil Quality and Land Composition

Regarding the entire Niksar District, the area of 40,547 hectares, which constitutes approximately 45.6% of the whole area, is suitable for agriculture. The total forests and semi natural area of the province is 46,179 hectares, which constitutes 52% of the whole area. The land usage classes of Niksar district are as in Table 4-2 and Figure 4-10.

<sup>&</sup>lt;sup>9</sup> https://www.mgm.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx?k=H&m=TOKAT











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Table 4-2. I and	Usage	Classes	of Niksar	District	(from	Corine	Database	)10
Table 4-2. Land	Usage	0103303	or mixsur	DISTINCT	(110111	0011110	Database	/

Land Usage Classes	ha	%
1) Artificial Areas	1,334.33	1.50
2) Agricultural Areas	40,547.14	45.60
3) Forest and Semi-Natural Areas	46,179.15	51.93
4) Water Masses	862.30	0.97
TOTAL	88,922.92	100.00



Figure 4-10 Land Usage Classes of Niksar District (from Corine Database)

Soil classification of Niksar District was evaluated through the Agricultural Land Evaluation and Management Automation (TADPORTAL) of the Ministry of Agriculture and Forestry, General Directorate of Agricultural Reform. While most of the project area is residential in terms of land class, it remains in the soil classes of alluvial soils, brown forest soils, chestnut soils and limeless brown forest soils in terms of large soil groups classification (see Figure 4-11).





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Figure 4-11 Soil Classification of Niksar District<sup>11</sup>

# 4.1.9 Air Quality

Continuous measurements are made by the Central Black Sea Clean Air Center through the Air Quality Monitoring Stations located in the city center of Tokat and its two districts. The locations of the monitoring stations are given in Figure 4-12 and their coordinates, distances and directions to the project area and the pollutant parameters measured are given in Table 4-3.



Figure 4-12 Air Quality Monitoring Station in Tokat

<sup>11</sup> https://tad.tarim.gov.tr/





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Table 4-3. Distances and directions of the Monitoring Stations according to the Project Area and Measured Parameters

Station	Coordinate	Distance to the	Direction relative		Меа	sured	Parame	eters	
olution	Coordinate	project area	area	SO <sub>2</sub>	NOx	со	<b>O</b> <sub>2</sub>	НС	РМ
Tokat	40° 19' 34"- 36° 33' 18"	44 km	west-northwest	x	-	-	-	-	x
Tokat Meydan	40° 19' 07"- 36° 33' 07"	45 km	west-southwest	-	x	x	-	-	x
Erbaa	40° 40' 18"- 36° 33' 41"	33 km	south west	x	x	-	-	-	x
Turhal	40° 23' 08"- 36° 04' 58"	75 km	south west	x	x	-	-	-	x

The average concentrations of Tokat and Erbaa stations, which are the two closest stations to the project area, in line with the measured parameters for 2020 are given in the Table 4-4.

		TO	KAT				ERB	AA		
MONTH	SO₂ (μg/m3)	NDE*	РМ10 (µg/m3)	NDE*	SO <sub>2</sub> (µg/m3)	NDE*	PM10 (µg/m3)	NDE*	NO <sub>2</sub> (µg/m3)	NDE*
January	8.55	0	29.90	2	19.65	0	85.20	24	28.62	0
February	10.12	0	30.27	1	12.59	0	57.90	14	26.55	0
March	13.63	0	19.32	0	11.47	0	48.06	12	25.97	0
April	14.03	0	20.73	0	10.28	0	53.66	2	29.21	0
Мау	15.18	0	40.80	1	9.30	0	42.33	11	22.58	0
June	12.02	0	28.25	0	9.24	0	40.62	5	20.77	0
July	11.28	0	31.19	0	8.58	0	41.46	4	15.78	0
August	10.95	0	-	-	9.18	0	43.04	7	20.60	0
September	12.23	0	24.95	0	9.35	0	54.32	17	24.24	0
October	13.37	0	32.43	3	11.61	0	80.11	25	-	0
November	11.73	0	25.12	0	12.20	0	98.25	27	-	0
December	11.96	0	33.93	4	14.10	0	159.39	31	-	0
Industrial Air Pollution Control Regulation, Ambient Air Quality Limit Values	20	-	40	-	20	-	40	-	40	-

Table 4-4. Average Concentrations of Tokat and Erbaa Stations and Number of Days Exceeded

\*Number of Days Exceeded











In 2020, the measurement results of  $NO_2$  and  $SO_2$  parameters at Tokat and Erbaa Air Quality Monitoring Stations near the project area did not exceed the Ambient Air Quality Limit Values specified in the Industrial Air Pollution Control Regulation. Especially in Erbaa Air Quality Monitoring Station, the number of days exceeding the limit value for PM10 parameter is quite high. The increase in excess of the limit, especially in winter, indicates that it may be caused by heating.

Within the scope of the baseline studies of this ESMP Report, 24-hour PM10 and PM2.5 measurements were carried out on 01-02.09.2021 and 30.11-01.12.2021, respectively. While determining the sample location, a point that can represent the current air quality was selected by considering the prevailing wind direction and topography. That is; according to the long-term wind data of Niksar District, the prevailing wind direction changes throughout the year (see Figure 4-13). While the wind blowing from the south is dominant in autumn and winter, the wind blowing from the north direction is dominant in spring and summer. The wind rate blowing from the west and east direction is very low.



Figure 4-13 Dominant Wind Direction by Month in accordance with Long Years Data<sup>12</sup>

Due to the prevailing wind blowing from two different directions at certain times of the year, a point in the center of Niksar District where the safety of measuring equipment can be ensured has been selected. Besides, due to the lack of any major industrial emission sources, the city center demonstrates a homogenic feature in terms of air quality. Therefore, it was envisaged that the selected measurement point would reflect similar results considering any receptor point within the city center. In this scope, the PM10 measurement was carried out in the garden of Danışmend Gazi Anatolian High School located at 326503.82 E 4495050.67 N coordinates. However, PM2.5 measurements were carried out in front of the Municipality Building with the coordinates 326503.82 E 4495050.67 N, which is 600 meters away from the PM10 measurement point, since it coincides with the period when the schools are open. PM2.5 and PM10 measurement points are shown in Figure 4-14 on the satellite view.

<sup>&</sup>lt;sup>12</sup> https://tr.weatherspark.com/y/99894/Niksar-T%C3%BCrkiye-Ortalama-Hava-Durumu-Y%C4%B1I-Boyunca







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Figure 4-14 Satellite View of the PM10 and PM2.5 Measurement Points

Measurements and analyzes were carried out by an accredited Environmental Laboratory and the measurement reports is given in Annex-A. According to the measurement results, the 24-hour PM10 and PM2.5 concentration values were measured as **170 µg/m<sup>3</sup>** and **30 µg/m<sup>3</sup>**, respectively (see Table 4-5). These values are above the limit values of the Industrial Air Pollution Control Regulation and WBG General EHS Guidelines. The high concentration values can be associated with the ongoing sewerage network works at seven points in the district and the use of solid fuel for heating purposes.

			Measurement	Turkish A Quality Lin	mbient Air nit Values <sup>13</sup>	Table 1.1.1: WHO Ambient
Parameter	Duration	Unit	Result	2019- 2023	2024 and after	Air Quality Guidelines
Particulate	24-hour		170	50	50	50
PM <sub>10</sub>	1-Year	µg/m³	-	40	40	20
Particulate	24-hour		30	-	-	25
PM <sub>2.5</sub>	1-Year		-	-	-	10

Table 4-5. Co	omparison	of Measur	ement Results	s with Lim	it Values
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The U.S. Air Quality Index, or AQI, is EPA's tool for communicating daily air quality. It uses color-coded categories and provides statements for each category that tell you about air quality in your area, which groups of people may be affected, and steps you can take to reduce your

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<sup>&</sup>lt;sup>13</sup> not to be exceeded more than 35 times in a year









exposure to air pollution. It's also used as the basis for air quality forecasts and current air quality reporting.

The AQI for 24-hours' average is described in Table 4-6. The measurement results according to AQI show that Niksar District has "unhealthy" air quality in terms of PM10 and "moderate" air quality in terms of PM2.5.

Air Quality Index (AQI)	Index Levels (µg/m³)		Description	
	PM10	PM2.5	Description	
Good	0-50	0-12	Air quality is satisfactory and air pollution poses little or no risk.	
Moderate	51-100	12-35.4	Air quality is favorable but for a very small number of people who are unusually sensitive to air pollution, some pollutants may be of moderate health concern.	
Unhealthy for Sensitive Groups	101-150	35.5-55.4	Health effects may occur for vulnerable groups. The public is unlikely to be affected.	
Unhealthy	151-200	55.5-150.4	Anyone can begin to experience health effects, serious health effects for vulnerable groups.	
Very Unhealthy	201-300	150.5-250.4	It can create a health emergency. The entire population is likely to be affected.	
Hazardous	301-500	250.5-500.4	Health alert: Anyone can experience more serious health effects.	

#### Table 4-6. Air Quality Index Level

## 4.1.10 Noise

In Turkiye, the Regulation on Assessment and Management of Environmental Noise (RAMEN) published in the Official Gazette dated 04.06.2010 and numbered 27601 regulates the environmental noise. The regulation sets noise limits applicable to various areas (e.g., industrial areas, residential areas, or combination of both) for three time periods. Similarly, WBG General Environmental, Health and Safety Guidelines sets limits for noise for two types of receptors and two time periods. The guideline requires that noise levels do not exceed the given levels or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site. The limit values of national and international standards are summarized in Table 4-7 and Table 4-8.

Table 4-7. National Environmental Noise Limit Values (Leq dBA)

Areas	Daytime (07:00 – 19:00)	Evening (19:00 – 23:00)	Nighttime (23:00 – 07:00)
Areas where sensitive receptors are located including education, culture, health, summer houses and camping areas	60	55	50
Commercial and residential areas where residential buildings dominate	65	60	55
Commercial and residential areas where workplaces dominate	68	63	58
Industrial areas	70	65	60











#### Table 4-8. WBG Noise Level Guidelines Limit Values (One-hour Leq-dBA)

Receptor	Daytime (07:00 – 22:00)	Nighttime (22:00 – 07:00)
Residential areas	55	45
Commercial/industrial areas	70	70

Within the scope of the baseline studies of the project, one 24-hour noise measurement was made on 01-02.09.2021. While determining the noise measurement location, a central point was chosen that can reflect the worst case where the population density and traffic load are above the average (see Figure 4-15). Since the network system will be constructed in the city center, where there are numerous noise sources, no other measurement was conducted in the scope of this ESMP.



Figure 4-15 Satellite View of the Noise Measurement Point

In the current situation, the limit value given in the context of areas where commercial buildings and noise sensitive uses are densely located is exceeded. The evaluation of the measurements was made according to the Regulation on Assessment and Management of Environmental Noise and WBG General EHS Guidelines. In this direction, the measurement results exceed the limit value of "Commercial buildings and areas with dense residences" specified in the regulation on assessment and management of environmental noise. In addition, the limit value specified in the WBG EHS Guidelines is also exceeded (see Table 4-9).





The report on the measurement details and results prepared by Environmental Laboratory is presented in Annex-B.

Table 4-9. Result of Baseline Noise Measurement

Standards	Period	Noise Limit Values (Leq dBA)	Danışment Gazi Anatolian High School 326503.82 E 4495050.67 N (UTM 37 T Projection) Measurement Results A- Band Weighting		
			Leq (dBA)	Lmax (dBA)	
National	Daytime (07:00 – 19:00)	65	77.5		
	Evening (19:00 – 23:00)	60	77.5		
	Nighttime (23:00 – 07:00)	55	70.8	101.2	
WBG Noise Level Guidelines	Daytime (07:00 – 22:00)	55	77.2		
	Nighttime (22:00 – 07:00)	45	70.8		

# 4.1.11 Cultural Heritage

There are 163 registered assets such as civil architecture structures, mosques, fountains, bridges and tombs in Niksar District. At the same time, Niksar District is on the UNESCO World Cultural Heritage tentative list. Niksar Castle and Melikgazi Tomb are the structures registered as 1<sup>st</sup> degree archaeological sites in Niksar District Center. The area with civil architecture around Niksar Castle has been registered as a 3<sup>rd</sup> degree archaeological site (see Figure 4-16).




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Figure 4-16 1<sup>st</sup> and 3<sup>rd</sup> Degree Archaeological Site Boundaries

Archaeological site boundaries, which are located in Niksar District Center and have been included in the Implementation Development Plans by the Municipality, are shown in Figure 4-17.





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Figure 4-17 Archaeological Sites Within the Working Area of The Project

Within the scope of the project, opinion was received from the Ministry of Culture and Tourism, Sivas Cultural Heritage Preservation Regional Board (see Annex-F). The decision of the Board stated that the excavations in the 1<sup>st</sup> degree archaeological site should be carried out manually without the use of construction equipment, and in the 3<sup>rd</sup> degree archaeological sites, light tonnage construction machines with rubber wheels should be used. During the construction works, these instructions will be taken into consideration.





# 4.2 Ecology and Biodiversity

# 4.2.1 Flora

Literature information was used while preparing the flora list of the project. The flora species of the project area and its surroundings are prepared by using the reference named "Flora of Turkiye and The East Aegean Islands" and are given in Table 4-10. Since there is no database where the species are specified specifically for the districts in Turkiye, the flora species found in provincial level (in Tokat Province) are provided.

In this table, the family, genus and species of the plants, endemism and rarity, -if known-phytogeographical region and endangered categories of plant species are indicated. The criteria for the categories were determined by IUCN and "Red Book of Plants of Turkiye" prepared by Ekim et al. (2000) and published by the Turkish Nature Conservation Society was used.

In addition, TUBIVES (Turkish Plants Data Service) scanning and evaluation was carried out for each flora species.

Family and Species Name	Endemism and Rarity	Phytogeographic Region	IUCN		
Aceraceae					
Acer tataricum	-	-	-		
Acer trautvetteri	-	EU-SI	-		
Apiaceae / Umbelliferae	-				
Chaerophyllum byzantium	-	EU-SI	-		
Daucus carota	-	-	-		
Eryngium giganteum	-	EU-SI	-		
Araceae	-				
Arum italicum	-	-	-		
Hedera colchica	-	EU-SI	-		
Aristolochiaceae	Aristolochiaceae				
Aristolochia pontica	-	EU-SI	-		
Aspidiaceae					
Dryopteris affinis	-	-	-		
Asteraceae / Compositae					
Achillea millefolium	-	EU-SI	-		
Anthemis tinctoria	-	-	-		
Carlina vulgaris	-	-	-		
Centaurea iberica	-	-	-		
Centaurea salicifolia	-	EU-SI	-		

Table 4-10. Flora Species in Tokat Province











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Family and Species Name	Endemism and Rarity	Phytogeographic Region	IUCN	
Cichorium intybus	-	-	-	
Cirsium hypoleucum	-	EU-SI	-	
Cirsium lappaceum subsp. anatolicum	-	IR-TU	-	
Crepis micrantha	-	-	-	
Echinops viscosus	-	Eastern MED	-	
Filago pyramidata	-	-	-	
Inula germanica	-	EU-SI	-	
Leontodon hispidus	-	EU-SI	-	
Logfia gallica	-	-	-	
Mycelis muralis	-	EU-SI	-	
Onopordum carduchorum	-	IR-TU	-	
Pilosella hoppeana	-	-	-	
Senecio pseudo-orientalis	-	IR-TU	-	
Solidago virgaurea subsp. virgaurea	-	EU-SI	-	
Taraxacum buttleri	-	-	-	
Telekia speciosa	-	EU-SI	-	
Boraginaceae				
Lappula barbata	-	IR-TU	-	
Lithospermum officinale	-	EU-SI	-	
Brunnera orientalis	-	-	-	
Brassicaceae / Cruciferae				
Alyssum alyssoides	-	-	-	
Alyssum dasycarpum	-	-	-	
Alyssum desertorum var. desertorum	-	-	-	
Alyssum xanthocarpum	-	-	-	
Boreava orientalis	-	-	-	
Camelina hispida var. hispida	-	-	-	
Cardamine hirsuta	-	-	-	
Cardamine quinquefolia	-	EU-SI	-	
Crambe orientalis	-	IR-TU	-	
Neslia apiculata	-	-	-	





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Family and Species Name	Endemism and Rarity	Phytogeographic Region	IUCN
Sisymbrium orientale	-	-	-
Campanulaceae			
Campanula rapunculus	-	EU-SI	-
Legousia speculum-veneris	-	MED	-
Caprifoliaceae			
Sambucus ebulus	-	EU-SI	-
Caryophyllaceae			
Dianthus armeria subsp. armeria	-	EU-SI	-
Silene compacta	-	-	-
Convolvulaceae			
Calystegia sepium	-	-	-
Convolvulus arvensis	-	-	-
Crassulaceae			
Sedum stoloniferum	-	EU-SI	-
Cyperaceae			
Carex ovalis	-	EU-SI	-
Carex sylvatica subsp. sylvatica	-	EU-SI	-
Dipsacaceae			
Scabiosa columbaria	-	-	-
Fabaceae / Leguminosae			
Dorycnium pentaphyllum	-		-
Lathyrus aphaca	-	-	-
Lathyrus laxiflorus	-	-	-
Lathyrus vernus	-	EU-SI	-
Lens orientalis	-	-	-
Melilotus taurica	-	-	-
Trifolium canescens	-	EU-SI	-
Trifolium dubium	-	-	-
Trifolium micranthum	-	-	-
Trifolium pratense	-	-	-
Vicia galeata	-	-	-
Vicia peregnira	-	-	-
Fagaceae			











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Family and Species Name	Endemism and Rarity	Phytogeographic Region	IUCN	
Fagus orientalis	-	EU-SI	-	
Quercus cerris var. cerris	-	MED	-	
Quercus petraea subsp. iberica	-	-	-	
Gentianaceae				
Centaurium tenuiflorum	-	-	-	
Geraniaceae	•			
Geranium purpureum	-	-	-	
Gramineae / Poaceae	•			
Aegilops triuncialis subsp. triuncialis	-	-	-	
Alopecurus myosuroides var. myosuroides	-	EU-SI	-	
Bromus japonicus	-	-	-	
Bromus squarrosus	-	-	-	
Bromus tectorum	-	-	-	
Catabrosa aquatica	-	-	-	
Festuca heteropphylla	-	EU-SI	-	
Glyceria plicata	-	-	-	
Lolium perenne	-	EU-SI	-	
<i>Melica ciliata</i> subsp. <i>ciliata</i>	-	-	-	
Piptatherum holciforme	-	-	-	
Poa nemoralis	-	-	-	
Stipa bromoides	-	MED	-	
Stipa holosericea	-	IR-TU	-	
Taeniatherum caput-medusae	-	-	-	
Triticum baeoticum	-	-	-	
Vulpia bromoides	-	EU-SI	-	
Juncaceae				
Juncus articulatus	-	EU-SI	-	
Lamiaceae / Labiatae				
Ballota nigra	-	EU-SI	-	
Glechoma hederacea	-	EU-SI	-	
Lamium purpureum	-	EU-SI	-	
Lallemantia iberica	-	IR-TU	-	





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Family and Species Name	Endemism and Rarity	Phytogeographic Region	IUCN	
Marrubium astracanicum	-	-	-	
Mentha longifolia	-	EU-SI	-	
Nepeta fissa	-	IR-TU	-	
Phlomis pungens	-	-	-	
Prunella vulgaris	-	EU-SI	-	
Salvia glutinosa	-	EU-SI	-	
Salvia virgata	-	IR-TU	-	
Sideritis taurica	-	-	-	
Teucrium scordium	-	EU-SI	-	
Thymbra spicata	-	Eastern MED	-	
Thymus leucotrichus	-	-	-	
Liliaceae			•	
Paris incompleta	-	EU-SI	-	
Ruscus hypoglossum	-	EU-SI	-	
Linaceae			•	
Linum nodiflorum	-	MED	-	
Linum trigynum	-	MED	-	
Malvaceae				
Alcea hohenackeri	-	-	-	
Oleaceae				
Fraxinus angustifolia	-	IR-TU	-	
Onagraceae			•	
Circaea alpina	-	-	-	
Circaea lutetiana	-	-	-	
Epilobium angustifolium	-	-	-	
Epilobium minutiflorum	-	IR-TU	-	
Epilobium montanum	-	EU-SI	-	
Epilobium tetragonum	-	-	-	
Epilobium parviflorum	-	-	-	
Orchidaceae				
Dactylorhiza romana	-	EU-SI	-	
Dactylorhiza saccifera	-	Eastern MED	-	
Dactylorhiza urvilleana	-	EU-SI	-	





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Family and Species Name	Endemism and Rarity	Phytogeographic Region	IUCN
Serapias vomeracea	-	Eastern MED	-
Steveniella satyrioides	-	EU-SI	-
Plantaginaceae			
Plantago major	-	-	-
Polygonaceae			
Polygonum hydropiper	-	-	-
Rumex acetosella	-	-	-
Rosaceae			
Filipendula ulmaria	-	EU-SI	-
Potentilla erecta	-	-	-
Potentilla micrantha	-	-	-
Pyracantha coccinea	-	-	-
Sorbus torminalis	-	-	-
Sorbus umbellata	-	-	-
Rubiaceae			
Asperula involucrata	-	EU-SI	-
Galium palustre	-	EU-SI	-
Galium paschale	-	Eastern MED	-
Salicaceae			
Populus tremula	-	EU-SI	-
Salix caprea	-	EU-SI	-
Scrophulariaceae			
Digitalis ferruginea	-	EU-SI	-
Digitalis lamarckii	-	IR-TU	-
Linaria genistifolia	-	EU-SI	-
Scrophularia scopolii	-	-	-
Verbascum thapsus	-	EU-SI	-
Veronica beccabunga subsp. beccabunga	-	-	-
Veronica filiformis	-	EU-SI	-
Veronica magna	-	EU-SI	-
Sparganiaceae			
Sparganium erectum	-	EU-SI	-
Thymelaeaceae			

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Family and Species Name	Endemism and Rarity	Phytogeographic Region	IUCN
Daphne pontica	-	EU-SI	-
Ulmaceae			
Ulmus glabra	-	EU-SI	-

EU-SI: European-Siberian Eastern MED: Eastern Mediterranean IR-TU: Irani-Turanian MED: Mediterranean





In the project area, no plant species that should be strictly protected according to the Appendix- I list of the "Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)" could be observed.

# 4.2.2 Fauna

The IUCN Red List Classes and Criteria are designed as an easily understood system for classifying species at high risk of global extinction (see Figure 4-18). The purpose of this system is to establish a clear and objective method for classifying different species according to their risk of extinction. However, while the Red List draws attention to species at high risk of extinction, it is not the only way to prioritize conservation measures. Comprehensive consultations and tests during the development of the system have shown that the system yields solid results for most living things. Although the system consistently places species in threat classes, the criteria used do not take into account the biological characteristics of each species.

Purposes of IUCN Red List Classes and Criteria;

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



Figure 4-18 Structure of the Categories<sup>14</sup>

<sup>&</sup>lt;sup>14</sup> IUCN. (2012). IUCN Red List Categories and Criteria: Version 3.1. Second edition. Gland, Switzerland and Cambridge, UK: IUCN. iv + 32pp







## **Bern Convention**

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

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

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

The fauna species that need to be strictly protected are listed in the Appendix-2, and the fauna species that need to be protected are listed in the Appendix-3 of the Bern Convention.

Based on the literature information, the amphibian, reptile, bird and mammal species of the project area and its surroundings are given in Table 4-11, Table 4-12, Table 4-13 and Table 4-14 respectively.

Since there is no database where the species are specified specifically for the districts in Turkey, the fauna species found in provincial level (in Tokat Province) are provided.

Family and Species Name	IUCN	BERN CONVENTION APPENDIX	
BUFONIDAE			
Bufo bufo	LC	III	
Bufotes variabilis	LC	II	
RANIDAE			
Pelophylax ridibundus	LC	111	

#### Table 4-11. Amphibian Species in Tokat Province

#### Table 4-12. Reptile Species in Tokat Province

Family and Species Name	IUCN	BERN CONVENTION APPENDIX
Geoemydidae		
Mauremys caspica	-	II











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Family and Species Name	IUCN	BERN CONVENTION APPENDIX	
Testudinidae			
Testudo graeca	VU	II	
Anguidae			
Anguis fragilis	-		
Pseudopus apodus	-	II	
Lacertidae			
Darevskia rudis	LC		
Lacerta media	LC		
Colubridae			
Dolichophis caspius	-		
Eirenis modestus	LC		
Natrix natrix	LC		
Natrix tessellata	LC	II	

#### Table 4-13. Bird Species in Tokat Province

Family and Species Name	IUCN	BERN CONVENTION APPENDIX		
Accipitridae				
Accipiter nisus	LC	II		
Buteo buteo	LC	II		
Buteo rufinus	LC	II		
Columbidae				
Columba palumbus	LC	-		
Streptopelia decaocto	LC			
Streptopelia turtur	LC			
Falconidae				
Falco peregrinus	LC	II		
Falco subbuteo	LC	II		
Falco tinnunculus	LC	II		
Alaudidae				
Alauda arvensis	LC			
Eremophila alpestris	LC	II		
Melanocorypha bimaculata	LC	II		
Melanocorypha leucoptera	LC	II		





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Family and Species Name	IUCN	BERN CONVENTION APPENDIX	
Corvidae			
Corvus corax	LC	III	
Corvus corone	LC	-	
Corvus monedula	LC	-	
Pica pica	LC	-	
Emberizidae			
Emberiza hortulana	LC	III	
Emberiza melanocephala	LC	II	
Miliaria calandra	LC	III	
Fringillidae			
Carduelis cannabina	LC	II	
Carduelis carduelis	LC	II	
Carduelis chloris	LC	II	
Fringilla coelebs	LC		
Serinus serinus	LC	II	
Hirundinidae			
Delichon urbicum	LC	II	
Hirundo rustica	LC	II	
Laniidae			
Lanius collurio	LC	II	
Lanius minor	LC	II	
Lanius senator	LC	II	
Motacillidae			
Motacilla alba	LC	II	
Muscicapidae			
Erithacus rubecula	LC	II	
Luscinia luscinia	LC	II	
Luscinia megarhynchos	LC	II	
Monticola saxatilis	LC	II	
Oenanthe hispanica	LC	II	
Oenanthe oenanthe	LC	II	
Saxicola torquatus	LC	II	
Passeridae			
Passer domesticus	LC	-	









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Family and Species Name	IUCN	BERN CONVENTION APPENDIX
Passer montanus	LC	III
Sylviidae		
Cettia cetti	LC	II
Hippolais pallida	LC	II
Sylvia borin	LC	II
Sylvia communis	LC	II
Sylvia hortensis	-	II
Turdidae		
Turdus merula	LC	111
Turdus pilaris	LC	111
Turdus viscivorus	LC	
Strigidae		
Athene noctua	LC	II
Bubo bubo	LC	II

Table 4-14. Mammal Species in Tokat Province

Family and Species Name	IUCN	BERN CONVENTION APPENDIX
Canidae		
Vulpes vulpes	LC	-
Mustelidae		
Lutra lutra	NT	II
Meles meles	LC	
Mustela nivalis	LC	
Suidae		
Sus scrofa	LC	
Rhinolophidae		
Rhinolophus ferrumequinum	LC	-
Rhinolophus hipposideros	LC	-
Vespertilionidae		
Pipistrellus pipistrellus	LC	-
Erinaceidae		
Erinaceus concolor	LC	-
Soricidae	•	





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Family and Species Name	IUCN	BERN CONVENTION APPENDIX
Sorex minutus	LC	II
Talpidae		
Talpa levantis	LC	-
Leporidae		
Lepus europaeus	LC	-
Cricetidae		
Arvicola amphibius	LC	-
Cricetulus migratorius	LC	-
Muridae		
Apodemus mystacinus	LC	-
Apodemus sylvaticus	LC	-
Rattus norvegicus	LC	-
Spalacidae	·	·
Spalaxleucodon	DD	-

According to literature research results, there are 3 amphibian species, 10 reptile species, 50 bird species and 18 mammal species are found in Tokat Province. The fauna species found in the area are categorized as LC, expect one reptile species which is Tortoise (*Testudo graeca*). It is categorized as "VU" according to IUCN. It is a widely spread reptile species found in every region except the Eastern Black Sea region in Turkiye. It is generally found in dry, stony and sandy terrains. Since the Project will be realized in the city center and the mentioned species is widely spread in almost every region in Turkiye, no negative impact on the *Testudo graeca* populations is expected due to the Project activities.

## 4.2.3 Natural Assets

The natural assets in the project area and its surroundings have been determined using the Turkish National Geographic Information Systems of the Ministry of Environment, Urbanization and Climate Change. No natural assets were encountered along the drinking water network route. However, there are two monumental trees within the boundaries of the project. The closest natural asset is the Erkilet Valley, which is approximately 9 km away. The natural assets in the project area and its surroundings are shown in Figure 4-19.











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Figure 4-19 Natural Assets

## 4.2.4 Key Biodiversity Areas

Key biodiversity areas (KBA) in the project area and its surroundings are identified using the website https://www.keybiodiversityareas.org/. In line with the data obtained, the project area remains within the Kelkit Valley. KBA status is expressed as "regional"<sup>15</sup> (see Figure 4-20 and Figure 4-21).



Figure 4-20 Kelkit Valley KBA

<sup>&</sup>lt;sup>15</sup> Regional: a KBA of international significance that was identified using previously established criteria and thresholds for the identification of Important Bird and Biodiversity Areas (IBAs) and for which available data indicate that it does not meet global KBA criteria and thresholds set out in the Global Standard.











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Figure 4-21 Screenshot of the Project Area within the Kelkit Valley KBA

Although Kelkit Valley is an IBA that includes various districts of Tokat, Amasya, Sivas and Samsun Provinces, it also covers a part of Niksar District, which is the Project area.

There are oak, red pine, yellow pine, larch and beech forests within the KBA. Two remnants of cedar assemblages in the area constitute the northernmost end of the world distribution of cedar trees. Mixtures of Euro-Siberian and Mediterranean biomes are seen together in the valley.

The valley is an important nesting ground for various bird species, especially small vultures (*Neophron percnopterus*). The rough salamander (*Triturus karelinii*) found in forest and stony areas close to water is the important amphibian species in the KBA.

While the endemic flora species *Stachys insanis* is regionally evaluated in the VU category, the bird species *Buteo rufinus* is in the regional NT category, *Milvus migrans* (European population) is in the regional VU category, and *Neophron percnopterus* (European population) is in the EN category regionally.

In addition, the *Lutra lutra* species, which is evaluated in the NT category globally, and the *Glaucopsyche alexis* and *Tomares nogellini*, which are regionally categorized as VU and EN respectively, are other important fauna species in the area.

Moreover, according to definition gathered from the website of Alliance for Zero Extinction (AZE) Sites<sup>16</sup>. "All confirmed AZE sites are Key Biodiversity Areas (KBAs), 'sites contributing significantly to the global persistence of biodiversity.' However, not all KBAs are AZE Sites. Even though the criteria for defining the AZE and KBA sites are similar, there are some differences. AZE uses the following criteria to identify priority sites. An AZE site must meet all three criteria to qualify. The criteria can be summarized as follows:

**1. Endangerment:** An AZE site must contain at least one Endangered (EN) or Critically Endangered (CR) species, as assessed on the IUCN Red List.

<sup>&</sup>lt;sup>16</sup> Aze sites as key biodiversity areas. Alliance for Zero Extinction. (n.d.). Retrieved April 20, 2022, from https://zeroextinction.org/conservation/links-with-key-biodiversity-areas/











- 2. Irreplaceability: An AZE site should only be designated if it is the sole area where an EN or CR species occurs, contains the overwhelmingly significant known resident population (>95%) of the EN or CR species, or contains the overwhelmingly significant known population (>95%) for one life history segment (e.g. breeding or wintering) of the EN or CR species.
- **3. Discreteness:** The area must have a definable boundary within which the character of habitats, biological communities, and/or management issues have more in common with each other than they do with those in adjacent areas.

When Kelkit Valley KBA is evaluated against those criteria, it is concluded that the Kelkit Valley KBA is not an AZE Site<sup>1718</sup>.

Even though the proposed project area is partially located within the above-mentioned KBA as seen in Figure 4-21, since the project area is located within the city center, it has been subjected to long-lasting intense anthropogenic impacts. Therefore, damage/effect to the species in the KBA due to the construction and operation activities to be carried out in these already built-up areas are not expected.

# 4.2.5 Sensitive Regions

The project area has been evaluated below according to the List of Sensitive Regions in Annex-5 of the EIA Regulation.

## 1. Areas to be protected in compliance with the legislation of Turkiye

- a) It is not included in "National Parks", "Nature Parks", "Natural Monuments" and "Nature Protection Areas".
- b) It is not included in the "Wildlife Protection Areas and Wild Animal Settlement Areas" determined by the Ministry of Environment and Forestry in accordance with the Land Hunting Law.
- c) It is not included in the areas defined as "Cultural Assets", "Natural Assets", "Site" and "Conservation Area" and determined and registered in accordance with the relevant articles of Law No. 3386 dated 17/6/1987 with the same law.
- d) It is not included in the Fisheries Production and Breeding Areas within the scope of the Fisheries Law No. 1380 and dated 22/3/1971.
- e) It is not included in Drinking and Potable Water Resources within the scope of the Regulation on the Protection of Drinking-Usage Water Basins published in the Official Gazette dated 28/10/2017 and numbered 30224.
- f) It is not included in the "Sensitive Pollution Zones" defined in Article 49 of the Air Quality Protection Regulation published in the Official Gazette dated 2/11/1986 and numbered 19269.
- g) It is not included in the areas determined and declared as "Special Environmental Protection Areas" by the Council of Ministers pursuant to Article 9 of the Environment Law No. 2872 dated 9/8/1983.









 <sup>&</sup>lt;sup>17</sup> Aze sites as key biodiversity areas. Alliance for Zero Extinction. (n.d.). Retrieved April 20, 2022, from https://zeroextinction.org/site-identification/aze-site-criteria/
<sup>18</sup> Aze sites as key biodiversity areas Alliance for Zero Extinction (n.d.). Retrieved April 20, 2022, from

<sup>&</sup>lt;sup>18</sup> Aze sites as key biodiversity areas. Alliance for Zero Extinction. (n.d.). Retrieved April 20, 2022, from https://zeroextinction.org/site-identification/2018-global-aze-map/



- h) It is not included in the protected areas according to the Bosphorus Law No. 2960 dated 18/11/1983.
- i) It is not included in the places considered as forest area in accordance with the Forest Law No. 6831 dated 31/8/1956.
- j) It is not included in the areas where a building ban is imposed pursuant to the Coastal Law No. 3621 and dated 4/4/1990.
- k) It is not included in the areas specified in the Law No. 3573 on the Improvement of Olive Cultivation and Vaccination of Wilds, dated 26/1/1939.
- I) It is not included in the areas specified in the Pasture Law No. 4342 dated 25/2/1998.
- m) It is not included in the areas specified in the Regulation on the Protection of Wetlands, which came into force after being published in the Official Gazette dated 17/5/2005 and numbered 25818.

# 2. Areas to be protected in accordance with international conventions to which Turkiye is a party

- a) In accordance with the BERN Convention, the project area is not in the I. and II. Conservation Zones are not included in the "Mediterranean Seal Habitat and Breeding Areas".
- b) It is not included in the protected areas in accordance with the "Convention on the Protection of the Mediterranean Sea against Pollution" (Barcelona Convention).
- c) It is not included in the cultural, historical and natural areas that have been given the status of "Cultural Heritage" and "Natural Heritage", which have been taken under protection by the Ministry of Culture in accordance with the 1st and 2nd articles of the "Convention for the Protection of the World Cultural and Natural Heritage".
- d) It is not included in the protected areas in accordance with the "Convention on the Protection of Wetlands of International Importance, especially as Waterfowl Habitat" (RAMSAR Convention), which was published in the Official Gazette dated 17/5/1994 and numbered 21937.
- e) It is not included in the scope of the European Landscape Convention, which came into force after being published in the Official Gazette dated 27/7/2003 and numbered 25181.

# 3. Protected Areas

- a) The project area is not included in the approved Environmental Plans, the areas determined as an area to be protected and prohibited for construction (area to be protected with natural character, biogenetic reserve areas, geothermal areas, etc.).
- b) The project area is not included in the agricultural development areas, irrigated, irrigable and land use capability classes I, II, III and IV, I. and II. class and special crop plantation areas.
- c) The project area is not included in the wetlands, swampy reeds and turbias, which are important as the living environment of living things, especially waterfowl, and these areas are not included in the ecological wetlands from the coastal edge line to the land side.
- d) The project area is not located within the lakes, rivers and groundwater operation areas.











e) The project area is not included in the areas that are important for scientific research and/or endangered or endangered species and habitats of endemic species, biosphere reserve, biotopes, biogenetic reserve areas, geological and geomorphological formations with unique characteristics.

# 4.3 Socio-Economic Environment

## 4.3.1 Population and Demography

According to the data of the Turkish Statistical Institute (TurkStat) for 2021, the population of Niksar district is 37,841. Of this population, 18,815 are men and 19,026 are women. The population graph of Niksar district between 2007-2021 is given in Figure 4-22. According to the graph, although the population of the district decreases and increases over time, it can be said that the general trend tends to decrease.



Figure 4-22 The population of Niksar District Centrum between 2007-2020

Figure 4-23 shows the birth and death numbers of Niksar district between 2014-2019. In the specified periods, while the number of deaths increases, the number of births decreases. The fact that the number of births and deaths were equal in 2019 and the population decreased in the same year is an indication that Niksar district gave immigration.





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Figure 4-23 Birth and Death of Niksar District<sup>19</sup>

Considering the Figure 4-24, which includes the age distribution of the male and female population in Niksar district, it is seen that the number of people aged 55-59 and 60-64 is high. It has been observed that the male population in the 0-44 age range is higher than the female population, while the female population is higher than the male population in the population over 65 years old.



#### Figure 4-24 Age Distribution of the Male and Female Population in Niksar

According to the 2021 official data of TurkStat, the total population of Niksar district (including the district center and the villages of the district) is 63,486. The project area consists only of Niksar district center and includes 25 neighborhoods. The population of the district center is

<sup>&</sup>lt;sup>19</sup> Since the number of deaths in 2020 is not included in the TurkStat data, the evaluation was made over the most recent period until 2019.









more than 37 thousand people, and the population of the district center is given in Table 4-15 on a neighborhood basis.

Table 4-15. Neighborhoods within the Project Scope

	POPULATION		
SETTLEMENT	TOTAL	MALE	FEMALE
Bahçelievler Neighborhood	3,650	1,793	1,857
Bağlar Neighborhood	3,227	1,603	1,624
Kayapaşa Neighborhood	2,543	1,264	1,279
Fatih Neighborhood	3,166	1,585	1,581
Kültür Neighborhood	3,042	1,510	1,532
İsmetpaşa Neighborhood	2,455	1,215	1,240
G.Osmanpaşa Neighborhood	2,182	1,073	1,109
50. Yıl Neighborhood	2,186	1,120	1,066
Bengiler Neighborhood	1,724	843	881
Ayvaz Neighborhood	3,148	1,611	1,537
Cedit Neighborhood	1,442	687	755
Kırkkızlar Neighborhood	1,293	660	633
Şair Emrah Neighborhood	1,466	705	761
Melikgazi Neighborhood	1,205	618	587
Yusufşah Neighborhood	735	357	378
Gaziahmet Neighborhood	658	324	334
Akpınar Neighborhood	793	393	400
Aydınlıkevler Neighborhood	514	260	254
Dönekse Neighborhood	548	267	281
Cepnibey Neighborhood	470	232	238
Kılıçarslan Neighborhood	457	220	237
Haydarbey Neighborhood	339	170	169
Kumçiftlik Neighborhood	241	127	114
Hamidiye Neighborhood	187	89	98
Çengelli Neighborhood	170	89	81
TOTAL	37,841	18,815	19,026

# 4.3.2 Livelihood

Although the economic life in the district is largely based on agriculture, significant progress has been made in the industry in recent years. The Niksar plain, irrigated by the Kelkit River, is entirely devoted to agriculture. In addition, the climatic conditions in the district, which is in a transition region between the Black Sea and Central Anatolia, create an environment suitable









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for agricultural production. Grain production is carried out in a large part of 37.8% of the areas suitable for cultivation. The areas, where cereals are produced in the district, are followed by orchards, industrial plants, vegetable crops and legumes, respectively. The main cereals grown in the district are wheat, barley and corn. In addition, the other products are the raw materials for industry such as sugar beet, tobacco, sunflower, potato and mahaleb. The most grown fruits in the district are grapes, apples, cherries, peaches and walnuts. Walnut has an important place in Niksar district. Walnuts, which make a great contribution to the economy of the district, are usually sold abroad after the kernels are removed in the crushing workshops.

12% of the forests in Tokat province remain within the borders of Niksar district. Poplar production is also carried out to a large extent in Niksar district. Niksar district, which is on the way to become one of the important centers of highland tourism with Çamiçi Highland, has taken important steps in this regard with the Highland Festivals it has organized in the past. The industrial structure, which was based mostly on agriculture and small industry, has developed to a great extent today, and many workplaces have been established in the food, apparel, weaving and woodworking industries and have become enterprises that provide significant employment. Niksar Ayvar Water, one of the softest waters in the world, has a great contribution to the economy of the district and the country. The water bottled in the filling facilities is distributed to every region of the country and exported abroad.<sup>20</sup>

## 4.3.3 Employment

Unemployment rates in the province of Tokat were below the Turkiye average in the 2008-2013 period.<sup>21</sup> However, this does not mean that the unemployment problem in Tokat is low. The fact that the population change in the province is negative is related to the amount of emigration. Inadequate employment opportunities come to the fore among the causes of outward migration. Therefore, interpreting the unemployment rate data alone would be misleading for the province of Tokat.

There is no employment data for Niksar district. It is predicted that problems related to unemployment, which is one of the main reasons for immigration, will decrease with the arrival of new investors in Niksar Organized Industrial Zone.

## 4.3.4 Education

There are 495 classrooms in 68 schools in Niksar district. Education is provided to 12,110 students with 774 teachers. There are Niksar Vocational School of Social Sciences, Niksar Vocational School of Technical Sciences and Niksar School of Applied Sciences, affiliated to Gaziosmanpaşa University.

In Niksar Vocational School of Social Sciences, there are childcare and youth services department, finance, banking and insurance department, law department, accounting and tax





department, hotel, restaurant and catering services department, marketing and advertising department, and management and organization department.

Niksar Technical Sciences Vocational School has computer technologies department, electricity and energy department, electronics and automation department and forestry department.

Niksar School of Applied Sciences has banking and finance department, food technology department, public relations and advertising department, human resources management department, and restoration and conservation department.<sup>22</sup>

## 4.3.5 Health

In the province of Tokat, health services are provided by the Ministry of Health, GOP University and a private hospital with 49 beds, with a bed capacity of 2,197. In March 2014, Tokat Mental Health and Diseases Hospital, and in March 2015, the Oral and Dental Health Center with 20 units started to serve. The number of hospitals and bed capacity of Tokat province are given in Table 4-16.

<sup>&</sup>lt;sup>22</sup> Central Black Sea Development Agency Niksar District Report, 2018











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#### Table 4-16. Number of Hospitals and Beds in Tokat<sup>23</sup>

	Number of Hospitals	Number of Beds
University Hospital	1	601
Public Hospital	8	1493
Integrated District Hospital	5	54
Private Hospital	1	49
Total	15	2,197

There is a public hospital with a capacity of 125 beds in the center of Niksar District. Family Medicine Practice in the district started on August 9, 2010. There are 1 community health center, 7 family health centers, 18 family medicine units, 10 village health houses and 2 emergency aid stations in the district.

## 4.3.6 Traffic and Transportation

Provinces and districts in the vicinity are connected by asphalt roads and these highways are shown in Figure 4-25.



Figure 4-25 Access Roads

<sup>23</sup> Tokat Provincial Sectoral Action Plans 2018-2023

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Niksar district is on the crossroad of the road extending from the Central Anatolia to the north on Sivas-Tokat line and the road extending from the Eastern Anatolia to the west along the Kelkit valley. The road then extends to the north and reaches the Black Sea in Ünye.

Niksar district is connected to the city center by the road facing southwest, following Yeşilırmak Valley. On the other hand, it reaches Iran over Reşadiye, Erzincan and Erzurum by a road reaching in the southeast direction following Kelkit Valley. A state road in western direction of Niksar enables transportation to Samsun over Erbaa and Taşova while another state road in northern direction travels to Ünye.

Within the scope of the project, the routes of the network lines are exclusively on public roads and no new roads are planned to be opened. Therefore, it is planned to use the existing roads in the district center.

# 4.4 Existing Infrastructure

# 4.4.1 Existing Water Supply and Distribution Systems

Water supply system of Niksar District was first constructed between the years 1946-1949 and extensions were added in 1972-1982. Then, between year 1983-1985 a new water supply project was initiated by İlbank, however design and construction were partly finalised. Currently, the water is supplied from numerous large and small sources. Major ones of these sources are Ağpınar, Sulugöl and Keltepe. Besides, in the near past a drill for water supply purposes was performed in Çamiçi Plateau and water supply is achieved. All sources are underground and spring water, and they are all collected by catchment structures except the borehole in Çamiçi Plateau.

The majority of 12 reservoirs included in water supply systems were built in 1972 and two reservoirs constructed in 1949 and 1963 are still in use. (Kazancı and Aydınlıkevler). In addition, there are two big reservoirs, Ayvaz and Harmancık which were planned in 1985 and constructed in 1987. There is an 800 m<sup>3</sup> reservoir, which was planned and constructed but is not being used due to damage to distribution line caused by landslide in region. Proper operation for not only consumption but also for pressure cannot be maintained in the system, since some of the reservoirs were constructed in 1949-1972 planning period. Some reservoirs are planned and constructed in 1983-85 planning period, and a reservoir having 800 m<sup>3</sup> volume cannot be used. Many of existing reservoirs have completed useful service lifetime. Niksar Municipality has constructed a reservoir having 1000 m<sup>3</sup> volume in 2003 since reservoirs within the water system do not meet the requirements.

There is asbestos cement, cast iron and PVC pipes in the water distribution network. Old asbestos cement and cast-iron pipes are replaced with new PVC pipes by municipality technicians whenever a need arises. Pressure problems are experienced as the elevations and capacities of the reservoirs in the network are not suitable for the development plans of district (see Figure 4-26).

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Figure 4-26 Niksar Municipality Archives

The schematic plan for Niksar existing drinking water supply is given in Figure 4-27 as prepared in the scope of "Feasibility Report" prepared under "Technical Assistance for Preparation of Integrated Water Projects – Lot 2" Project (EuropeAid/128134/D/SER/TR), (CDM Smith – IWP2 Consortium, September 2017). In addition, "Hydraulic Analysis of Current Water Distribution Network and Hydraulic Modelling for Target Year 2051" prepared in the scope of "Technical Assistance and Supervision for Niksar Water and Wastewater Project (EuropeAid/139814/IH/SER/TR)," (Prepared by SUEZ in coordination of Ministry of Environment, Urbanization and Climate Change and Niksar Municipality, March 2021) is also taken into consideration in Figure 4-27.





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Figure 4-27 Existing Water Supply Scheme (prepared by CDM Smith IWP2 Consortium)

Niksar's water sources are summarized below:

**Ağpınar Spring;** is near Reşadiye road, approximately 4 km southeast of Niksar, at an elevation of 280 m. It emerges from the cracks of the limestones with a nearly horizontal bedding in more than ten headwaters along a 60 m long line. It was decided to use it in the project carried out between 1983-1985. Its structure is constructed in 1987. Its minimum efficiency is 86 l/s.

*Sulugöl Spring;* is located approximately 6 km east of Niksar. It's capture structure was constructed in 1972. The elevation of the source is 594.06 m.

*Keltepe Spring*; is in 18 km east of Niksar, is also known as Şeher Source. It was built in 1987 and at an elevation of 1,500 m. There are other small sources on the water transmission mains which carries Keltepe (Şeher) water to the city. These sources are also connected to water transmission mains. All these sources are shown as Keltepe Source in the report. Other connected sources are Zera Water, Ağsu and Teslime Water. Minimum yield of Keltepe Source with these sources is accepted as 45 l/s in total. According to information obtained from the Municipality, source flow increases with the rains and melting of snow in spring and reaches its maximum capacity in the period between 15 March and 15 August.

*Arap River, Şahsuvar and Kavaklık:* These sources located in 5 km north of the municipality were built between the years of 1995-1996 and 2003-2004. Municipal authorities estimated the total capacity of all these sources as 3 l/s. According to information obtained from the











Municipality, additional supply from Çamiçi drilling is made in the summer period when the water decreases in source.

*Eşek Square, Lülecizade and Sarıboyun:* Sources located in 5-6 km north of Niksar were built in years 1992-93 (Lülecizade), 1996 (Eşekmeydanı) and 2005 (Sarıboyun). Municipal authorities estimated the total capacity of all sources as 3 l/s. According to information obtained from The Municipality, additional supply from Çamiçi drilling is made in the summer period when the water decreases in source.

**Maduru-Kazanci:** Maduru-Kazanci water in 1 km north of the city is located at an elevation of 434 m and supplies water obtained with drainage to the city. Exact construction year is not known but it appears that it was also used before the drinking water project in 1983. Municipal authorities estimated that the source was built before 1950. The capacity of the source is very low and almost dry in summer and is not used in the current system.

**Şeyhler:** Water is supplied via system which was built nearly 50 years ago by the community living there from 2 sources placed in the northwest of Niksar. The Municipality replaced the water transmission mains of one of these sources and the other one is planned to be replaced. Total capacity of the source is set as 1.5 l/s by municipal authorities.

**Çamiçi:** There are small sources to supply water for municipality residents for summer in the plateau placed in the north of city. Total capacity of these sources named as "Çamiçi diğer" is estimated as 2 l/s by municipal authorities. In addition, a new source with capacity of 7 l/s was built through a borehole in 2013. This source is named as "Çamiçi sondaj".

**Karabodur:** It started to supply water in 2003 and 2004 with 1.5 l/s from the source, which is approximately 3 km north of the city.

**Analan:** Capacity of the source, which is approximately 4.5 km east of Niksar, is estimated as 4 l/s by the municipal authorities.

**Derebağ:** Capacity of this source, which is in 2.5 km east of city at 498.5 m elevation, is taken as 1 l/s. Construction year is not known exactly, but it appears that it was also used before the year1983.

Technical characteristics of the sources are summarized in Table 4-17.

Name	Construction Year	Elevation (m)	Source Capacity in Summer (I/s)	Source Capacity in Winter (I/s)	Status
Ağpınar Catchment	1987	280	86.00	86.00	Average
Sulugöl Catchment	1972	595	40.00	80.00	Poor
Keltepe (Şeher) Spring Ağsu+Teslime+Analan+Kazım	1987	1,430	43.00	28.00	Poor / Average
Tekke Spring	-	950	0.00	0.00	
Arap River/ Şahsuvar/Kavaklık	1995-96 2003-04	1,010	1.50	3.00	Average

#### Table 4-17: Characteristics of Existing Water Sources





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Name	Construction Year	Elevation (m)	Source Capacity in Summer (I/s)	Source Capacity in Winter (I/s)	Status
Lülecizade	1992-93				
Eşekmeydanı	1996	1,030	1.5	3	Good
Sarıboyun	2005				
Maduru-Kazancı	1949	434	0.00	0.00	Poor
Karabodur	2003-04	670	0.75	1.50	Good
Analan		680	2.00	4.00	Normal
Derebağ	Bdfore 1983	499	0.50	1.00	Poor
Şeyhler	1963	380	0.75	1.50	Average
Çamiçi Well	2013	1,150	3.50	7.00	Good
Çamiçi - Other	-		1.00	2.00	-
TOTAL			182.00	220.00	
ANNUAL TOTAL (m <sup>3</sup> /year)			5,739,552	6,937,920	

No treatment is required in the sources of Niksar District. Disinfection is performed using liquid chlorine in water reservoirs.

Existing main transmission lines are given in Table 4-18 and Table 4-19. All lines except the one between Ağpınar catchment and Ayvaz reservoir are operated by gravity.

Table 4-18: Characteristics of Existing Transmission Lines

Transmission mains	Diameter (mm)	Pipe Type	Length (m)	Const. Year	Status
Ağpınar Catchment – Ayvaz Reservoir (pump line)	400	Steel and AC	4,000	1987	Poor
Sulugöl Catchment – Chlorination Reservoir	300	AC	8,000	1972	Poor
Keltepe Catchment – Harmancık Reservoir	300	AC	17,000	1987	Poor
Ağsu Catchment – K/BR1	140	PVC	1,300	-	Average
Teslime Fountain – K/BR2	90	PVC	300	-	Average
Zera-Kazım Water – K/BR3	140	PVC	2,000	-	Average
Analan Water – TOKİ Reservoir	140	PVC	3,300	-	Average
Derebağ Catchment – Derebağ Reservoir	110	PVC	120	Before 1983	Poor
Arap River/Şahsuvar/Kavaklık – Gecekondu (Melikgazi) Reservoir	110	PVC	5,500	1995-96	Average











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Transmission mains	Diameter (mm)	Ріре Туре	Length (m)	Const. Year	Status
Lülecizade/Eşekmeydanı/Sarıboyun – Sarıboyun Reservoir	90	PVC	5,600	1992-93	Average
Maduru-Kazancı – Kazancı Reservoir	90	Cast Iron	1,500	1949	Poor
Karabodur – Yeni Karabodur Reservoir	63-110	PVC	3,500	2003-04	Good
Şeyhler Suyu – Aydınlıkevler Reservoir	110	PVC	1,650	1963	Poor
TOTAL			53,770		

Table 4-19: Characteristics of Existing Transmission Lines between Reservoirs

Transmission Line	Diameter	Pipe Type	Length (m)	Cons. Date	Status
Ayvaz Reservoir. – Harmancık Reservoir	200	Cast Iron	2,000	1987	Average
Chlorination Reservoir – Harmancık Reservoir	110	PVC	500	1987	Poor
Chlorination Reservoir – Kale PRV	225	Cast Iron & AC	3,000	1987	Poor
Kale Break Pressure Tank – Düztepe 1 (two parallel lines)	110-90	PVC- Cast Iron	2x2,000	Before 1983	Poor
Düztepe 1 – Düztepe 2	110	PVC	100	Before 1983	Poor
TOTAL			9,600		

According to the information gathered from CDM's Feasibility Report (CDM and IWP2 Consortium, 2017), estimated pipe lengths of the existing network is given as in Table 4-20.

Table 4-20: Characteristics of Existing Network

Ріре Туре	Ø - Pipe Diameter (mm)	Installed before year 1987 (m)	Installed after year 1990 (m)	Total (m)
Asbestos cement	100, 150, 175, 200, 250, 300, 400	18,012	-	18,012
Cast Iron	65, 90, 110, 125	2,904	-	2,904
PVC	63	31,142	4,380-	35,522
PVC	110,140	-	78,641	78,641
PVC	400	-	230	230
GRAND TOTAL		52,058	83,251	135,309











Asbestos cement and cast-iron pipes were used specifically in the network. The Municipality replaced these pipes with PVC pipes in case of any breakdown or a fault. A detailed length and diameter information for the pipes used in the network does not exist. The municipal authorities have a network plan which is based on pipe material, based on their own assessment. Total network length is estimated as 126 km based on this study. The length of asbestos cement pipes is 18 km, length of cast iron pipes is 2.9 km and the rest is PVC pipes. It is predicted that the diameter of asbestos cement pipes varies between 100 and 400 mm. The diameters of PVC pipes are between 63 mm and 140 mm.

Niksar drinking water network was planned with the ILBANK project between years 1983-85 and revised in 1987. In the original design the network is designed in 5 pressure zones, however, as some of the planned facilities are not in operation, borders of the pressure zones have been changed. According to the information gathered from Municipality, currently 6 zones are in operation as shown in Figure 4-28.



Figure 4-28 Existing Pressure Zones of Niksar Water Distribution Network (model prepared by CDM Smith IWP2 Consortium)

Under the current situation, IPA II Project for construction of the reservoirs, transmission lines, pump station has been initiated.





# On-going Niksar Water Supply Project Components under Project under Lot-2 of IPA II Scope

In the scope of "IPA II – Niksar Integrated Water Project - Lot-2 Water Supply and Wastewater Collection Project (FIDIC Red Book)", the following components of water supply systems are under construction. Construction works were initiated in May 2020 (see Figure 4-29).

- Construction and installation of 55 km water transmission lines and associated structures,
- Construction and installation of 2 Spring Catchment chambers and 3 Collecting chambers for the water sources,
- Construction and installation of 4 new water reservoirs (500 m<sup>3</sup>, 1000 m<sup>3</sup>, 1500 m<sup>3</sup> and 5000 m<sup>3</sup> in volume),
- Rehabilitation of 3 existing water reservoirs,
- Construction and installation of 2 new water pumping stations (Ağpınar) and 6.5 km forced mains and rehabilitation of 1 water pumping station (Ayvaz),
- Construction of 725 m Service roads,
- Construction of 963 m creek crossing structure and 15 m highway horizontal drilling and 300 m creek and canal crossing by hanging pipe on bridge,
- Installation of automation system for water distribution network.



Figure 4-29 Photos from the On-going Niksar Lot-2 Project under IPA (photo from Municipality and TA Consultant archive)





# 4.4.2 Existing Wastewater System

Wastewater generated in Niksar District is currently collected by a sewerage system, which was constructed by the Municipality. This network is not a technical sewerage system and made of poor cement culverts and system, laid approximately in 1.00 m depth. An important part of the system consists of 200 - 300 mm diameter pipes. 95% of the wastewater generated is collected via this network.

Niksar Municipality Sewerage Network Final Design was prepared with the order of İLBANK in 2003. All sewerage network, collector lines and wastewater treatment plant (WWTP) were planned within the scope of the project. However, as the budget of the Municipality was not enough to realize all the investment, only a part of the collectors was constructed between the years 2006-2007. The constructed collector ends at a point close to the planned WWTP site and discharges to Kelkit Creek at that point. While most of the wastewater generated in the Municipality area is discharged from this point, wastewater of Aydınlıkevler and Bahçelievler neighborhood are collected by a network constructed by the residents of the district. Wastewater from these neighborhoods' discharges to land between croplands at the south of the districts before reaching Kelkit Creek (2 separate discharge lines). Besides, there are 2 discharge points in the small industrial zone across Kelkit Creek. One of them is the line discharging the wastewater of Olca Gıda, and the second one is the line collecting and discharging the wastewater of other industrial plants in the zone.

Ø - Pipe Diameter (mm)	Material	Length (m)	Construction Year
200	Concrete	130,000	Before year 2003
300	Concrete	13,225	Before year 2003
400	Concrete	13,721	Before year 2003
600	R.C.	2,983	2007
800	R.C.	1,431	2007
1,000	R.C.	2,231	2007
TOTAL		163,592	

Characteristics of the existing sewerage network are given in Table 4-21.

Table 4-21: Characteristics of Existing Sewerage Network

Under the current situation, IPA II Project for construction of the sewerage system and wastewater treatment plant has been initiated.

## **On-going Niksar Sewerage and Wastewater Treatment Project under IPA II Scope**

In the scope of "IPA II – Niksar Integrated Water Project - Lot-2 Water Supply and Wastewater Collection Project (FIDIC Red Book)", the following components of sewerage system are under construction. Construction works have been initiated in May 2020.









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- Construction of 85 km of sewer mains and supply, installation, and construction of 32 km wastewater house connection pipes and 4518 parcel manholes and 2259 manholes,
- Construction and installation of two new package type wastewater pumping stations and 2.1 km forced mains and associated structures,
- **7** Construction of 370 m creek crossing structure for wastewater collection system
- Installation of automation system for existing pumping stations.

The photographs of the completed parts of the Water Supply and Wastewater Collection Project are given in Figure 4-30.



Figure 4-30 Completed Parts of Water Supply and Wastewater Collection Project











In the scope of "IPA II – Niksar Integrated Water Project - Lot-1 Wastewater Treatment Plant (FIDIC Yellow Book)", construction of Niksar Wastewater Treatment Plant has been initiated in April 2021 and is planned to last for 28 months. Planned Niksar WWTP is designed with  $11,132 \text{ m}^3$ /day capacity for 2032 and 12,177 m $^3$ /day in 2047. It has a typical extended activated sludge process with below process units:

- Coarse screens
- **7** Fine screens
- Aerated grit and grease chamber
- Anaerobic bio-phosphorous removal tanks
- Zarousel aeration tanks
- Sedimentation tanks
- Sludge building (mechanical sludge thickeners and dewatering units) and sludge drying unit
- Odor control unit
- Microfiltration and UV disinfection

Niksar Wastewater Treatment Plant General Layout Plan and Location of Niksar WWTP on Niksar Development Plan are given in Figure 4-31 and Figure 4-32, respectively.




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Figure 4-31 Niksar Wastewater Treatment Plant General Layout Plan (construction on-going)





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Figure 4-32 Location of Niksar WWTP on Niksar Development Plan

#### 4.4.3 Existing Stormwater System

The creek beds existing in Niksar function as collector channel, and the stormwater network in Niksar is also connected to these channels. The network is being established by the Municipality with its own resources and it is developed as per the requirements. There is no existing stormwater network drawing. The existing stormwater network is made of box culverts, open channels and pipes of 300, 700 and 1000mm diameter. The lines in the network connects with Kazancı or Çanakçı creeks and at the end, through Çanakçı Creek discharged to the Kelkit Creek.

A technical stormwater disposal system is designed by Piramit Engineering Inc. in year 2016 and approved by ILBANK (see Figure 4-33). There will be 24 discharge points in the existing rivers and creeks. Concrete and reinforced concrete pipes have been used in design. Currently, a small part of the system is being constructed. It is planned to finalize the whole stormwater system in 5 years.

The characteristics of stormwater disposal pipes are given in Table 4-22.





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Figure 4-33 Stormwater Disposal Pipes (Design by Piramit Engineers)

Table 4-22: Characteristics	of Stormwater Disposal Pipes
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DIAMETERS	PIPE TYPE	LENGTH (m) 1. Stage
Ø300	Concrete	8,286
Ø400	Concrete	3,930
Ø500	Concrete	2,165
Ø600	Concrete	791
Ø800	R.C.	1,686
Ø1000	R.C.	0
Ø1200	R.C.	0
Ø1400	R.C.	0





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DIAMETERS	PIPE TYPE	LENGTH (m) 1. Stage
TOTAL		16,858

## 4.4.4 Solid Waste Management

Solid waste collected inside District borders are sent to Landfill in Erbaa that serves Yeşilırmak Basin Solid Waste Union. This Union serves Erbaa, Reşadiye, Taşova, Başçiftlik, Karakaya, Tanoba, Gökal, Serenli, Gürçeşme, Yazıcık and Niksar Municipalities. The Landfill was commissioned in 2012.

The landfill is constructed on an area of approximately 7 hectares in the village of Evyaba, within the borders of Erbaa district, in the north of the city center of Tokat. The storage area consists of 2 lots and the total area is approximately 4 hectares. The wastewater generated in the solid waste Sanitary Landfill and the leachate generated after precipitation are collected by the leachate collection system and accumulate in the leachate pool. From here, it is recycled and drawn periodically and taken to the Erbaa Municipality Wastewater Treatment Plant (see Figure 4-34).



Figure 4-34 Google Earth View of Erbaa Landfill





# 5 ENVIRONMENTAL AND SOCIAL IMPACTS

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

As a result of this assessment relevant mitigation measures are developed to avoid, minimize, mitigate and off-set significant adverse impacts and enhancing beneficial impacts. Furthermore, the significance of project-induced residual adverse effects on the environment and community after implementation of the mitigation measures are assessed. And finally, planned monitoring activities for checking effectiveness of the proposed mitigation measures are identified.

## 5.1 Area of Influence (Aol)

The planning for the drinking water network of Niksar District was made using the existing network and the projections made for the years of 2032 and 2047 and the development areas were determined accordingly.

The entire system with a network length of 290 km is shown in Figure 3-4. The 194 km water network planned to be established within the scope of the Project remains within the existing settlement areas.

The area of influence (AoI) of the project consists of any urban or rural area likely to be affected by the project, its activities and facilities that are directly owned, operated, or managed (including by contractors). AoI also involves impacts from unplanned but predictable developments caused by the project, or indirect project impacts or cumulative impacts on biodiversity or on ecosystem services and on Affected Communities<sup>24</sup>.

In that regard, the AoI of the project has been determined by considering the 2032 and 2047 potential development areas shown in Figure 3-2.

Potential AoI is given in Figure 5-1 and the 25 neighborhoods within this area are listed in Table 4-15 according to their population size. All residents of the neighborhoods within the AoI are defined as affected groups.

<sup>24</sup> International Finance Cooperation (IFC). (2012). Guidance Note 1 Assessment and Management of Environmental and Social Risks and Impacts Published January 1, 2012 (updated June 14, 2021).











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Figure 5-1 Potential Area of Influence

Since the construction will be carried out within the residential area, sensitive receptors (hospitals, schools, etc.) that may be affected by the project impacts have been identified within the AoI. Schools and hospitals determined as sensitive receptors are given in Figure 5-2 on the satellite image. It should be noted that red marks with a symbol of a "graduation cap" shows the schools and education institutions while the red marks with a letter "H" shows hospitals and health care institutions in the figure, which are determined as the sensitive receptors.



Figure 5-2 Sensitive Receptors in Area of Influence





## 5.2 Impact Assessment Approach

During construction and operation phases of the Project, environmental and social impacts caused by project activities may arise. Any potential impacts of the Project during the construction phase would be generally short term with low to medium magnitude that would be locally significant. These impacts would mostly be related to traffic, noise, vibration, air quality, soil disturbance and contamination, waste management, community health and safety, and labor and working conditions (including occupational health and safety). During the operation phase, significant adverse environmental impacts are not expected since the aim of the project serves for the public interest. Operation of the Project might create noise, and soil contamination related impacts on sensitive receptors, and occupational health and safety risks which could be considered as significant if not properly managed, particularly during maintenance and repair works. Maintenance and repair work of water network have minor environmental impacts such as soil contamination and increased level of noise. These impacts will be local and short-term with low in significance.

Potential positive and negative impacts are required to be identified and assessed in order to define relevant mitigation measures. The assessment of environmental and social impacts has been done based on the criteria provided below using mainly expert judgement, relevant standards, and guidelines:

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

The magnitude and severity of the adverse impacts have been assessed based on the criteria given above and significance of the impacts has been determined based on this assessment and sensitivity of the receptors or sources exposed to the impact, as much as possible. The matrix given below combines the sensitivity information with the magnitude of impacts (see Table 5-1).

The significance of the impact is evaluated without mitigation measures and in the mitigation plan, it is evaluated with proposed mitigation measures. This evaluation serves to determine the significance of the residual impacts (impact left after employing mitigation measures).

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

#### Table 5-1. Impact Significance Matrix<sup>25</sup>

Environmental and Social Impact Identification for each project phase is given in Table 5-2, Table 5-3 and Table 5-4.

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<sup>&</sup>lt;sup>25</sup> Scottish Natural Heritage (2013). A handbook on environmental impact assessment. Retrieved from https://www.nature.scot/doc/handbook-environmental-impact-assessment-guidance-competent-authorities-consultees-andothers



#### **Pre-Construction Phase:**

Table 5-2. Environmental and Social Impact Identification During Pre-Construction Phase<sup>26</sup>

				Impact				
Definition of Potential Impact	Nature/Type	Extent/Area	Duration	Likelihood of Occurrence	Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without measures	
Biodiversity								
Disturbance on flora and fauna species	Adverse/ Direct	On-site/project footprint	Short term	Unlikely*	Medium	Negligible	Negligible	
Cultural Heritage								
Destruction or damage to cultural heritage	Adverse/ Direct	On-site/project footprint	Permanent	Unlikely*	High	Low	Medium	
Traffic		•		•		-		
Disturbance due to the road closure, traffic jam due to the construction vehicles, etc.	Adverse/ Direct	Local	Short term	Very likely/ certain*	High	Medium	High	
Labor Force and Influx								
Improper Working Conditions	Adverse/ Direct	On-site/project footprint	Short term	Likely*	High	Medium	High	

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<sup>&</sup>lt;sup>26</sup> The mitigation measures do not indicate the phase when the impact will occur, but at which phase it should be taken. Therefore, mitigation measures to be taken at the pre-construction phase may have been specified against the impacts of the construction and operation phases.

<sup>\*</sup> Likelihood of Occurrence refers to impact to be observed during the construction phase.

<sup>\*\*</sup> Likelihood of Occurrence refers to impact to be observed during the operation phase. \*\*\* Likelihood of Occurrence refers to impact to be observed during the construction and operation phases.



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				Impact			
Definition of Potential Impact	Nature/Type	Extent/Area	Duration	Likelihood of Occurrence	Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without measures
Workers Engaged by Third Parties and the Supply Chain	Adverse/ Direct	Local	Short term	Likely*	High	Medium	High
Child labor, forced labor and unregistered employment	Adverse/ Direct	On-site/project footprint	Short term	Unlikely*	High	Medium	High
Temporary labor influx Risk of social conflict Impacts on community dynamics:	Adverse/ Indirect	On-site/project footprint	Mid term	Likely*	High	Medium	High
Community and Occupational Hea	alth and Safety						
Inadequate worker's health and safety conditions	Adverse/ Direct	Local	Short term	Likely*	High	Medium	High
Stakeholder Engagement							
Communication issues with the stakeholders	Positive/ Direct	Local	Long term	Likely***	Medium	Medium	Medium





# Land Preparation and Construction Phase:

Table 5-3. Environmental and Social Impact Identification During Land Preparation and Construction Phase

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				li	mpact		
Definition of Potential Impact	Nature/Type	Extent/Area	Duration	Likelihood of Occurrence	Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without measures
Land Use, Soil and Geology			•				
Topsoil loss, Physical Deterioration	Adverse/ Direct	On- site/project footprint	Permanent	Likely	Medium	Low	Low
Soil contamination	Adverse/ Direct	On- site/project footprint	Long Term	Likely	Medium	Low	Low
Natural Disasters			•	•			
Erosion potential	Adverse/ Direct	On- site/project footprint	Short term	Unlikely	Medium	Low	Low
Structural Damage to Buildings	Adverse/ Direct	On- site/project footprint	Permanent	Unlikely	High	Medium	High
Rockfall and Flood Potential	Adverse/ Direct	On- site/project footprint	Permanent	Unlikely	Medium	Low	Low
Water Resources							
Impacts on Water Resources	Adverse/ Direct	Local	Short term	Unlikely	Medium	Low	Low

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		Impact									
Definition of Potential Impact	Nature/Type	Extent/Area	Duration	Likelihood of Occurrence	Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without measures				
Decrease in surface water quality	Adverse/ Direct	Local	Short term	Unlikely	Medium	Low	Low				
Decrease in groundwater quality	Adverse/ Direct	Local	Short term	Unlikely	Medium	Low	Low				
Waste and Wastewater											
Impacts on the Environment and Human Health	Adverse/ Direct	On- site/project footprint	Short term	Unlikely	High	Medium	High				
Excavation Waste Generation	Adverse/ Direct	On- site/project footprint	Short term	Likely	Medium	Low	Low				
Domestic Wastewater Generation	Adverse/ Direct	On- site/project footprint	Short term	Likely	Medium	Low	Low				
Solid (Domestic) Waste Generation	Adverse/ Direct	On- site/project footprint	Short term	Likely	Medium	Low	Low				
Hazardous Waste Generation	Adverse/ Direct	On- site/project footprint	Short term	Likely	Medium	Low	Low				
Air Quality											
Dust and PM Generation	Adverse/ Direct	On- site/project footprint	Short term	Very likely/ certain	High	Medium	High				





				li	mpact		
Definition of Potential Impact	Nature/Type	Extent/Area	Duration	Likelihood of Occurrence	Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without measures
Exhaust Emissions	Adverse/ Direct	On- site/project footprint	Short term	Very likely/ certain	High	Medium	High
Noise							
Increase in Noise Level	Adverse/ Direct	On- site/project footprint	Short term	Likely	High	Medium	High
Vibration	Adverse/ Direct	On- site/project footprint	Short term	Likely	High	Medium	High
Biodiversity		·					
Disturbance on flora and fauna species	Adverse/ Direct	On- site/project footprint	Short term	Unlikely	Medium	Low	Low
Habitat Loss	Adverse/ Direct	On- site/project footprint	Short term	Unlikely	Medium	Low	Low
Cultural Heritage		·		·		· · · · · · · · · · · · · · · · · · ·	·
Destruction or deliberate damage to cultural heritage	Adverse/ Direct	On- site/project footprint	Long term	Likely	High	Medium	High





				li	mpact		
Definition of Potential Impact	Nature/Type	Extent/Area	Duration	Likelihood of Occurrence	Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without measures
Traffic and Transport							
Disturbance due to the road closure, traffic jam due to the construction vehicles, etc.	Adverse/ Direct	On- site/project footprint	Short term	Unlikely	High	Medium	High
Labor Force and Influx							
Improper Working Conditions	Adverse/ Direct	On- site/project footprint	Short term	Likely	High	Medium	High
Workers Engaged by Third Parties and the Supply Chain	Adverse/ Direct	On- site/project footprint	Short term	Likely	High	Medium	High
Child labor, forced labor and unregistered employment	Adverse/ Direct	On- site/project footprint	Short term	Unlikely	High	Medium	High
Temporary labor influx Risk of social conflict Impacts on community dynamics:	Adverse/ Indirect	Local	Short term	Likely	High	Medium	High
Community and Occupational Hea	alth and Safety	·		·			
Inadequate workers' health and safety conditions Increase in community exposure to hazards.	Adverse/ Direct	On- site/project footprint	Short term	Unlikely	High	Medium	High





				Ir	npact		
Definition of Potential Impact	Nature/Type	Extent/Area	Duration	Likelihood of Occurrence	Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without measures
Uncertainty of Emergency Response Methods	Adverse/ Direct	On- site/project footprint	Short term	Unlikely	High	Medium	High
Increase in Health Problems	Adverse/ Direct	Local	Short term	Unlikely	High	Medium	High
Asbestos Pipe	Adverse/ Direct	On- site/project footprint	Short term	Likely	High	Medium	High
Socio-Economic Environment							
Impacts on Local Economy, Livelihood Sources and Employment	Affirmative/Indirect	Local	Short term	Likely	Medium	Medium	Medium
Loss of Land and Structures	Adverse/ Direct	On- site/project footprint	Permanent	Unlikely	Medium	Low	Low
Impacts on Infrastructure Status and Social Services	Adverse/ Direct	On- site/project footprint	Short term	Likely	Medium	Low	Low
Impacts on Vulnerable Individuals / Groups	Adverse/ Direct	Local	Local	Likely	High	Medium	High
Climate Change							
Greenhouse gas emissions	Adverse/ Direct	Regional	Short term	Unlikely	High	Medium	High





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		Impact							
Definition of Potential Impact	Nature/Type	Extent/Area	Duration	Likelihood of Occurrence	Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without measures		
Stakeholder Engagement									
Communication issues with the stakeholders	Positive/ Direct	Local	Long term	Likely	Medium	Medium	Medium		





# **Operation Phase:**

#### Table 5-4. Environmental and Social Impact Identification During Operational Phase

	Impact								
Definition of Potential Impact	Nature/Type	Extent/Area	Duration	Likelihood of Occurrence	Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without measures		
Operation of Water Network									
Waterborne Diseases	Adverse/ Direct	Local	Short term	Unlikely	High	Medium	High		
Chlorine Gas Leakage	Adverse/ Direct	On-site/project footprint	Short term	Unlikely	High	Medium	High		
Excavations Carried Out as par	Excavations Carried Out as part of Maintenance Works								
Soil Contamination and Physical Deterioration	Adverse/ Direct	On-site/project footprint	Short term	Likely	Medium	Low	Low		
Water Resources									
Water Overflows	Adverse/ Indirect	Local	Short term	Likely	Medium	Low	Low		
Noise									
Increase in Noise Level	Adverse/ Direct	On-site/project footprint	Short term	Likely	High	Medium	High		
Vibration	Adverse/ Direct	On-site/project footprint	Short term	Likely	High	Medium	High		
Air Quality				•		•			
Dust and PM Generation	Adverse/ Direct	On-site/project footprint	Short term	Likely	High	Medium	High		





	Impact								
Definition of Potential Impact	Nature/Type	Extent/Area	Duration	Likelihood of Occurrence	Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without measures		
Exhaust Emissions	Adverse/ Direct	On-site/project footprint	Short term	Likely	High	Medium	High		
Waste Management									
Excavation Waste Generation	Adverse/ Direct	On-site/project footprint	Short term	Likely	Medium	Low	Low		
Waste Generation	Adverse/ Direct	verse/ Direct On-site/project Short term Likely Medium		Low	Low				
Labor Force and Influx									
Improper Working Conditions	Adverse/ Direct	On-site/project footprint	Short term	Likely	High	Medium	High		
Workers Engaged by Third Parties and the Supply Chain	Adverse/ Direct	On-site/project footprint	Short term	Likely	High	Medium	High		
Child labor, forced labor and unregistered employment	Adverse/ Direct	On-site/project footprint	Short term	Unlikely	High	Medium	High		
Labor Influx	Adverse/ Indirect	Local	Short term	Likely	High	Medium	High		
Community and occupational H	ealth and Safety								
Inadequate workers' health and safety conditions, Increase in community exposure to hazards.	Adverse/ Direct	On-site/project footprint	Short term	Unlikely	High	Medium	High		





	Impact								
Definition of Potential Impact	Nature/Type	Extent/Area	Duration	Likelihood of Occurrence	Sensitivity of the Receptor	Magnitude of the Impact	Impact Significance without measures		
Uncertainty of Emergency Response Methods	Adverse/ Direct	On-site/project footprint	Short term	Unlikely	High	Medium	High		
Increase in Health Problems	Adverse/ Direct	Local	Short term	Unlikely	High	Medium	High		
Traffic and Transport	Traffic and Transport								
Disturbance due to the road closure, traffic jam due to the maintenance activities, etc.	Adverse/ Direct	On-site/project footprint	Short term	Likely	High	Medium	High		
Climate Change									
Greenhouse gas emissions	Adverse/ Direct	Regional	Short term	Unlikely	Medium	Low	Low		
Stakeholder Engagement									
Communication issues with the stakeholders	Positive/ Direct	Local	Long term	Likely	Medium	Medium	Medium		





# 5.3 Environmental Impacts

## 5.3.1 Land Use, Soil and Geology

#### **Construction Phase**

The excavation of trenches for the drinking water pipes will have some minor impacts on the soil environment. However, these impacts are on project footprint and restricted to the construction sites. The potential impacts will consist of:

- Leakage and spill of fuels, and oils to be used for the construction machinery and equipment can create soil contamination risk.
- During replacement of the sewerage pipes, soil contamination risk can occur.
- Soil erosion and contamination because of oil or fuel leaks or spillage that may result from incidents and unexpected events.
- Alterations of the natural soil and land structure because of soil stripping, levelling excavation and filling activities, work of construction machinery.
- Uncontrolled storage or disposal of solid and/or liquid waste can cause soil pollution.
- Piling of soil along public routes and improper reinstatement of soil to its original position.

These impacts can be easily managed and mitigated to low in significance with the implementation of the mitigation measures given in Table 6-2.

## **Operation Phase**

In the operation phase of the Project, the activities will have a limited physical interaction with the environment. No additional significant direct impacts on topography, soil and land use are anticipated under normal operating conditions. Impacts of operational phase of the Project are related with:

• During repair and maintenance works, such as spillage/leakage of oil, and chemicals to soil and the permanent land use change at pumping station and new reservoirs to be constructed.

The impact significance is determined as negligible; therefore, it is not mentioned in Table 6-3.

#### 5.3.2 Air Quality and Noise

#### **Construction Phase**

The major impacts on air quality during the construction phase of this project will be related with the material handling, vehicle movement, excavation and backfilling, compaction works and emissions from heavy construction machinery (trucks, excavators, etc.).

Air pollution will be mainly dust emissions and exhaust emissions as well as Greenhouse Gas (GHG) emissions. The sensitive receptors that will be exposed to these air emissions will be the local population who lives near the construction sites. During the construction phase of the project, impacts on air quality will be mainly due to dust emissions caused by:

• Dust emission during the site preparation, excavation, backfilling, and compaction works performed for the construction works.

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- Dust emission due to the vehicle movement for transportation of various construction materials to the project site.
- Exhaust emissions originating from vehicles used in construction activities.
- GHG emissions generated from vehicles and machinery in small amounts.

These air quality impacts will be limited in terms of area and short-term since there will be a limited number of equipment and machinery operating on site. Therefore, the receptors will be limited to the ones located near the construction sites. Necessary mitigation measures described in Table 6-2 and Table 6-3 to be taken are designated to decrease possible impacts. With the implementation of these mitigation measures, the air quality impacts will be low, short term, local, and low in significance.

The project activities within the construction phase are associated with a range of activities that generate noise. The noise would be potentially generated by transportation vehicles, machinery, and outdoor equipment to be used for preparation of the site and the construction activities, pipe placement /replacement, trench filling, and paving and asphalting. Necessary mitigation measures are identified in Table 6-2 to reduce possible impacts/risks. Construction of the drinking water distribution network will affect inhabitants living on the network route, but this impact will be short term and low in magnitude.

Vibration that will affect humans or the structure in the vicinity is not expected to occur as there will be no blasting activity within the project. The impact is assessed as direct and negative with short term duration, local and low in significance.

### **Operation Phase**

Dust and emission gases are likely to occur within the scope of maintenance and repair works. However, it is not expected to cause significant dust and exhaust emissions if the mitigation measures specified in Table 6-3 are followed during the operation phase of the project.

During the operation phase of the Project, noise will be generated from pumping station equipment such as engines, pumps, and fans. The level of noise generated from the equipment is expected to be constant as all equipment will be in operation during the day. For the equipment generating noise, isolation will be provided for the pumps.

The noise will also be generated from repair and maintenance works. Vehicles and maintenance equipment and machinery will be used temporarily, and the number of vehicles will be limited during repair and maintenance works. Therefore, noise impact resulting from these works is not expected to be significant during the operation phase of the project. In Table 6-3, the mitigation measures to be taken against the impacts of project on noise are indicated. The impact is assessed as direct and negative with long term duration, local and low in significance.

#### 5.3.3 Water Resources and Wastewater

#### **Construction Phase**

During the construction phase, water supply requirements will be created due to the needs of employees, and dust suppression. The drinking water needs of employees will be fulfilled by bottled water to be purchased from the local market, and the utility water needs will be met by connecting to the existing drinking water network. The domestic wastewater generated in the

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camp site will be connected to the existing sewage network or where the connection is not possible it will be collected into the impervious septic tanks and then discharged into the nearest sewage network by vacuum trucks. Portable toilets will be supplied for the workers at the construction sites.

For dust suppression, water will be provided to the site by water trucks with a sprinkler system. The quality of water that will be supplied to the Project shall follow the Regulation Concerning the Water Intended for Human Consumption together with WBG's General EHS Guidelines.

Minor short-term negative impacts due to surface runoff, muddy water filling the excavation trenches, etc. would occur during construction. Construction activities may also pose the potential for release 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 should be placed to minimize the risk of soil and groundwater contamination during construction. In the construction phase of the project the impact on the surface water resources will be direct and negative with short term duration, local and negligible in significance.

During the construction phase, the major impact on groundwater may be seen due to accidental oil leakages in the areas where the works with construction machinery are carried out as well as improper disposal of wastes. This may affect the groundwater quality in the project area, if necessary, mitigation measures are not taken. However, it can be said that the impacts will not be significant upon implementation of the mitigation measures and adherence to good engineering methods. It is assessed that in the construction phase of the Project, the impact significance will be negligible.

In addition, attention should be paid to pipe sitting in places with high groundwater levels. The decrease in the groundwater level will reduce the sitting height of the pipes and cause hydraulic problems. Soil dewatering should be carried out in these areas.

The mitigation measures against the impacts of the project on water resources during the construction phase are given in Table 6-2.

## **Operation Phase**

Although the proposed project will have positive impacts on the water resources, during the operation phase of the Project, the regular maintenance works to be performed on drinking water network might create impacts like the ones in construction phase. During the operation phase, there will also be storage of some chemicals such as disinfectants, etc. All storage tanks and drums will be placed on concrete areas with proper secondary containments.

To conclude, operation phase impacts of the Project is generally found to be positive on water resources. However, measures should be taken to prevent any unexpected deterioration on the receiving water quality. During the operation phase of the project the impact will be direct and positive with long term duration.

The impacts on groundwater resources in the operation phase will be similar to the ones of the construction phase. The impacts will be mostly related to accidental spills/leakages and poor management of generated wastes and sludge. The impacts will be low negligible in significance upon adherence to good engineering methods.

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The mitigation measures against the impacts of the project on water resources during the operation phase are given in Table 6-3.

## 5.3.4 Waste Management

## **Construction Phase**

During the construction phase of the Project, activities such as vegetation clearance, levelling, construction and installation of main operation and auxiliary units, procurement, transportation and assembly of units and equipment will be carried out. Solid waste types expected to be generated within the scope of these activities are municipal wastes, packaging wastes of system equipment (e.g., wood, cardboard, plastic, etc.), hazardous wastes, special wastes, excavation, and construction wastes (e.g., scrap metal, wood, concrete waste, etc.), and waste system equipment (panels, cables, electronic components). Hazardous and special wastes might contain chemical substances (e.g., paint, solvent) or packaging materials and cloths contaminated with oils, waste oils resulting from operation and maintenance of machinery and vehicles, solvents, accumulators, batteries, filters, machine parts.

In the case of cooking at the cafeteria of construction site facilities, vegetable oil will be regularly collected and given to enterprises licensed and certified under the Regulation on Control of Vegetable Waste Oils. Vegetable waste oils, which are likely to occur during the construction phase, will be collected in leak-proof drums with corrosion-resistant internal and external surfaces and given to environmentally authorized and licensed vegetable waste oil plants for recycling.

If any asbestos pipe is encountered by the Contractor during the excavations, it will not be removed to the surface. In cases where asbestos pipes need to be brought to the surface, the principles of the Regulation on Health and Safety Precautions in Working with Asbestos will be followed. The work should be carried out by an asbestos removal specialist, who has a vocational training certificate.

Waste generated during the construction phase of the Project will be managed in accordance with the waste management hierarchy. The contractor will take mitigation measures described in Table 6-2 but will not be limited to these measures. No significant impact resulting from waste generation is expected due to the nature and scale of the Project. However, the potential impacts can be reduced to a low level with the mitigation measures; therefore, the impact is assessed as direct and negative with short-term duration, local and low significance.

#### **Operation Phase**

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

In the operation phase of the Project, due to the oil change needs of equipment, there will be limited amount of waste oil generation. The impact resulting from the generation of the wastes is assessed as direct and negative with short-term duration, local and low in significance.

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

## 5.3.5 Biological Environment and Natural Assets Area

### **Construction Phase**

In the construction phase of the project, some direct or indirect impacts are expected to occur. The loss of habitat and biodiversity might be a concern in the project area located at the boundaries of protected areas. However, the planned Project will be realized in an already modified area. There is no sensitive habitat or flora species found in the area, no significant impact is expected to occur such as sensitive habitat and vegetation loss during the construction activities of the Project.

Another direct impact of the construction phase will be the vehicle traffic for construction. The fauna species which have limited mobility will be prone to fauna mortality. The risk of hit will increase as the animals cross the road.

The impacts of the construction activities on the terrestrial environment will include dust but this impact will be a short-term impact. When necessary, measures are taken and after the construction activity is over, it is expected that the composition of the plant species will return to its original state in time.

There are poor vegetation and settlements in the immediate vicinity of the project area. This results in mammals and bird species not preferring these areas. However, some minor impacts resulting from the construction activities on fauna species can be seen. These effects will mostly consist of secondary effects. Due to the construction activities, mortalities may be observed due to disturbed fauna species and traffic congestion. At the same time, dust and noise formation due to construction activities may also have a negative impact on fauna species. All these effects can be eliminated by taking appropriate measures. The impact on the fauna species is assessed as direct and negative and low in significance.

#### **Operation Phase**

No negative impact of the project's operational activities on terrestrial flora and fauna is expected. When necessary, preventive measures are taken, natural life will continue in its former state after the construction activities are over.

#### 5.3.6 Cultural Heritage

In the vicinity of the project area, cultural heritage assets are located; however, the water network route and its footprint do not overlap with cultural conservation areas. It is possible that some activities conducted within the project and impact area of the project may cause irreversible negative effects on tangible cultural heritage assets in the area. Some mitigation measures are proposed to minimize these effects.

"As the initial stage of baseline studies, literature and surficial studies will be performed. Depending on these studies, potential impact on these sources and related mitigation measures are assessing in EA/ESIA. However, due to the nature of physical cultural resources,

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buried assets (i.e. graves or mounds) may not be determined during baseline studies. The principal issue is twofold: (i) <u>"chance finds" identification of during construction</u>, and (ii) potential impact of the project on known cultural values. <u>Turkish laws</u>, notably Law No. 2863 dated 21.07.1983 on the Protection of Cultural and Natural Assets (revised through the amendment issued on 27.07.2004 dated Official Gazette) and practices meet the World Bank requirements. The Regulation on Researches, Drillings and Excavations in Relation to the Cultural and Natural Assets, which was published in the Official Gazette No. 18485 dated 10.08.1994 define the procedures and obligations concerning the cultural and natural assets found out during construction. The municipalities are responsible for the application of the said law and regulation. As part of the regular reporting, the municipalities will inform ILBANK of the historical and cultural findings, if any, as well as the actions taken. ILBANK is responsible for avoiding or mitigating impacts on physical or cultural resources of the financed projects. Therefore, ILBANK will not proceed with sub-project funding until all requirements of the Turkish legislation are met."

There are cultural assets within the boundaries of the area determined as the AoI (Niksar District Centre Since all the excavation works will be carried out on the existing roads, there is no cultural property on the project route (network plan), that is, on the existing roads. For the cultural assets near the excavations, the opinion letter obtained from the Sivas Cultural Heritage Preservation Regional Directorate was stated as follows and is presented in the annex of the report.

"The excavations in the 1<sup>st</sup> degree archaeological site should be carried out manually without the use of construction equipment, and in the 3<sup>rd</sup> degree archaeological sites, light tonnage construction machines with rubber wheels should be used."

As the initial stage of baseline studies, literature and surficial studies will be performed. Depending on these studies, potential impact on these sources and related mitigation measures are assessing in ESMP. However, due to the nature of physical cultural resources, buried assets (i.e. graves or mounds) may not be determined during baseline studies. The principal issue is twofold: (i) "chance finds" identification of during construction, and (ii) potential impact of the project on known cultural values. Turkish laws, notably Law No. 2863 dated 21.07.1983 on the Protection of Cultural and Natural Assets (revised through the amendment issued on 27.07.2004 dated Official Gazette) and practices meet the World Bank requirements. The Regulation on Researches, Drillings and Excavations in Relation to the Cultural and Natural Assets, which was published in the Official Gazette No. 18485 dated 10.08.1994 define the procedures and obligations concerning the cultural and natural assets found out during construction. Niksar Municipality is responsible for the application of the said law and regulation. As part of the regular reporting, Niksar Municipality will inform ILBANK of the historical and cultural findings, if any, as well as the actions taken. ILBANK is responsible for avoiding or mitigating impacts on physical or cultural resources of the financed projects. Therefore, ILBANK will not proceed with sub-project funding until all requirements of the Turkish legislation are met.

The excavations to be carried out near the 1st degree archaeological site should be carried out manually without using a construction machine. In the project activities to be carried out within the 3rd degree protected area, light tonnage construction machines with rubber wheels

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should be used. The mitigations for possible impacts on cultural assets are defined in Table 6-2.

During the construction phase, excavation activities will take place, which may lead to come across with chance finds and therefore a chance finds procedure will be implemented.

# 5.3.7 Climate Change

## **Construction Phase**

The Project's contribution to climate change during the construction phase will be due to the emission of GHG. The majority of greenhouse gas emissions will be due to construction machinery/equipment usage. The major greenhouse gas emission will be CO<sub>2</sub> emissions resulting from the combustion of petroleum-based products, like gasoline, in internal combustion engines. Relatively small amounts of methane and nitrous oxide will also be emitted during fuel combustion. Therefore, these emissions will contribute to climate change.

The project's contribution to climate change through GHG emissions is assessed as a negative and direct impact. The impact's extent will be regional, and duration will be short-term. Although the sensitivity of the receptor is considered medium, due to the usage of small number of construction machinery/equipment, the significance of the impact is considered low.

## **Operation Phase**

The project's contribution to climate change during the operation phase will be similar to the one explained for the construction phase and the significance of the impact will be low. In the operation phase, usage of fossil fuel burning equipment/machinery usage will be limited.

As a result, GHG emissions generated during land preparation, construction and operation phases of the project can be considered as relatively short-term emissions. With the realization of proper mitigation measures, GHG emissions can be minimized.

## 5.4 Socio-Economic Impacts

## 5.4.1 Traffic

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

During the operation phase of the Project, the traffic will also be affected during the repair and maintenance works on the drinking water network line.

The project's impact on traffic during both the construction and operation phases is assessed as a negative and direct impact. The impact's extent will be local, and the duration will be shortterm. Although the sensitivity of the receptor is considered medium, due to the usage of small number of construction machinery/equipment, the significance of the impact is considered low.

## 5.4.2 Labor, Employment and Occupational Health & Safety

According to the intensity of the work during the construction phase of the project, it is planned to employ 20 personnel at a minimum and 70 personnel at a maximum by the contractor.

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During the operation phase, the maintenance and repair works of the network will be carried out by the existing municipality personnel. In addition, environmental experts, social experts and OHS experts can be employed to work in the Project Implementation Unit, if deemed necessary. Priority will be given by Niksar Municipality to local people in the recruitment process. Overall, labor and working conditions for the construction and operation phase include the issues listed below:

- Working Conditions and Management of Worker Relationship
- Protecting the Work Force
- Occupational Health and Safety

Commitments on labor and working conditions are concluded with a range of mitigation measures for managing labor-related risks and impacts in Table 6-1.

Niksar Municipality will ensure measures to prevent child labor and forced labor. In this respect, children under 18 years of age will not be employed during construction and operation stages. All Turkish Laws and ILO related to child labor, forced labor, discrimination, freedom of association and collective bargaining shall be complied with.

Construction stage of the Project includes excavation, installation of pipes, backfilling and the use of heavy-duty vehicles. The work at water facilities is often physically demanding and may involve hazards such as open water, trenches, slippery walkways, working at heights, energized circuits, and heavy equipment. Vehicular movements can cause accidents resulting in injuries and death. Work at water facilities may also involve entry into confined spaces, including trenches, and pump stations which will expose workers to occupational safety risks and accidents. Occupational Health and Safety (OHS) risk might arise due to risk of pollution, emission of dust and production of noise during the site preparation and construction works.

Working in trenches and excavations is hazardous to both the workers who work inside them, and to workers on the surface. The hazards include:

- Zave-ins or collapses that can trap workers,
- Equipment or excavated soil falling on workers (e.g., equipment operated or soil/debris stored too close to the excavation),
- Falling into the trench or excavation,
- Flooding or water accumulation,
- Exposure to a hazardous atmosphere (e.g., gas, vapor, dust, or lack of oxygen),
- Contact with buried service lines such as electrical, natural gas, water, sewage, telecommunications, etc.,
- Contact with overhead electrical lines,
- Slips, trips and falls as workers climb on and off equipment, or from inappropriate access and egress methods,
- Being struck by moving machinery, or by falling or flying objects,
- Hazards related to materials handling (e.g., lifting, struck by, crushed between, etc.).

During the operational phase, the anticipated impacts will include:

Falls, slips, and trips on the level on floors made wet and slippery during the handling of water,

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- Falls due to working with a defective ladder and/or falls from heights while climbing and staying on an elevated industrial installation,
- Falls inside an industrial installation and/or into water well while inspecting them and/or taking water samples for analysis,
- Injuries caused by capture of work-clothes and/or various parts of body, in/between moving/ rotating unprotected parts of machinery,
- Electric shock caused by contact with "live" wires or defective electrical installations (the danger is especially high because the work is done in a wet and humid environment),
- Fire hazard due to contact of a very strong oxidizer (disinfectant) with a flammable substance, as a result of improper storage of chemicals, human error, sudden release from process piping, etc.,
- Hazard of drowning when working inside reservoirs, or immersed in watercourses with a strong current,
- Suffocation hazard while carrying-out maintenance or installation works, such as working in a confined place (tank, boiler) or when doing excavation work (collapse of excavation or a tunnel),
- Exposure to high noise levels, from electro-mechanical equipment and a noisy environment,
- Exposure to adverse weather conditions: risk of catching a cold as a result of working in windy weather, at low temperatures and while raining; or as a result of over-sweating in the summer; and suffering heat and/or cold strokes,
- Exposure to UV radiation during water disinfection may be damaging for eyes and skin,
- Exposure to various disinfectants used for water disinfection Chlorine (gas): a very strong oxidizer and disinfectant. It is a toxic and corrosive gas that causes irritation of the eyes and the respiratory tract even at low concentrations,
- Chlorine dioxide is a very corrosive gas that causes strong irritation of the respiratory tract and the eyes,
- No biological hazards have been identified, except possible exposure to insects and rodents that may transmit diseases,
- Hazard of exposure to pathogenic micro-organisms due to accidental contact between drinking water,
- Musculoskeletal injuries caused by awkward working postures during the cleaning/inspection of the pipe system and/or the of installation,
- Overexertion while moving or handling heavy and bulky equipment or big packages of chemicals may affect various systems of the body,
- Psychological stress and pressure due to environmental factors: annoying noise, water splashing, odors, high humidity, etc.,
- Psychosocial problems due to increased workload, requirements of improving work output, constant need of high skill levels, lack of privacy due to the increased possibility of superiors to locate and reach the worker (by means of cellular phone or beeper, even after normal working hours), and due to the commitment to answer unexpected calls during emergency situations; requirement of doing shift work overtime,

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Psychological problems of adaptation to computer-based jobs (especially for elderly workers).<sup>27</sup>

These potential impacts need to be mitigated with the implementation of the measures given in Table 6-1, Table 6-2 and Table 6-3.

Except local recruitment, the Project impacts on labor and working conditions are generally assessed as adverse but low in significance. These impacts are expected to be observed on workers such as migrant workers, workers engaged by third parties, and workers in the client's supply chain. Risks to worker safety can arise through workplace incidents or fatalities during the site preparation and construction works and during the repair and maintenance works in the operational phase of the project. OHS risks and impacts will be managed and mitigated by OHS Management Plan and Risk Assessment (including Emergency Response Plans) to be prepared by the Contractor during construction and by the Niksar Municipality during operation.

In case when personnel, material or services required for the works to be carried out in a construction project cannot be sourced from local sources; technical personnel with adequate capacity or materials that meet international standards must be brought from outside the project area. In such cases, suppliers, potential suppliers, and potential jobseekers might move to the vicinity of the project area to provide goods and services to the Project and thus create an influx in the region. Such a situation of workforce influx can be observed in any project, and people who will work on the project or provide goods and services to the project should be settled quickly in the region. In such a case, people who settle in the area due to the project may have a negative impact on the local population (especially if the area is rural, remote, and small).

To avoid the negative impacts of such workforce influx, Niksar Municipality will give priority to the local people in recruitment, and this will be added to the terms of the contracts of the Contractor and possible sub-contractors to ensure this. In the contracting process, Niksar Municipality will request the contractor to plan the workforce and request the contractor to prepare a Workforce Management Plan for the Project. The Municipality will evaluate and submit this plan to ILBANK for approval. In addition, there will be no provision of workers' accommodation within the scope of the Project. The Project is not expected to cause workforce influx, unless an unusual situation is triggered. Therefore, it is thought that the impact of workforce influx will be insignificant. Niksar Municipality and the Contractor shall ensure that Code of Conduct and public awareness training are given to all employees as an orientation training to prevent a possible future dispute.

Differences between women and men's exposure to the risk of specific forms of workplace violence are reinforced by sex-segregated workplaces – both horizontally (across operational layers of the organization or company) and vertically (up and down the hierarchy). While men predominate in better-paying and higher status jobs as well as hold more supervisory positions, the majority of women are concentrated in lower-paying and lower status jobs with little decision-making power. Gender-related expectations about "male" and "female" behavior also influence levels of exposure to risk when men and women workers have the same job tasks in similar conditions – although variations are small, across countries men tend to experience slightly higher levels of physical violence while women experience marginally more verbal

<sup>&</sup>lt;sup>27</sup> https://www.ilo.org/wcmsp5/groups/public/@ed\_protect/@protrav/@safework/documents/publication/wcms\_190172.pdf





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abuse and sexual assault.<sup>28</sup> If an employee faces GBV and Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) issue s/he can either apply to a higher level superior or directly go to police station, as stipulated in the national referral system of the country for dealing such cases. The content and procedures of the project's GRM will also have a reporting line on such cases in regard to SEA/SH issues and will be handled under full confidentiality. The GRM focal point receiving the SEA/SH related grievance should direct this to national referral systems immediately and record that this has been directed, as set out in the GRM Procedure of ILBANK. All details of the complainant of the sensitive case will be kept strictly confidential.

Necessary training will be given to the personnel at the very beginning of the recruitment process which will be also refreshed during the work period. Trainings will cover workers' rights, contract requirements, Code of Conduct, grievance redress mechanism and contact channels. Compliance with the rules of code of conduct, including gender-based violence, sexual harassment, sexual exploitation and abuse, which are included in the trainings to be provided, will be in the contract articles of the personnel. The sanctions for non-compliance with the code of conduct will be clearly stated in the contract.

## 5.4.3 Community Health and Safety

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

In the operation phase of the Project, the traffic will also be affected during the repair and maintenance works on the drinking water network line.

The project's impact on traffic during both the construction and operation phases is assessed as a negative and direct impact. The impact's extent will be local, and the duration will be shortterm. Although the sensitivity of the receptor is considered medium, due to the usage of small number of construction machinery/equipment, the significance of the impact is considered low.

Measures to be taken at workplaces are included in the COVID-19 outbreak management and work guide. The purpose of the measures to be taken at construction sites within the scope of COVID-19 is to prevent the frequency of cases and to prevent the development of the epidemic in case any case is detected. It is important to remember that even if no employee is diagnosed with COVID-19, there may be people who are infected by contact but do not show symptoms. Measures to be taken at the workplaces will be strictly followed under the heading 16 of the "Guidance to COVID-19 Outbreak Management and Working" prepared by the Scientific Advisory Board of the Turkish Ministry of Health.

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<sup>&</sup>lt;sup>28</sup> Gender-based violence in the world of work: overview and selected bibliography / International Labour Office. – Geneva: ILO, 2011



# **6 MITIGATION PLAN**

As the project owner, it is the responsibility of Niksar Municipality to manage the environmental and social issues of the project and to ensure that the necessary mechanisms are developed and implemented by the Contractor and/or Sub-contractor.

Within the scope of the SCP-II AF, it is envisaged that planned water network project possible to arise some the environmental and social impacts in the pre-construction, land preparation and construction, and operation stages.

The management of the impacts that may occur on the environmental and social components during the pre-construction, land preparation and construction, and operation phases and the relevant mitigation measures defined for these impacts are given in the Table 6-1, Table 6-2 and Table 6-3.





#### Table 6-1. Mitigation Plan for Pre-Construction Phase

Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
Biodiversity					I	ł	
Disturbance on flora and fauna species	Adverse/ Direct	Negligible	<ul> <li>Prior to the land preparation phase, definite working areas will be set up where activities (e.g., vegetation clearing, vegetation removal, leveling and construction) and permanent structures (units and roads) will be established;</li> </ul>	Negligible	Niksar Municipality/PIU Contractor and/or sub- contractor Supervision Consultant	Visual observations ESMR Findings	Included in project budget
Cultural Heritage	•						
Destruction or damage to cultural heritage	Adverse/ Direct	Medium	• The Contractor will consult with the Sivas Cultural Heritage Conservation Regional Board and will comply with the measures to be taken requested by the Conservation Regional Board in accordance with the Law No. 2863 at all stages of the Project. 30 days prior to commencement of the works, "Chance Finds Procedure" will be prepared (as proposed for TMP) and workers/employees will be trained on cultural heritage issues by the Conductor.	Low	Niksar Municipality/PIU Contractor and/or sub- contractor Supervision Consultant	Visual observations Random Site Inspections ESMR Findings	Included in project budget
Traffic					·	·	
Disturbance due to the road closure, traffic jam due to the construction vehicles, etc.	Adverse/ Direct	High	<ul> <li>A Traffic Management Plan (TMP) will be developed to minimize potential traffic related impacts on the residential areas located in close vicinity of the water network lines. The traffic management plan will be prepared by the Contractor 30 days prior to commencement of the works. The TMP should include details about the following: <ul> <li>construction plan by phases,</li> <li>beginning and duration of works,</li> <li>overview of the existing conditions near the construction sites,</li> <li>identification of affected areas,</li> <li>mitigation measures,</li> <li>traffic diversion plans, including zones of entry and exit, routes for towing of material, turnaround points, parking areas, zones of interlocking with other traffic roads etc.,</li> <li>routes for pedestrians and vehicles,</li> <li>temporary passages for people to provide safe access to get in and out,</li> <li>traffic controls for each expected intervention, including illustrations of barriers, paths, signalization plan, warning signs, etc.,</li> <li>requirements for special vehicles, for example, those of large dimensions,</li> <li>accessible routes/paths for construction works (access, ramps, loading, unloading),</li> <li>connection roads for supply vehicles and storage of material,</li> <li>expected interaction of pedestrians and vehicles,</li> <li>roles and responsibilities of persons on construction site regarding traffic management, and</li> <li>instructions on the procedures regarding traffic control, including urgent situations.</li> </ul> </li> <li>The appropriate signage will be determined based on the Regulations on Traffic Signs.</li> <li>Alternative routes will be determined, and transportation will be programmed according to intensity of traffic.</li> </ul>	Medium	Niksar Municipality/PIU Contractor and/or sub- contractor Supervision Consultant	Traffic Grievance Records Training Records Visual observations (such as traffic signs and warnings are placed at appropriate locations) ESMR Findings	Included in project budget

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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
Labor Force and	d Influx			1	ł	ł	
Improper Working Conditions	Adverse/ Direct	High	<ul> <li>Workers will be provided with documented information that is clear and understandable, regarding their rights under national labor law; including collective agreements, their rights related to hours of work, wages, overtime, compensation, and benefits as of startup of working relationship and when any material changes occur.</li> <li>A grievance redress mechanism for workers will be provided to raise workplace concerns. The workers will be informed about the grievance redress mechanism at the time of recruitment, and it will be made easily accessible to them.</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub- contractor Supervision Consultant	ESMR Findings	Included in project budget
Workers Engaged by Third Parties and the Supply Chain	Adverse/ Direct	High	<ul> <li>Subcontractors will be reputable and legitimate enterprises and have an appropriate Environmental and Social Management System (ESMS) that will allow them to operate in a manner consistent with the labor conditions requirements</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub- contractor Supervision Consultant	Sub-contractor Agreements Grievance Records ESMR Findings	Included in project budget
Child labor, forced labor and unregistered employment	Adverse/ Direct	High	• Unregistered employment, child labor and forced labor will be prevented. In case of subcontracting of the construction activities, the Contractor will establish procedures for managing and monitoring the performance of subcontractors in relation to the requirements to prevent child labor, unregistered employment and forced labor. The Contractor will require such subcontractors to include requirements related to this issue and non-compliance remedies in their contractual agreements.	Low	Niksar Municipality/PIU Contractor and/or sub- contractor Supervision Consultant	No child and forced labor Grievance Records	Included in project budget
Temporary labor influx Risk of social conflict Impacts on community dynamics	Adverse/ Indirect	High	<ul> <li>In the contracting process, Niksar Municipality will request the contractor to plan the workforce and request from the contractor to prepare a Workforce Management Plan. The Municipality will evaluate and submit this plan to ILBANK for approval.</li> <li>The Municipality and the Contractor shall ensure that code of conduct and public communication trainings are given to all employees as an orientation training to prevent a possible future dispute.</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub- contractor Supervision Consultant	Grievance Records	Included in project budget
Community and	Occupation	al Health and S	iafety	·	•	•	•
Inadequate workers health and safety conditions	Adverse/ Direct	High	<ul> <li>The Contractor formally agrees that all work will be carried out in a safe and disciplined manner and is designed to minimize risks on neighboring residents and environment</li> <li>A brochure will be prepared by the Contractor, and it will contain the sketch of the site, authorized person information to communicate in case of emergency, start date and targeted end date. The brochure will be distributed to all buildings in the vicinity of the construction sites.</li> <li>The occupational health and safety training for the workers will be performed in accordance with the following points: <ul> <li>Trainings will be performed in accordance with the Regulations on the Procedures and Principles of Occupational Health and Safety Trainings of Employees,</li> <li>The contractor will inform and train its personnel about the occupational health and safety issues (including Covid-19 symptoms, how to be protected and what to do when symptoms appear, etc.) in general and in particular about the requirements of the Health and Safety Management Plan to be prepared by the Contractor. To achieve this objective, the contractor could use its own resources or consult private companies or related departments of universities.</li> <li>A basic training (including Covid-19 symptoms, how to be protected and what to do when symptoms appear, etc.) will be provided during the commencement of works and further trainings will be performed on monthly basis in line with the above-mentioned regulation,</li> <li>Training records will be kept, and evaluation activities will be carried out after the trainings,</li> <li>Training for operators who work with chemicals will be conducted regarding safe handling practices and emergency response procedures,</li> <li>The contractor is required to ensure that the personnel of its sub-contractors will also take the trainings and should consider this issue in its protocols with its sub-contractors.</li> </ul></li></ul>	Low	Niksar Municipality/PIU Contractor and/or sub- contractor Supervision Consultant	Incident Records Number of nonconformities Training records Work Permits ESMR Findings H&S reports H&S meetings Emergency drills	Included in project budget

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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Resp
			• Emergency Preparedness and Response Plan will be prepared for a possible accident and emergency (including Covid-19 or any other communicable disease) and emergency teams will be established, and drills and trainings will be carried out in line with the emergency scenarios.		
			<ul> <li>Appropriate Personal Protective Equipment will be provided for the workers in line with international best practice and Regulation on Personal Protective Equipment including the health and safety measures related to Covid-19 provided by the Ministry of Health and Ministry of Labor and Social Services (always hardhats, as needed masks and safety glasses, harnesses and safety boots, etc.).</li> </ul>		
			<ul> <li>An adequate OHS organizational structure will be defined, as defined by the Regulation on Occupational Health and Safety and necessary number of full-time OHS officers should be assigned at the site.</li> </ul>		
			<ul> <li>A risk assessment (including Covid-19 risks and other communicable disease risks) will be done before commencing the works and personnel will be trained regarding the risks.</li> </ul>		
			<ul> <li>The Contractor will develop a site-specific Occupational Health and Safety (OHS) Management Plan based on construction site OHS risk assessment in line with Regulation on Occupational Health and Safety and other related legislation and WBG EHS Guidelines, which will as a minimum incorporate the measures, described here but will not be limited to these measures.</li> </ul>		
Stakeholder Eng	agement	1			1
Communication issues with the stakeholders	Positive/ Direct	Medium	<ul> <li>Disclosure of ESMP and other relevant project documents and information.</li> <li>Establishment of a grievance redress mechanism and orientation about its proper functioning incl. confidentiality in case of GBV/SEAH related complaints</li> </ul>	Medium	Niksar Mu Contracto cor Supervisio



oonsibility	Key Performance Indicators	Cost
	[	
unicipality/PIU or and/or sub- ntractor ion Consultant	Enquiries/ questions/ grievances by stakeholders Minutes of Meetings Grievance Records (number of grievances & percentage of closed grievances)	Included in project budget



#### Table 6-2. Mitigation Plan for Land Preparation and Construction Phase

Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
Land Use, Soil a	nd Geology						
Topsoil loss, Physical Deterioration	Adverse/ Direct	Low	<ul> <li>Public roads and streets will be backfilled, and road cover will be recovered by the Contractor.</li> <li>Amount of soil that could be subject to compaction will be minimized by ensuring the use of only the designated worksites and routes for the construction machinery and equipment and field personnel.</li> <li>To avoid soil compaction, stripping operation will not be done when soil is wet. Average height of topsoil stacks will be 2 meters. Side slope of these stacks will not exceed 3:1.</li> <li>The provisions of the Regulation on Control of Excavation Soil, Construction and Demolition Wastes shall be complied during land preparation and construction phase of the Project and excess excavation material will be re-used as appropriate or disposed of in existing licensed excavation waste storage sites.</li> </ul>	Negligible	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Reused excavation amount Amount of excavated material that is sent to final disposal ESMR findings	Included in project budget
Soil contamination	Adverse/ Direct	Low	<ul> <li>Amount of soil that could be subject to contamination will be minimized by ensuring the use of only the designated worksites and routes for the construction machinery and equipment and field personnel.</li> <li>Machinery and equipment will be checked regularly for leaking oil and fuel.</li> <li>In an event of an accident, leak or spill, necessary repair works and/or replacement of parts will be performed promptly.</li> <li>Spill kits, absorbent pads and absorbent sands will be available on Project construction sites continuously.</li> <li>The fuel required for the construction equipment and vehicles to be used within the site during the construction phase will be supplied primarily from the nearest station; if deemed necessary, fuels that may be stored at the site will be stored in the areas where necessary impermeability precautions (including secondary containment) are taken.</li> <li>Provisions of the Regulation on the Control of Soil Pollution and Sites Contaminated by Point Sources will be complied.</li> <li>Wastes and wastewater (rainfall filled in trenches) to be generated during the land preparation and construction phases of the Project will be stored and disposed of in a controlled manner in accordance with the relevant regulations and in line with the management practices described in this report.</li> </ul>	Negligible	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	The number of events that trigger spill and leakage response Environmental spill/leak incident records/report ESMR findings	Included in project budget
Natural Disaster	Adverse/ Direct	Low	<ul> <li>Construction activities (especially excavation works) will be undertaken in dry weather condition as much as possible.</li> <li>Stripping of topsoil will not be conducted earlier than required to prevent the erosion of soil (wind and water).</li> <li>Limit circulation of heavy machinery to minimal areas.</li> <li>Works will be planned in a way to avoid opening up new parts before closing the parts completed as much as possible.</li> <li>The disturbed areas and soil stockpiles will be kept moist to avoid wind erosion of soil and stockpile height of topsoil does not exceed 2m maximum.</li> <li>The potential impact of surface runoff will be minimized by establishing proper drainage systems.</li> <li>Topography will be restored for stop stabilization immediately after the completion of construction at each location.</li> </ul>	Negligible	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	ESMR findings	Included in project budget
Structural Damage to Buildings	Adverse/ Direct	High	<ul> <li>The project area is located in the 1<sup>st</sup> degree earthquake zone. In the structures to be constructed within the scope of the project, provisions of "Regulation on the Structures to be Built in Natural Disaster Areas", "Regulation on Building Constructions in Earthquake Zones" and "Regulation on Building Earthquake of Turkiye" and Disaster and Emergency Management Presidency will be strictly followed.</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	ESMR findings	Included in project budget
Rockfall and Flood Potential	Adverse/ Direct	Low	<ul> <li>Potential rockfalls will be detected especially around Niksar Castle. Fixed or hinged connection rockfall barriers will be used in high potential areas.</li> <li>Potential flood risk will be determined especially around Çanakçı and Moduru rivers before commencing construction works at these sites, and necessary measures will be identified and implemented during construction works.</li> </ul>	Negligible	Niksar Municipality/PIU Contractor and/or sub-contractor	Visual observations ESMR findings	Included in project budget

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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
			• Meteorological forecasts will be followed to allow sufficient time to evacuate and prepare the project area before the onset of heavy rainfall and flooding.		Supervision Consultant		
			Construction equipment (or excess material) will be removed from low-lying areas, especially around stream areas.				
Water Resources	s						
Impacts on Water Resources	Adverse/ Direct	Low	<ul> <li>Discharge of wastewater, residues or other waste into groundwater or into surface water will be avoided. Portable toilets will be supplied for the workers at the construction sites. The wastewater generated in the construction sites will be collected into the impervious septic tanks and transferred to nearest wastewater treatment plant (Erbaa WWTP) by vacuum trucks, until the Niksar WWTP is put into operation. Once the Niksar WWTP is put into operation if the construction activities have not been completed by then, the wastewater generated in the construction sites will be connected to the sewage network.</li> <li>The wastewater arising from cleaning or washing vehicles and construction equipment will be collected in tanks and disposed of via the septic trucks. It will be transferred to the nearest wastewater treatment plant (Erbaa WWTP) until the Niksar WWTP is put into operation.</li> <li>In case the excavated trenches are filled with surface water, groundwater or rainfall, the muddy water accumulated here will be drained with the help of the municipal vacuum truck. The discharged sludge will be collected in watertight septic tanks and will not be discharged to the receiving environment. It will be transferred to the nearest wastewater treatment plant (Erbaa WWTP) until the Niksar WWTP is put into operation.</li> <li>Spill kits will always be available on the construction sites.</li> <li>The discharges resulting from the hydro testing and pressure testing will not be directly discharged to the environment. These will be collected in impermeable containers and will be disposed by transporting to the nearest wastewater treatment plant (Erbaa WWTP) until the Niksar WWTP is put into operation.</li> </ul>	Negligible	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Visual observations Related grievance records Sampling and Analysis ESMR findings	Included in project budget
Decrease in surface water quality	Adverse/ Direct	Low	<ul> <li>Surface water will be crossed via appropriately designed art structures and techniques if any.</li> <li>Surface runoff due to watering for dust suppression activities will be prevented.</li> <li>Any spill/leak of hazardous materials into the irrigation channel with seasonal / continuous flowing streams where the project routes intersect will be taken under control immediately and surface waters will be protected against pollution.</li> </ul>	Negligible	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Visual observations Related grievance records Sampling and Analysis (if available) ESMR findings	Included in project budget
Decrease in groundwater quality (or level)	Adverse/ Direct	Low	<ul> <li>When determining the locations of temporary fuel or oil storage areas, the locations of water resources will be taken into consideration and dangerous material spills / leaks such as fuel, oil, oil, cement etc. will be taken under control immediately.</li> <li>In case of detection of project-related pollution in groundwater, the Measures Program specified in Section 3 of the Regulation on the Protection of Groundwater against Pollution and Determination will be applied.</li> </ul>	Negligible	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Related grievance records Sampling and Analysis (if available) ESMR findings	Included in project budget

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TÜRKYE CUMHURIYETİ ÇEVRE, ŞEHİRCİLİK VE İKLIM DEĞİŞİKLİĞİ BAKANLIĞI

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SÜRÜLEBİLİR ŞEHİRLER



Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
Waste and Waste	ewater						
Impacts on the Environment and Human Health	Adverse/ Direct	High	<ul> <li>Requirements of applicable waste management regulations will be complied with for the management of all wastes generated as a result of project activities.</li> <li>Waste will be separated (i.e., hazardous / non-hazardous, recyclable / non-recyclable) and stored in designated temporary storage areas.</li> <li>All types of waste shall be transferred to a licensed disposal facility via licensed waste transportation companies following the relevant legislation.</li> <li>Some amount of hazardous or special wastes likely to be generated (e.g. filters and protective clothes, rags, packages contaminated with chemical substances such as paint/solvent or oils) within the scope of the Project will be stored in special compartments in the Temporary Storage Area allocated for this purpose, in containers, separated from the non-hazardous wastes. This area be ensured that the waste storage areas comply with the standards defined in Table 2-1, under the topic of Waste. 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.</li> <li>Impermeability will be provided on the floors of the storage areas against possible contamination of soil and groundwater. Besides, a suitable drainage system will be installed against leaks.</li> <li>Physical access to the waste storage areas will be restricted, and only authorized personnel will be allowed to enter the storage areas.</li> <li>Warning signs and boards with the name and contact number of the authorized personnel will be placed in the storage areas.</li> <li>Except for the areas reserved for this purpose, it will be ensured. Solid waste collected are transported to the Waste Transfer Station in Nikasr. Collecton point will be ensured. Solid waste collected are transported to the Waste Transfer Station in Nikasr. Collecton point will be transferred to licensed Erbaa Sanitary Landfill that has sufficient capacity for disposal of such waste.</li> <li>All</li></ul>	Low	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Visual observations Waste segregation practices Waste Disposal Agreements and Records Waste Grievance Records ESMR Findings	Included in project budget
Excavation Waste Generation	Adverse/ Direct	Low	<ul> <li>Excavation wastes, which are formed as a result of the trench excavations should be classified (as asphalt, curbs, parquet, concrete and soil), and recovered, re-evaluated, and re-use opportunities in the construction site must be considered.</li> <li>Excavation waste that will not be used for filling operations will be kept in temporary storage containers. Temporary storage containers will be yellow colored, and type of the waste materials will be indicated on the containers. Domestic and hazardous wastes will not be disposed in these temporary containers. The containers filled with excavation waste will be disposed of in consultation with the Niksar Municipality. They will be sent to the licensed excavation waste storage areas designated for the excavation material by Niksar Municipality. The transportation of such wastes will be provided by licensed transport vehicles.</li> <li>Excavation works will comply with the provisions of the Regulation on Control of Excavated Soil, Construction and Demolition Wastes.</li> </ul>	Negligible	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Visual observations Excavation amount Waste Disposal Agreements and Records Waste Grievance Records ESMR Findings	Included in project budget
Domestic Wastewater Generation	Adverse/ Direct	Low	• The domestic wastewater generated at construction sites will be properly connected to the existing wastewater network. Portable toilets will be supplied for the workers at the construction sites. Where the connection to the existing sewage	Negligible	Niksar Municipality/PIU	Wastewater connection agreements	Included in project budget

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TÜRKİYE CUMHURİYETİ CEVRE, SEHİRCİLİR VE İKLİM DEĞİŞİKLİĞİ BAKANLIĞ

SÜRÜLEBİLİR ŞEHİRLER


This project is co-funded by the European Union, the Republic of Turkey and the World Bank Bu Proje Avrupa Birliği, Türkiye Curnhuriyeti ve Dünya Bankası tarafından ortaklaşa finanse edilmektedir

Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
			network is not possible, the wastewater generated in the construction sites will be collected in the septic tanks and transferred to the nearest wastewater treatment plant (Erbaa WWTP) until the Niksar WWTP is put into operation.		Contractor and/or sub-contractor	Wastewater grievance records	
			<ul> <li>In case of need, the septic tank will be made of concrete material to provide impermeability. If ready-made septic tanks are used, basement impermeability will be ensured.</li> </ul>		Supervision Consultant	ESMR findings	
			<ul> <li>Wastes to be generated within the scope of the Project will be managed in accordance with the waste management hierarchy.</li> <li>Hazardeus or non hazardeus inscription, waste code, stored waste amount and storage date will be indicated/labeled on</li> </ul>				
			• Razardous of hon-hazardous inscription, waste code, stored waste amount and storage date will be indicated/labeled off wastes temporary stored by classifying according to their properties. The reaction of wastes with each other will be prevented by the measures taken in the Temporary Storage Area.		Niliaan	Visual observations	
			• Collection of all solid waste from generation points and safe transportation to a collection point will be ensured.		Niksar Municipality/PIU	Waste Disposal	
Solid (Domestic) Waste Generation	Adverse/ Direct	se/ ct Low	<ul> <li>Domestic solid wastes generated on work sites will be stored in containers and collected daily by the Niksar Municipality and transported to the Waste Transfer Station in Niksar. Collected solid wastes will be transferred to licensed Erbaa Sanitary Landfill that has sufficient capacity for disposal of such waste.</li> </ul>	Negligible	Contractor and/or sub-contractor Supervision Consultant	Agreements and Records Waste Grievance Records ESMR Findings	Included in project budget
			<ul> <li>Packaging materials (such as sacks, pallets, parcels, plastic coatings) from the products used at the head office and work sites shall be collected separately according to the provisions of the "Regulations for Control of Packaging and Packaging Wastes".</li> </ul>				
			<ul> <li>Incineration or burying of wastes by any means at site and/or dumping of wastes to nearby roads or water resources will not be in question.</li> </ul>				
			Employees will be trained on waste management practices.				
			• Waste oils originating from machinery and vehicles will be stored in impervious tanks and containers that would be situated on impervious base in accordance with the "Regulation on Control of Waste Oils". Tanks and containers will be equipped with apparatus that would prevent over filling and will be filled till the designated level mark. Tanks and containers will have a red color and must be labeled as "waste oil".		Niksar Municipality/PIU	Waste segregation practices (amount of	
Hazardous			Osed batteries from construction site and accumulators from vehicles will be disposed in compliance with the consumer responsibilities specified in Article 13 of the "Regulation on Control of Used Batteries and Accumulators". Accordingly, used batteries will be collected separately (from municipal wastes) and transferred to the designated collection sites (for example, the collection site award by Union of Transportable Battery Manufacturers (TAB)) if there is one in the region			Visual observations (at temporary waste	Included in
Waste Generation	Adverse/ Direct	Low	<ul> <li>Hazardous wastes to be temporarily stored on site will be delivered by licensed transport vehicles appropriate to the type of waste for disposal. Information related to the operations in this context will be recorded.</li> </ul>	Negligible	Contractor and/or sub-contractor Supervision	Waste Disposal Agreements and	project budget
			<ul> <li>All other hazardous materials will be disposed of in accordance with the Waste Management Regulation.</li> </ul>		Consultant	Records	
			<ul> <li>Hazardous or non-hazardous inscription, waste code, stored waste amount and storage date will be indicated/labeled on wastes temporary stored by classifying according to their properties. The reaction of wastes with each other will be prevented.</li> </ul>			Waste Grievance Records ESMR Findings	
			<ul> <li>Hazardous wastes will be stored at the construction site away from buildings in impermeable and safe containers placed on concrete ground that are established according to the Waste Management Regulation.</li> </ul>				
Air Quality	I	l				<u> </u>	
Dust and			• The impact of the dust formed during the construction phase will be mitigated by watering the network routes and roadside embankment, regulating the time intervals of the works, controlling the vehicle speeds and covering the tops of the transportation vehicles with tarpaulin.		Niksar Municipality/PIU	Air pollution grievance records	Included in
Particulate Matter	Adverse/ Direct	High	The top of the excavated material will be wetted to prevent dust formation.	Low	Contractor and/or sub-contractor	Air Quality Measurement (if	project
Generation		ineot	Loading/unloading will be carried out carefully without scattering.		Supervision	available)	budget
			<ul> <li>wind shield and barriers will be used in the working area depending on wind conditions.</li> </ul>		COnsuldIIL		

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TÜRKIYE CUMHURIYETİ CEVRE, ŞEHİRCÜLİK VE İKLİM DEĞİŞİKLİĞİ BAKANLIĞİ

SURDURULEBILIR SEHIRLER



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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
			<ul> <li>Trucks hauling excavation material will be covered, the material will be prevented from scattering during transportation, and the roads will be cleaned quickly if the material is scattered.</li> <li>Care will be taken during filling and unloading of the material.</li> <li>The route to be used in the transport of the excavation material/waste will be carefully selected and care will be taken not to pass through the densely populated areas.</li> <li>Care will be taken to enforce speed limits for transport vehicles. Accordingly, the speed limit will not exceed 30 km/h on roads with a poor coating.</li> <li>In order to prevent the effect on the air quality from affecting the working and resting activities, the construction activities will be carried out at the determined time of period, and this determined time interval will be announced beforehand to the residents who will be affected by the construction activities through the means of communication tools of Niksar Municipality and Contractors/Subcontractors.</li> <li>Compliance with the air emission limit values stipulated in national legislation and WBG General EHS Guidelines will be ensured.</li> <li>Dust measurements will be conducted if any grievance regarding dust generation is received and mitigation measures will be enhanced in this respect such as increasing wet suppression/watering activities, further reducing speed/traffic, etc., if</li> </ul>				
Exhaust Emissions	Adverse/ Direct	High	<ul> <li>deemed necessary, considering both national and WBG EHS Guidelines limit values.</li> <li>In accordance with the "Exhaust Gas Emission Control Regulation"; vehicles with traffic inspections, exhaust gas emission measurements will be used, and vehicles that need maintenance will be taken into maintenance after routine checks and other vehicles will be used until their maintenance is completed.</li> <li>Each vehicle to be used for transport during the construction phase shall have the "Motor Vehicle Exhaust Emission Measurement Stamp". The measurement stamp will be renewed every year by measuring exhaust gas.</li> <li>Routine inspection and maintenance of the vehicles used for transportation will be performed (daily and periodically). Maintenance forms will be filled regularly.</li> <li>Use of fuel conforming to standards will be ensured.</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Air pollution grievance records Vehicle exhaust measurements Maintenance forms ESMR findings	Included in project budget
Noise							
Increase in Noise Level	Adverse/ Direct	High	<ul> <li>In this direction, the activities to be carried out in and around the residential areas will not be carried out in the evening and nighttime periods, but during the daytime period.</li> <li>In order to prevent the effect of the noise from affecting the working and resting activities, the construction activities will be carried out at the determined hours and in a way that does not exceed limit values stipulated in national legislation and WBG EHS Guidelines.</li> <li>An attention will be given to the selection of equipment with low noise level.</li> <li>In places where these limit values are exceeded, sound barriers will be used around the work area. In this context, muffler or sound suppressor parts will be used in all kinds of motor vehicles.</li> <li>Regular maintenance of equipment and vehicles to be used in excavation, construction, transportation, pipe placement and asphalting phases will be carried out.</li> <li>The maintenance of construction equipment will be carried out in accordance with the relevant regulations and manufacturer's recommendations.</li> <li>All construction activities will be carried out in compliance with the noise limits set out in the Regulation on the Assessment and Management of Environmental Noise (RAMEN) and WBG EHS Guidelines, and the contractor will take additional mitigation measures in case of a requirement revealed by the monitoring,</li> <li>The machinery and equipment to be used during the land preparation and construction activities will not be operated at the same point/location but homogeneously distributed in the site.</li> <li>The machinery, equipment and vehicles with lower sound power levels and sound reduced models will be preferred.</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Noise level measurement results (if available) Construction machinery and equipment maintenance log Noise grievance records ESMR findings	Included in project budget

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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
			<ul> <li>Noise measurements will be conducted if any grievance regarding noise is received and mitigation measures will be enhanced in this respect such as use of noise barriers, limiting construction activities at certain times, etc., if deemed necessary, considering both national and WBG EHS Guidelines limit values.</li> </ul>				
			The nearby residents will be informed about the time of construction activities.				
Vibration	Adverse/ Direct	High	<ul> <li>Sensitive care will be taken in the selection of equipment and parts in accordance with the ground vibration velocity values given in Annex-VII Table-7 of The Regulation on the Assessment and Management of Environmental Noise.</li> <li>In case of any complaints relevant to the selected vehicles and equipment generating vibrations above the expected level, measurement studies will be carried out and necessary corrective actions to prevent the transmission of vibration from the floor and side surfaces to the floor by using elastic mattress and steel construction will be taken if required.</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Vibration level measurement results (if available) Construction machinery and equipment maintenance log Vibration grievance records ESMR findings	Included in project budget
Biodiversity							
Disturbance on flora and fauna species	Adverse/ Direct	Low	<ul> <li>Project workers will not be allowed to bring any live animals or plants into the construction site to avoid the risk of pest/invasive species establishing in the Project Area.</li> <li>Construction work will be done gradually so that it will have enough time to escape for possible fauna species to be found;</li> <li>Activities will be minimized when seeds are available (e.g., avoid walking with long drawings, car washing, activities outside the working area).</li> <li>Efforts will be taken to mitigate or reduce impacts of disturbance.</li> <li>Where necessary, new structures will also be considered in areas determined to be important for animal migrations to ensure that there is no net loss of populations of fauna species.</li> </ul>	Negligible	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Visual observations ESMR Findings	Included in project budget
Habitat Loss	Adverse/ Direct	Low	<ul> <li>Land preparation and construction activities will be limited to designated work areas.</li> <li>The Project personnel will be informed on the sensitivity of the habitats.</li> <li>Project-induced impacts on air, soil and water in natural habitats will be avoided.</li> </ul>	Negligible	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Visual observations ESMR Findings	Included in project budget
Cultural Heritage	•	1			I	Γ	Ι
Destruction or deliberate damage to cultural heritage	Adverse/ Direct	High	<ul> <li>All construction works will be carried out under the supervision of the experts of the museum directorate as stipulated by Sivas Cultural Heritage Preservation Regional Directorate.</li> <li>The Chance Find Procedure, based on national laws, international standards and best practices, will be applied during any chance find.</li> <li>In case of a chance find, all activities will be stopped and experts of the Museum Directorate will be contacted and the site will be secured the Contractor.</li> <li>The experts of the Museum Directorate will properly secure chance find site via flagging, no-entry signs, etc. and prevent/limit the vehicle traffic within the immediate vicinity of chance find and also protect the site by not moving, removing or further disturbing the chance find.</li> <li>Boundaries of discovered archaeological site coordinates will be recorded and photograph of the location and the finding shall be taken and video record should be made.</li> <li>The site and its vicinity will be secured against damage or loss until a final decision is made about this site by Board.</li> </ul>	Medium	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Visual observations Random Site Inspections ESMR Findings	Included in project budget

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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Resp					
			• If any human remains such as contemporary grave or graveyard are noticed, security forces will be informed. Unless the remains are determined to be recent, the local administration (village head: mukhtar, or district governor) has the full authority.							
			• Further steps to be followed and proper procedures to be implemented for the management of the finding(s) (changes in the layout, conservation, preservation, restoration, or salvage) will be decided and reported in writing by the Museum Directorate.							
			• In case the site is considered to be of no significance by the Museum Directorate, the experts of the Museum Directorate will inform the Construction Manager.							
			• The excavations in the 1 <sup>st</sup> degree archaeological site should be carried out manually without the use of construction equipment, and in the 3 <sup>rd</sup> degree archaeological sites, light tonnage construction machines with rubber wheels should be used.							
Traffic and Trans	port									
			• All vehicles to be used in transportation activities will obey the speed limits set out in the Regulation on Highway Traffic.							
			<ul> <li>Safe driving by Project personnel will be ensured through trainings.</li> </ul>							
	e Adverse/ Direct		<ul> <li>Construction materials, equipment and machinery will not be stored in traffic lanes.</li> </ul>							
Disturbance due to the road closure, traffic jam due to the construction vehicles, etc.		Adverse/ Direct	due c Adverse/ e Direct		<ul> <li>If possible, traffic activities will be planned to avoid rush hour on local roads.</li> </ul>		Munic			
				Adverse/ Direct	Adverse/ Direct	Adverse/ Direct	Adverse/ Direct	Adverse/ Direct	Adverse/ Direct	High
			• The appropriate signage will be determined based on the Regulations on Traffic Signs		Cor					
			Alternative routes will be determined, and transportation will be programmed according to intensity of traffic							
			Traffic Management Plan prepared during pre-construction phase will be implemented.							
Labor Force and	Influx		······							
			All employees including contractors, subcontractors and suppliers will have the right to organize directly, contractually, and otherwise.							
			<ul> <li>The Contractor formally agrees that all work will be carried out in a safe and disciplined manner and is designed to minimize risks on neighboring residents and environment.</li> </ul>							
			<ul> <li>A grievance redress mechanism system will be established that can be used by employees at all levels.</li> </ul>							
			• A fair and transparent employment procedure will be adopted.							
				Positive discrimination will be encouraged for disadvantaged groups.						
Improper	Adverse/		<ul> <li>The drinking and utility water to be supplied will meet the requirements of the Regulation on Water Intended for Human Consumption and the WHO Drinking Water Quality Guide.</li> </ul>		Munic					
Working Conditions	Direct	High	• Non-discrimination in working areas, creating equal opportunities for all employees and the elimination of child, and forced labor will be aimed in the Project scope.	Low	sub-c					
			<ul> <li>All accommodation sites to be used will have adequate emergency response equipment such as first aid kits and firefighting equipment.</li> </ul>		Cor					
			Appropriate emergency response equipment will be available at various locations at the construction site.							
			<ul> <li>Camping areas (If any) will be arranged to accommodate workers properly and their needs can be met within the camp area.</li> </ul>							
			<ul> <li>Works will be carried out in accordance with the provisions of the "Occupational Health and Safety Law No. 6331" and necessary measures will be taken to protect workers from risks that may arise from health and safety, especially hearing risks, as a result of exposure to noise.</li> </ul>							
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ponsibility	Key Performance Indicators	Cost
Niksar icipality/PIU ractor and/or -contractor upervision onsultant	Traffic Grievance Records Training Records Visual observations (such as traffic signs and warnings are placed at appropriate locations) ESMR Findings	Included in project budget
Niksar icipality/PIU ractor and/or -contractor ipervision onsultant	Number of nonconformities Training records Grievance Records ESMR Findings	Included in project budget



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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
			<ul> <li>Proper first aid equipment will be ensured on site, at various related locations.</li> <li>Trainings will be given to personnel on general waste management, housekeeping, first aid practices and infectious diseases as well as the general and technical Occupational Health and Safety (OHS) trainings.</li> <li>Routine visual checks will be performed on site to ensure proper cleanliness.</li> <li>Periodic medical check-ups for personnel will be carried out and vaccination and/or other mitigation measures will be provided if needed.</li> <li>Preference should be given to contractors who proactively work to reduce or eliminate gender-based violence, sexual exploitation and abuse and sexual harassment (SEA/SH).</li> </ul>				
Workers Engaged by Third Parties and the Supply Chain	Adverse/ Direct	High	<ul> <li>The performance of subcontractors will be monitored such that human rights policy and labor rights of all workers are exercised properly; and</li> <li>The workers of subcontractors will have access to the overall grievance redress mechanism to be established for the Project.</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Sub-contractor Agreements Grievance Records ESMR Findings	Included in project budget
Child labor, forced labor and unregistered employment	Adverse/ Direct	High	• Unregistered employment, child labor and forced labor will be prevented. In case of subcontracting of the construction activities, the Contractor will establish procedures for managing and monitoring the performance of subcontractors in relation to the requirements to prevent child labor, unregistered employment and forced labor. The Contractor will require such subcontractors to include requirements related to this issue and non-compliance remedies in their contractual agreements.	Low	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	No child and forced labor ESMR Findings	Included in project budget
Temporary labor influx Risk of social conflict Impacts on community dynamics	Adverse/ Indirect	High	<ul> <li>People who will work on the project or provide goods and services to the project should be settled quickly in the region. In such a case, people who settle in the area due the project may have a negative impact on the local population (especially if the area is rural, remote and small).</li> <li>In case personnel or material or services required for the works to be carried out in a construction project cannot be sourced from local sources; technical personnel with adequate capacity or materials that meet international standards must be brought from outside the project area.</li> <li>Selection of local procurement options for supply of construction materials as much as possible and feasible.</li> <li>The Municipality and the Contractor shall ensure that code of conduct and public communication trainings are given to all employees as an orientation training to prevent a possible future dispute;</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Grievance Records ESMR Findings	Included in project budget
Community and	Occupation	al Health and Sat	fety				
Inadequate workers health and safety conditions Increase in community exposure to hazards	Adverse/ Direct	High	<ul> <li>The access of local people to the construction sites will be fencing, blocked with plastic tapes, barriers, phosphorescent or illuminated warning signs so that the work does not cause harm to people living in the area (especially children, the elderly, the disabled). The entry of personnel and third parties into the facility will be carried out in a controlled manner.</li> <li>Especially the areas where excavation work is to be carried out will not be accessible other than the authorized personnel. 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 barriers.</li> <li>If workers are accommodated on site require them to minimize contact with people outside the construction/refurbishment site or prohibit them from leaving the site for the duration of their contract.</li> <li>Temperatures of workers and other people entering the site will be checked and recorded or require self-reporting prior to or on entering.</li> <li>Smoking will be prohibited where the risk of fire is high. All the workers will be informed about the action plan, to be prepared by the Contractors, in a case of fire.</li> <li>All equipment will be operated in proper working order.</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Incident Records Number of nonconformities Training records Work Permits H&S reports H&S meetings ESMR Findings	Included in project budget

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TÜRKİYE CUMHURİYETİ CEVRE, ŞEHİRCİLİK VE İKLİM DEĞİŞİKLİĞİ BAKANLIR

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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
			<ul> <li>In the trench excavation areas performed by excavators, bulldozers and similar machines, no one will be present within the movement area of these machines, and only authorized personnel will operate these machines.</li> </ul>				
			• The necessary health and safety signs and traffic signs will be placed around the project site. Employees will be informed and alerted about the subject matter markings.				
			• Equipment that meets international standards in terms of performance and safety will be used at the construction sites.				
			Railings will be installed around all tanks, pits and excavation trenches.				
			<ul> <li>Sufficient number of personal gas detection equipment will be provided for the employees.</li> </ul>				
			• Relevant procedures such as confined space entry, working at height, working in confined spaces, in trench etc. will be prepared in accordance with applicable national requirements and internationally accepted standards.				
			• Site-specific OHS Management Plan prepared based on construction site OHS risk assessment during pre-construction phase and relevant procedures will be implemented by the contractor.				
			<ul> <li>Provision of appropriate PPE to the workers will be ensured at all times.</li> </ul>				
			<ul> <li>OHS trainings and toolbox talks will be provided to the employees including the code of conduct indicating the possible risks regarding the work site and works to be carried out. These will include regular trainings to workers on COVID-19 symptoms, how to be protected and what to do when symptoms appear.</li> </ul>				
			<ul> <li>Assigned full-time OHS specialist with relevant certification and experience will daily inspect the site and if any additional risk is observed relevant plans and trainings will be renewed.</li> </ul>				
			• In the event of any significant incident (e.g. environmental, social, labor or lost-time incidents) the Contractor shall immediately notify Niksar Municipality and the Municipality shall inform ILBANK and WB within three business days. Then, within 30 days, a report on the root causes of the incident and the corrective actions to be taken will be presented to ILBANK and WB.				
			• Both trainings and incidents (fatalities, lost time incidents, any significant events including spills, fire, outbreak of pandemic or communicable diseases, social unrest, etc.) will be recorded.				
			<ul> <li>The compliance of all the activities with the related regulations of Labor Law numbered 4857 such as "Regulation on Occupational Health and Safety", "Regulation on Noise", "Regulation on Health and Safety at Construction Works" and "Regulation on Using of Personal Protective Equipment at Workplaces"; and WBG EHS Guidelines will be ensured.</li> </ul>				
			• Before the construction works start, a Risk Assessment study will be implemented for all works to be carried out. Relevant procedures and plans (including "Emergency Plans") will be put in place. Both the Risk assessment and Emergency Response Plans will take into consider the COVID-19 risks and other communicable disease risks, as relevant.				
			<ul> <li>Daily briefings will be provided to workers prior to commencing work, focusing on Covid-19 specific considerations including cough etiquette, hand hygiene and distancing measures.</li> </ul>				
			• The workers will be required to self-monitor for possible symptoms (fever, cough) and to report to their supervisor if they have symptoms or are feeling unwell.				
			• A worker will be prevented from an affected area or who has been in contact with an infected person from entering the site during the current quarantine period within the scope of the (COVID) measures.				
			• A sick worker will be prevented from entering the site, referring them to local health facilities if necessary or requiring them to isolate at home during the current quarantine period within the scope of the (COVID) measures.				
			• In case an epidemic/communicable disease risk, the Contractor can also implement a screening program in the workplace. Screening can include providing free testing to workers and other employees who are exhibiting symptoms of the disease or requiring employees returning from high-risk areas to stay home for a predetermined amount of time to ensure that disease symptoms do not develop.				
			• Guidance, directives, and recommendations of Ministry of Health, Ministry of Labor and Social Services, and World Health Organization 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.				

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TÜRKIYE CUMHURIYETİ ÇEVRE, ŞEHİRCİLİK VE İKLİM DEĞİŞİKLİĞİ BAKAMU

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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
			• Necessary training will be given to the personnel at the very beginning of the recruitment process which will be also refreshed during the work period. Trainings will cover workers' rights, contract requirements, Code of Conduct, grievance redress mechanism and contact channels. Compliance with the rules of code of conduct, including gender-based violence, sexual harassment, sexual exploitation and abuse, which are included in the trainings to be provided, will be in the contract articles of the personnel. The sanctions for non-compliance with the code of conduct will be clearly stated in the contract.				
Uncertainty of Emergency Response Methods	Adverse/ Direct	High	<ul> <li>The issues related to Emergency Preparedness and Response stated in this Plan will be complied with in accordance with the national and international standards.</li> <li>All accommodation areas will have adequate emergency response equipment such as first aid kits and firefighting equipment.</li> <li>Appropriate emergency response equipment will be available at various locations at the construction site.</li> <li>Absorbent materials, fire extinguishing equipment, etc., in order to be able to respond immediately in case of any emergency such as spillage and fire will be available in close proximity to the construction area.</li> <li>Periodic visual checks will be made in hazardous waste storage areas, and possible spills/leaks will be detected quickly.</li> </ul>	Medium	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Incident Records Number of nonconformities Training records H&S reports H&S meetings ESMR Findings	Included in project budget
Increase in Health Problems	Adverse/ Direct	High	<ul> <li>Training of all staff on health and general hygiene and cleaning will be provided.</li> <li>In order to eliminate or minimize the health problems may arise among workers and local people, the excavation materials will be stored in the area to be determined by the Municipality after the necessary hygiene measures are taken.</li> <li>Before commissioning, components such as pipes, valves, fire hydrants, etc. will be cleaned and disinfected.</li> <li>The ends of the installed pipes will be closed to prevent any contamination before commissioning.</li> <li>Asbestos-containing waste will be transported and disposed of in accordance with Regulation on the Road Transportation of Hazardous Goods by signing a contract with a waste transport company licensed by the Ministry of Environment, Urbanization and Climate Change and an authorized waste disposal organization.</li> <li>Water quality analysis will be performed in case of contamination in the existing water network system in line with the national and international standards. If a contamination is proved to be occurred, necessary precautions will be taken immediately such as ensuring the continuity of water pressure throughout the network at a level that will prevent stagnation and backflows and using more stable secondary disinfectants.</li> <li>Whenever a new pipe is laid, a part of the water distribution system is expanded, or a part of the water distribution system or a pipe is replaced, pressure tests will be performed, and the distribution pipes should be disinfected.</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Number of nonconformities Training records H&S reports H&S meetings ESMR Findings	Included in project budget
Asbestos Pipe	Adverse/ Direct	High	<ul> <li>The Waste Management Plan to be prepared by the Contractor will include the management of asbestos pipes or an individual Asbestos Management Plan will be prepared.</li> <li>If any asbestos pipe is encountered by the Contractor during the excavations, it will not be removed to the surface.</li> <li>In cases where asbestos pipes need to be brought to the surface, the principles of the Regulation on Health and Safety Precautions in Working with Asbestos will be followed. The work should be carried out by an asbestos removal specialist, who has a vocational training certificate.</li> <li>In case of encountering asbestos in the project area, it will be clearly identified as hazardous substance.</li> <li>Where asbestos removal is required, wetting agent will be used to keep asbestos dust to a minimum before dismantling.</li> <li>Where asbestos required to be stored temporarily, this hazardous waste will be kept in securely closed containers and appropriately labelled.</li> <li>Removed asbestos will not be reused. Asbestos-containing wastes will be disposed of by transferring them to Class I landfills in accordance with the provisions of the Waste Management Regulation.</li> <li>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 will be posted at the work area and warning signs will be placed.</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Training records Work Permits H&S reports ESMR Findings	Included in project budget

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TÜRKİYE CUMHURİYETİ CEVRE, SEHİRCİLİR VE İKLİM DEĞİŞİKLİĞİ BAKANLIĞ

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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
			• Appropriate respiratory protection and other personal protective equipment will be used. Working and exposure time will be recorded. Records are retained for at least 40 years after exposure to asbestos dust has ceased.				
Socio-Economic	Environme	nt					•
Impacts on Local Economy, Livelihood Sources and Employment	Affirmativ e/Indirect	Medium	<ul> <li>The construction works on the streets where the tradesmen and shops are concentrated will be planned and organized to be completed as soon as possible in order not to cause any significant decrease in those tradesmen and shop staff's livelihoods.</li> <li>Traffic safety management measures will be implemented.</li> <li>Local employment will be prioritized as much as possible for unskilled, semi-skilled and skilled works within the scope of Project.</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Socio-Economic Grievance Records ESMR Findings	Included in project budget
Loss of Land and Structures	Adverse/ Direct	Low	<ul> <li>In case any unanticipated damage occurs on the neighboring lands, assets, crops and structures during construction works, the losses will be compensated by Contractor.</li> <li>Assistance to affected people shall be provided by the project to enable them to improve their living standard and full compensation of loss of land shall be provided according to asset types and location.</li> <li>In any case, if a land acquisition process is triggered, the full compensation payments will be made to the landowners as per the Resettlement Policy Framework of the Project and the Resettlement Action Plan to be prepared for the sub-project. No landowners will be victimized.</li> </ul>	Negligible	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Excavation amount ESMR findings	Included in project budget
Impacts on Infrastructure Status and Social Services	Adverse/ Direct	Low	<ul> <li>Plans showing the locations of underground and surface service facilities (electricity, telecom, other) are presented in Annex-C. Numerical data regarding the locations of these facilities will be obtained from the relevant administrations. Before starting the excavation process, these plans will be reviewed and the residents and/or landowners will be consulted about the relocation of the facilities.</li> <li>The relevant permits, protocols will be granted for other 3rd party crossings such as underground electricity cables etc. during construction stage.</li> <li>A team/teams to accompany the excavation team will be provided from the related utility authority; and the construction activities will be performed in a way not to give any damage to the utilities located in the working area.</li> <li>Consultations and grievance redress mechanisms will be properly implemented to ensure minimum negative impact and maximum positive impact on the local economy.</li> <li>In order to reduce the economic negative effects of short-term closures and route changes, alternative routes will be created and these changes will be announced through local media and corporate announcements.</li> <li>In order to reduce the economic negative effect on the roads, relevant complaints will be taken into account and necessary maintenance and repair works will be carried out.</li> <li>Compensation for damaged assets due to construction vehicles will be included in the scope of contracts.</li> <li>In order to minimize the socio-economic impacts that may occur in the event that construction activities temporarily interrupt infrastructure services such as water, electricity and internet in a planned or unplanned manner, a planning that avoids interruptions as much as possible will be made.</li> </ul>	Negligible	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Socio-Economic Grievance Records ESMR Findings	Included in project budget
Impacts on Vulnerable Individuals/ Groups	Adverse/ Direct	High	<ul> <li>Vulnerable Groups will not be at risk of being excluded from decision-making processes for activities that will benefit them or receiving socially inappropriate benefits or adversely affecting their livelihoods from project activities.</li> <li>It will be ensured that vulnerable groups have a voice to shape the benefits they would like to see from the Project.</li> <li>Equal participation of women in consultations and decision-making processes will be ensured.</li> <li>An adequate communication framework will be established to ensure that vulnerable groups' voices are heard, pending issues are resolved and grievances heard.</li> </ul>	Medium	Niksar Municipality/PIU Contractor and/or sub-contractor Supervision Consultant	Socio-Economic Grievance Records ESMR Findings	Included in project budget

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TÜRKİYE CUMHURİYETİ ÇEVRE, Şehiricilik ye İklim değişikliği Bakanlır

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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken		Resp
			• The use of transportation roads to the neighborhoods where education is provided will be planned in a way that does not endanger the travel safety of the service vehicles.		
			• Traffic precautions (warning signs, speed limits, settlement, and school information for the periods when large and dangerous loads will be transported) will be taken.		
			• Special crossings will be developed by taking additional measures for the elderly, pregnant women, people with small children and disabilities.		
			• Niksar Municipality/Contractor will inform the relevant institutions and organizations (Municipality, Electricity Distribution Company, natural gas distribution and operating company) before the construction starts so that the usage habits of those living in these areas are not affected during the construction works.		
			• If a water outage is required during the construction and operation, the public will be informed and the water outage will be made between 12.00-18.00. The citizen will be informed 24 hours before the water outage.		
Climate Change			·		
			• It will be ensured that the existing construction equipment and materials are used in an optimum way to reduce greenhouse gas emissions.		۱ Munic
Greenhouse gas	Adverse/		Speed restrictions will be implemented on construction vehicles and equipment to optimize fuel efficiency.	· ·	Contra
emissions	Direct	High	Regular maintenance of construction vehicles and equipment will be carried out.	Low	sub-
			Energy use related to construction vehicles and equipment will be monitored.		Sup
			Trainings on energy efficiency will be given to the project personnel.		Co
Stakeholder Eng	agement				
			<ul> <li>The ESMP and other relevant project documents and information will be disclosed to project employees including contractors, project stakeholders and public.</li> <li>The public will be informed in advance regarding traffic route changes, drinking water interruption, etc.</li> </ul>		
			Information materials (brochures, brochures, etc.) will be prepared		
			Platforms/meetings will be organized for information disclosure and consultation.		
			There will be regular consultations with local authorities and communities regarding the management of the construction.		Munic
Communication issues with the stakeholders	Positive/ Direct	Medium	Establishment and proper functioning of a grievance redress mechanism will be ensured and information about it disseminated to the public.	Low	Contra sub-o
			It will be ensured that the concerns of all stakeholders are addressed.		Sup
			<ul> <li>The public will be notified of the works, including the Covid-19 measures taken on sites, through appropriate notification in the media and/or at publicly accessible sites (including the site of the works).</li> </ul>		
			Stakeholder engagement events will be preceded with the procedure of articulating hygienic practices.		
			All details of the Gender-Based Violence (GBV) and Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH)     survivors will be kept strictly confidential in the Grievance Register Database.		



ponsibility	Key Performance Indicators	Cost
Niksar icipality/PIU ractor and/or -contractor upervision onsultant	Construction machinery and equipment maintenance log Grievance Records ESMR Findings	
Niksar icipality/PIU <sup>r</sup> actor and/or -contractor upervision onsultant	Enquiries/ questions/ grievances by stakeholders Minutes of Meetings Grievance Records (number of grievances & percentage of closed grievances)	



#### Table 6-3. Mitigation Plan for Operation Phase

Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost	
Operation of Wat	ter Network				I			
				• In order to minimize the negative effects on the water distribution function and the environment and public health, failures and leaks in the entire water distribution system, pipes and other materials will be detected by leakage detection instruments, recorders, portable pressure gauges and flow meters.				
			• Routine maintenance of equipment such as pumps, valves and electrical equipment will be performed.					
			• Detailed records of maintenance/repair/replacement works will be kept, and future maintenance/repair/replacement plans are planned according to these records.			Patient Records Water Sampling and Analysis Grievance Records ESMR Findings	Included in	
Diseases	Adverse/ Direct	High	• Whenever a new pipe is laid, a part of the water distribution system is expanded, or a part of the water distribution system or a pipe is replaced, pressure tests will be performed, and the distribution pipes should be disinfected.	Medium	Niksar Municipality/PIU		operation budget	
			• Before and after any maintenance and repair in the network system, the Public Health Directorate and the Community Health Center will be informed about the location to be repaired.					
			• The public will be informed about how long the cut will continue during the periods when the water outage is made.					
			• According to the parameters specified in Annex-1 of the Regulation on Water Intended for Human Consumption, samples will be taken from drinking water, analyzed and monitored.					
	Adverse/ Direct	Adverse/ High Direct	• Use signs to clearly identify all areas where chlorine is used or stored. Only qualified personnel are permitted to enter these areas. Store chlorine cylinders and containers in a cool, dry, and relatively isolated area, protected from weather and extreme temperatures. If storing cylinders and containers outside, shield them from direct sunlight, unless they are specifically designed for unshaded, outdoor storage.	Medium	Niksar Municipality/PIU	The number of events that trigger spill and leakage response ESMR Findings		
Chlorine Gas Leakage			• In case of a chlorine leak or emergency, Niksar Municipality will have a working alarm that can be heard and seen by workers. A continuous (24-hour) chlorine monitor will be connected to the alarm system. The continuous monitor will check chlorine concentrations in the air and the alarm will response if chlorine concentrations reach a certain pre-set level.				Included in operation budget	
			• Emergency response workers who are controlling a serious chlorine leak will have access to full-body protective suits.				2.L.get	
			• A suitable fan, providing at least 15 air changes per hour, will ventilate the chlorine storage room.					
			• Niksar Municipality will conduct a risk assessment and prepare emergency procedures, including escape and evacuation, drills, and notification of emergency services.					
Excavations Car	ried Out as	part of Maintena	nce Works					
			• By carrying out periodic control and maintenance activities along the routes, additional durability and structural measures will be developed and implemented in cuts and fills when necessary.					
			• These activities will damage the land physically to a limited extent, and heavy equipment will use the designated routes and areas.			The number of events that trigger		
Soil Contamination	Adverse/		<ul> <li>Machinery and equipment will be checked regularly for leaking oil and fuel.</li> </ul>			response	Included in	
and Physical	Direct	Low	• In an event of an accident, leak or spill, necessary repair works and/or replacement of parts will be performed promptly in accordance with the standards.	Negligible	Niksar Municipality/PIU	Environmental spill/leak incident	operation budget	
			• Provisions of the Regulation on the Control of Soil Pollution and Sites Contaminated by Point Sources will be complied.			records/report		
			• Wastes and wastewater (rainfall filled in trenches) to be generated during maintenance and repair works will be stored and disposed of in a controlled manner in accordance with the Regulation on Waste Management and other relevant regulations and in line with the management practices described in this ESMP.			ESMR findings		

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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
Water Resource	es			•		• 	
Water Overflows	Adverse/ Indirect	Low	<ul> <li>Broken pipes and other repairs will be made without delay.</li> <li>Maintenance of pump stations will be done at regular intervals.</li> <li>Water quality of the surface waters and groundwater will be monitored in case of any complaint, within the area of influence.</li> </ul>	Negligible	Niksar Municipality/PIU	Number of Water and Sewage Overflow Maintenance forms Water Sampling and Analysis ESMR findings	Included in operation budget
Noise		·					
Increase in Noise Level	Adverse/ Direct	High	<ul> <li>The noise impact resulting from vehicles, and maintenance equipment and machinery will be temporary and is not expected to be significant. The number of vehicles will be limited during operation and maintenance. The staff will use an ear protection. During the maintenance activities, necessary measures, such as installing acoustic screens will be taken to minimize noise near noise-sensitive areas, if needed.</li> <li>The maintenance activities during the operational phase to be carried out in and around the residential areas will not be carried out in the evening and night-time periods.</li> <li>The maintenance activities will be carried out at the determined hours and in a way that does not exceed the determined environmental noise limit value.</li> <li>The determined hours will be announced beforehand to the residents, who will be affected by the maintenance activities, through the means of communication tools of Niksar Municipality.</li> <li>Regular maintenance of equipment and vehicles to be used in maintenance activities in operation phase will be carried out.</li> <li>All maintenance activities will be carried out in compliance with the noise limits set out in national legislation and the WGB EHS Guidelines.</li> </ul>	Low	Niksar Municipality/PIU	Operation machinery and equipment maintenance log Noise grievance records ESMR findings	Included in operation budget
Vibration	Adverse/ Direct	High	<ul> <li>Sensitive care will be taken during repair activities in accordance with the ground vibration velocity values given in Annex- VII Table-7 of The Regulation on the Assessment and Management of Environmental Noise.</li> </ul>	Low	Niksar Municipality/PIU	Operation machinery and equipment maintenance log Vibration grievance records ESMR findings	Included in operation budget
Air Quality							1
Dust and Particulate Matter Generation	Adverse/ Direct	High	<ul> <li>The impact of the dust formed during the repair/maintenance activities in operation phase will be mitigated by watering, controlling the vehicle speeds and covering the tops of the transportation vehicles with tarpaulin.</li> <li>The top of the excavated material will be wetted to prevent dust formation.</li> <li>In order to prevent the effect on the air quality from affecting the working and resting activities, the dusty maintenance activities will be carried out at the determined time of period and this determined time interval will be announced beforehand to the affected residents.</li> </ul>	Low	Niksar Municipality/PIU	Air pollution grievance records ESMR findings	Included in operation budget
Exhaust Emissions	Adverse/ Direct	High	<ul> <li>In accordance with the "Exhaust Gas Emission Control Regulation"; vehicles with traffic inspections, exhaust gas emission measurements will be used, and vehicles that need maintenance will be taken into maintenance after routine checks and other vehicles will be used until their maintenance is completed.</li> <li>Each vehicle to be used for transport during the operational phase shall have the "Motor Vehicle Exhaust Emission Measurement Stamp". The measurement stamp will be renewed every year by measuring exhaust gas.</li> </ul>	Low	Niksar Municipality/PIU	Air pollution grievance records Vehicle exhaust measurements Maintenance forms ESMR findings	Included in operation budget

TÜRKIYE CUMHURIYETİ ÇEVRE, ŞEHİRCİLİK VE İKLIM DEĞİŞİKLİĞİ BAKANLIĞ

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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
			<ul> <li>Routine inspection and maintenance of the vehicles used for transportation will be performed (daily and periodically). Maintenance forms will be filled regularly.</li> <li>Use of fuel conforming to standards will be ensured.</li> </ul>				
Waste Managem	ent	1			1		L
Excavation Waste Generation	Adverse/ Direct	Low	<ul> <li>Excavation wastes, which are formed as a result of the trench excavations carried out during the operation phase due to maintenance, will be classified separately as asphalt, curbs, parquet, concrete and soil. Excavation that will not be used for filling operations will be kept in temporary storage containers. The containers filled with excavation waste will be sent to the licensed excavation waste storage areas designated for the excavation material by Niksar Municipality. The transportation of such wastes will be provided by licensed transport vehicles.</li> <li>Excavation works to be carried out during the maintenance phase will comply with the provisions of the Regulation on Control of Excavated Soil. Construction and Demolition Wastes</li> </ul>	Negligible	Niksar Municipality/PIU	Visual observations Excavation amount Waste Grievance Records ESMR Findings	Included in operation budget
Waste Generation	Adverse/ Direct	Low	<ul> <li>Strict waste disposal policy will be applied, and wastes produced will be managed in accordance with the waste management hierarchy.</li> <li>Waste will be separated (i.e., hazardous / non-hazardous, recyclable / non-recyclable) and stored in designated temporary storage areas.</li> <li>All types of waste shall be transferred to a licensed disposal facility via licensed waste transportation companies following the relevant legislation.</li> <li>Domestic solid wastes generated on work sites and drinking water facilities will be stored in containers and collected daily by the Niksar Municipality and transported to the Waste Transfer Station in Niksar. Collected solid wastes will be transferred to licensed Erbaa Sanitary Landfill that has sufficient capacity for disposal of such waste.</li> <li>Hazardous or non-hazardous inscription, waste code, stored waste amount and storage date will be indicated/labeled on wastes temporary stored by classifying according to their properties. The reaction of wastes with each other will be prevented by the measures taken in the Temporary Storage Area and a suitable drainage system will be installed. Spill kits will be available at the Temporary Storage Area and necessary precautions will be taken against possible fires such as provision of appropriate firefighting equipment.</li> <li>Employees will be trained on waste management practices.</li> <li>All kinds of practices that may threaten personnel or public health will be avoided in all activities including the collection, temporary storage, transportation, and disposal of wastes throughout the project.</li> <li>Used batteries from the operational facilities and accumulators from vehicles will be disposed in compliance with the consumer responsibilities specified in Article 13 of the "Regulation on Control of Used Batteries and Accumulators". Accordingly, used batteries will be collected separately (from municipal wastes) and transferred to the designated collection sites (for example, the site owned by the Union of Tr</li></ul>	Negligible	Niksar Municipality/PIU	Visual observations Waste Disposal Agreements and Records Waste Grievance Records ESMR Findings	Included in operation budget
Labor Force and	Influx						
Improper Working Conditions	Adverse/ Direct	High	<ul> <li>Workers will be provided with clear and understandable documented information on their rights under national labor law; including collective agreements, working hours' rights, wages, overtime, compensation, and benefits from the start of the employment relationship and any material change occur.</li> </ul>	Low	Niksar Municipality/PIU	Number of nonconformities Training records Grievance Records	Included in operation budget

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TURIYE CUMHURIYETI CEVRE, SEHIRICLIK VE IRLIM DEĞIŞIRLIĞI BAKANLIĞI

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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
			<ul> <li>Workers will not be deterred from electing workers' representatives, forming, or joining workers' organizations of their own choosing, or bargaining collectively, and will not discriminate or retaliate against workers who join or attempt to participate in such organizations and collective bargaining.</li> </ul>			ESMR Findings	
			<ul> <li>Special attention will be paid to the principles of non-discrimination and equal opportunity. In this context, information about recruitment decisions (recruitment and hiring, compensation, wages, and benefits, working conditions and employment conditions, access to training, assignment, promotion, dismissal or retirement and disciplinary practices) will not be made based on personal characteristics unrelated to job requirements. Wages, working hours and other benefits will be in accordance with the Turkish Labor Law.</li> </ul>				
			• A grievance redress mechanism will be provided for workers to raise concerns in the workplace. The workers will be informed about the grievance redress mechanism at the time of recruitment and this mechanism will be made accessible to them easily.				
Workers Engaged by Third Parties and the Supply	Adverse/ Direct	High	<ul> <li>Subcontractors will be reputable and legitimate businesses and have an appropriate ESMS to allow them to operate in a manner consistent with working conditions requirements.</li> <li>The performance of subcontractors will be monitored for the proper exercise of human rights policy and labor rights of all employees.</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub- contractor (if available)	Sub-contractor Agreements Grievance Records	Included in operation budget
Chain			<ul> <li>Employees of subcontractors will have access to the overall grievance redress mechanism to be established for the Project.</li> </ul>			ESMR Findings	
Child labor, forced labor and unregistered employment	Adverse/ Direct	High	<ul> <li>It is not envisaged that the contractor or subcontractor will take part in the operation phase of the project. In case of subcontracting of the operational activities, the Niksar Municipality will establish procedures for managing and monitoring the performance of subcontractors in relation to the requirements of child labor, unregistered employment and forced labor. The Municipality will require such subcontractors to include requirements related to this issue and non-compliance remedies in their contractual agreements.</li> </ul>	Low	Niksar Municipality/PIU	No child and forced labor ESMR Findings	Included in operation budget
Labor Influx	Adverse/ Indirect	High	<ul> <li>In order to avoid the negative effects of the labor influx, Niksar Municipality will give priority to the local people in possible recruitments during the operation phase and this will be added to the contract terms of potential contractors and subcontractors.</li> </ul>	Low	Niksar Municipality/PIU	Grievance Records ESMR Findings	Included in operation budget
Community and	Occupation	al Health and Sa	fety	•			
Inadequate workers' health and safety conditions Increase in community exposure to hazards.	Adverse/ Direct	High	<ul> <li>Private security guards will be recruited to ensure the safety of the work area. The special security applications within the scope of the project and the competent authorities will follow the provisions of the Law on Private Security Services and the Implementation of the Law on Private Security Services.</li> <li>PPE will be provided to the workers according to the nature of the work to be done. Necessary training will be provided for their use.</li> <li>The Municipality will prepare an Occupational Health and Safety Management Plan (including relevant procedures) based on OHS risk assessment and adherence to all requirements of the Plan will be ensured.</li> <li>Emergency Preparedness and Response Plan will be prepared for a possible accident and emergency and emergency teams will be established, and drills and trainings will be carried out in line with the emergency scenarios.</li> <li>An adequate OHS organizational structure, as defined in Regulation on Occupational Health and Safety Trainings will be given to employees and operational and maintenance personnel within the scope of the Regulation on Procedures and Principles of Occupational Health and Safety Trainings and measurement, and evaluation activities will be carried out after the trainings.</li> <li>Both trainings and incidents (fatalities, lost time incidents, any significant events including spills, fire, outbreak of pandemic or communicable diseases, social unrest, etc.) will be recorded.</li> <li>Entrance of operation and maintenance personnel and third parties will be carried out in a controlled manner from the doors of the security personnel.</li> </ul>	Low	Niksar Municipality/PIU	Incident Records Number of nonconformities Training records Work Permits H&S reports H&S meetings ESMR Findings	Included in operation budget

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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
			• Equipment that meets international standards in terms of performance and safety will be used at the facilities.				
			• Niksar Municipality will ensure the compliance of all the activities with national standards and WBG EHS Guidelines.				
			<ul> <li>Niksar Municipality will inform the public in written, visual and telecommunication about how long the excavations in the operation phase will last and when they will be opened to traffic in order to reduce the possible negative effects on social life.</li> <li>Appropriate warning signs and lights will be used on roads where traffic is closed in the city and will not be removed until the work is completed.</li> <li>Considering that there will be traffic density, alternative routes will be determined and transportation planning will be</li> </ul>				
			made. Off-peak hours will be preferred.				
Uncertainty of Emergency Response Methods	Adverse/ Direct	High	<ul> <li>Risk assessment will be made, and personnel will be trained on risks.</li> <li>Niksar Municipality will ensure that the Emergency Preparedness and Response Plan covers the escape plans in case of disinfectant emission/spillage;</li> <li>Smoking will be prohibited where the risk of fire is high. All the workers will be informed about the action plan in a case of fire.</li> <li>All equipment will be operated in proper working order.</li> </ul>	Low	Niksar Municipality/PIU	Incident Records Number of nonconformities Training records H&S reports H&S meetings ESMR Findings	Included in operation budget
Increase in Health Problems	Adverse/ Direct	High	<ul> <li>The functioning of the entire water network will be monitored periodically, and in case of any malfunction in the system (clogging, pipe damage, etc.), necessary maintenance and repairs will be carried out on time.</li> <li>In case of encountering sewage waste during excavation for maintenance purposes, the material will be stored in the area to be determined by the Municipality after the necessary hygiene measures are taken.</li> <li>Before commissioning, components such as pipes, valves, fire hydrants, etc. will be cleaned and disinfected.</li> <li>The ends of the installed pipes will be closed to prevent any contamination.</li> <li>Water quality measurements will be performed in case of contamination in the existing water network system.</li> <li>If a contamination is proved to be occurred, necessary precautions will be taken immediately such as ensuring the continuity of water pressure throughout the network at a level that will prevent stagnation and backflows and using more stable secondary disinfectants.</li> <li>Water network elements that lost their hygiene after interruptions and maintenance works will be cleaned and disinfected to ensure hygienic conditions.</li> <li>Particular attention will be paid to the cleanliness of the inner surfaces of tanks and reservoirs.</li> <li>The drinking water quality will be monitored in accordance with the provisions of the "Regulation on Water Intended for Human Consumption", and the results of the monitoring will be announced to the public.</li> <li>In case of any other epidemic and/or infectious disease, including COVID-19, during the operation phase, the directives and recommendations of the Ministry of Health and the World Health Organization will be followed, and all necessary measures will be taken.</li> <li>Employees will be trained on COVID-19 symptoms, how to protect them, and what to do when symptoms occur.</li> <li>Working environments, machinery and equipment will be clean and hygienic.</li> <li>Employees will be ensured to comply with the prec</li></ul>	Low	Niksar Municipality/PIU	Number of nonconformities Training records H&S reports H&S meetings ESMR Findings	Included in operation budget
Traffic and Trans	sport						
Disturbance due to the road closure, traffic jam due to the	Adverse/ Direct	High	<ul> <li>All vehicles to be used in transportation activities will obey the speed limits set out in the Regulation on Highway Traffic.</li> <li>Safe driving by Project personnel will be ensured through training.</li> <li>Maintenance and repair materials, equipment and machinery will not be stored in traffic lanes.</li> </ul>	Low	Niksar Municipality/PIU Contractor and/or sub- contractor	Traffic Grievance Records Training Records	Included in operation budget
			It44 It44				



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Definition of Potential Impact	Type of Impact	Impact Significance Before Mitigation	Measures to be Taken	Impact Significance After Mitigation	Responsibility	Key Performance Indicators	Cost
maintenance activities, etc.			<ul> <li>If possible, traffic activities will be planned to avoid rush hour on local roads.</li> <li>Traffic has to be regulated in a way that will guarantee traffic safety and minimum traffic flow disruptions. When road closures, traffic diversions, are necessary, official permits will be obtained from Provincial Directorate of Traffic and the route &amp; duration of disruption will be determined. Advance notification will be provided to local people to be affected from blockages and diversions,</li> <li>The appropriate signage will be determined based on the Regulations on Traffic Signs.</li> <li>Alternative routes will be determined, and transportation will be programmed according to intensity of traffic.</li> </ul>			Visual observations (such as traffic signs and warnings are placed at appropriate locations) ESMR Findings	
Climate Change							
Greenhouse gas emissions	Adverse/ Direct	Low	<ul> <li>Optimal utilization of the available operational equipment and materials in such a way that reduces greenhouse gas emissions.</li> <li>Speed restrictions will be adopted by vehicles and equipment to optimize fuel efficiency and regular maintenance of vehicles and equipment will be applied</li> <li>Trainings will be performed on project personnel regarding energy efficiency.</li> </ul>	Negligible	Niksar Municipality/PIU	Operation machinery and equipment maintenance log Grievance Records ESMR Findings	Included in operation budget
Stakeholder Eng	agement						
Communication issues with the stakeholders	Positive/ Direct	Medium	<ul> <li>Establishment and proper functioning of a grievance redress mechanism will be ensured and information about it disseminated.</li> <li>It will be ensured that the concerns of all stakeholders are addressed.</li> <li>All details of the Gender-Based Violence (GBV) and Sexual Exploitation and Abuse/Sexual Harassment (SEA/SH) survivors will be kept strictly confidential in the Grievance Register Database.</li> </ul>	Medium	Niksar Municipality/PIU	Enquiries/ questions/ grievances by stakeholders Minutes of Meetings Grievance Records	Included in operation budget

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# 7 MONITORING PLAN

Monitoring plays a key role in ensuring the continuity and effectiveness of the implementation of the identified mitigation management strategies. The main purpose of the Monitoring Plan is to provide a basis for assessing the implementation of the prescribed measures and requirements of this ESMP.

Information gathered by monitoring can be used to improve management plans at all phases of the Project. Although impact assessment attempts to cover all relevant potential impacts to determine their significance and to include appropriate responses for these impacts, unexpected impacts may occur that can be managed or mitigated before they become a problem using information obtained through monitoring. Therefore, monitoring will ensure the successful implementation of mitigation/management plans and optimize environmental protection through good practices at each stage of the Project.

Monitoring studies are submitted in Table 7-1, Table 7-2 and Table 7-3.





Table 7-1. Pre-Construction Phase Monitoring Plan

Potential impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard <sup>29</sup>	Cost	Responsibility
Destruction or damage to cultural heritage	Permission (required by the contractor) Existence of Chance Finds Procedure	Administration Office	Documentation Check	No damage to cultural assets during construction works	Once 30 days before the start of the construction works	<ul> <li>Physical Cultural Resources (OP 4.11)</li> <li>Conservation of Cultural and Natural Assets Law</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Disturbance due to the road closure, traffic jam due to the construction vehicles, etc.	Existence and requirements of the Traffic Management Plan (TMP)	Administration Office	Documentation Check	To minimize potential traffic related impacts during construction works on the water network lines.	Once 30 days before the start of the construction works	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>WBG EHS Industry Sector Guidelines for Infrastructure - for Water and Sanitation</li> <li>WBG EHS Industry Sector Guidelines for General Manufacturing - for Construction Materials Extraction</li> <li>Highways Traffic Law</li> <li>Regulation on Highway Traffic</li> <li>Regulation on the Road Transportation of Hazardous Goods</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
	<b>F</b> acility (1)	Administration Office	Documentation Check (Health records of workers)	To increase the working	Once in the contract process	<ul> <li>WBG EHS Guidelines: Occupational Health and Safety</li> <li>WBG EHS Guidelines: Community Health and Safety</li> </ul>		Niksar Municipality/PIU
Improper Working Conditions	Environmental Hygiene	Within and around the worksite	Visual observation	conditions levels of workers	Daily	<ul> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	project budget	Contractor and/or sub- contractor
Workers Engaged by Third Parties and the Supply Chain	ESMS implementation of Subcontractors	Administration Office	Documentation Check	To ensure that subcontractors are reputable and legitimate businesses and have an appropriate Environmental and Social Management System (ESMS) that will allow them to operate in a manner consistent with working conditions requirements.	Once in the contract process	<ul> <li>WBG EHS Guidelines: Occupational Health and Safety</li> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Child labor, forced labor and unregistered employment	Labor registers	Administration Office	Documentation Check	To prevent unregistered employment, child labor and forced labor	Once in the contract process	<ul> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Temporary labor influx Risk of social conflict	Existence and requirements of the	Administration Office	Documentation Check	To avoid a possible future dispute between	Once in the contract process	Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines	Included in project budget	Niksar Municipality/PIU

<sup>29</sup> The most stringent among national legislation and WB standards will be complied and also the most up-to-date legislation will be considered.

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Potential impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard <sup>29</sup>	Cost	Responsibility
Impacts on community dynamics:	Workforce Management Plan			the Municipality and the Contractor.		<ul> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>		Contractor and/or sub- contractor
Inadequate workers' health and safety conditions	Existence and requirements of the OHS Management Plan (including risk assessment and adequate OHS organizational structure) Existence and	Administration Office	Documentation Check (training records, OHS documents, EPR Plan) Visual observation	To detect, prevent and	<ul> <li>Once in the contract process</li> <li>WBG EHS Guid Health and Safe</li> <li>WBG EHS Guid and Safety</li> <li>Environmental A</li> </ul>			Niksar Municipality/PIU
	requirements of the Emergency Preparedness and Response Plan		Work Permits	intervene diseases and accidents.	<ul> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the tenic of Lealth Cofety and Labor</li> </ul>	Included in project budget	Contractor and/or sub- contractor	
	Training Records					the topic of Health, Safety and Labor		
	Presence of Personal Protective Equipment	Within and around the worksite	Visual observation (Presence of Personal Protective Equipment)		Weekly before the start of the construction works			
Communication with the	Stakeholder engagement activities implementation	Administration Office	Documentation Check (Engagement records.	To ensure Disclosure of the ESMP To check whether the issues specified in the stakeholder engagement plan are fulfilled	Upon each engagement	• Environmental Assessment (OP 4.01), via	Included in	Niksar Municipality/PIU Contractor and/or sub-
Communication with the stakeholders	Grievance redress mechanism implementation- number and nature of grievances recorded, addressed and analyzed	Municipality/PIU Office	Grievance Registers, Consultation Registers)	To inform Stakeholders about the Grievance redress mechanism	Daily basis starting from the initialization of Pre-Construction Phase	<ul> <li>reference to WBG EHS Guidelines</li> <li>Involuntary Resettlement (OP 4.12)</li> </ul>	project budget	contractor E&S Consultant

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## Table 7-2. Land Preparation and Construction Phase Monitoring Plan

Potential impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard	Cost	Responsibility
Topsoil loss, Physical Deterioration	Amounts of the topsoil removed/stripped	Work sites and storage areas (if needed)	Amounts of the topsoil removed/stripped which will not be used in landscaping activities and stored at the determined storage area will be estimated and the data will be recorded in a Project- specific Document Control System	To prevent the topsoil from being damaged and compacted	Monthly until the topsoil removal activities and storage activities are completed	<ul> <li>WBG EHS Guidelines: Construction and Decommissioning</li> <li>WBG EHS Industry Sector Guidelines for General Manufacturing - for Construction Materials Extraction</li> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> </ul>		Niksar Municipality/PIU Contractor and/or sub- contractor
	Soil stripping, excavation and backfilling activities		Visual Observation		Daily at the project construction areas	<ul> <li>Regulations defined in Table 2-1, under the topic of Soil and Land Use</li> </ul>		
	Soil quality (spill-related	Work sites and storage	Soil Sampling and Analyzing		In case of an accident	WBG EHS Guidelines: Community Health     and Safety		
Soil contamination	pollutant parameters)	areas (if needed)	Visual Observation	ervation Daily at the pro		WBG EHS Guidelines: Environment – Contaminated Land     WBG EHS Guidelines: Construction and		
	Number of leakages/spills of oil and fuels	Administration Office	Environmental incident registry	To prevent soil contamination	Monthly basis starting from the initialization of Construction Phase	<ul> <li>Decommissioning</li> <li>WBG EHS Industry Sector Guidelines for General Manufacturing - for Construction Materials Extraction</li> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Soil and Land Use</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Erosion potential	Weather at the time of soil stripping and excavation activities	Work sites	Visual Observation	To prevent erosion caused by wind and precipitation	Daily at the project construction areas	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>WBG EHS Guidelines: Construction and Decommissioning</li> <li>WBG EHS Industry Sector Guidelines for General Manufacturing - for Construction Materials Extraction</li> <li>Environmental Assessment (OP 4.01)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Soil and Land Use</li> <li>Regulations defined in Table 2-1, under the topic of Structural Safety</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Structural Damage to Buildings (if any building is to be constructed)	Temporary Building Consent Occupancy Permit	Administration Office	Documentation Check	To take precautions against earthquake	Once as of land preparation	<ul> <li>WBG EHS Guidelines: Construction and Decommissioning</li> <li>WBG EHS Industry Sector Guidelines for General Manufacturing - for Construction Materials Extraction</li> <li>Environmental Assessment (OP 4.01)</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor

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Potential impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard	Cost	Responsibility
						<ul> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Structural Safety</li> </ul>		
Rockfall and Flood Potential	Weather at the time of soil stripping and excavation activities	Work sites	Visual Observation	To take precautions against Rockfall and Flood	Daily at the project construction areas	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>WBG EHS Guidelines: Construction and Decommissioning</li> <li>WBG EHS Industry Sector Guidelines for General Manufacturing - for Construction Materials Extraction</li> <li>Environmental Assessment (OP 4.01)</li> <li>Environmental Law</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
		Administration Office	Documentation Check (Grievance Registration)		Daily basis starting from the initialization of Construction Phase	<ul> <li>WBG EHS Guidelines: Environment – Contaminated Land</li> <li>WBG EHS Guidelines: Construction and Decommissioning</li> <li>WBG EHS Industry Sector Guidelines for</li> </ul>		
Loss of Land and Structures	Grievances about damage to neighboring lands, assets, crops and structures	Work sites	Visual Observation	To compensate the losses arising from the project activities	In case of any compliant	<ul> <li>WBG Enst industry Sector Guidelines for General Manufacturing - for Construction Materials Extraction</li> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Structural Safety</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
	Discharge from hydrotesting /	Work sites	Visual Observation	To prevent the damage	Daily basis starting from the	WBG EHS Guidelines: Environment –     Wastewater and Ambient Water Quality		
	pressure testing	Work Sites	Water Quality Analysis (if needed)	resources	initialization of Construction Phase	WBG EHS Guidelines: Construction and Decommissioning		
Impacts on Water Resources	Excavated trenches	Work sites	Visual Observation	To discharge the water accumulated in the excavated trenches after removing the sand and mud.	Daily at the project construction areas	<ul> <li>WBG EHS Industry Sector Guidelines for General Manufacturing - for Construction Materials Extraction</li> <li>WBG EHS Industry Sector Guidelines for Infrastructure - for Water and Sanitation</li> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Water and Wastewater</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Decrease in surface water quality	Surface Water Quality	Work sites	Surface Water Sampling and Analysis	To maintain existing surface water quality	In case of any compliant	<ul> <li>WBG EHS Guidelines: Environment – Wastewater and Ambient Water Quality</li> <li>WBG EHS Industry Sector Guidelines for Infrastructure - for Water and Sanitation</li> <li>Environmental Assessment (OP 4.01)</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor



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Potential impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard	Cost	Responsibility
						<ul> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Water and Wastewater</li> </ul>		
Decrease in groundwater quality	Groundwater Quality	Work sites	Groundwater Sampling and Analysis	To maintain existing groundwater quality	In case of any compliant	<ul> <li>WBG EHS Guidelines: Environment – Wastewater and Ambient Water Quality</li> <li>WBG EHS Guidelines: Construction and Decommissioning</li> <li>WBG EHS Industry Sector Guidelines for General Manufacturing - for Construction Materials Extraction</li> <li>WBG EHS Industry Sector Guidelines for Infrastructure - for Water and Sanitation</li> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Water and Wastewater</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Impacts of Waste and Wastewater on the Environment and Human Health	Waste Disposal Agreements/Protocols Records of the wastes generated (records are kept separately according to their types) Waste management and awareness trainings records	Administration Office	Documentation Check	To reduce the impact of waste on the environment and human health	Monthly	<ul> <li>WBG EHS Guidelines: Environment – Wastewater and Ambient Water Quality</li> <li>WBG EHS Guidelines: Environment – Waste Management</li> <li>WBG EHS Industry Sector Guidelines for General Manufacturing - for Construction Materials Extraction</li> <li>WBG EHS Industry Sector Guidelines for Infrastructure - for Water and Sanitation</li> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
	Conformity of waste storage areas	Temporary Waste Storage Area Work sites	Visual Observation	To meet the requirements of applicable waste management regulations	Daily	<ul> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Water and Wastewater</li> <li>Regulations defined in Table 2-1, under the topic of Waste</li> </ul>		
Excavation Waste Generation	Amount of Excavation Waste Waste Storage Area Waste Disposal Activities	Work sites Waste Storage Area	Visual Observation Documentation Check	To ensure the disposal of excavation waste that cannot be used in backfill	Monthly until the excavation activities and storage activities are completed	<ul> <li>WBG EHS Guidelines: Environment – Waste Management</li> <li>WBG EHS Guidelines: Construction and Decommissioning</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor

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Potential impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard	Cost	Responsibility
						<ul> <li>WBG EHS Industry Sector Guidelines for General Manufacturing - for Construction Materials Extraction</li> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Soil and Land Use</li> <li>Regulations defined in Table 2-1, under the topic of Waste</li> </ul>		
	Wastewater Connection Permits (if needed)				Once as of land preparation	WBG EHS Guidelines: Environment –     Wastewater and Ambient Water Quality		
	Vacuum Truck Records (if available)					WBG EHS Guidelines: Construction and Decommissioning		
Domestic Wastewater Generation	Septic Tank Discharge Records	Administration Office	Documentation Check	To prevent the damage of wastewater to water resources	Monthly	<ul> <li>WBG EHS Industry Sector Guidelines for Infrastructure - for Water and Sanitation</li> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Water and Wastewater</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Solid (Domestic) Waste	Waste Disposal Agreements/Protocols, Waste management and awareness trainings records	Administration Office	Documentation Check	To determine whether the waste is disposed of in accordance with	Monthly	<ul> <li>WBG EHS Guidelines: Occupational Health and Safety</li> <li>WBG EHS Guidelines: Environment – Hazardous Materials Management</li> </ul>	Included in	Niksar Municipality/PIU Contractor and/or sub-
Generation	Conformity of waste management activities	Temporary Waste Storage Area Work sites	Visual Observation	the relevant regulations.	Daily	<ul> <li>WBG EHS Guidelines: Environment – Waste Management</li> <li>WBG EHS Guidelines: Construction and</li> </ul>	project budget	contractor
Hazardous Waste Generation	Waste Disposal Agreements/Protocols, Waste management and awareness trainings records, Mobile Waste Collection Vehicle Records MSDS Records	Administration Office	Documentation Check	To observe whether hazardous wastes are disposed of in accordance with the Waste Management	Monthly	<ul> <li>Decommissioning</li> <li>WBG EHS Industry Sector Guidelines for Infrastructure - for Water and Sanitation</li> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
	Conformity of waste management activities	Temporary Waste Storage Area Work sites	Visual Observation	Regulation	Daily	<ul> <li>Regulations defined in Table 2-1, under the topic of Waste</li> </ul>		
Dust and Particulate Matter	Grievances about Air Quality	Administration Office	Documentation Check (Grievance Registration)	To determine the presence of any	Daily during the construction phase	WBG EHS Guidelines: Community Health and Safety     WBC EHS Guidelines: Environment	Included in	Niksar Municipality/PIU Contractor and/or sub-
	Settled dust, PM10 and PM2.5	Location of the complaint	Visual Observation	air environment	In case of any compliant	Emissions and Ambient Air Quality	projoci budgot	contractor





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TÜRKİYE CUMHURİYETİ ÇEVRE, ŞEHİRCİLİK VE İKLİM DEĞİŞİKLİĞİ BAKAN



This project is co-funded by the European Union, the Republic of Turkey and the World Bank Bu Proje Avrupa Birliği, Türkiye Cumhuriyeti ve Dünya Bankası tarafından ortaklaşa finanse edilmektedir

Potential impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard	Cost	Responsibility
			Air Quality Measurement			WBG EHS Guidelines: Construction and Decommissioning		
Exhaust Emissions	Maintenance records of all machinery and equipment Exhaust Emission Decal	Administration Office	Documentation Check	To determine whether machinery and equipment meet national and international exhaust emission standards	Weekly during construction phase	<ul> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Air Quality</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Increase in Noise Level	Grievances about Noise Level	Administration Office	Documentation Check (Grievance Registration)	To make sure that the noise levels do not	Daily during the construction phase	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>WBG EHS Guidelines: Environment –</li> </ul>	Included in	Niksar Municipality/PIU Contractor and/or sub-
	Noise Level	Location of the complaint	Noise Measurement	exceed the limit values	In case of any compliant	<ul> <li>Noise</li> <li>WBG EHS Guidelines: Construction and Decommissioning</li> </ul>	project budget	contractor
	Grievances about Vibration	Administration Office	Documentation Check (Grievance Registration)	To make sure that the	Daily during the construction phase	<ul> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> </ul>		Niksar Municipality/PIU
Vibration	Vibration Level	Location of the complaint	Vibration Measurement	vibration levels do not exceed the limit values	In case of any compliant	<ul> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Noise</li> </ul>	Included in project budget	Contractor and/or sub- contractor
Disturbance on flora and fauna species	Fauna mortality due to the Project activities (such as Project traffic) Incident records	Work sites	Visual Observation	To minimize the fauna mortality impacts on biological environment	Quarterly during the construction phase	<ul> <li>WBG EHS Guidelines: Environment – Noise</li> <li>WBG EHS Guidelines: Construction and Decommissioning</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
	Records of damage caused by project activities on Habitat	Administration Office	Documentation Check		Daily at the work sites	<ul> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> </ul>		
Habitat Loss	Habitat Integrity	Work sites	Visual Observation	To minimize habitat loss and disturbance to wildlife	Quarterly during the construction phase	<ul> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Biodiversity Conservation and Protection of Nature</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Destruction or deliberate	Chance Finds	Administration Office	Documentation Check (chance finds register)	To mitigate and prevent	Monthly during the construction phase	Physical Cultural Resources (OP 4.11)	In clude d in	Niksar Municipality/PIU
damage to cultural heritage	Machinery and equipment used around archaeological sites	Work sites	Visual Observation	adverse impacts on the cultural heritage	Daily at the work sites	Conservation of Cultural and Natural Assets Law     Chance Find Procedure	project budget	Contractor and/or sub- contractor
Disturbance due to the road closure, traffic jam	Grievances about traffic Traffic safety training records of the employees	Administration Office	Documentation Check	To raise traffic safety awareness in local community and Project	Daily during the construction phase	WBG EHS Guidelines: Community Health     and Safety	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor

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TÜRKİYE CUMHURİYETİ ÇEVRE, ŞEHİRCİLİK VE İKLİM DEĞİŞİKLİĞİ BAKAN SÜRDURULEBILIR SEHIRLER



This project is co-funded by the European Union, the Republic of Turkey and the World Bank Bu Proje Avrupa Birliği, Türkiye Cumhuriyeti ve Dünya Bankası tarafından ortaklaşa finanse edilmektedir

Potential impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard	Cost	Responsibility
due to the construction vehicles, etc.	Records of traffic accidents / incidents occurred due to Project Activities			employees, and provide traffic safety		<ul> <li>WBG EHS Industry Sector Guidelines for Infrastructure - for Water and Sanitation</li> <li>WBG EHS Industry Sector Guidelines for</li> </ul>		
	Traffic Flow	Work sites	Visual Observation		Daily	<ul> <li>General Manufacturing - for Construction Materials Extraction</li> <li>Highways Traffic Law</li> <li>Regulation on Highway Traffic</li> <li>Regulation on the Road Transportation of Hazardous Goods</li> </ul>		
Improper Working Conditions	Environmental Hygiene Internal Grievances	Administration Office	Documentation Check	To increase the working conditions of workers	Weekly during the construction phase	<ul> <li>WBG EHS Guidelines: Occupational Health and Safety</li> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Workers Engaged by Third Parties and the Supply Chain	ESMS implementation of Subcontractors	Administration Office	Documentation Check Visual observation	To increase the working conditions of workers	Prior to agreement during the construction phase	<ul> <li>WBG EHS Guidelines: Occupational Health and Safety</li> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Child labor, forced labor and unregistered employment	Labor registers	Administration Office	Documentation Check	To prevent unregistered employment, child labor and forced labor	Prior to recruitment during the construction phase	<ul> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Temporary labor influx Risk of social conflict Impacts on community dynamics	Existence and requirements of the Workforce Management Plan	Administration Office	Documentation Check	To avoid a possible future dispute between the Municipality and the Contractor.	Prior to contract process during the construction phase	<ul> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Inadequate workers' health and safety conditions Increase in community exposure to hazards	Existence and requirements of the OHS Management Plan and EPR Plan Training Records Incident investigation Grievance recorded Incident records Presence of Personal Protective Equipment Conformity of OHS	Administration Office Work sites	Documentation Check (training records, OHS documents) Visual Observation (field implementation activities of the relevant	To detect, prevent and intervene diseases and accidents	Weekly Daily	<ul> <li>WBG EHS Guidelines: Occupational Health and Safety</li> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor



TÜRKİYE CUMHURİYETİ ÇEVRE, ŞEHIRCİLİK VE İKLİM DEĞİŞİRLİĞİ BAKANLİ



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Potential impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard	Cost	Responsibility
Lincertainty of Emergency	Emergency Drill Records	Administration Office	Documentation Check (Drill records, EPR documents)	To prevent injury to people in dangerous	Weekly	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>Environmental Assessment (OP 4.01), via</li> </ul>	Included in project budget	Niksar Municipality/PIU
Response Methods	Emergency response equipment such as first aid kits and firefighting equipment	Work sites	Visual Observation	situations and to minimize damage to the environment	Daily	<ul> <li>reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>		Contractor and/or sub- contractor
Increase in Health Problems	Period of disease occurrence Local Disease Statistics Number of people/personnel infected with a contagious disease Drinking Water Quality (if available) Environmental and Hygiene Standards Training Records	Administration Office	Documentation Check (Disease follow-up record, training records and Drinking Water Quality Analysis)	To ensure occupational and community health	Weekly during the construction phase	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
	Environmental Hygiene	Work sites	Visual Observation	-	Daily			
	Vocational Training Certificate Work and exposure records	Administration Office	Documentation Check (training certificate, work and exposure records)	To check whether the principles of Working with Asbestos are complied with	Weekly during the construction phase	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>WBG EHS Industry Sector Guidelines for Infrastructure - for Water and Sanitation</li> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	Included in	Niksar Municipality/PIU
Asbestos Pipe	Presence of Personal Protective Equipment Conformity of asbestos management activities	Work sites	Visual Observation		On the days of Working with Asbestos		project budget	Contractor and/or sub- contractor
Impacts on Local Economy, Livelihood Sources and Employment	Number of affected business owner Loss of income from access restrictions	Work sites	Survey studies (if needed) Face-to-face meetings with affected business owners	To determining whether businesses around the project area are affected by the project	Monthly during the construction phase	<ul> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Involuntary Resettlement (OP 4 12)</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub-
	Grievances about loss of income	Administration Office	Documentation Check (Grievance Registration)	activities	Daily during the construction phase			contractor
Impacts on Vulnerable Groups	Grievances from Vulnerable Groups	Administration Office	Documentation Check (Grievance Registration)	To determining whether on Vulnerable Groups are excluded from decision-making processes, receive socially inappropriate	Daily during the construction phase	<ul> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Involuntary Resettlement (OP 4.12)</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor

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Potential impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard	Cost	Responsibility
	Stakeholder engagement activities implementation			benefits from project activities, or risk negatively impacting their livelihoods				
Impacts on Infrastructure Status and Social Services	Relevant Permits and Protocols Corporate announcement records regarding service cuts Number of damages	Administration Office	Documentation Check	To ensure that the works are carried out in a way that will not damage the infrastructure status	Monthly during the construction phase	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>Environmental Assessment (OP 4.01)</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
	Other infrastructure     Visual Observation       administrations complaints     Work sites	about service cuts	In case of any compliant					
Greenhouse gas emissions	Maintenance records of all machinery and equipment Exhaust Emission Decal Energy consumption records	Administration Office	Documentation Check	To reduce greenhouse gas emissions	Weekly during construction phase	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Air Quality</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Communication issues with the stakeholders	Stakeholder engagement activities implementation Grievance redress mechanism – number and types of grievances recorded, addressed and analyzed	Administration Office	Documentation Check (Engagement records, Grievance Registers)	To inform Stakeholders about the Grievance redress mechanism To check whether the issues specified in the stakeholder engagement plan are fulfilled	Upon each engagement	<ul> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Involuntary Resettlement (OP 4.12)</li> </ul>	Included in project budget	Niksar Municipality/PIU Contractor and/or sub- contractor

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Table 7-3. Operational Phase Monitoring Plan

Potential Impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard	Cost	Responsibility
Waterborne DiseasesAnnex-1 of the Regulation on Water Intended for Human ConsumptionMunicipa (Chlorine Chamb	Annex-1 of the	Municipal Water	Analysis of water quality via SCADA	To determine whether it meets human	Constantly	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>WBG EHS Guidelines: Environment – Wastewater and Ambient Water Quality</li> <li>WBG EHS Industry Sector Guidelines for Infrastructure - for Water and Sanitation</li> </ul>	Included in	
	(Chiorine Dosing Chambers)	Analysis of water quality with portable measuring equipment (for limited parameter)	consumption standards	On the site	<ul> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Water and Wastewater</li> </ul>	budget		
Chlorine Gas Leakage	Chlorine Concentration	Chlorine Dosing Chambers Water reservoirs	With Automatic Gas Detection and Alarm Equipment	To prevent chlorine gas leakages which are dangerous for those who inhale it	Constantly	<ul> <li>WBG EHS Guidelines: Occupational Health and Safety</li> <li>WBG EHS Guidelines: Community Health and Safety</li> </ul>	Included in operation budget	Niksar Municipality/PIU
	Soil quality (spill-related pollutant parameters)	Maintenance sites	Soil Sampling and Analyzing Visual observation		Measurement when required Daily visual checks at the project excavated areas	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>WBG EHS Guidelines: Environment – Contaminated Land</li> <li>WBC ELIS Inductor Sector Guidelines</li> </ul>		
Soil Contamination and Physical Deterioration Number of leakages/spills of oil and fuels Environmental incident registry (exca mainter St	(excavated areas for maintenance and repair) Storage Areas (if needed)	(excavated areas for laintenance and repair) Storage Areas (if needed) Documentation Check	To prevent soil contamination	Daily	<ul> <li>for Infrastructure - for Water and Sanitation</li> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Soil and Land Use</li> </ul>	Included in operation budget	Niksar Municipality/PIU	
Water Overflows	Fault Condition Water Pressure	Municipal Water System (on SCADA) At pumping stations	Monitoring of pressure via SCADA Site Inspection	To prevent network failures and maintain water quality	Constantly	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>WBG EHS Guidelines: Environment – Wastewater and Ambient Water Quality</li> </ul>	Included in operation budget	Niksar Municipality/PIU

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Potential Impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard	Cost	Responsibility
	Equipment Maintenance Forms	Municipality	Documentation Check (Maintenance records)		Weekly	<ul> <li>WBG EHS Industry Sector Guidelines for Infrastructure - for Water and Sanitation</li> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Water and Wastewater</li> </ul>		
Increase in Noise Level	Grievances about Noise Level	Municipality	Documentation Check (Grievance Registration)	To make sure that the noise levels do not	Daily during the operational phase	WBG EHS Guidelines: Community Health and Safety	Included in operation	Niksar Municipality/PIU
	Noise Level	Location of the complaint	Noise Measurement	exceed the limit values	In case of any compliant	Noise	budget	
	Grievances about Vibration	Municipality	Documentation Check (Grievance Registration)		Daily during the operational phase	<ul><li>Environmental Assessment (OP 4.01)</li><li>Natural Habitats (OP 4.04)</li></ul>		
Vibration	n Vibration Level Location of the complaint Vibration Measurement exceed th	To make sure that the vibration levels do not exceed the limit values	ke sure that the on levels do not I the limit values In case of any compliant	<ul> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Noise</li> </ul>	Included in operation budget	Niksar Municipality/PIU		
Dust and Particulate Matter	Grievances about Air Quality	Municipality	Documentation Check (Grievance Registration)	To determine the presence of any	Monthly during the operational phase	WBG EHS Guidelines: Community Health and Safety	Included in	Niksar Municipality/PILL
Generation	Settled dust, PM10 and PM2.5	Location of the complaint	Air Quality Measurement	adverse effects on the air environment	In case of any compliant	WBG EHS Guidelines: Environment – Air Emissions and Ambient Air Quality     Environmental Assessment (OP 4.01)	budget	
Exhaust Emissions	Maintenance records of all machinery and equipment Exhaust Emission Decal	Municipality	Documentation Check	To determine whether machinery and equipment meet national and international exhaust emission standards	Weekly during operational phase	<ul> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Air Quality</li> </ul>	Included in operation budget	Niksar Municipality/PIU
Excavation Waste Generation	Amount of Excavation Waste and Waste Storage Area	Maintenance sites Waste Storage Area	Visual Observation Documentation Check	To ensure the disposal of excavation waste that cannot be used in backfill	Upon excavation	<ul> <li>WBG EHS Guidelines: Environment – Waste Management</li> <li>WBG EHS Guidelines: Construction and Decommissioning</li> <li>WBG EHS Industry Sector Guidelines for General Manufacturing - for Construction Materials Extraction</li> <li>Environmental Assessment (OP 4.01)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Soil and Land Use</li> <li>Regulations defined in Table 2-1, under the topic of Waste</li> </ul>	Included in operation budget	Niksar Municipality/PIU

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TÜRRYE CUMHURYETİ ÇEVRE, ŞEHİRCİLİK VE İRLİM DEĞİŞİRLİĞİ BAKANLIĞ

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Potential Impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard	Cost	Responsibility
Waste Generation	Waste management and awareness trainings records Type and amount of waste generated Waste Disposal Agreements/Protocols	Facilities	Documentation Check (Waste Records, Training Records)	To meet the requirements of applicable waste management	Monthly	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>WBG EHS Guidelines: Environment – Hazardous Materials Management</li> <li>WBG EHS Guidelines: Environment – Waste Management</li> <li>WBG EHS Guidelines: Construction and Decommissioning</li> </ul>	Included in	
	Conformity of waste management activities	Maintenance sites	Visual Observation	To reduce the impact of waste on the environment and human health.	Weekly	<ul> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Waste</li> </ul>	budget	Niksar Municipality/PIU
	Internal Grievances	Municipality	Documentation Check		Daily during the operational phase	WBG EHS Guidelines: Occupational Health and Safety		
Improper Working Conditions	Environmental Hygiene	Maintenance sites	T wor Visual Observation	To increase the working conditions of workers	Daily	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	Included in operation budget	Niksar Municipality/PIU
Workers Engaged by Third Parties and the Supply Chain	ESMS implementation of Subcontractors	Administration Office	Documentation Check	To increase the working conditions of workers	Prior to agreement during the operational phase	<ul> <li>WBG EHS Guidelines: Occupational Health and Safety</li> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	Included in operation budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Child labor, forced labor and unregistered employment	Statement of Employment (for contractors and subcontractors)	Administration Office	Documentation Check	To prevent unregistered employment, child labor and forced labor	Prior to recruitment during the operational phase	<ul> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	Included in operation budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Labor Influx	Recruitments	Administration Office	Documentation Check (contract terms of potential contractors and subcontractors)	To avoid the negative effects of the labor influx and to give priority to local people in recruitment	Prior to recruitment during the operational phase	<ul> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	Included in operation budget	Niksar Municipality/PIU Contractor and/or sub- contractor
Inadequate workers health and safety conditions	Existence and requirements of the OHS Management Plan and EPR Plan	Municipality	Documentation Check (training records, OHS documents)	To detect, prevent and intervene diseases and accidents.	Monthly	<ul> <li>WBG EHS Guidelines: Occupational Health and Safety</li> <li>WBG EHS Guidelines: Community Health and Safety</li> </ul>	Included in operation budget	Niksar Municipality/PIU



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Potential Impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard	Cost	Responsibility
Increase in community exposure to hazards.	Training Records Number of incidents Incident investigation Grievances recorded					<ul> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>		
	Presence of Personal Protective Equipment Conformity of OHS management activities	Maintenance sites	Visual Observation		Daily			
Uncertainty of Emergency Response Methods	Existence and requirements of the EPR Plan Emergency Drill Records	Municipality/PIU Office	Documentation Check (drill records, EPR documents)	To prevent injury to people in dangerous situations and to	Monthly	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> </ul>	Included in operation	Niksar Municipality/PIU
	Emergency response equipment such as first aid kits and firefighting equipment Visual Observation	the environment	Daily	<ul> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	budget			
Increase in Health Problems	Period of disease occurrence Environmental Hygiene Number of people/personnel infected with a contagious disease Environmental and Hygiene Standards Training Records	Maintenance sites Municipality	Documentation Check (Disease follow-up record and training records)	To ensure occupational and community health	Monthly during the operational phase	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Occupational Health and Safety Law</li> <li>Regulations defined in Table 2-1, under the topic of Health, Safety and Labor</li> </ul>	Included in operation budget	Niksar Municipality/PIU
Disturbance due to the road closure, traffic jam due to the maintenance activities, etc.	Grievances about traffic Traffic safety training records of the employees Records of traffic accidents / incidents occurred due to Project Activities	Municipality	Documentation Check	To raise traffic safety awareness in local community and workers, and provide traffic safety	Monthly during the operational phase	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>WBG EHS Industry Sector Guidelines for Infrastructure - for Water and Sanitation</li> <li>WBG EHS Industry Sector Guidelines for General Manufacturing - for Construction Materials Extraction</li> </ul>	Included in operation budget	Niksar Municipality/PIU
	Traffic Flow	Maintenance sites	Visual Observation	traffic safety	Upon each maintenance activity carried out on the road and its surroundings.	<ul> <li>Highways Traffic Law</li> <li>Regulation on Highway Traffic</li> <li>Regulation on the Road Transportation of Hazardous Goods</li> </ul>		

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Potential Impact	Which parameters shall be monitored?	Where the parameters shall be monitored?	How the parameters shall be monitored?	Why parameters should be monitored?	When the parameters shall be monitored?	Monitoring Requirements/ Relevant Legislation - Standard	Cost	Responsibility
Greenhouse gas emissions	Maintenance records of all machinery and equipment Exhaust Emission Decal Energy consumption records	Municipality	Documentation Check	To reduce greenhouse gas emissions.	Monthly during the operational phase	<ul> <li>WBG EHS Guidelines: Community Health and Safety</li> <li>Environmental Assessment (OP 4.01)</li> <li>Natural Habitats (OP 4.04)</li> <li>Environmental Law</li> <li>Regulations defined in Table 2-1, under the topic of Environmental Permit and Licenses</li> <li>Regulations defined in Table 2-1, under the topic of Air Quality</li> </ul>	Included in operation budget	Niksar Municipality/PIU
Communication issues with the stakeholders	Stakeholder engagement implementation activities Grievance redress mechanism – number and nature of grievances recorded, addressed and analyzed	Municipality	Documentation Check (Engagement records, Grievance Registers)	To inform Stakeholders about the Grievance redress mechanism To check whether the issues specified in the stakeholder engagement plan are fulfilled	Upon each engagement	<ul> <li>Environmental Assessment (OP 4.01), via reference to WBG EHS Guidelines</li> <li>Involuntary Resettlement (OP 4.12)</li> </ul>	Included in operation budget	Niksar Municipality/PIU





## 8 INSTITUTIONAL ARRANGEMENTS

To ensure that works associated with the Project i.e., improving water network system of Niksar district, are undertaken in a manner that minimizes potential impacts, it is necessary to have resources dedicated to managing the environmental and social issues.

In this context, first of all, the current administrative structure of Niksar Municipality was evaluated, and the institutional infrastructure needed to provide the specified services was tried to be revealed.

## 8.1 Current Administrative (Institutional) Structure

The organizational chart of Niksar Municipality is given in Figure 8-1. The directorates within the municipality are divided into two main service units, administratively and technically. There are seven directorates affiliated to administrative affairs and seven directorates affiliated to technical affairs.

There are four supervisors within the Directorate of Civil Work of the Municipality of Niksar, and the water administration of the municipality is referred to as the water network supervisor within this directorate.





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Niksar Municipality has one water plant, one cold storage warehouse, one cobblestone workshop, one sand screening plant, one slaughterhouse, rental workplaces and one wedding hall. Municipal revenues, on the other hand, consist of general budget revenues, taxes, fees, rents, Ayvaz spring water, enterprises, drinking water and city bus revenues.

On the Niksar Municipality Web Site, there is a "Beyaz Masa", a mechanism where problems related to local government are communicated and the resolution process is followed.

#### 8.2 Roles and Responsibilities

It is in the responsibility of Niksar Municipality to manage the issues specified in the ESMP prepared for the healthy execution of the project and to ensure that the necessary mechanisms are developed and implemented by the Contractor.

In consideration with this ESMP, the Science Affairs Directorate, the Survey Project Directorate, the Plan-Project Directorate, the Headmen's Office, the Human Resources and Education Directorate, the Cultural and Social Affairs Directorate and the Editorial Office will take charge.

The studies to be carried out within the scope of this ESMP and the parties responsible for these studies are presented in Table 8-1. Moreover, a summary flowchart of the roles and responsibilities are given in Figure 8-2.

Institution	Roles and Responsibilities
World Bank	<ul> <li>Supervising the implementation and recommendations of project ESMPs,</li> <li>Recommend additional measures for strengthening the management framework and implementation performance,</li> <li>Overall supervision and provision of technical support and guidance to ensure that the Project is in compliance with WB Safeguards Policies,</li> <li>Visit project sites on occasion, and as required, as part of project supervision,</li> <li>Reviewing, approving, and disclosing ESMPs on WB's official website.</li> </ul>
ILBANK	<ul> <li>Preparation of Niksar Municipality's project documents in accordance with WB requirements and providing guidance on public participation and announcement requirements,</li> <li>Providing guidance to Niksar Municipality officials and consultants on WB's requirements for protection measures (documents and procedures) on cultural assets, land acquisition and involuntary resettlement, natural habitats, forests and international waterways,</li> <li>Reviewing the documents related to the environmental and social assessment of the project, provide comments to consultants, and giving official approval to these documents and procedures in accordance with the WB safeguards requirements, performing an overall quality assurance function that the EA documents prepared meet WB requirements,</li> <li>Monitoring work such as the implementation of the ESMP and other environmental and social mitigation measures,</li> <li>Monitoring and auditing Niksar Municipality's ESMP practices and giving feedback on its performance, recommendations and further steps to be taken within the overall project audit,</li> <li>Informing WB via Environmental and Social Monitoring Reports (ESMRs), which will be submitted by Niksar Municipality quarterly.</li> <li>Submitting Project Progress Reports to WB every 6 months,</li> </ul>

Table 8-1. Roles and Responsibilities of the studies to be carried out within the scope of the ESMP











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Institution	Roles and Responsibilities
	<ul> <li>Obtaining the opinions of relevant groups and local environmental/social experts about the environmental and social aspects of the project implementation and meeting with these groups during the field visits, when necessary,</li> <li>Providing coordination and communication regarding the field visits to be made within the scope of the WB inspection missions regarding the environmental and social protection measures of the project implementation.</li> </ul>
Niksar Municipality	<ul> <li>Preparing the tender documents during the implementation, carrying out the tenders in accordance with the legislation of the Public Procurement Authority and the legal requirements of WB, following the Construction Contract and working in cooperation with ILBANK for construction supervision,</li> <li>Implementation of the ESMP and related management plans and fulfillment of all commitments under the ESMP,</li> <li>Sharing the ESMP with the Contractor, guiding the Contractor in preparing the submanagement plans, approving these plans,</li> <li>Updating the ESMP when necessary and sharing additional commitments with the Contractor,</li> <li>Environmental review, monitoring and audits related to ESMP practices, evaluation of results,</li> <li>Informing ILBANK via Environmental and Social Monitoring Reports (ESMRs) quarterly, which will be submitted by contractors on a monthly basis,</li> <li>Auditing contractor activities in line with ESMP requirements,</li> <li>Providing EHS trainings to all Project staff,</li> <li>Ensuring compliance with project standards, taking urgent action in case of noncompliance,</li> <li>Stopping work in any situation that threatens environment and community and occupational health and safety,</li> <li>Providing follow-up and analysis of environmental (including OHS) and social accidents/incidents,</li> <li>Ensuring stakeholder participation, implementing the grievance redress mechanism, ensuring continuous information transfer through open communication,</li> <li>Notify ILBANK and WB within three business days of any contingencies such as environmental, social and labor issues or accidents, incidents or loss of time that has or is likely to have a significant adverse impact on the environment, affected communities, the public or workers,</li> <li>Coordinating the actions and evaluations in case of a change due to engineering/design changes, route/location changes, legislative changes related to environmental and social issues, authorization provision changes, new environmental/</li></ul>
Contractor	<ul> <li>Fulfillment of all requirements of ESMP and management plans,</li> <li>Implementation of additional commitments determined by Niksar Municipality,</li> <li>Ensuring compliance with project standards, obtaining all relevant permits and licenses,</li> <li>Monitoring of construction activities (including subcontractor activities) and taking measures within the scope of ESMP,</li> <li>Development of sub-management and monitoring plans/procedures in accordance with the ESMP structure, implementation after the approval of Niksar Municipality,</li> <li>Employment of competent Environmental, Social and OHS Experts (at least one Social Expert, one Environmental Expert and one OHS Expert) within the scope of the project,</li> <li>Providing necessary training on environmental and social issues to contractor and subcontractor personnel,</li> <li>Ensuring the follow-up and analysis of environmental and social accidents,</li> <li>Environmental audits, monitoring and audits related to ESMP practices, reporting to Niksar Municipality.</li> </ul>



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Institution	Roles and Responsibilities
	<ul> <li>Submission of monthly Environmental and Social Monitoring Reports (ESMRs) to the Project Owner,</li> <li>Immediate notification of the contingencies such as environmental, social and labor issues or accidents, incidents or loss of time to the Project Owner and keeping an event log on site throughout the life of the Project. The incident report including root cause analysis and the corrective actions to be taken will be submitted to ILBANK and WB within 30 days.</li> </ul>
Supervision Consultant	<ul> <li>Supervision of construction and/or rehabilitation works and installation of equipment,</li> <li>Identification and management of environmental, social and OHS related risks,</li> <li>Ensuring initiation of corrective actions where necessary implementation of mitigation measures by the contractor, and sufficient capacity in the team to perform E&amp;S supervision effectively in accordance with the requirements of the ESMP,</li> <li>Procuring regularly (monthly) report the E&amp;S performance of the contractor to the Municipality and ILBANK,</li> <li>Preparing time-bound action plans for the contractor in case of non-compliance,</li> <li>Using the contractual authority and notifying ILBANK and the Municipality on time if non-compliances persist,</li> <li>Monitoring and evaluating the performance of the services provided by the Contractor,</li> <li>Providing guidance on public participation and announcement requirements in compliance with WB requirements,</li> <li>Providing guidance to Niksar Municipality officials and consultants on the WB's requirements (documents and procedures).</li> </ul>
E & S Consultant	<ul> <li>Preparing the Environmental and Social Assessment Study Reports, i.e. ESMP and SEP (and RAP/LRP if required), for the approval of ILBANK and WB;</li> <li>Taking a part in organizing the ESMP introduction meeting to be held for the public and NGOs as part of the project; and</li> <li>Finalizing the reports as per the concerns/opinions of the stakeholders</li> </ul>



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Figure 8-2. Summary Flowchart of Roles and Responsibilities

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ILBANK Project Management Unit (PMU) will include one environmental, one social and one OHS specialist to supervise the implementation of the ESMP. The specialists will supervise the implementation of the ESMP by Niksar Municipality and document performance, recommendations and any further actions required. They will provide guidance to municipality officials on World Bank procedures, consultation and disclosure requirements.

Niksar Municipality holds ultimate responsibility for the environmental and social performance of the overall Project, including the performance of its contractors and any other contractors. A Project Implementation Unit (PIU) will be established to carry out operational and administrative tasks. The PIU will consist of at least six people, the head of the PIU, two financial experts, one environmental expert, one social expert and one OHS expert. The PIU staff will be the municipality's own staff.

The Municipality's environmental engineer/expert, who will act as the Environmental Manager of this Project, will oversee the implementation of the ESMP and monitoring progress. The environmental engineer/expert will be supported by environmental consultants, when necessary. Environmental engineer/expert will appoint a representative on the site to lead the development of this ESMP, and site implementation of it. In addition, the Municipality informs the public about the services provided within the scope of the project via its own website.

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Niksar Municipality is the owner of the Water Network Projects and is responsible for the implementation of the ESMP, indirectly during the construction phase and directly during the operation phase. Niksar Municipality will include the Environmental and Social Management Plan (ESMP) in the tender documents prepared while selection of the contractor for the construction work. For this reason, it will be ensured that the contractor submits a proposal that includes the costs related to the management of environmental and social issues, and any problems during the execution of the contract will be avoided. In this context, the works related to reducing the environmental and social impacts requested by the contractor but not included in the tender dossier of most projects can be easily handled.

All conditions and rules in the ESMP document, which is a part of the contract document, will be implemented by the contractor in the field and technical office. The trainings specified in Section 8.4 will be given by the Contractor to the personnel who will work during the construction phase. The information obtained at the consultation meetings to be held by the contractor will be provided to Niksar Municipality. Complaints that will come directly to the Contractor will be regularly reported to Niksar Municipality. Project activities will be regularly monitored by the Contractor and monthly Environmental and Social Monitoring Reports (ESMRs) to be prepared within the scope of ESMP will be submitted to Niksar Municipality.

The Supervision Consultant will have at least one Environmental Expert, one Social Expert and one Occupational Health and Safety Expert in its team. Number of experts will be increased, if necessary. Supervision Consultant will oversee the supervision of construction and/or rehabilitation works and installation of equipment. The respective experts will be responsible for identification and management of environmental, social and OHS related risks and will ensure initiation corrective actions where necessary. The experts will also monitor and evaluate the performance of the services provided by the Contractor.

The World Bank and ILBANK will be promptly notified of any incident or accident related to the Project which has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public 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, 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 World Bank's Environment and Social Incidence Response Toolkit. Subsequently, per the Bank's request, a report on the incident or accident and propose any measures to prevent its recurrence will be prepared.

Therefore, Niksar Municipality will report details of any significant environmental or social incidents (e.g. fatalities, lost time incidents, environmental spills etc.) within three business days and submit an incident report, precautions and compensation measures taken within 30 business days. ILBANK will forward the incident report to the World Bank immediately upon receipt from Niksar Municipality. Prompt notification of any accident and incident will remain inclusive under the contractor's ESMP.

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## 8.3 Implementation of ESMP Disclosure

It is the responsibility of the Niksar Municipality to ensure that this ESMP is fully integrated into and implemented in all Project preparation and planning activities. The ESMP shall form part of any tender documentation for physical works within the scope of the Project, and it should be ensured that the technical requirements of Project bid documentation are subject to review against this ESMP for appropriate implementation of safeguard measures.

As part of the requirements of WB Safeguard Policies, the ESMP is to be publicly disclosed and will be in the responsibility of the Project Implementation Unit (PIU). The Niksar Municipality will ensure that the final approved ESMP to be disclosed will be available locally at the Niksar Municipality offices, places easily accessible to affected groups as Mukhtars offices and local NGOs, which are described in detail under Chapter 10 of this report and will be published on Niksar Municipality's website (<u>http://www.niksar.bel.tr/</u>). The ESMP is a dynamic document and will be reviewed, updated, and approved as necessary throughout the implementation of the Project. For each approved updated version of this ESMP, the Niksar Municipality will be responsible for disclosure through the communication channels.

Within the scope of environmental and social assessment studies, ESMP and Stakeholder Engagement Plan (SEP) have been prepared to be disclosed. In addition, this ESMP has overlaps and cross-links with the Internal and External Grievance Redress Mechanism Procedure that will be prepared for the Project by the Consultant before the implementation of the project. Further information related to implementation and disclosure of ESMP and other documents to be prepared are mentioned under Chapter 10 of this ESMP.

#### 8.4 Training

The Project Owner, the Niksar Municipality, shall carry out a training and awareness program covering ESMP expectations and commitments. Supervision Consultant shall organize, together with the Project Owner, a workshop for this training. As a minimum requirement, this program shall be implemented as training for employees and contractors responsible for the implementation of ESMP. The Project Owner shall provide training to employees and subcontractors before the construction phase starts. The training shall last at least two days and be organized twice a year. Depending on the level of responsibility for implementing ESMP, further training programs may need to be implemented.

Necessary training shall be given to the person before the recruitment process. Compliance with the code of conduct rules, including gender-based violence, sexual harassment, sexual exploitation and abuse, which are included in the training to be provided, shall be in the contract articles of the personnel. The contract shall clearly state the sanctions for non-compliance with the code of conduct.

Measurement and evaluation should be done at the end of the training given to the personnel. This is intended to enhance the personnel's competency. According to the review results, the training program can be modified, or trainers can be replaced or training can be repeated, if needed, upon determining whether the training is effective.

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

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Purpose of ESMP regarding the Project activities,

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Requirements in management plans and monitoring activities to be performed within the scope of this plan,

- Understanding of the sensitive environmental and social receptors within the project area and its vicinity, and
- Awareness-raising about the potential risk and impacts from the project activities,
- Grievance redress mechanism developed within the scope of the project, grievance redress mechanism officer and employee rights,
- Community health and safety risks and measures,
- OHS, first aid, emergency preparedness,
- Covid-19 related measures and protection measures,
- Code of conduct and clothing,
- Communication with the local community,
- Code of conduct training, including gender-based violence, sexual harassment, sexual exploitation and abuse,
- Traffic and road safety principles, and
- **7** Training aiming at the sorting, storage and environmental planning of waste.

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

An example of the basic training program to be developed and delivered by the PIU for the ESMP implementation is given in Table 8-2.

	Item-1	Item-2
Training course	Environmental supervision, monitoring and reporting	Implementation of mitigation measures
Participants	Environmental staff, technical staff, and administrative staff of the PIU	Contractor, related authorities: On-site construction management staff, environmental staff of contractor, related authorities
Time	Soon after the project effectiveness but at least 1 month before the construction of the contract. The follow-up training will be scheduled as needed.	After signing the works contract
Duration	Two days of training twice a year to be repeated on a yearly basis until the end of the DLP.	Two days of training twice a year to be repeated on a yearly basis depending on needs.
Content of the Training	General environmental and social management relating to the Project Requirements on environmental monitoring Monitoring and implementation of mitigation measures Guide and supervise contractor in implementation of the ESMP Documentation and reporting Risk response and control	Overview of potential impacts and mitigation measures Requirements of environmental monitoring Occupational Health and Safety Training Role and responsibilities of the contractor Content and methods of implementation of environmental mitigation measures Response and risk control Preparation and submission of report

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Table 8-2. Recommended Training Program











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	Item-1	Item-2
	Other areas to be determined	Risk response and control Code of Conduct Other areas to be determined
Trainer	Environmental and Social Consultant or ILBANK	PIU with support of the Technical Assistance team

# 8.5 Environmental and Social Monitoring Report

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

The results of technical assessments of relevant issues given in Table 7-1, Table 7-2 and Table 7-3 will be presented in the monitoring report. The results shall be compared with the national legislative requirements and WBG EHS Guidelines. The results of the visual observations together with the key issues observed will be submitted in written form. The report should focus on the negative findings as well as the good practices. The negative findings should be supported with photographical evidence. For each negative observation, corrective action should be suggested with a reasonable due date. Any analysis/sampling/measurement report should be given as an annex of the report together with the relevant assessment and necessary remediation activities. The findings of the Environmental and Social Monitoring Reports will keep this ESMP as a living document; thus, the ESMP should be reviewed and revised by the environmental and social unit of the Municipality according to these findings.

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

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# 9 GRIEVANCE REDRESS MECHANISM (GRM)

Managing, avoiding, minimizing and effective handling of grievances is an integral part of a sound stakeholder engagement strategy. Experience indicates that a significant number of grievances arise from misunderstandings and that such grievances can be avoided or reduced through proactive and consistent engagement with communities. Engagement also helps anticipate and review community concerns to prevent them from escalating to grievances. For this reason, the following Grievance Redress Mechanism (GRM) as per WB policies, which is given in detail in the Stakeholder Engagement Plan of the Project, will be implemented by Niksar Municipality throughout the lifetime of the Project including pre-construction, construction, and operation phases. A specific Project GRM is useful for:

- Addressing community and individual concerns and complaints before they escalate beyond control,
- Reducing developers/project executing agencies exposure to litigation and related risks and costs,
- Identify and implement appropriate and mutually acceptable actions to address complaints,
- Ensure that complainants are satisfied with the outcome of the corrective actions and
- Avoid the tendency to resort to judicial proceedings.

Grievances are useful indicators of a Project's environmental and social performance. High number of grievances may point out a need to adjust work practices or procedures to mitigate adverse effect or conflicts with the stakeholders.

During the interviews and discussions carried out with the Mukhtars of the neighborhoods located within the AoI of the Project, service availability in Turkish for the GRM will be adequate as there is no individual/groups speaking different languages in respective neighborhoods. However, the GRM will stand ready to adjust itself to any language needed when necessary.

On the Web Site of Niksar Municipality, there is "Beyaz Masa", the mechanism through which the grievances/requests related to municipality's activities are communicated and the resolution process is followed (please refer to Figure 9-1). Also, the municipality has a phone line (0850 633 06 60) that is accessible 24/7.



Figure 9-1 Screenshot of Niksar Municipality Official Web Page





"Beyaz Masa" applications are primarily evaluated by the municipality's editorial office. Grievances received on the Beyaz Masa are directed to the relevant branch office. Afterwards, there is no feedback on whether the complaint has been resolved or not. In addition, it was stated that there is no database regarding applications and complaints, only written complaints records are kept in the current situation.

Therefore, within the scope of proposed project, arrangements should be made in terms of collection, recording and feedback of the grievances within the existing system, or a new Grievance Redress Mechanism should be established for the Project.

In fact, the Information Application Form within the website should be arranged / revised according to content of the Grievance Form.

In addition, PIU team should be formed within the Municipality and the Project-related grievances, requests and suggestions should be forwarded to this team to be recorded, tracked and monitored, and to give feedback to the grievance holder.

Since the existing established system (Beyaz Masa) does not have a mechanism and registration system in line with international standards, a Grievance Redress Mechanism will need to be established for the Project. It is planned to implement this system to be created together with Niksar Municipality and PIU.

In order to establish an effective GRM, specific GRM software will be designed and put in effect by ILBANK for its projects (the effectuation date will be determined in the upcoming months). Relevant software will be accessible and usable by the municipality focal staff members to register feedback and complaints.

Grievances, requests, suggestions, and opinions will be recorded through the Community Liaison Officer (CLO) to be assigned by Niksar Municipality. The grievances collected regarding the Project should be recorded on the Grievance Registration Forms provided in Annex-G and then they should be registered in the Grievance Database. Grievance registration forms will be sent to the PIU on the same day (if possible, as soon as the complaint is received). Within 2 business days after the complaint is received, a notification should be sent to the complaint by CLO stating that the complaint has been received and evaluated.

The PIU team will also have access to the grievance database to be created within the scope of the project and will be constantly updated by the PIU Social Expert. The process will be followed through the Grievance Database. The complaint database will include complainant information, date of receipt of complaint/suggestion, date and method of feedback to complainant, current status of complaint (open, under review, closed, rejected) and explanations of that current situation (like this one why it was rejected), closing/rejection and feedback dates.

For the grievances which can or should be resolved by the contractor/subcontractor, the contractor/subcontractor has the responsibility to resolve them. In fact, all grievances received by the contractors and subcontractors will be recorded and informed Niksar Municipality and the Council's Community Liaison Officer (CLO) using grievance registration forms. CLO will also register those grievances received by the Contractors/subcontractors into the Grievance Database. On the same day, it will be opened to the access of PIU via data entry of the Grievance Database.

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Niksar Municipality and PIU team will also establish a project specific internal GRM Team for the employees of the Project including the ones of contractors / sub-contractors / suppliers. This GRM Team will be in place to cover the grievances related to labor conditions. Niksar Municipality and PIU team will assess the grievances and suggest solutions for employees of direct and contracted employees with the use of this internal GRM which will be easily accessible for all Project workers.

The municipality official who will manage the GRM Team will be informed about the guide prepared by the WB on the prevention of sexual exploitation, abuse and harassment cases of projects financed within the scope of construction works. Complaints of gender-based violence, exploitation and harassment can create a culture of silence due to negative reactions by the society. In order to prevent this, it is important that the stakeholders are able to anonymously submit complaints regarding these issues regarding the Project. In addition, authorities dealing with complaints should deal with such matters with confidentiality and an unbiased approach.

If all internal and external stakeholders and affected groups are not satisfied with the solutions offered by the Project's Complaint Mechanism or have requests for a higher-level explanation, complaints / requests / suggestions can be shared at the ILBANK International Relations Department, GRM Team contact addresses given below.

- **7** ILBANK:
  - Web site: <u>https://www.ilbank.gov.tr/form/bilgiedinmeuluslararasi</u>
  - E-mail: <u>bilgiuidb@ilbank.gov.tr</u>
  - Phone: 0312 508 79 79
  - Official Letter: ILBANK Department of International Relations, GRM Team Emniyet Mahallesi Hipodrom Caddesi No:9/21 Yenimahalle/ANKARA
- Presidency's Communication Center: The Presidency's Communication Center (CIMER) has been providing a centralized complaint system for Turkish citizens, legal persons and foreigners. CIMER will be available to Project stakeholders as an alternative and well-known channel for conveying their Project-related grievances and feedback directly to state authorities.
  - <u>www.cimer.gov.tr</u>
  - Call Center: 150
  - Phone number: +90 312 525 55 55
  - Fax number: +90 0312 473 64 94
  - Mail addressed to Republic of Turkiye, Directorate of Communications
  - Individual applications at the community relations desks at governorates, ministries and district governorates.
- Foreigners Communication Center: The Foreigners Communication Center (YIMER) has been providing a centralized complaint system for foreigners. YIMER will be available to Project stakeholders as an alternative and well-known channel for conveying their Project-related grievances and feedback directly to state authorities.

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- <u>www.yimer.gov.tr</u>
- Call Center: 157

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- Phone number: +90 312 5157 11 22
- Fax number: +90 0312 920 06 09



- Mail addressed to Republic of Turkiye, Directorate of Communications
- Individual applications at the Republic of Turkiye General Directorate of Migration Management

All the complaints will be registered in ILBANK GRM software within 2 days and feedback will be given to the Applicant immediately (as long as the application is not anonymous). ILBANK notifies the complainant that complaint has been received within the period of registering the complaint (2 business days) and may request detailed information about the complaint from the complainant within this period.

When ILBANK receives a complaint, GRM Team will register and evaluate the complaint. If the complaint is related with any of sub-projects, ILBANK will send the complaint to municipalities'/utilities' GRM since they will (there is a Project Implementation Unit for projects financed by ILBANK through IFI) have their own GRM. After this stage, ILBANK's role will be to follow the progress of the complaint within its GRM system. If the complaint is not resolved within the committed duration, ILBANK GRM Team will take over the issue.

Certain complaints warrant urgent action, and the regular GRM procedure may be inappropriate or too slow to prevent an issue from escalating. A separate fast-tracked GRM, including guidance on the circumstances under which it should be employed, can help ensure that high-priority complaints are dealt with in a timely manner. In the case of complaints alleging serious harm or risk of harm, and/or serious rights violations, the GRM's standard operating procedures will call for a fast-track response, whether by the GRM or by immediate referral to another office or organization and immediate notification to the complainant of that referral.

Applicants, whose complaints could not be resolved through existing GRM or whose complaints contain sensitive issues can always apply to the relevant legal institutions. Such institutions can be summarized as follows:

- Civil Courts of First Instance,
- Administrative Court,
- Commercial Courts of First Instance
- Labor Courts, and
- Ombudsman (https://ebasvuru.ombudsman.gov.tr/)

Relevant legal processes will be monitored through GRM.

For the cases relevant to sexual exploitation and abuse/sexual harassment (SEA/SH) at workplace or any potential child abuse in the project sites, the complaint will be directed by the GRM focal point (based in ILBANK headquarter) to relevant legal authorities/service providers such as Ministry of Family and Social Services and Prosecutors Office. All details of the complainant of the sensitive case will be kept strictly confidential.

The feedbacks and grievances will be classified based on their severity, frequency and more importantly sensitivity. Categories of complaints, descriptions and the responsible parties are presented in Table 9-1.

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#### Table 9-1. Classification of Complaint

Project Related Complaint					
Category	Description	Responsible Party			
Level 1	When an answer can be provided immediately and/or CLO and PIU Team are already working on a resolution	• CLO • PIU Team			
Level 2	One off grievance that will not affect the project schedule or will not affect the reputation of the Bank	• CLO • PIU Team			
Level 3	Repeated, extensive and high-profile grievances that may jeopardize the Project or the reputation of the Bank	<ul> <li>CLO</li> <li>PIU Team</li> <li>ILBANK Ethics Committee</li> <li>External Expert (assigned by ILBANK when necessary)</li> </ul>			
	Worker Complaints				
Category	Description	Responsible Party			
Level 1	When an answer can be provided immediately and/or CLO and Municipal/Contractor Community Engagement Officers are already working on a resolution	• GRM Team • PIU Team			
Level 2	Repeated, extensive and high-profile grievances that may jeopardize the Project or the reputation of the Bank	<ul> <li>GRM Team</li> <li>PIU Team</li> <li>ILBANK Ethics Committee</li> <li>External Expert (assigned by the ILBANK when necessary)</li> </ul>			

All grievances are reviewed to be classified whether they are genuine and related to Project activities or not. Determining specific actions for the complaint and producing a solution starts with the PIU's notification of the complaint to the relevant units/departments/contractors and subcontractors. If the issues/disputes raised are not related to Project, guidance is provided to the Complainant to contact relevant party. Eligible complaints are responded according to Project social and environmental requirements which are identified in ESMP.

All grievances received through direct phone calls, e-mails and face-to-face meetings/ communications are taken under registration and PIU and GRM Teams get contact with the Complainant within 10 days following registration in order to explain the Project response process to Grievance.

Investigations may include photographs and other evidence, witness statements, interviews with affected stakeholders and other parties, review of site registers, and other information gathering activities. The results of these investigations will be reviewed, and a resolution will be proposed. The development of the resolution may involve consultation with the person(s) involved.

ILBANK examines and evaluates the complaints received from external stakeholders within 10 working days and determines whether the complaint meets the admissibility criteria stated above by advising with the relevant personnel. Additional information and/or documentary evidence that justify the cause for the complaint may be requested from the complainant during





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the assessment process. ILBANK staff complaints will be handled directly by Ethics Committee (EC) while complaints received from related project staff will be assessed by the GRM Team. In case the complaint received from related project staff contains sensitive issues, relevant complaint will be directed to EC with ensuring the anonymity and confidentiality immediately. The duration of assessment of the worker/staff complaints is the same with the external complaints/feedbacks.

The grievances, recommendations and requests should be evaluated within 15 working days after response. During this period, an ongoing communication with the complainant can be established, if necessary.

If the resolution is accepted by all Project Parties, it is implemented, and the grievance is closed. If the resolution is not accepted, it will be reconsidered, and a revised resolution may be proposed. The affected person(s) may choose to pursue external remedies (e.g., through legal proceedings) at any time, including if an agreed resolution cannot be found. However, the Project is committed to fairly and collaboratively resolving grievances through the Grievance Redress Mechanism wherever possible.

After the complaint is closed or eliminated, the complainant will be notified, and relevant records will be kept.

After the evaluation of the complaint, ILBANK will address and take corrective actions to resolve the complaint within 15 working days. Within this period, relevant responsible parties to manage the grievance will be in communication with the recipient at all times and all the communication will be recorded in the GRM system.

In case of settle a mutual agreement on closing of the complaint, process is provided in "Giving Feedback of Complaint Closure" section will be applied. In case of the complaints that cannot be resolved due to the nature or timing of the required corrective action within 15 working days, ILBANK and the complainant may reach an agreement on extending the time to close the complaint. Relevant agreement will be documented and registered in the GRM system with the consent of the applicant.

Complaints are closed within thirty (30) days from day of application unless an alternative agreement is made with the Complainant. If grievances are not resolved within thirty (30) days, mitigating circumstances are documented and reported.

After the complaint is resolved and the result is communicated to the complainant, CLO to be appointed takes the necessary signatures and closes the complaint. Information on the current status of the complaint and how the complaint was resolved is recorded in the Grievance Database. The purpose of recording more information in the complaints database is to provide the necessary reference for similar complaints that may arise in the future.

If the complaint is made anonymously, a summary of the complaint and resolution should be posted on notice boards in common areas within the facility and announced through training and weekly meetings.

Grievances made through ILBANK GRM, ILBANK and the complainant agree that the complaint is closed and the complainant is informed that the complaint has been closed after the necessary actions are taken. If an agreement cannot be reached on the closure of the



complaint, the complainant will be informed that he/she can apply other external remedies. After the notification of this process, the complaint is closed.





# 10 CONSULTATIONS WITH AFFECTED GROUPS AND NON-GOVERNMENTAL ORGANIZATIONS

In the scope of the consultation activities carried out for the Project, primarily, meetings were held with the mukhtars of the neighborhoods in September 2021. Apart from these interviews, the level of knowledge of public institutions and non-governmental organizations about the Project was obtained.

A summary of previous engagement activities for the Project is provided in the Table 10-1.

Table 10-1. Participants of Previous Engagement Activities

Participant	Date	Location	Scope of Meeting
Bahçelievler Neighborhood Mukhtar Kayapaşa Neighborhood Mukhtar Fatih Neighborhood Mukhtar İsmetpaşa Neighborhood Mukhtar 50. Yıl Neighborhood Mukhtar Ayvaz Neighborhood Mukhtar Cedit Neighborhood Mukhtar Çedit Neighborhood Mukhtar Melikgazi Neighborhood Mukhtar Yusufşah Neighborhood Mukhtar Gaziahmet Neighborhood Mukhtar Gaziahmet Neighborhood Mukhtar Akpınar Neighborhood Mukhtar Dönekse Neighborhood Mukhtar Cepnibey Neighborhood Mukhtar Kılıçarslan Neighborhood Mukhtar Haydarbey Neighborhood Mukhtar	17.09.2021	Wedding Hall of The Municipality	Obtaining information about the socio- economic structure of the neighborhood Determining the level of knowledge, opinions and concerns about the project
Niksar District Governorship	16.09.2021	Governor's Office	
Niksar Forestry Management Directorate	16.09.2021	Directorate Campus	Determining the level
Niksar District Directorate of Agriculture and Forestry	16.09.2021	Directorate Office	of knowledge, opinions and concerns about the
Niksar Chamber of Commerce and Industry	17.09.2021	Office of the Chairman	project

#### **10.1** Mukhtar Interviews and Survey Studies

SEHIRI EI

Mukhtar interviews were carried out in Niksar District on 16<sup>th</sup> and 17<sup>th</sup> September 2021. The mukhtars were phoned by the Mukhtar Branch Directorate within the municipality on 16<sup>th</sup> September, and they were ensured to be at the wedding hall of the municipality at 11:00 on September 17.

Community Level Surveys were conducted with 19 mukhtar from 25 neighborhoods where the Project will be carried out. In the survey study, while trying to obtain information about the

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socio-economic structure of the neighborhood, it was also tried to determine the level of knowledge, opinions and concerns about the Project. There were no female participants in the meetings held, only with the mukhtars and the officials of the relevant institutions. Ms. Sevinç, the mukhtar's branch manager of the municipality, accompanied the meetings.

As a result of the survey conducted, the level of knowledge and opinions about the Project are as follows.

- 15 mukhtars have information about the project while 4 mukhtars reported they had no information about the Project,
- In 8 neighborhoods, the residents of the neighborhood do not have information about the project, in 11 neighborhoods the general opinion about the Project is positive,
- During the construction phase of the Project, 7 mukhtars did not expect negative impact, while the remaining 12 mukhtars expected negative environmental outcomes such as dusting, traffic and deterioration of roads related to the sewerage network project, which is under construction within the scope of the IPA Project. Therefore, it was stated that similar negative effects in this project are expected as well.
- During the operation phase of the project, 2 mukhtars did not expect positive effects however12 mukhtars expected positive environmental impacts,
- While 7 mukhtars did not want foreign workers to be employed, 6 mukhtars stated that local workers should be employed. 5 mukhtars stated that it does not matter whether the workers to be employed are foreign or local.
- While 13 mukhtars think that the Project will contribute to the regional economy, 2 mukhtars stated that the proposed Project will not contribute to the local economy,
- 6 mukhtars shared their concerns that the compulsory road closure within the scope of the construction activities of the Project will have a negative impact on the district traffic.

The photographs taken during the survey are given in Figure 10-1. Moreover, a sample survey (in Turkish) is provided in Annex-J.

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Figure 10-1 Survey Images with Mukhtars<sup>30</sup>

# **10.2 Consultations with Public Institutions and Non-Governmental Organizations**

During the site visit held on 16<sup>th</sup> and 17<sup>th</sup> September 2021, the following institutions were visited to understand the level of knowledge on the Project to receive their opinions and suggestions.

- Niksar District Governorship,
- Niksar Forestry Management Directorate,
- Niksar District Directorate of Agriculture and Forestry,
- Niksar Chamber of Commerce and Industry.

#### **Niksar District Governorship**

SEHIRI EF

Niksar District Governor was visited on 16<sup>th</sup> September 2021 at 11.30 am. During the interview, it was learned that the District Governor had information about the Project and this information was given directly by Niksar Municipality. Again, in the same meeting, it was learned that many complaints were submitted to the District Governor's Office due to the wastewater line project, which is another infrastructure project currently under construction. Many of these complaints come from the tradesmen in the region, and it is said that there is a dust problem since the

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<sup>&</sup>lt;sup>30</sup> Disinfectant was available during the meetings and care was taken to use masks. Warnings have been made for mukhtars to sit by following the social distance rules.



pavement works have not been done yet. Therefore, good planning for the Project and working with competent contractors were advised by the District Governor's Office. In addition, it was suggested that it would be good for the Project to establish an efficient grievance redress mechanism and its functioning efficiency and compliance should be audited.

#### Niksar Forestry Management Directorate

On September 16, 2021 at 11:00, a meeting was held with Niksar Forest Operations Manager to get his views on the project (see Figure 10-2). The operation manager, who has sufficient knowledge about the project, stated that the cooperation and coordination with the Municipality is currently very good. He stated that an application should be made through the Regional Directorate of Forestry regarding the forest qualified lands planned to be used within the scope of the project. It is remarked that the cost of afforestation will be calculated based on the application and will be notified to the Municipality during the permit process.



Figure 10-2 Meeting with the Niksar Forestry Management Directorate

SEHIRI EI

#### Niksar District Directorate of Agriculture and Forestry

On 16<sup>th</sup> September, 2021 at 14.00, the Niksar District Directorate of Agriculture and Forestry was visited, and consultations were held with the District Director of Agriculture and Forestry (see Figure 10-3). It was learned that information about the project was obtained through municipality officials and social media. It was also stated that the contractor company should pay attention to this situation during the construction phase, since the roads in the district center are narrow. It was also stated that the works to be done on the main arteries should be completed in a short time, otherwise the city traffic could be disrupted.

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Figure 10-3 Meeting with the Niksar District Directorate of Agriculture and Forestry

#### Niksar Chamber of Commerce and Industry

Consultations were held with the Chairman of the Board of Directors of Niksar Chamber of Commerce and Industry, on 17<sup>th</sup> September 2021 at 16.30 and it was learned that he had knowledge about the project (see Figure 10-4). It was emphasized that in the excavation works to be carried out within the scope of the project, attention should be paid to the formation of dust and mud so that the tradesmen are affected at a minimum level. In addition, it was learned that the complaints of the tradesmen arising from the sewerage network project, which is under construction, were conveyed to the municipal authorities as much as possible.



Figure 10-4 Meeting with the Chairman of the Board of Directors Chamber of Commerce and Industry





#### 10.3 Summary of Consultations

In the scope of the Project, the stakeholders have been determined, and consultations or surveys have been performed with them. The stakeholders identified in the region were informed about the location of the Project, its components and that the project will not require any additional land to be acquired. Preliminary consultations conducted during the ESMP process have been aimed at informing regional public authorities about the Project and receiving their feedback and concerns about the potential impacts of the Project.

In line with the survey studies carried out specifically for the neighborhood mukhtars, under the category of "affected parties", vulnerable persons or communities that may be directly/indirectly affected by the Project are analyzed. In this context, the existence and numbers of the following groups were asked in the interviews held with the mukhtars.

- Households with physically and / or mentally disabled family members
- People with chronic diseases,
- Elderly people over 70 years of age who live alone and in need of care,
- Women,
- Female-headed households,
- Households where the head of the household is a child,
- Households with low or no income, and
- Refugee households.

The information obtained on the key characteristics of the neighborhoods, the language requirement during the stakeholder participation meeting, the methods of being informed about the Project and the needs of the neighborhoods are summarized in Table 10-2.

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#### Table 10-2. Summary of Mukhtars Surveys

Community	Stakeholder Group	Key Characteristics	Language Needs	Preferred Notification Means	Specific Needs
Bahçelievler Neighborhood		4 shops, poor household and physically/ mentally disabled		Phone call, face to face interview or brochure	Asphalt Road
Kayapaşa Neighborhood		5 shops, poor household and physically disabled, female-headed households		Phone call, face to face interview or brochure	Improvement of infrastructure
Fatih Neighborhood		25 shops, approximately 10 poor household and physically/mentally disabled		Brochure	Asphalt Road
İsmetpaşa Neighborhood	lements	50 shops, approximately 10 physically/ mentally disabled		SMS or phone call	-
50. Yıl Neighborhood	in The Sett	6 shops, physically/mentally disabled	nage	SMS, phone call, face to face interview, email or brochure	Employment
Ayvaz Neighborhood	s Living i	poor household and physically/ mentally disabled	ial Lang	SMS, phone call, face to face interview or brochure	Asphalt Road
Cedit Neighborhood	munitie	physically/ mentally disabled and elderly people over 70 years of age	Offic	face to face interview	Employment
Şair Emrah Neighborhood	Local Com	5 shops, poor household, elderly people over 70 years of age and physically/ mentally disabled		Phone call	Actions/measures for animal waste and odor problem
Melikgazi Neighborhood		15 shops, physically disabled and female-headed households		Face to face interview	-
Yusufşah Neighborhood		_		SMS, phone call, face to face interview or brochure	Water Infrastructure
Gaziahmet Neighborhood		female-headed households		SMS, phone call, face to face interview	Employment

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Community	Stakeholder Group	Key Characteristics	Language Needs	Preferred Notification Means	Specific Needs
Akpınar Neighborhood		poor household and physically/ mentally disabled		SMS, phone call, face to face interview, email or brochure	Improvement of infrastructure
Aydınlıkevler Neighborhood		10 female-headed households, physically/ mentally disabled		Face to face interview	Asphalt Road
Dönekse Neighborhood		2 shops, elderly people over 70 years of age and physically/mentally disabled		Phone call	Water Infrastructure
Cepnibey Neighborhood		80 shops, 60 poor household, elderly people over 70 years of age and mentally disabled		Phone call and face to face interview	Parking area
Kılıçarslan Neighborhood		60 shops, approximately 5 poor household, 5 elderly people over 70 years of age, 25 poor household and physically/mentally disabled		SMS and face to face interview	Asphalt Road
Haydarbey Neighborhood		15 female-headed households, 10 elderly people over 70 years of age and 6 physically and 2 mentally disabled		face to face interview	Asphalt Road, Cultural Center for the youth
Kumçiftlik Neighborhood		2 female-headed households, elderly people over 70 years of age and physically/mentally disabled		SMS, face to face interview, email or brochure	Improvement of Infrastructure
Çengelli Neighborhood		5 female-headed households, 10 elderly people over 70 years of age and 2 physically/mentally disabled		SMS or phone call	-

The summary of the consultation with public institutions and non-governmental organizations is given in Table 10-3.





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#### Table 10-3. Summary of the Consultation With Public Institutions and Non-Governmental Organizations

Stakeholder	Interviewee	Title	Consultation Date	Consultation Place	General Attitude	Concerns/Remarks
Niksar District Governorship	İlhami Doğan	District Governor	16.09.2021	Governor's Office	Neutral	<ul> <li>the sewerage network project, which is currently under construction, and that the local people are uncomfortable with this situation</li> <li>the scope of the drinking water project should be agreed with a competent contractor in order not to cause such problems</li> <li>a functioning grievance redress mechanism should be established, and its compliance should be audited.</li> </ul>
Niksar Forestry Management Directorate	Erdal Düzgün	Forest Operations Manager	16.09.2021	Directorate Campus	Positive	the cost of afforestation will be calculated based on the application and will be notified to the Municipality during the permit process.
Niksar District Directorate of Agriculture and Forestry	Namık Özdüzgün	Directorate of Agriculture and Forestry	16.09.2021	Directorate Office	Positive	<ul> <li>the contractor firm should pay attention to the narrow roads in the district center.</li> <li>the works to be carried out on the main arteries should be completed in a short time</li> </ul>
Niksar Chamber of Commerce and Industry	Mahmut Bülent Aybak	The Board of Directors	17.09.2021	Chairman Office	Positive	attention should be paid to the formation of dust and mud in order to affect the tradesmen at a minimum level





# **10.4 Future Consultation Activities**

According to the Environmental and Social Management Framework prepared for Sustainable Cities Project – II Additional Financing, For Category B subprojects, one consultation meeting with affected groups and local NGOs identified during the stakeholder identification phase should be undertaken, following the finalization of ESMP. Therefore, a consultation meeting is planned to be held during January 2023.

This meeting will be held to inform the public about the project and to get their opinions and suggestions. Time and place of the meeting will be announced in the local and national newspaper at least 10 days before the meeting day. At the same time, the meeting will be announced on the Niksar Municipality's official website and official social media accounts i.e., official Instagram and Facebook accounts.

A presentation comprising information related to the Project details, characteristics, duration of construction works, roles and responsibilities, expected environmental and social impacts of the Project and related mitigation measures, monitoring activities and grievance redress mechanism established specific to the Project will be made during the meeting. Following the presentation, a question-and-answer session will be held to answer the questions of the participants. These questions, suggestions and concerns will be recorded during the meeting by the Consultant and will further be incorporated into the ESMP. The outcomes of the consultations, the concerns/suggestions/requests of the consultees will be considered and addressed during the implementation of the Project.

Before the meeting, participant registration forms will be prepared and the duties, e-mail addresses and contact numbers of the participants will be taken. It should be noted that this information will be kept in the records, however, will not be made publicly available in the annex of the ESMP during the disclosure. The respective lines will be blurred while disclosing in the ESMP within the scope of the Law on the Protection of Personal Data.

Future consultation activities will be held in accordance with the Covid-19 guidelines published by the Ministry of Health and WB. In case of any travel, restriction or ban, the meeting will be held online with remote access. Covid-19 measures will be provided as specifically requested by WB.

In addition, a Stakeholder Engagement Plan (SEP) has been prepared for this sub-project in order to identify all stakeholders and their interest in the Project and to establish an effective communication with stakeholders and to define procedures and principles to improve participation. This Plan aims to create long-term relations between the Project and local communities based on mutual trust and transparency. By implementation of the SEP, stakeholders will be able to access the information about the Project, its investments, installation works and operation activities in a timely manner. Data will be fully understandable for the targeted groups and access to consultation locations is available for all.

This SEP also aims to ensure vulnerable groups have been identified and these groups have been included in ongoing consultation and engagement process and, to ensure that all relevant parties have been engaged and no group has been excluded. In this content, this SEP aims to be a useful tool for management of communication between the Project and its stakeholders.

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# ANNEXES





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# Annex-A: Air Quality Measurement Report

(Provided as a separate file)



# İLLER BANKASI SÜRDÜRÜLEBİLİR ŞEHİRLER PROJESİ EK FİNANSMAN (SCP II-AF GROUP 1) KAPSAMINDAKİ NİKSAR BELEDİYESİ SU ŞEBEKESİ PROJESİ İMİSYON ÖLÇÜM RAPORU

Yavuz Selim Caddesi No.50 Fatih/ İSTANBUL Tel: (0212) 621 23 40 (Pbx) Fax: (0212) 621 23 59

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# İÇİNDEKİLER

HALİÇ ÇEV LABORATUV	<b>'RE ARI Haliç Çevre</b> ' Ali Kuşı	F <b>eknolojileri Müh. Müş. Turz. Ve Sa</b> çu Mh.Yavuz Selim Cad. No: 50 34083 <b>Deney Raporu</b> <i>Test Report</i>	<b>ğ. Hiz. Tic. Paz. Ltd. Şti.</b> Fatih/ İSTANBUL	С С С С С С С С С С С С С С
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Cusiomer Numer Address		GROUP I) kapsamindaki Niksar	Belediyesi Su Şebekesi I	rojesi
		Niksar/Tokat		
Referans No		· 034 21/1123-00		
Order No		• 054.21/1125 00		
Numune Adı ve Tarifi		• Ortamda PM10 Ölcümleri		
Name andidentity of test item		• Ortanida i Mito Olçanıleri		
Numune Kayıt Numar	ası	:2109-0853		
Test item registration number				
Olçüm Tarihi		:01-02.09.2021		
Date of measurement				
Numunenin Kabul Ta	rihi	:08.09.2021		
TheDate of receipt of test item				
Açıklamalar Pomarka		:-		
Analiz Tarih Aralığı				
Completion date of analysis		<b>:</b> 16.09.2021		
Rapor Numarası/ Tari	hi	END 106/04 10 2021		
Report number/ Date		<b>:</b> EMR-196/04.10.2021		
Rapor Sayfa/ Nüsha S	ayısı			
Number of pages and copies of the report		:16 Sayfa-2 Ek/1 Nüsha		
Karekod/OR Code	Tarih/Date	Deney Sorumlusu/Person in charge of test	Laboratuvar Yöne	eticisi/
			Laboratory Manage	er

	<u><b>Tarın</b></u> /Date 04.10.2021	<u>Deney Sorumiusu/Person in charge of test</u> e-imzalıdır Yusuf KAŞIKÇI	<u>Laboratuval Yoneucisi</u> <u>Laboratory Manager</u> <i>e-imzalıdır</i> <b>Feyza YALÇIN</b>
Ölçüm Sorumluları/ Person in chargeof measuring		Raporu Hazırlayan/Reporter	Raporu Kontrol Eden/Controller
M.Enes DURAN Yerine e-imzalayan İlker CİVİL		e-imzalıdır Nazan BÜKER	e-imzalıdır Kübra Çisil KANAT

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Deney laboratuvarı olarak faaliyet gösteren Haliç Çevre Teknolojileri Müh. Müş. Turz. Ve Sağ. Hiz. Tic. Paz. Ltd. Şti., TÜRKAK'tan AB- 0095-T ile [TS EN ISO/IEC 17025/Aralık 2017] standardına göre akredite edilmiştir. Haliç Çevre Teknolojileri Müh. Müş. Turz. Ve Sağ. Hiz. Tic. Paz. Ltd. Şti.. accredited by TÜRKAK under registration number AB-0095-T for [TS EN ISO/IEC 17025/Aralık 2017] as test laboratory"

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The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

Bu analiz raporu laboratuara gelen numuneyi/örneklemeyi temsil eder.Bu rapor ve sonuçları Haliç Çevre Analizleri Laboratuvarı'nın izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.Rapor numarasının başında yer alan (R) raporun güncellendiğini belirtir.Analiz yapılan numunede, numunenin alınışından laboratuarımıza teslimine kadar olan prosedürlerin ve bakılması istenilen grup ve parametrelerin belirlenmesinde teknik ve hukuki sorumluluk numuneyi/örneklemeyi alana aittir. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir. İş bu rapor Çevre Mevzuatına ilşkin resmi işlemlerde kullanılamaz.This report shall not be reproduced other than in full except with the permission of the laboratory. . Reports which are in the form of wet signed without sign and seal and in the form of digitally signed without process ID are invalid. The Laboratory is not responsible for any latter changes on the report, addition/removal of pages. The results are related to the process conditions during the measurement.

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# BÖLÜM 1 GİRİŞ

#### **1.1. TANIMLAR**

20.12.2014 tarihli ve 29211 sayılı Resmi Gazete' de yayınlanarak yürürlüğe giren "Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliğinde Değişiklik Yapılmasına Dair Yönetmelik" te yer alan bazı tanımlar aşağıda verilmiştir.

Atık gazlar: Katı, sıvı veya gaz emisyonlar ihtiva eden gaz halinde salımları,

Çevre İzni: Çevre Kanunu uyarınca alınması gereken; hava emisyonu, çevresel gürültü, atık su deşarjı, derin deniz deşarjı ve tehlikeli madde deşarjı konularından en az birini içeren izni,

Çift veya çoklu yakıt yakan tesis: Aynı anda veya değişimli olarak iki veya daha fazla yakıt ile ateşlenebilen yakma tesisini,

Büyük Yakma Tesisi: Anma ısıl gücü 50 MW ve üzeri olan, yalnızca enerji üretimi için inşa edilen katı, sıvı veya gaz yakıtların kullanıldığı yakma tesislerini,

Emisyon: Yakıt ve benzerlerinin yakılmasıyla; sentez, ayrışma, buharlaşma ve benzeri işlemlerle; maddelerin yığılması, ayrılması, taşınması ve diğer mekanik işlemler sonucu bir tesisten atmosfere yayılan hava kirleticilerini,

Emisyon Kaynağı: Atmosfere emisyon veren baca veya baca dışı kaynağı,

Emisyon Ölçüm Raporu Geçerlilik Süresi: İlk ölçüm tarihi esas alınarak, 10/9/2014 tarihli ve 29115 sayılı Resmî Gazete'de yayımlanan Çevre İzin ve Lisans Yönetmeliği kapsamındaki işletmeler için emisyon ölçüm raporu geçerlilik süresi iki yılı,

Emisyon Sınır Değeri (yakma tesisleri için): Sıvı ve gaz yakıtlarda % 3, katı yakıtlarda % 6, gaz türbinlerinde % 15 oranında oksijen olduğu varsayılarak, mg/Nm3 olarak ifade edilen, kütle bölü atık gazın hacmi olarak hesaplanan ve yakma tesisinden havaya verilen atık gazların içinde bir maddenin bulunmasına izin verilen konsantrasyonu,

Üretim Prosesi: Yakıtın ham madde ile birlikte muamele gördüğü veya yakıttan elde edilen enerjinin hammaddeyi veya ürünü kurutma, kavurma ve benzeri işlemlerde kullanıldığı ve bacasından proses kaynaklı baca gazı emisyonlarının ve yanma gazlarının birlikte çıktığı veya sadece proses kaynaklı baca gazı emisyonlarının çıktığı tesisleri,

Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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> Yakma Isıl Gücü/Isıl Güç/Yakıt Isıl Gücü/Anma Isıl Gücü: Bir yakma tesisinde birim zamanda yakılan yakıt miktarının yakıt alt ısıl değeriyle çarpılması sonucu bulunan KW, MW birimleri ile ifade edilen asıl güç değerini,

Yakma Tesisi: Yakıtları okside ederek oluşan ısının kullanıldığı teknik ekipmanı,

➢ İş Termin Planı: Tesis sahibi tarafından hazırlanacak ve bu Yönetmelikte belirtilen yükümlülükleri ve sınır değerleri sağlayacak proses ve baca gazı arıtım tesislerinin gerçekleştirilmesi sürecinde yer alan proje, ihale, inşaat ve işletmeye alma gibi işlerin zamanlamasını gösteren planı,

Mevcut Tesis: Ek-5.A.1 kapsamındaki tesisler için; 8.6.2010 tarihinden önce, diğer tesisler için ise 3/7/2009tarihinden önce kurulmuş veya Çevresel Etki Değerlendirmesi mevzuatına göre kurulması uygun bulunan tesisleri,

➢ Kısa Vadeli Değer (KVD): Maksimum günlük ortalama değerler veya istatistik olarak bütün ölçüm sonuçları sayısal değerlerinin büyüklüğüne göre dizildiğinde, ölçüm sonuçlarının % 95 ine tekabül eden değeri, çöken tozlar için farklı olarak aşılmaması gereken maksimum aylık ortalama değerleri,

➢ Kısa Vadeli Sınır Değer (KVS): Maksimum günlük ortalama değerleri veya sayısal değerlerinin büyüklüğüne göre dizildiğinde, istatistik olarak bütün ölçüm sonuçlarının % 95 ine tekabül eden ve Ek-2 Tablo 2.2 de belirtilen aşmaması gereken değeri,

Uzun Vadeli Değer (UVD): Uzun Vadeli Değer (UVD): Yapılan bütün ölçüm sonuçlarının aritmetik ortalaması olan değeri,

Uzun Vadeli Sınır Değer (UVS): Yapılan bütün ölçüm sonuçlarının aritmetik ortalaması olan, Ek-2 Tablo 2.2 de belirtilen aşılmaması gereken değeri ifade eder.

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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#### **1.2. GENEL**

27277 sayılı ve 3 Temmuz 2009 tarihli Resmi Gazete'de yayınlanarak yürürlüğe giren "Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliği", sanayi ve enerji üretim tesislerinin faaliyeti sonucu atmosfere yayılan is, duman, toz, gaz, buhar ve aerosol halindeki emisyonları kontrol altına almayı, insanı ve çevresini hava alıcı ortamındaki kirlenmelerden doğacak tehlikelerden korumayı, hava kirlenmeleri sebebiyle çevrede ortaya çıkan umuma ve komşuluk münasebetlerine önemli zararlar veren olumsuz etkileri gidermeyi ve bu etkilerin ortaya çıkmamasını amaç edinmiştir.

Bu PM10 raporu **"İller Bankası Sürdürülebilir Şehirler Projesi Ek Finansman (SCP II-AF GROUP 1) kapsamındaki Niksar Belediyesi Su Şebekesi Projesi"** nin Niksar/TOKAT adresinde Enlem: 326503.82 d D Boylam: 4495050.67 m K koordinatlarında (UTM 37 T Projeksiyonu) 01-02.09.2021 tarihinde gerçekleştirilen 24 saatlik PM10 ölçümleri neticesi hazırlanmıştır.

İş bu rapor, ölçüm yapılan dönemdeki mevcut arka plan koşullarını kapsamakta olup, mevcut durumda yapılan herhangi bir değişiklik (inşaat çalışması, bu çalışmalardaki makine/ekipmanlar, havalandırma sistemi, yerleşim, vb.) durumunda, ölçüm sonuçları değişiklik göstereceğinden bunlar gerekirse tekrarlanabilir. Ölçüm için temin edilen teknik bilgilerde talep edenin beyanı esas olup laboratuvarımız bu konuda sorumluluk kabul etmeyecektir.

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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#### Tablo 1.1. Genel Bilgiler

	İller Bankası Sürdürülebilir Şehirler Projesi Ek Finansman
<sup>a</sup> Proje Adı	(SCP II-AF GROUP 1) kapsamındaki Niksar Belediyesi
	Su Şebekesi Projesi
	Niksar/TOKAT adresinde Enlem: 326503.82 d D
<sup>a</sup> Adres	Boylam: 4495050.67 m K koordinatlarında (UTM 37
	T Projeksiyonu)
Belirlenen PM10 Ölçüm Noktası	1) Danişment Gazi Anadolu Lisesi Bahçesi

<sup>a</sup>: Firma beyanıdır.

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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#### a- Uydu Fotoğrafları



Genel Uydu Görüntüsü (PM10 Ölçüm Noktası)

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# **BÖLÜM 2**

# MEVCUT EMİSYONLARIN YÖNETMELİK KAPSAMINDA İRDELENMESİ

İşletmede ölçümleri gerçekleştirilen kaynakların SKHKKY kapsamında ele alındığı yönetmelik maddeleri aşağıda liste halinde verilmiştir.

#### PM10 Ölcüm Noktası Adı:

• 1) Danişment Gazi Anadolu Lisesi Bahçesi; Ek 2 Tablo 2.2.

# 2.1. SKHKKY EK- 2 KAPSAMINDA İRDELEME

29211 sayılı ve 20 Aralık 2014 tarihli Resmi Gazete'de yayınlanarak yürürlüğe giren "Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliği";

## 2.1.1. Ortam Toz (PM 10) Emisyonları

Ek 2 Tablo 2.2.' ye göre; PM10 ölçüm sonuçları 50 µg/m<sup>3</sup> (0,05 mg/m<sup>3</sup>) sınır değerini sağlamalıdır.

International Finance Corporation (IFC)' na göre; PM10 ölçüm sonuçları 50 µg/m<sup>3</sup> (0,05 mg/m<sup>3</sup>) sınır değerini sağlamalıdır.

Table 1.1.1: WHO Ambient Air Quality Guidelines <sup>7,8</sup>				
	Averaging Period	Guideline value in µg/m <sup>3</sup>		
Sulfur dioxide (SO <sub>2</sub> )	24-hour 10 minute	125 (Interim target1) 50 (Interim target2) 20 (guideline) 500 (guideline)		
Nitrogen dioxide (NO2)	1-year 1-hour	40 (guideline) 200 (guideline)		
Particulate Matter PM <sub>10</sub>	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)		
	24-hour	150 (Interim target1) 100 (Interim target2) 75 (Interim target3) 50 (guideline)		
Particulate Matter PM25	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)		
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)		
Ozone	8-hour daily maximum	160 (Interim target1) 100 (guideline)		

<sup>12</sup> US EPA Prevention of Significant Deterioration Increments Limits applicable to non-degraded airsheds.

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. İslak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



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#### Tesis Etki Alanında Uzun Vadeli, Kısa Vadeli Sınır Değerler ve Kademeli Azaltım Tablosu

	Süre	Birimi	YIL						
Parametre			2014	2015	2016	2017	2018	2019-23	2024 ve sonrası
Havada Aslı Partikül Madde (PM10)	24 Saatlik (bir yılda 35 defadan fazla aşılmaz.)	µg/m³	100	90	80	70	60	50	50
	Yıllık		60	56	52	48	44	40	40

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# BÖLÜM 3 EMİSYON KAYNAKLARI

# 3.1. EMİSYON PARAMETRELERİ, KİRLETİCİ EMİSYONLARIN NEREDEN KAYNAKLANDIĞI VE BUNLARIN KAYNAKLARA GÖRE DAĞILIMI

Kirleticiler firma talebi sonucu belirlenmiştir. Yapılan tespit çalışması ile mevcut kaynaklarda standartlara uygun örnekleme yerlerinde cihazlar konumlandırılarak ölçümler gerçekleştirilmiştir.

İller Bankası Sürdürülebilir Şehirler Projesi Ek Finansman (SCP II-AF GROUP 1) kapsamındaki Niksar Belediyesi Su Şebekesi Projesi'ne ait PM10 ölçümleri 1 noktada ortamda gerçekleştirilmiştir. Yapılan ölçümlerle ilgili bilgiler aşağıda Tablo 4.1.1.' de verilmiştir.

#### Tablo 3.1.1. Ölçüm Noktasında Ölçümü Gerçekleştirilen Parametreler

No		Parametre	
	Olçum Noktası	PM10	
1	Danişment Gazi Anadolu Lisesi Bahçesi	$\checkmark$	

Ölçüm noktaları mevcut hakim rüzgar yönü dikkate alınarak Enlem: 326503.82 d D Boylam: 4495050.67 m K koordinatlarında (UTM 37 T Projeksiyonu) gerçekleştirilmiştir.

# 3.2. ÖLÇÜMLERDE KULLANILAN YÖNTEMLER

## 3.2.1. PM10 NUMUNE ALMA

Ölçümlere ilişkin numune alma işlemleri, 01-02.09.2021 tarihinde numune almadan sorumlu ve deneyimli personelimiz tarafından Numunelerin Nakli, Taşınması ve Muhafazası Prosedürü ile Numune Alma ve İlgili Verilerin, İşlemlerin Kaydedilmesi Prosedürleri dikkate alınarak 1 gün süreyle gerçekleştirilmiştir.

İşletmeden alınan toz numuneleri; toz filtreleri vasıtasıyla cam petri kapları içerisinde, özenle ve uygun şartlarda muhafaza edilerek, 08.09.2021 tarihinde laboratuvarımıza ulaştırılmış olup, analizleri 16.09.2021 tarihinde tamamlanmıştır.

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



## 3.2.3. ÇEVRE ŞARTLARI

PM10 ölçümleri 1 noktada ortamda gerçekleştirilmiş olup, ölçüm gününe ilişkin çevre şartları aşağıda Tablo 4.2.3.' te verilmiştir.

#### Tablo 3.2.3. Çevre Şartları

Tarih	Ölçüm Yeri	Nokta Koordinatları	Sıcaklık ( <sup>0</sup> C)	Basınç (kPa)
01-02.09.2021	Danişment Gazi Anadolu	X: 326503.82 d D	25.08	06.030
	Lisesi Bahçesi	Y: 4495050.67 m K	25,98	90,030

# 3.2.4. ÖLÇÜM NOKTALARI

Ölçümler, toz çıkışının olduğu noktalar dikkate alınarak yapılmıştır. Gerçekleştirilen deneylerde Uluslararası Standartlar ve TSE Standartları kullanılmaktadır. Ortam ölçümleri için uygun noktalar tespit edilerek ölçümler gerçekleştirilmiştir.

#### 3.2.5. ÖLÇÜM SAYISI

1 noktada 24 saatlik ölçüm gerçekleştirilmiş olup, örnekleme sonucu verilmektedir.

# 3.2.6. ÖLÇÜMDE KULLANILAN CİHAZLAR VE METOTLAR

Ölçümde kullanılan cihazlar ve kullanılan metotlar aşağıda verilmiştir.

Tablo 3.2.6. Ölçüm Yöntemleri

Ölçüm Parametresi	Kullanılan Cihaz/ Seri No	Kalibrasyon Süresi	Deney Adı	Deney Metodu
Partikül Madde (Ortamda)	ECO Instruments/ DA-PM/ 19PM-400008	Yılda 1 Kez	Gravimetrik Metot ile Havada Süspansiyon Durumunda Bulunan Madde Miktarının Tayini (PM10) Tayini	TS EN 12341

Ölçümler Tablo 3.2.6.' da verilen standartlara uygun olarak hazırlanmış olan çalışma talimatları doğrultusunda gerçekleştirilmiştir.

Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# BÖLÜM 4 ölçüm fotoğrafları

Ölçümler ortamda gerçekleştirilmiştir.

## a. PM10 Ölçüm Fotoğrafları





Danişment Gazi Anadolu Lisesi Bahçesi

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



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# **BÖLÜM 5**

## ÖLÇÜM SONUÇLARI VE DEĞERLENDİRİLMESİ

## 5.1. PM10 ÖLÇÜM SONUÇLARI

Ölçüm yapılan noktalara ait ölçüm sonuçları ve hesaplamalar aşağıda tablolarda verilmiştir.

## Tablo 5.1. Ölçüm Sonuçları

Ölçüm Noktaları	PM10 Kons. (µg/Nm <sup>3</sup> )	SKHKKY Sınır Değer (µg/Nm³)	IFC (µg/Nm³)
1. Nokta- Danişment Gazi Anadolu Lisesi Bahçesi	170	50	50

## 5.2. ÖLÇÜM SONUÇLARININ DEĞERLENDİRİLMESİ

29211 sayılı ve 20 Aralık 2014 tarihli Resmi Gazete'de yayınlanarak yürürlüğe giren "Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliğinde Değişiklik Yapılmasına Dair Yönetmelik" kapsamında yapılan değerlendirmeler aşağıda verilmiştir;

## 5.2.1. SKHKKY EK- 2 KAPSAMINDA DEĞERLENDİRMELER

## a) Ortam Toz (PM 10) Emisyonları

• Ek 2- Tablo 2.2.' ye göre; PM10 ölçüm sonucu sınır değeri sağlamamaktadır.

• International Finance Corporation (IFC)' na göre; ilgili noktada ölçülen PM10 ölçüm sonucu sınır değeri sağlamamaktadır.

Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# BÖLÜM 6

## AKREDİTASYON VE YETERLİLİK BELGELERİ

TÜRK	TÜRK AKREDİTASYON KURUMU
AK	REDİTASYON SERTİFİKASI
Deney Lab	oratuvarı olarak faaliyet gösteren,
HALÌ	Ç ÇEVRE TEKNOLOJİLERİ Mühendislik Müşavirlik Turizm Ve Sağlık Hizmetleri Ticaret Pazarlama Ltd. Şti.
	Yavuz Selim cad. No:50 Fatih İSTANBUL 34240 İSTANBUL / TÜRKİYE
TÜRKAK Standardın	tarafından yapılan denetim sonucunda TS EN ISO/IEC 17025:2017 a göre Ek'te yer alan kapsamlarda akredite edilmiştir.
Akreditasy	yon No : AB-0095-T
Akreditasy	yon Tarihi : 5 Mart 2008
Revizyon <sup>·</sup>	Tarihi / No :26 Mayıs 2021 / 021
Bu Sertifika Standardına Haziran 202	ı, yukarıda açık adı ve adresi yazılı Kuruluşun TS EN ISO/IEC 17025:2017 a, ilgili Yönetmelik ve Tebliğlere uygunluğunu sürdürmesi halinde , 22 24 tarihine kadar geçerlidir.
	Bouilth
	G. Banu MÜDERRİSOĞLU Genel Sekreter
Türk Akreditasy Uluslararası La	ron Kurumu (TÜRKAK) ISO/IEC 17025 alanında Avrupa Akreditasyon Birliği (EA) ve boratuvar Akreditasyon Birliği (ILAC) ile çok taraflı anlaşma (MLA/MRA) İmzalamıştır.

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



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#### Akreditasyon Sertifikası Eki (Sayfa 4/32)

İÇ ÇEVRE TEKNOLOJİLERİ Mühəndislik Mü Ticarət Pazarlama L Akroditasyon No: AE	işavirlik Turizm Ve Sağlık Hizmotlori .td. Şti.
Akreditasyon No: AB	
	3-0095-T
Revizyon No: 021 Tarih:	26.05.2021
Danay Adı	Deney Metodu (Ulusal, Uluslararası standardlar, işlotmo içi metodlar)
Kaynak Emisyonları -Krom VI (Cr * <sup>6</sup> ) klemesi ve Tayini trofotometre	CARB 425
da Metan gazı (CH₄ ) tayini	İşletme içi metot-"TA.307.Rev.00"
n: Elektroximyasal Hucre Metodu Örnekleme ve Tayini (SiO <sub>2</sub> ) kleme: Pompa ile filtreye numune alma trofotometre	İşletme içi Metot "Ta.339 Rev.01" (Niosh 7602:2017)
a Tayini Kleme: Pompa ile sorbent tüpe numune alma z: Spektrofotometrik Metot	şletme içi Metot-"Tə.353 Rev.01" (NIOSH 6002:2015)
Kaynak Emisyonları- PCDDs/PCDFs ve Dioksin eri PCBs Bileşiklerinin Örneklenmesi m 1:Numune alma	TS EN 1948-1
Kaynak Emisyonları - Gaz ve Partikül Fazında iklik Aromatik Hidrokarbonların (PAH) iklerinin Örneklenmesi	ISO 11338-1
yum Oksit (CaO) ve Magnezyum Oksit(MgO) 11	İşletme içi Metot- "Ta.354 Rev.00" (Epa 29:2017)
. Kaynak Emisyonları- Bacalarda Gaz Akış Hız ve Tayini i Pitot Tüpü ile	EPA Metot 2
. Kaynak Emisyonları- İzokinetik Halojen iklenmesi HF, HBr, Cla, Bra)	EPA Metot 26 A
Jaki Tanecikli Maddenin PM 10 Kütle imlerinin Tayini imetrik Metot	EPA 40 CFR Part 50 AppJ
laki Tanecikli Maddenin PM 2,5 Kötle Imlerinin Tayini imetrik Metot	EPA 40 CFR 50 AppL
.0 Kesrinde Ağır Metəllerin Tayini (As, Cd, NI, Pb) AAS Metodu	TS EN 14902 TS EN 14902/AC
Jaki Tanecikli Maddenin PM 10 veya PM 2,5 a Darisimlarinin Tavini	TS EN 12341
	Donoy Adı Kaynak Enilsyonları -Krom VI (Cr. *6) klemesi ve Tayini irofotometre Ja Metan gazı (CH.) tayini m: Elektrokimyasal Hücre Metodu Örnekleme ve Tayini (SIO2) kleme: Pompa ile filtreye numune alma trofotometre n Tayini kleme: Pompa ile sorbent tüpe numune alma z: Spektrofotometrik Metot Kaynak Enilsyonları- PCDD3/PCDFs ve Dioksin eri PCDs fileşiklerinin Örneklenmesi m 1:Numune alma Kaynak Enilsyonları- Gaz ve Partikül Fazında iklik Aromatik Hidrokarbonların (PAH) klerinin Örneklenmesi m 1:Numune alma Kaynak Enilsyonları- Bacalarda Gaz Akış Hiz ve Tayini Pitot Tüpü ile Kaynak Enilsyonları- İzokinetik Halojen klenmesi Hr, Hür, CJ, Br.) Jaki Tanecikli Maddenin PM 10 Kütle şinlerinin Tayini imetrik Metot IO Kesrinde Ağır Metallerin Tayini (As, Cd, NI, Pb) AS Metodu Jaki Tanecikli Maddenin PM 10 veya PM 2,5

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



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#### Akreditasyon Sertifikası Eki (Sayfa 5/32)

	Akreditasyon Kapsami	
	HALİÇ ÇEVRE TEKNOLOJİLERİ Mühəndislik Müş Ticarət Pazarlama Lt	avirlik Turizm Vo Sağlık Hizmotleri d. Şti.
TOAL	Akreditasyon No: AB-	0095-T
15321150115012025 AD-0095-T	Revizyon No: 021 Tarih:	26.05.2021
Dənəyi Yapılan Malzomeler / Ürünler	Denoy Adı	Deney Metodu (Ulusal, Uluslararası standardlar, işletme içi metodlar)
İmisyon (Çevre Havası)	PM 10 Kesrinde Ağır Metallerin Tayini (Al, As, Ba, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Se, Sn, Ti, V, Zn)	VDI 2267 Part 1
	GF-AAS Metodu	
Imisyon (Çevre Havası)	Çöken Tozda Ağır Metallerin Tayini Al, As, Ba, Cd, Co, Cr, Cu, Mn, Ni, Pb, Se, Sn, V, Sb, Tl ve Zn'ların Tayini GF- AAS Metodu	VDI 2267 Part 2
İmisyon (Çevre Havası)	Çöken Tozda Cd, Co, Cr, Cu, Ni, Pb, Sb, V ve Zn'lerin tayini Atomik Absorbsiyon Metodu	VDI 2267 Part 16
İmisyon (Çevre Həvəsi)	Çöken Toz Tayini Gravimetrik Metot	TS 2341
lmisyon (Aktif Ərnekleme) Uçucu Organik Bileşikler	Uçucu Organik Bileşiklerin Tayinl Örnekleme: Pompa ile aktif karbona numune alma Etanol, n-Pentan, 2-Propanol, Aseton, Dikloro metan, Metanol, Vinil asetat, n-Hekzan, Butanon, Kloroform, Dikloroetan, Butanol, Benzen, Triklor etilen, n-Heptan, Pridin, Toluen, n-Oktan, n-Butil asetat, Monokloro benzen, Etil benzen, m-Ksilen, pKsilen, o-Ksilen, Sitren, Fenol, Anilin, Bütil gilkol, İsopropilasetat, Asetonitril, Dietil eter, Asetik asit, Dietilamin, 1 -Propanol, Tersiyerbutilmetilketon, Etilasetat, 2 -Metoksletanol, Tetrahidrofuran, Siklohekzan, 1 -Metoksi-2-propanol, Trietilamin, 1,4-Dioksan, Metilisklohekzan, Isobutilmetilketon, Asetilaseton, 1,1,2-Trikloroetan, 1,2,4-Triklorbenzen, 2-Heptanon, Siklohekzanon, 5-Metil-3-heptanon, Propilbenzen, 1,2,4-Trimetilbenzen.	ASTM D 3686 ASTM D 3687
İmisyon(Çevre Havası)	NOz Derişimlerinin Tayini Numune Alma:Difüzyon Cihazlarının Seçimi, Taşıma ve Belirsizlik Bileşenleri Cihaz Seçimi ve Numune Alma Noktalarının Seçimi Şeçkirofotometre	TS EN 13528 1,2,3 İşletme İçi Metot "TA.338 Rev.02"

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



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#### Akreditasyon Sertifikası Eki (Sayfa 6/32)

TÜRKAR	HALİÇ ÇEVRE TEKNOLOJİLERİ Mühəndisilk Müş Ticarət Pazarlama Lt	şavirlik Turizm Vo Sağlık Hizmotlori (d. Şti.	
	Akraditasyon No: AB	-0095-7	
Tosli TS EN ISO IEC 17025	Povizion No: 021 Taribi	26 06 2021	
AB-0095-T	Rovizyon No. 621 Tanii.	20.00.2021	
Denoyi Yapılan Malzemeler / Ürünler	Deney Adı	Deney Motodu (Ulusa), Uluslararası standardlar, İşlətmə içi mətədlar)	
İmisyon(Çevre Havası)	BTEX Örnekleme ve Taylni (Benzen, Toluen, Etilbenzen, Ksilen(m,p,o) Numune Alma:Difüzyon Cihazlarının Seçimi,Taşıma ve Belirsizlik Bileşenleri Cihaz Seçimi ve Numune Alma Noktalarının Seçimi GC-FID	TS EN 13528 1,2,3 Işletme içi Metot "TA.344.Rev.00"	
İmisyon(Çevre Havası)	VOC Örnekleme ve Tayini Numune Alma:Difüzyon Cihazlarının Seçimi, Taşıma ve Belirsizlik Bileşenleri Cihaz Seçimi ve Numune Alma Noktalarının Seçimi (Etanol, n-Pentan, Asetonitril, 2-Propanol, Dietileter, Azəton Actik Asit, Diklorometan, J. Browand	TS EN 13528 1,2,3 İşletme içi Metot "TA.344.Rev.00"	
	<ul> <li>Arteksi, Arteksi, Eskologuari, Erilisaetat, Kloroform, 2</li> <li>Metoksietanol, Metanol, Tetrahidrofuran,</li> <li>Dikkoroetan, Sikolekskan, Isopropilasetat, Biltanol,</li> <li>Benzen, Trikloretilen, 1,4-Dioksan, n-Heptan,</li> <li>Metilsiklohekzan, 4-Metil-2-pentanon, Pridin, Toluen,</li> <li>1,1,2-Trikloretan, n-Bollissetat, Monoklorobenzen,</li> <li>Etilbenzen, Killen (mp-Ksilen), Stiren, Sikohekzanon,</li> <li>o-Ksilen, S-Metil-3-heptanon, Propilbenzen, 1,2,4</li> <li>-Trimetilbenzen, n-Oktan, I-Metoksi-2-Propanol,</li> <li>Tersiyerbutilmetilketon)</li> <li>GC-FID</li> </ul>		
İmisyon(Çevre Həvəsı)	H <sub>5</sub> S Örnekleme ve Tayini Numune Alma:Difüzyon Cihazlarının Seçimi, Taşıma ve Belirsizlik Bileşenleri Cihaz Seçimi ve Numune Alma Noktalarının Seçimi Spektrofotometre	TS EN 13528 1,2,3 İşletme içi Metot "TA.342.Rev.00"	
İmisyon(Çevre Havası)	Merkaptan Örnekleme Ve Tayini Numune alma: Aktif Örnekleme Spektrofotometre	TS 9628	
İmlsyon (Çevre Havası)	Gəzlərin ve Buhərlərin Derişimlerinin Təyini Numune Alma: Difüzyon Cihəzlərinin Seçimi, Təşimə ve Belirsizlik Bileşenleri Cihəz seçimi ve Numune Alma Noktələrinin Seçimi (NOı, Formaldehit, HCI, HF, NH,-NHı, O., SO.)	TS EN 13528-1 TS EN 13528-2 TS EN 13528-3	

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## EKLER (Ref. No: 034.21/1123-00

Rapor No: EMR-196)

- Ek 1 Cihaz Kalibrasyon Belgeleri
- Ek 2 Cihaz Çıktıları

# EK 1 CİHAZ KALİBRASYON BELGELERİ



Kısıklı Mahallesi Ferah Cd. No:6 Pk:34692 Üsküdar – İSTANBUL Tel: 0216 523 63 47 - Fax: 0212 243 63 41 e-posta: info@pentaotomasyon.com.tr



AB-0113-K
AK-2103810/02
08-21

web: www.pentaotomasyon.com.tr Kalibrasyon Sertifikası

Certificate of Calibration

<b>Cihazın Sahibi / Adresi</b> <i>Customer / Address</i>	: HALİÇ ÇEVRE TEKNOLOJİLERİ MÜ TİC. PAZ. LTD. ŞTİ. Ali Kuşçu Mahallesi Yavuz Selim Caddesi N	ÜHENDİSLİK MÜŞAVİRL Jo: 50/1-2-3-4 Fatih / İSTANE	.İK TUR. VE SAĞLIK HİZM. BUL
<b>İstek Numarası</b> Order No	: 2103810		
<b>Makine / Cihaz</b> Instrument / Device	: TOZ ÖRNEKLEME CİHAZI (EDBİMI	ETRE)	
İmalatçı Manufacturer	: ECO INSTRUMENTS		
<b>Tip</b> Type	: PM10		
<b>Seri Numarası</b> Serial Number	: 19PM-400008		
<b>Penta Kodu</b> Penta Code	: 2103810/02	Envanter No Inventory Number	: 400
<b>Kalibrasyon Tarihi</b> Date of Calibration	: 27.08.2021		
<b>Sertifikanın Sayfa Sayısı</b> Number of pages of the certificate	: 3		
Bu kalibrasyon sertifikası, Uluslararası B This calibration certificate documents the tra	irimler Sistem'inde (SI) tanımlanmış birimleri realize eden u aceabilty to national standards, which realize the unit of measure	lusal ölçüm standartlarına izlenebilirl ement according to the International Sys	<b>iği belgeler.</b> tem of Units (SI).

Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir. The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.

Kalibrasyon laboratuvarı olarak faaliyet gösteren Penta Otomasyon, TÜRKAK'tan AB-0113-K ile TS EN ISO / IEC 17025:2017 standardına göre akredite edilmiştir. Penta Otomasyon accredited by TÜRKAK under registration number AB-0113-K & TS EN ISO / IEC 17025:2017 as Calibration Laboratory'

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Bu sertifikadaki sonuçlar, cihazın kalibrasyon tarihindeki durumunu kapsamaktadır. Bu sertifika, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. Sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. İmzasız sertifikalar geçersizdir. This result in this certicate refer to condition of the instrument on the date of calibration. This certificate shall not be reproduced other than in full except with the permission of the laboratory. This certificate is signed using secure digital signature according to article of law, number 5070. Calibration certificates without signature are not valid Bu Delge, guvenli elektronik imza ile imzalanmıştır

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#### Kalibrasyon Sertifikası



BS-2103810/02 08-21

Certificate of Calibration

: HALİÇ ÇEVRE TEKNOLOJİLERİ MÜHENDİSLİK MÜŞAVİRLİK TUR. VE SAĞLIK HİZM. TİC. PAZ. LTD. ŞTİ. Ali Kuşçu Mahallesi Yavuz Selim Caddesi No: 50/1-2-3-4 Fatih / İSTANBUL		
: 2103810		
: BAROMETRE		
: ECO INSTRUMENTS		
: PM10		
: 19PM-400008		
: 2103810/02	<b>Envanter No</b> Inventory Number	: 400
: 26.08.2021		
: 3		
	<ul> <li>: HALİÇ ÇEVRE TEKNOLOJİ TİC. PAZ. LTD. ŞTİ. Ali Kuşçu Mahallesi Yavuz Selim</li> <li>: 2103810</li> <li>: BAROMETRE</li> <li>: ECO INSTRUMENTS</li> <li>: PM10</li> <li>: 19PM-400008</li> <li>: 2103810/02</li> <li>: 26.08.2021</li> <li>: 3</li> </ul>	<ul> <li>: HALİÇ ÇEVRE TEKNOLOJİLERİ MÜHENDİSLİK MÜŞAVİ TİC. PAZ. LTD. ŞTİ. Ali Kuşçu Mahallesi Yavuz Selim Caddesi No: 50/1-2-3-4 Fatih / İSTA</li> <li>: 2103810</li> <li>: BAROMETRE</li> <li>: ECO INSTRUMENTS</li> <li>: PM10</li> <li>: 19PM-400008</li> <li>: 2103810/02</li> <li>Envanter No Inventory Number</li> <li>: 26.08.2021</li> <li>: 3</li> </ul>

This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the International System of Units (SI).

Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir. The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.

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Mühür	Yayımlandığı Tarih	Kalibrasyonu Yapan	<b>Onaylayan</b> / Approval
Seal	Date	Calibrated by	Tarih / Date
ON LABOR		Kalibrasyon Sorumlusu	Teknik Müdür
5	26.08.2021	Hasan TANRIKULU	Gamze Ergiyen BULDU
a penta \$		SN: 37965c5cbed914080169	SN: 68d484980ccd5962c17e
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ISTANBUL			2021.08.26 15:27:51+03'00'

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#### Kalibrasyon Sertifikası



AB-0113-K S-2103810/02 08-21

Certificate	e of Calibration

Cihazın Sahibi / Adresi : Customer / Address	HALİÇ ÇEVRE TEKNOLOJİLERİ MÜH TİC. PAZ. LTD. ŞTİ. Ali Kuşçu Mahallesi Yavuz Selim Caddes	IENDİSLİK MÜŞAVİRLİ i No: 50/1-2-3-4 Fatih / İS	K TUR. VE SAĞLIK HİZM. TANBUL
İstek Numarası : Order No	2103810		
Makine / Cihaz:Instrument / Device	Göstergeli Sıcaklık Ölçer		
İmalatçı : Manufacturer	ECO INSTRUMENTS		
Tip : Type	PM10		
Seri Numarası : Serial Number	19PM-400008		
Penta Kodu:Penta Code	2103810/02	Envanter No Inventory Number	: 400
Kalibrasyon Tarihi:Date of Calibration	26.08.2021		
Sertifikanın Sayfa Sayısı : Number of pages of the certificate	3		

Bu kalibrasyon sertifikası, Uluslararası Birimler Sistem'inde (SI) tanımlanmış birimleri realize eden ulusal ölçüm standartlarına izlenebilirliği belgeler. This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the International System of Units (SI).

Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir. The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.

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Mühür	Yayımlandığı Tarih	Kalibrasyonu Yapan	<b>Onaylayan</b> / Approval
Seal	Date	Calibrated by	Tarih / Date
N LABOO		Kalibrasyon Sorumlusu	Teknik Müdür
10. AN	26.08.2021	Yılmaz OCAK	Gamze Ergiyen BULDU
a pentor \$		SN: 37a36c384a39d3c44aca	SN: 68d484980ccd5962c17e
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Tel: 0 216 523 63 47 Fax: 0 212 243 63 41 web: www.kalibrasyonlaboratuvari.com.tr

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----BITIRME TARIHI-----

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# İLLER BANKASI SÜRDÜRÜLEBİLİR ŞEHİRLER PROJESİ EK FİNANSMAN (SCP II-AF GROUP 1) KAPSAMINDAKİ NİKSAR BELEDİYESİ SU ŞEBEKESİ PROJESİ İMİSYON ÖLÇÜM RAPORU

Yavuz Selim Caddesi No.50 Fatih/ İSTANBUL Tel: (0212) 621 23 40 (Pbx) Fax: (0212) 621 23 59

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## İÇİNDEKİLER

HALİÇ ÇEV LABORATUV	<b>/RE</b> <b>Haliç Çevre</b> Ali Ku	e <b>Teknolojileri Müh. Müş. Turz. Ve Sa</b> ışçu Mh.Yavuz Selim Cad. No: 50 34083 <b>Deney Raporu</b> <i>Test Report</i>	<b>ğ. Hiz. Tic. Paz. Ltd. Şti.</b> 3 Fatih/ İSTANBUL	С С С С С С С С С С С С С С
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Deferans No		Niksai/ I Okat		
Order No		: 034.21/1519-00		
Numune Adı ve Tarifi				
Name and identity of test item		: Ortamda PM2,5 Olçumleri		
Numune Kayıt Numa	rası	·2111-1102		
Test item registration number		•2111 1102		
Olçüm Tarihi		:30.11.2021-01.12.2021		
Numunenin Kahul Ta	rihi			
TheDate of receipt of test iter	n <b>1111</b>	: 06.12.2021		
Açıklamalar		-		
Remarks		• -		
Analiz, Tarih Araligi Completion date of analysis		: 10.12.2021		
Rapor Numarası/ Tar	ihi	•EMB 251/17 12 2021		
Report number/ Date		EWIR-251/17.12.2021		
Rapor Sayfa/ Nüsha S	ayısı			
number of pages and copies	n ine report	:15 Sayfa-2 Ek/1 Nüsha		
Karekod/QR Code	Tarih/Date	Deney Sorumlusu/Person in charge of test	Laboratuvar Yöne	eticisi/
■統計■			Laboratory Manage	<u>er</u>
	17.12.2021	e-imzalıdır	e-imzalıdır	
		Doğan DURSUN	Feyza YALÇI	N

Ölçüm Sorumluları/ Person in chargeof measuring	Raporu Hazırlayan/Reporter	Raporu Kontrol Eden/Controller
e-imzalıdır Kubilay SUDAN	e-imzalıdır Nazan BÜKER	e-imzalıdır Selin ÇAKMAK

RP.09/Rev.04/21.07.20

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Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

Bu analiz raporu laboratuara gelen numuneyi/örneklemeyi temsil eder.Bu rapor ve sonuçları Haliç Çevre Analizleri Laboratuvarı'nın izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.Rapor numarasının başında yer alan (R) raporun güncellendiğini belirtir.Analiz yapılan numunede, numunenin almışından laboratuarımıza teslimine kadar olan prosedürlerin ve bakılması istenilen grup ve parametrelerin belirlenmesinde teknik ve hukuki sorumluluk numuneyi/örneklemeyi alana aittir. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir. İş bu rapor Çevre Mevzuatına ilşkin resmi işlemlerde kullanılamaz.This report shall not be reproduced other than in full except with the permission of the laboratory. . Reports which are in the form of wet signed without sign and seal and in the form of digitally signed without process ID are invalid. The Laboratory is not responsible for any latter changes on the report, addition/removal of pages. The results are related to the process conditions during the measurement.

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AB-0095-T

EMR-251

# BÖLÜM 1 GİRİŞ

## **1.1. TANIMLAR**

20.12.2014 tarihli ve 29211 sayılı Resmi Gazete' de yayınlanarak yürürlüğe giren "Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliğinde Değişiklik Yapılmasına Dair Yönetmelik" te yer alan bazı tanımlar aşağıda verilmiştir.

Atık gazlar: Katı, sıvı veya gaz emisyonlar ihtiva eden gaz halinde salımları,

Çevre İzni: Çevre Kanunu uyarınca alınması gereken; hava emisyonu, çevresel gürültü, atık su deşarjı, derin deniz deşarjı ve tehlikeli madde deşarjı konularından en az birini içeren izni,

Çift veya çoklu yakıt yakan tesis: Aynı anda veya değişimli olarak iki veya daha fazla yakıt ile ateşlenebilen yakma tesisini,

Büyük Yakma Tesisi: Anma ısıl gücü 50 MW ve üzeri olan, yalnızca enerji üretimi için inşa edilen katı, sıvı veya gaz yakıtların kullanıldığı yakma tesislerini,

Emisyon: Yakıt ve benzerlerinin yakılmasıyla; sentez, ayrışma, buharlaşma ve benzeri işlemlerle; maddelerin yığılması, ayrılması, taşınması ve diğer mekanik işlemler sonucu bir tesisten atmosfere yayılan hava kirleticilerini,

Emisyon Kaynağı: Atmosfere emisyon veren baca veya baca dışı kaynağı,

Emisyon Ölçüm Raporu Geçerlilik Süresi: İlk ölçüm tarihi esas alınarak, 10/9/2014 tarihli ve 29115 sayılı Resmî Gazete'de yayımlanan Çevre İzin ve Lisans Yönetmeliği kapsamındaki işletmeler için emisyon ölçüm raporu geçerlilik süresi iki yılı,

Emisyon Sınır Değeri (yakma tesisleri için): Sıvı ve gaz yakıtlarda % 3, katı yakıtlarda % 6, gaz türbinlerinde % 15 oranında oksijen olduğu varsayılarak, mg/Nm3 olarak ifade edilen, kütle bölü atık gazın hacmi olarak hesaplanan ve yakma tesisinden havaya verilen atık gazların içinde bir maddenin bulunmasına izin verilen konsantrasyonu,

> Üretim Prosesi: Yakıtın ham madde ile birlikte muamele gördüğü veya yakıttan elde edilen enerjinin hammaddeyi veya ürünü kurutma, kavurma ve benzeri işlemlerde kullanıldığı ve bacasından proses kaynaklı baca gazı emisyonlarının ve yanma gazlarının birlikte çıktığı veya sadece proses kaynaklı baca gazı emisyonlarının çıktığı tesisleri,

Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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> Yakma Isıl Gücü/Isıl Güç/Yakıt Isıl Gücü/Anma Isıl Gücü: Bir yakma tesisinde birim zamanda yakılan yakıt miktarının yakıt alt ısıl değeriyle çarpılması sonucu bulunan KW, MW birimleri ile ifade edilen asıl güç değerini,

Yakma Tesisi: Yakıtları okside ederek oluşan ısının kullanıldığı teknik ekipmanı,

İş Termin Planı: Tesis sahibi tarafından hazırlanacak ve bu Yönetmelikte belirtilen yükümlülükleri ve sınır değerleri sağlayacak proses ve baca gazı arıtım tesislerinin gerçekleştirilmesi sürecinde yer alan proje, ihale, inşaat ve işletmeye alma gibi işlerin zamanlamasını gösteren planı,

Mevcut Tesis: Ek-5.A.1 kapsamındaki tesisler için; 8.6.2010 tarihinden önce, diğer tesisler için ise 3/7/2009tarihinden önce kurulmuş veya Çevresel Etki Değerlendirmesi mevzuatına göre kurulması uygun bulunan tesisleri,

➢ Kısa Vadeli Değer (KVD): Maksimum günlük ortalama değerler veya istatistik olarak bütün ölçüm sonuçları sayısal değerlerinin büyüklüğüne göre dizildiğinde, ölçüm sonuçlarının % 95 ine tekabül eden değeri, çöken tozlar için farklı olarak aşılmaması gereken maksimum aylık ortalama değerleri,

➢ Kısa Vadeli Sınır Değer (KVS): Maksimum günlük ortalama değerleri veya sayısal değerlerinin büyüklüğüne göre dizildiğinde, istatistik olarak bütün ölçüm sonuçlarının % 95 ine tekabül eden ve Ek-2 Tablo 2.2 de belirtilen aşmaması gereken değeri,

Uzun Vadeli Değer (UVD): Uzun Vadeli Değer (UVD): Yapılan bütün ölçüm sonuçlarının aritmetik ortalaması olan değeri,

Uzun Vadeli Sınır Değer (UVS): Yapılan bütün ölçüm sonuçlarının aritmetik ortalaması olan,
 Ek-2 Tablo 2.2 de belirtilen aşılmaması gereken değeri ifade eder.

#### RP.15/Rev.04/21.07.2020

Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



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## **1.2. GENEL**

27277 sayılı ve 3 Temmuz 2009 tarihli Resmi Gazete'de yayınlanarak yürürlüğe giren "Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliği", sanayi ve enerji üretim tesislerinin faaliyeti sonucu atmosfere yayılan is, duman, toz, gaz, buhar ve aerosol halindeki emisyonları kontrol altına almayı, insanı ve çevresini hava alıcı ortamındaki kirlenmelerden doğacak tehlikelerden korumayı, hava kirlenmeleri sebebiyle çevrede ortaya çıkan umuma ve komşuluk münasebetlerine önemli zararlar veren olumsuz etkileri gidermeyi ve bu etkilerin ortaya çıkmamasını amaç edinmiştir.

Bu PM2,5 raporu **"İller Bankası Sürdürülebilir Şehirler Projesi Ek Finansman (SCP II-AF GROUP 1) kapsamındaki Niksar Belediyesi Su Şebekesi Projesi"** nin Niksar/TOKAT adresinde Enlem: 327058.92 d D Boylam: 4495267.23 m K koordinatlarında (UTM 37 T Projeksiyonu) 30.11.2021-01.12.2021 tarihinde gerçekleştirilen 24 saatlik PM2,5 ölçümleri neticesi hazırlanmıştır.

İş bu rapor, ölçüm yapılan dönemdeki mevcut arka plan koşullarını kapsamakta olup, mevcut durumda yapılan herhangi bir değişiklik (inşaat çalışması, bu çalışmalardaki makine/ekipmanlar, havalandırma sistemi, yerleşim, vb.) durumunda, ölçüm sonuçları değişiklik göstereceğinden bunlar gerekirse tekrarlanabilir. Ölçüm için temin edilen teknik bilgilerde talep edenin beyanı esas olup laboratuvarımız bu konuda sorumluluk kabul etmeyecektir.

#### RP.15/Rev.04/21.07.2020

Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



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## Tablo 1.1. Genel Bilgiler

	İller Bankası Sürdürülebilir Şehirler Projesi Ek Finansman		
<sup>a</sup> Proje Adı	(SCP II-AF GROUP 1) kapsamındaki Niksar Belediyesi		
	Su Şebekesi Projesi		
	Niksar/Tokat adresinde Enlem: 327058.92 d D Boylam:		
<sup>a</sup> Adres	4495267.23 m K koordinatlarında (UTM 37 T		
	Projeksiyonu)		
Belirlenen PM2,5 Ölçüm Noktası	1) Niksar Belediye Binası Bahçesi		

<sup>a</sup>: Firma beyanıdır.

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



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a- Uydu Fotoğrafları



Genel Uydu Görüntüsü (PM2,5 Ölçüm Noktası)

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



# HALİÇ ÇEVRE TEKNOLOJİLERİ

Müh. Müş. Turz. Ve Sağ. Hiz. Tic. Paz. Ltd. Şti.

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# BÖLÜM 2

## MEVCUT EMİSYONLARIN YÖNETMELİK KAPSAMINDA İRDELENMESİ

İşletmede ölçümleri gerçekleştirilen kaynakların SKHKKY kapsamında ele alındığı yönetmelik maddeleri aşağıda liste halinde verilmiştir.

## PM2,5 Ölçüm Noktası Adı:

• Niksar Belediye Binası Bahçesi; Ek 2 Tablo 2.2.

## 2.1. SKHKKY EK- 2 KAPSAMINDA İRDELEME

29211 sayılı ve 20 Aralık 2014 tarihli Resmi Gazete'de yayınlanarak yürürlüğe giren "Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliği";

## 2.1.1. Ortam Toz (PM 2,5) Emisyonları

International Finance Corporation (IFC)' na göre; PM2,5 ölçüm sonuçları 25 µg/m<sup>3</sup> (0,025 mg/m<sup>3</sup>) sınır değerini sağlamalıdır.

• Ek 2 Tablo 2.2.' ye göre: PM2,5 için sınır değer bulunmamaktadır.

		anty Guidennes,
	Averaging Period	Guideline value in µg/m³
Sulfur dioxide (SO <sub>2</sub> )	24-hour 10 minute	125 (Interim target1) 50 (Interim target2) 20 (guideline) 500 (guideline)
Nitrogen dioxide (NO2)	1-year 1-hour	40 (guideline) 200 (guideline)
Particulate Matter PM <sub>10</sub>	1-year	70 (Interim target 1) 50 (Interim target 2) 30 (Interim target 3) 20 (guideline)
	24-hour	150 (Interim target1) 100 (Interim target2) 75 (Interim target3) 50 (guideline)
Particulate Matter PM25	1-year	35 (Interim target 1) 25 (Interim target 2) 15 (Interim target 3) 10 (guideline)
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target1) 100 (guideline)

 $^{12}$  US EPA Prevention of Significant Deterioration Increments Limits applicable to non-degraded airsheds.

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# BÖLÜM 3 EMİSYON KAYNAKLARI

## 3.1. EMİSYON PARAMETRELERİ, KİRLETİCİ EMİSYONLARIN NEREDEN KAYNAKLANDIĞI VE BUNLARIN KAYNAKLARA GÖRE DAĞILIMI

Kirleticiler firma talebi sonucu belirlenmiştir. Yapılan tespit çalışması ile mevcut kaynaklarda standartlara uygun örnekleme yerlerinde cihazlar konumlandırılarak ölçümler gerçekleştirilmiştir.

İller Bankası Sürdürülebilir Şehirler Projesi Ek Finansman (SCP II-AF GROUP 1) kapsamındaki Niksar Belediyesi Su Şebekesi Projesi' ne ait PM2,5 ölçümleri 1 noktada ortamda gerçekleştirilmiştir. Yapılan ölçümlerle ilgili bilgiler aşağıda Tablo 4.1.1.' de verilmiştir.

## Tablo 3.1.1. Ölçüm Noktasında Ölçümü Gerçekleştirilen Parametreler

No. Öleiim Nektoor		Parametre
INO	Olçulli Noktası	PM2,5
1	Niksar Belediye Binası Bahçesi	$\checkmark$

Ölçüm noktaları mevcut hakim rüzgar yönü dikkate alınarak Enlem: 327058.92 d D Boylam: 4495267.23 m K koordinatlarında (UTM 37 T Projeksiyonu) gerçekleştirilmiştir.

## 3.2. ÖLÇÜMLERDE KULLANILAN YÖNTEMLER

## 3.2.1. PM2,5 NUMUNE ALMA

Ölçümlere ilişkin numune alma işlemleri, 30.11.2021-01.12.2021 tarihinde numune almadan sorumlu ve deneyimli personelimiz tarafından Numunelerin Nakli, Taşınması ve Muhafazası Prosedürü ile Numune Alma ve İlgili Verilerin, İşlemlerin Kaydedilmesi Prosedürleri dikkate alınarak 1 gün süreyle gerçekleştirilmiştir.

İşletmeden alınan toz numuneleri; toz filtreleri vasıtasıyla cam petri kapları içerisinde, özenle ve uygun şartlarda muhafaza edilerek, 06.12.2021 tarihinde laboratuvarımıza ulaştırılmış olup, analizleri 10.12.2021 tarihinde tamamlanmıştır.

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



## 3.2.3. ÇEVRE ŞARTLARI

PM2,5 ölçümleri 1 noktada ortamda gerçekleştirilmiş olup, ölçüm gününe ilişkin çevre şartları aşağıda Tablo 4.2.3.' te verilmiştir.

#### Tablo 3.2.3. Çevre Şartları

Tarih	Ölçüm Yeri	Nokta Koordinatları	Sıcaklık ( <sup>0</sup> C)	Basınç (kPa)
30 11 2021-		X: 327058.92 d D		
30.11.2021-Niksar Belediye Binası01.12.2021Bahçesi	Y: 4495267.23 m K	14,97	92,136	

## 3.2.4. ÖLÇÜM NOKTALARI

Ölçümler, toz çıkışının olduğu noktalar dikkate alınarak yapılmıştır. Gerçekleştirilen deneylerde Uluslararası Standartlar ve TSE Standartları kullanılmaktadır. Ortam ölçümleri için uygun noktalar tespit edilerek ölçümler gerçekleştirilmiştir.

## 3.2.5. ÖLÇÜM SAYISI

1 noktada 24 saatlik ölçüm gerçekleştirilmiş olup, örnekleme sonucu verilmektedir.

## 3.2.6. ÖLÇÜMDE KULLANILAN CİHAZLAR VE METOTLAR

Ölçümde kullanılan cihazlar ve kullanılan metotlar aşağıda verilmiştir.

Tablo 3.2.6. Ölçüm Yöntemleri

Ölçüm Parametresi	Kullanılan Cihaz/ Seri No	Kalibrasyon Süresi	Deney Adı	Deney Metodu
Partikül Madde (Ortamda)	ECO Instruments/ DA-PM/ 19PM-400010	Yılda 1 Kez	Askıdaki Tanecikli Maddenin PM 2,5 Kütle Derişimlerinin Tayini Gravimetrik Metot	EPA 40 CFR 50 Appl

Ölçümler Tablo 3.2.6.' da verilen standartlara uygun olarak hazırlanmış olan çalışma talimatları doğrultusunda gerçekleştirilmiştir.

Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



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# BÖLÜM 4 ölçüm fotoğrafları

Ölçümler ortamda gerçekleştirilmiştir.

## a. PM2,5 Ölçüm Fotoğrafları



## Niksar Belediye Binası Bahçesi

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



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# BÖLÜM 5

# ÖLÇÜM SONUÇLARI VE DEĞERLENDİRİLMESİ

## 5.1. PM2,5 ÖLÇÜM SONUÇLARI

Ölçüm yapılan noktalara ait ölçüm sonuçları ve hesaplamalar aşağıda tablolarda verilmiştir.

## Tablo 5.1. PM2,5 Ölçüm Sonuçları

Ölçüm Noktaları	PM2,5 Kons. (μg/Nm <sup>3</sup> )	SKHKKY Sınır Değer (µg/Nm³)	IFC (µg/Nm³)
1. Nokta- Niksar Belediye Binası Bahçesi	30	-	25

## 5.2. ÖLÇÜM SONUÇLARININ DEĞERLENDİRİLMESİ

29211 sayılı ve 20 Aralık 2014 tarihli Resmi Gazete'de yayınlanarak yürürlüğe giren "Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliğinde Değişiklik Yapılmasına Dair Yönetmelik" kapsamında yapılan değerlendirmeler aşağıda verilmiştir;

## 5.2.1. SKHKKY EK- 2 KAPSAMINDA DEĞERLENDİRMELER

## a) Ortam Toz (PM 2,5) Emisyonları

- Ek 2- Tablo 2.2.' ye göre; PM2,5 için sınır değer bulunmamaktadır.
- International Finance Corporation (IFC)' na göre; ilgili noktada ölçülen PM2,5 ölçüm sonucu sınır

## değeri sağlamamaktadır.

Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



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## BÖLÜM 6

# AKREDİTASYON VE YETERLİLİK BELGELERİ

TÜRKAB	TÜRK AKREDİTASYON KURUMU
AKR	EDİTASYON SERTİFİKASI
Deney Labora	tuvarı olarak faaliyet gösteren,
HALİÇ (	ŞEVRE TEKNOLOJİLERİ Mühendislik Müşavirlik Turizm Ve Sağlık Hizmetleri Ticaret Pazarlama Ltd. Şti.
Y	avuz Selim cad. No:50 Fatih ISTANBUL 34240 ISTANBUL / TÜRKİYE
TÜRKAK tara Standardına g	afından yapılan denetim sonucunda TS EN ISO/IEC 17025:2017 öre Ek'te yer alan kapsamlarda akredite edilmiştir.
Akreditasyon	No : AB-0095-T
Akreditasyon	Tarihi : 5 Mart 2008
Revizyon Tar	ihi / No :26 Mayıs 2021 / 021
Bu Sertifika, y Standardına, i Haziran 2024 ta	ukarıda açık adı ve adresi yazılı Kuruluşun TS EN ISO/IEC 17025:2017 ilgili Yönetmelik ve Tebliğlere uygunluğunu sürdürmesi halinde , 22 arihine kadar geçerlidir.
	and the second sec
	Bonutyl
	G. Banu MÜDERRİSOĞLU Genel Sekreter
Türk Akreditasyon k Uluslararası Labora	Kurumu (TÜRKAK) ISO/IEC 17025 alanında Avrupa Akreditasyon Birliği (EA) ve tuvar Akreditasyon Birliği (ILAC) ile çok taraflı anlaşma (MLA/MRA) İmzalamıştır.

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



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#### Akreditasyon Sertifikası Eki (Sayfa 4/32)

	Akreditasyon Kapsam	11	
TÜRKAB	HALİÇ ÇEVRE TEKNOLOJİLERİ Mühəndislik Müşavirlik Turizm Və Sağlık Hizmətləri Ticarət Pazarlama Ltd. Şti.		
TO 11 TS. EN 150 IEC 17025	Revizyon No: 021 Tarih:	26.05.2021	
AB-0095-T	······································		
Donoyi Yapılan Malzemelor / Ürünlor	Deney Adı	Deney Metodu (Ulusal, Uluslararası standardlar, işlotmo işi motodlar)	
Baca Gazı	Sabit Kaynak Emisyonları -Krom VI (Cr * <sup>s</sup> ) Örneklemesi ve Tayini Spektrofotometre	CARB 425	
Baca Gazı	Bacada Metan gazı (CH4 ) tayini	lşletme içi metot-"TA.307.Rev.00"	
Baca Gazı	Silka Örnekleme ve Tayini (SiO <sub>2</sub> ) Örnekleme: Pompa ile filtreye numune alma Spektrofotometre	şletme  çl Metot "Tə.339 Rev.01" (Niosh 7602:2017)	
Baca Gazı	Fosfin Tayini Örnekleme: Pompa ile sorbent tüpe numune alma Apalia: Saekrofotomatrik Metot	İşletme içi Metot-"Tə.353 Rev.01" (NIOSH 6002:2015)	
Baca Gazı	Sabit Kaynak Emisyonları- PCDDs/PCDFs ve Dioksin Benzeri PCBs Bileşiklerinin Örneklenmesi Bölüm 1:Numune alma	TS EN 1948-1	
Baca Gazı	Sabit Kaynak Emisyonları - Gaz ve Partikül Fazında Polisiklik Aromatik Hidrokarbonların (PAH) Bileşiklerinin Örneklenmesi	ISO 11338-1	
Baca Gazı	Kalsiyum Oksit (CaO) ve Magnezyum Oksit(MgO) Tayini	İşletme içi Metot- "Ta.354 Rev.00" (Epa 29:2017)	
Baca Gazı	Sabit Kaynak Emisyonları- Bacələrdə Gəz Akış Hiz ve Debi Tayini S Tipi Pitot Tüpü ile	EPA Metot 2	
Baca Gazı	Sabit Kaynak Emisyonları- İzokinetik Halojen Örneklenmesi (HCI, HF, HBr, CI», Br»)	EPA Metol 26 A	
İmisyon (Çevre Havası)	Askıdaki Tanecikli Məddenin PM 10 Kütle Derişimlerinin Tayini Gravimetrik Metot	EPA 40 CFR Part 50 AppJ	
İmisyon (Çevre Havası)	Askıdaki Tanecikli Məddenin PM 2,5 Kötle Derişimlerinin Tayini Gravimetrik Metot	EPA 40 CFR 50 Appl	
İmisyon (Çevre Havası)	PM 10 Kesrinde Ağır Metallerin Tayini (As, Cd, NI, Pb) GF- AAS Metodu	TS EN 14902 TS EN 14902/AC	
İmisyon (Çevre Havası)	Askıdaki Tanecikli Maddenin PM 10 veya PM 2,5 Kütle Derişimlerinin Tayini Gravimetrik Metot	TS EN 12341	1
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#### RP.15/Rev.04/21.07.2020

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Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



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#### Akreditasyon Sertifikası Eki (Sayfa 5/32)

	Akreditasyon Kapsami		
	HALİÇ ÇEVRE TEKNOLOJİLERİ Mühendislik Müş Ticarot Pazarlama Lt Akreditasyon No: AB- Revizvon No: 021 Tarih:	avirlik Turizm Vo Sağlık Hizmotlori d. Şti. 0095-T 26.05.2021	
AD-0095-T	Revizyon No. 021 Tann.	20.05.2021	
Deneyi Yapılan Malzomoler / Ürünler	Donoy Adı	Deney Metodu (Ulusəl, Uluslararəsi standardlar, İşletme içi metodlar)	
İmisyon (Çevre Havası)	PM 10 Kesrinde Ağır Metallerin Tayini (Al, As, Ba, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Se, Sn, Tl, V, Zn) GF-AAS Metodu	VDI 2267 Part 1	
İmisyon (Çevre Havası)	Çöken Tozda Ağır Metallerin Tayini Al, Aş, Ba, Cd, Co, Cr, Cu, Mn, Ni, Pb, Se, Sn, V, Sb, Ti ve Zn'ların Tayini GF- AAS Metodu	VDI 2267 Part 2	
İmisyon (Çevre Havası)	Çöken Tozda Cd, Co, Cr, Cu, Ni, Pb, Sb, V ve Zn'lerin tayini Atomik Absorbsiyon Metodu	VDI 2267 Part 16	
İmisyon (Çevre Həvəsı)	Çöken Toz Tayini Gravimetrik Metot	TS 2341	
İmisyon (Aktif Örnekleme) Uçucu Organik Bileşikler	Uçucu Organik Bileşiklerin Tayini Örnekleme: Pompa ile aktif karbona numune alma Etanol, n-Pentan, 2-Propanol, Aseton, Dikloro metan, Metanol, Vinil aşetat, n-Hekzan, Butanon, Kloroform, Dikloroetan, Butanol, Benzen, Triklor etilen, n-Heptan, Pridin, Toluen, n-Oktan, n-Butil asetat, Monokloro benzen, Etil benzen, m-Ksilen, p-Ksilen, o-Ksilen, Stiren, Fenol, Anilin, Bütil glikol, İsopropilasetat, Asetonitril, Dottil eter, Asetik asit, Dietilamin, 1 -Propanol, Tersiyerbutilmetilketon, Etilasetat, 2 -Metoksietanol, Tetrahidrofuran, Sikklohekzan, 1 -Metoksi-2-propanol, Trietilamin, 1,4-Dioksan, Metilsiklohekzan, 1,2,4-Triklorbenzen, 2-Heptanon, Siklohekzanon, 5-Metil-3-heptanon, Propilbenzen, 1,2,4-Trimetilbenzen. (GC/FID)	ASTM D 3686 ASTM D 3687	
İmlsyon(Çevre Havası)	NO2 Derişimlerinin Tayinl Numune Arma:Difüzyon Cihazlarının Seçimi,Taşıma ve Belirsizlik Bileşenleri Cihaz Seçimi ve Numune Alma Noktalarının Seçimi Spektrofotometre	TS EN 13528 1,2,3  şletme  çi Metot "TA.338 Rev.02"	
		an	

RP.15/Rev.04/21.07.2020

14/15

Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.



AB-0095-T

EMR-251

#### Akreditasyon Sertifikası Eki (Sayfa 6/32)

TÜRKAD	HALİÇ ÇEVRE TEKNOLOJİLERİ Mühəndisilk Müş Ticarət Pazarlama Lt	şavirlik Turizm Vo Sağlık Hizmetlori Id. Şti.	
	Akreditasyon No: AB	-0095-T	
1631 1638/160.160.12028 AB-6095-7	Akróditasyon No: AB-0095-7 Revizyon No: 021 Tarih: 26.05.2021		
Denoyi Yapılan Malzomelor / Ürünler	Denoy Adı	Deney Motodu (Ulusal, Uluslararası standardlar, İşlətmə içi mətədlar)	
İmisyon(Çevre Havası)	BTEX Örnekleme ve Taylni (Benzen, Toluen, Etilbenzen, Ksilen(m,p,o) Numune Alma:Difüzyon Cihazlarının Seçimi, Taşıma ve Belirsizlik Bileşenleri Cihaz Seçimi ve Numune Alma Noktalarının Seçimi GG-FiD	TS EN 13528 1,2,3 Işletme içi Metot "TA.341.Rev.00"	
lmisyon(Çevre Havası)	VOC Örnekleme ve Tayini Numune Alma:olfüzyon Cihazlarının Seçimi, Taşıma ve Belirsizlik Bileşenleri Cihaz Seçimi ve Numune Alma Noktalarının Seçimi (Etanol, n-Pentan, Asetonitril, 2-Propanol, Dietileter, Aseton, Asetik Asit, Diklorometan, 1-Propanol, n-Hekxan, 2- Bütanon, Etilasetat, Kloroform, 2 -Metoksietanol, Metanol, Tetrahidrofuran, Dikloroetan, Siklohekzan, Isopropilasetat, Bütanol, Benzen, Trikloretilen, 1,4-Dioksan, n-Heptan, Metiliskihorkana, 4-Metil-2-pentanon, Pridin, Toluen, 1,1,2-Trikloretan, n-Bütilasetat, Monoklorobenzen, Etilbenzen, Siklein (mp-Ksilen), Sitren, Sikkohekzanon, o-Ksilen, S-Metil-3-ingenanon, Propilbenzen, 1,2,4 -Trimetilbenzen ,n-Oktan, 1-Metoksi-2-Propanol, Tersiyerbutilmetilketon) GC-FID	TS EN 13528 1,2,3 İşletme içi Metot "TA.344.Rev.00"	
İmisyon(Çevre Havası)	H <sub>5</sub> S Örnekleme ve Tayini Numune Alma:Difüzyon Cihazlarının Seçimi, Taşıma ve Belirsizlik Bileşenleri Cihaz Seçimi ve Numune Alma Noktalarının Seçimi Spektrofotometre	TS EN 13528 1,2,3 İşletme içi Metot "TA.342.Rev.00"	
İmisyon(Çevre Havası)	Merkaptan Örnekleme Ve Tayini Numune alma: Aktif Örnekleme Spektrofotometre	TS 9628	
İmlsyon (Çevre Havası)	Gəzlərin ve Buhərlərin Derişimlerinin Təyini Numune Alma: Difüzyon Cihəzlərinin Seçimi, Təşimə ve Belirsizlik Bileşenleri Cihəz seçimi ve Numune Alma Noktələrinin Seçimi (NO,, Formaldehit, HCI, HF, NH,-NH,, O., SO,)	TS EN 13528-1 TS EN 13528-2 TS EN 13528-3	

#### RP.15/Rev.04/21.07.2020

15/15

Bu rapor, laboratuvarın yazılı izni olmadan kısmen veya tamamen çoğaltılamaz. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir.Rapor üzerinde sonradan elle tadil yapmak, sayfa ekleyip/çıkarmak laboratuvarın sorumluluğunda değildir. Sonuçlar sadece ölçüm sırasındaki proses koşulları ile ilgilidir. İşbu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.

## EKLER (Ref. No: 034.21/1519-00

Rapor No: EMR-251)

- Ek 1 Cihaz Kalibrasyon Belgeleri
- Ek 2 Cihaz Çıktıları





Kısıklı Mahallesi Ferah Cd. No:6 Pk:34692 Üsküdar – İSTANBUL Tel: 0216 523 63 47 - Fax: 0212 243 63 41 e-posta: info@pentaotomasyon.com.tr web: www.pentaotomasyon.com.tr



AB-0113-K
AK-2006456/02
12-20

Kalibrasyon Sertifikası Certificate of Calibration

<b>Cihazın Sahibi / Adresi</b> Customer / Address	: HALİÇ ÇEVRE TEKNOLO TİC. PAZ. LTD. ŞTİ. Ali Kuşçu Mahallesi Yavuz Sel	JİLERİ MÜHENDİSLİK MÜŞAVİ im Caddesi No: 50/1-2-3-4 Fatih / İSTA	RLİK TUR. VE SAĞLIK HİZM. ANBUL
İstek Numarası Order No	: 2006456		
Makine / Cihaz Instrument / Device	: PM10 Örnekleme Cihazı(De	bimetre)	
İmalatçı Manufacturer	: ECO Instruments		
<b>Tip</b> <i>Type</i>	: DA-PM		
<b>Seri Numarası</b> Serial Number	: 19PM-400010		
<b>Penta Kodu</b> Penta Code	: 2006456/02	<b>Envanter No</b> Inventory Number	: 402
Kalibrasyon Tarihi Date of Calibration	: 01.12.2020		
<b>Sertifikanın Sayfa Sayısı</b> Number of pages of the certificate	: 3		
Bu kalibrasyon sertifikası, Uluslararası I This calibration certificate documents the tr	Birimler Sistem'inde (SI) tanımlanmış birimler raceabilty to national standards, which realize th	ri realize eden ulusal ölçüm standartlarına izlene e unit of measurement according to the International	<b>bilirliği belgeler.</b> I System of Units (SI).
ä	Rest-Bldestern In Block and Ard Control of the	Shannan Anna and anna a burnan a ban Anlaha a Shiri 🥵 🖉 👘	and a second second second second second second second second second second second second second second second

Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir. The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.

Kalibrasyon laboratuvarı olarak faaliyet gösteren Penta Otomasyon, TÜRKAK'tan AB-0113-K ile TS EN ISO / IEC 17025:2017 standardına göre akredite edilmiştir. Penta Otomasyon accredited by TÜRKAK under registration number AB-0113-K & TS EN ISO / IEC 17025:2017 as Calibration Laboratory'

Türk Akreditasyon Kurumu (TÜRKAK) kalibrasyon sertifikalarının tanınması konusunda Avrupa Akreditasyon Birliği (EA) ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanınma antlaşmasını imzalamıştır. /The Turkish Accreditation Agency (TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation (EA) and of the International Laboratory Accreditation (ILAC) for the Mutual recognation of calibration certificates.

Mühür	Yayımlandığı Tarih	Kalibrasyonu Yapan	<b>Onaylayan</b> / Approval
Seal	Date	Calibrated by	Tarih / Date
N LABOD		Teknik Müdür	Teknik Müdür
Pentor Parallel	15.12.2020	Alaettin DUYSAK	Ertaç AKGÜN
		SN: 3796e9334cfaab75aaa9	SN: 0226ebddec9c128d3f701f
		🔗 e-imzalıdır	🔗 e-imzalıdır
		2020.12.15 16:18:44+03'00'	2020.12.15 17:05:23+03'00'

Tel: 0 216 523 63 47 Fax: 0 212 243 63 41 web: www.kalibrasyonlaboratuvari.com.tr e-mail: info@pentakalibrasyon.com

Bu sertifikadaki sonuçlar, cihazın kalibrasyon tarihindeki durumunu kapsamaktadır. Bu sertifika, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. Sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. İmzasız sertifikalar geçersizdir. This result in this certicate refer to condition of the instrument on the date of calibration. This certificate shall not be reproduced other than in full except with the permission of the laboratory. This certificate is signed using secure digital signature according to article of law, number 5070. Calibration certificates without signature are not valid.



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#### Kalibrasyon Sertifikası



AB-0113-K S-2006456/02 12-20

Certificate of Calibration

<b>Cihazın Sahibi / Adresi</b> Customer / Address	: HALİÇ ÇEVRE TEKNOL TİC. PAZ. LTD. ŞTİ. Ali Kuşçu Mahallesi Yavu	LOJİLERİ MÜHENDİSLİK MÜŞAV 17 Selim Caddesi No: 50/1-2-3-4 Fatih	İRLİK TUR. VE SAĞLIK HİZM. / İSTANBUL
<b>İstek Numarası</b> Order No	: 2006456		
Makine / Cihaz Instrument / Device	: Göstergeli Sıcaklık Ölçer		
<b>İmalatçı</b> Manufacturer	: ECO INSTRUMENTS		
<b>Tip</b> <i>Type</i>	: ECO PM10		
<b>Seri Numarası</b> Serial Number	: 400010		
<b>Penta Kodu</b> Penta Code	: 2006456/02	<b>Envanter No</b> Inventory Number	: 402
Kalibrasyon Tarihi Date of Calibration	: 1.12.2020		
Sertifikanın Sayfa Sayısı Number of pages of the certificate	: 3		
Bu kalibrasyon sertifikası, Uluslararası I This calibration certificate documents the tr Ölçüm sonuçları, genişletilmiş ölçüm be	Birimler Sistem'inde (SI) tanımlanmış birin raceabilty to national standards, which realize slirsizlikleri ve kalibrasyon metotları bu se confidence probability and calibration method	nleri realize eden ulusal ölçüm standartlarına izlene e the unit of measurement according to the Internationa ertifikanın tamamlayıcı kısmı olan takip eden sayfala ds are niven on the following pages which are part of th	bilirliği belgeler. I System of Units (SI). ırda verilmiştir. is certificate

Kalibrasyon laboratuvarı olarak faaliyet gösteren Penta Otomasyon, TÜRKAK'tan AB-0113-K ile TS EN ISO / IEC 17025:2017 standardına göre akredite edilmiştir. Penta Otomasyon accredited by TÜRKAK under registration number AB-0113-K & TS EN ISO / IEC 17025:2017 as Calibration Laboratory"

Türk Akreditasyon Kurumu (TÜRKAK) kalibrasyon sertifikalarının tanınması konusunda Avrupa Akreditasyon Birliği (EA) ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanınma antlaşmasını imzalamıştır. /The Turkish Accreditation Agency (TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation (EA) and of the International Laboratory Accreditation (ILAC) for the Mutual recognation of calibration certificates.

Mühür	Yayımlandığı Tarih	Kalibrasyonu Yapan	<b>Onaylayan</b> / Approval
Seal	Date	Calibrated by	Tarih / Date
TON LABOR FILVAR	15.12.2020	Kalibrasyon Sorumlusu Tolga ERENOĞLU	Teknik Müdür Ertaç AKGÜN
		SN: 02e90dce9c4526 92c0d8f6	SN: 0226ebddec9c128d3f701f
ISTANBUL			2020.12.15 17:05:13+03'00'

*Tel:* 0 216 523 63 47 *Fax:* 0 212 243 63 41 *web: www.kalibrasyonlaboratuvari.com.tr* 

e-mail: info@pentakalibrasyon.com

Bu sertifikadaki sonuçlar, cihazın kalibrasyon tarihindeki durumunu kapsamaktadır. Bu sertifika, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. Sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. İmzasız sertifikalar geçersizdir. This result in this certicate refer to condition of the instrument on the date of calibration. This certificate shall not be reproduced other than in full except with the permission of the laboratory. This certificate is signed using secure digital signature according to article of law, number 5070. Calibration certificates without signature are not valid.



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#### Kalibrasyon Sertifikası



AB-0113-K BS-2006456/02 12-20

Certificate of Calibration

<b>Cihazın Sahibi</b> / <b>Adresi</b> <i>Customer / Address</i>	: HALİÇ ÇEVRE TEKNOLOJİLERİ MÜHENDİSLİK MÜŞAVİRLİK TUR. VE SAĞLIK HİZM. TİC. PAZ. LTD. ŞTİ. Ali Kuşçu Mahallesi Yavuz Selim Caddesi No: 50/1-2-3-4 Fatih / İSTANBUL		
İstek Numarası Order No	: 2006456		
Makine / Cihaz Instrument / Device	: BAROMETRE		
<b>İmalatçı</b> Manufacturer	: ECO INSTRUMENTS		
Tip Type	: ECO PM10		
<b>Seri Numarası</b> Serial Number	: 400010		
<b>Penta Kodu</b> Penta Code	: 2006456/02	<b>Envanter No</b> Inventory Number	: 402
<b>Kalibrasyon Tarihi</b> Date of Calibration	: 01.12.2020	Gelecek Kalibrasyon Tan Next Calibration Date	rihi: 12-21
Sertifikanın Sayfa Sayısı Number of pages of the certificate	: 3		
Bu kalibrasyon sertifikası Uluslararası F	Birimler Sistem'inde (SI) tanımlanmıs hirimleri	realize eden ulusal ölcüm standartlarına izlenebilirliği b	elgeler

This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the International System of Units (SI).

Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir. The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.

Kalibrasyon laboratuvarı olarak faaliyet gösteren Penta Otomasyon, TÜRKAK'tan AB-0113-K ile TS EN ISO / IEC 17025:2017 standardına göre akredite edilmiştir. Penta Otomasyon accredited by TÜRKAK under registration number AB-0113-K & TS EN ISO / IEC 17025:2017 as Calibration Laboratory"

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Mühür	Yayımlandığı Tarih	Kalibrasyonu Yapan	<b>Onaylayan</b> / Approval
Seal	Date	Calibrated by	Tarih / Date
JON LABORRY	01.12.2020	Kalibrasyon Sorumlusu Hasan TANRIKULU	Teknik Müdür Ertac AKGÜN
AN Pentor LAR		SN: 37965c5cbed914080169	SN: 0226ebddec9c128d3f701f
THE REAL		🤗 e-imzalıdır	🔗 e-imzalıdır
ISAWAR			2020.12.15 17:05:28+03'00'

*Tel:* 0 216 523 63 47 *Fax:* 0 212 243 63 41 *web: www.kalibrasyonlaboratuvari.com.tr* 

e-mail: info@pentakalibrasyon.com

Bu sertifikadaki sonuçlar, cihazın kalibrasyon tarihindeki durumunu kapsamaktadır. Bu sertifika, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. Sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. İmzasız sertifikalar geçersizdir. This result in this certicate refer to condition of the instrument on the date of calibration. This certificate shall not be reproduced other than in full except with the permission of the laboratory. This certificate is signed using secure digital signature according to article of law, number 5070. Calibration certificates without signature are not valid.


i

-----BASLAMA TARIHI----30/11/2021 7:0 ----BITIRME TARIHI---1/12/2021 7:1 OLCUM SURESI 24:1 FIRMA ADI--24 karakter KONUM ADI---24 karakter ----BARKOT/NOT-14 karakter BASLIK TURU------2.5 ---OLCUMU YAPAN FIRMA--------CIHAZ SERI NO---PM-400010 ----KALIBRASYON TARIHI----01/12/2020 SET EDILEN METOT EN 12341 ORT DEBI Qref=33.56 1/dk ORT DEBI Qamb=38.39 1/dk ORT SICAKLIK(fm)=14.97C ORT SICAKLIK(amb)=11.17C ORT BASINC (amb) 921.36 hPa ORT BASINC (fm) 795,34 hPa HACIM amb=55217.21 L HACIM ref=48263.77 L ORT SAPMA amb= 0.18 % REF SICAKLIK =0 C REF BASINC=1013 hpa



This project is co-funded by the European Union, the Republic of Turkey and the World Bank Bu Proje Avrupa Birliği, Turkiye Cumhuriyeti ve Dünya Bankası tarafından ortaklaşa finanse edilmektedir

# **Annex-B: Noise Measurement Report**

(Provided as a separate file)



# İLLER BANKASI SÜRDÜRÜLEBİLİR ŞEHİRLER PROJESİ EK FİNANSMAN (SCP II-AF GROUP 1) KAPSAMINDAKİ NİKSAR BELEDİYESİ SU ŞEBEKESİ PROJESİ ÇEVRESEL GÜRÜLTÜ ÖLÇÜM RAPORU

Yavuz Selim Caddesi No.50 Fatih/ İSTANBUL Tel: (0212) 621 23 40 (Pbx) Fax: (0212) 621 23 59

www.haliccevre.com

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A. GENEL BİLGİLER	2
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EK 2. LABORATUVAR YETERLİK BELGELERİ	
EK 3. GÜRÜLTÜ UZMANLIK SERTİFİKALARI ve MEZUNİYET BELGELERİ	
EK 4. ÖLÇÜM ÇIKTILARI	

# İÇİNDEKİLER

HALİÇ ÇEVRE LABORATUVARI	Haliç Çevre Teknolojileri Müh. Müş. T Paz. Ltd. Şti. Ali Kuşçu Mh.Yavuz Selim Cad. No: 50 34 Deney Raporu Test Report	urz. Ve Sağ. Hiz. Tic. .083 Fatih/ İSTANBUL AB-0095-T GR-053 09-21
<b>Müşteri Adı/ Adresi</b> Customer Name/ Address	: Ölçümler, İller Bankası Sürdürül II-AF GROUP 1) kapsamındaki N arka plan mevcut durum çevresel ş gerçekleştirilmiş olup, bu bilgiye y Danişment Gazi Anadolu Lisesi B	ebilir Şehirler Projesi Ek Finansman (SCP iksar Belediyesi Su Şebekesi Projesi için gürültü seviyesinin tespiti amacıyla ter verilmemiştir. ahçesi Niksar/TOKAT
<b>Referans No</b> Order No <b>Numune Adı ve Tarifi</b> Name andidentity of test item <b>Ölçüm Tarihi</b> Date of measurement	: 034.21/1123-00 : Çevresel Gürültü Ölçümü : 01.09.2021 ve 02.09.2021	
Ölçüm Standardı Standard of measurement Açıklamalar Remarks	: TS ISO 1996- 2/ TS 9315 ISO 1996- 1 : -	
Rapor Numarası/ Tarihi Report number/ Date Rapor Sayfa/ Nüsha Sayısı Number of pages and copies of the report	: GR-053/ 07.10.2021 rt : 10 sayfa/ 4 Ek- 1 Nüsha	
Karekod/QR Code	Code Tarih/Date Laboratuvar Yöneticisi/   Laboratory Manager Laboratory Manager   R 07.10.2021 e-imzalıdır	
Ölçüm Sorumluları/ Person in chargeof measuring M. Enes DURAN	Raporu Hazırlayan/Reporter	Raporu Kontrol Eden/Controller

(Yerine e-imzalayan İlker CİVİL)

RP.10/Rev.04/21.07.20

Deney laboratuvarı olarak faaliyet gösteren Haliç Çevre Teknolojileri Müh. Müş. Turz. Ve Sağ. Hiz. Tic. Paz. Ltd. Şti., TÜRKAK'tan AB- 0095-T ile [TS EN ISO/IEC 17025/Aralık 2017] standardına göre akredite edilmiştir.

e-imzalıdır

Yusuf KAŞIKÇI

Haliç Çevre Teknolojileri Müh. Müş. Turz. Ve Sağ. Hiz. Tic. Paz. Ltd. Şti.. accredited by TÜRKAK under registration number AB-0095-T for [TS EN ISO/IEC 17025/Aralık 2017] as test laboratory"

Türk Akreditasyon Kurumu(TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği(EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği(ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.

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Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

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e-imzalıdır

İlker CİVİL

Bu analiz raporu laboratuara gelen numuneyi/örneklemeyi temsil eder.Bu rapor ve sonuçları Haliç Çevre Analizleri Laboratuvarı'nın izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.Rapor numarasının başında yer alan (R) raporun güncellendiğini belirtir.Analiz yapılan numunede, numunenin alınışından laboratuarımıza teslimine kadar olan prosedürlerin ve bakılması istenilen grup ve parametrelerin belirlenmesinde teknik ve hukuki sorumluluk numuneyi/örneklemeyi alana aittir. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir. İş bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# A. GENEL BİLGİLER

Bu gürültü ölçüm raporu, Niksar Belediyesi Su Şebekesi Projesi kapsamında, 01.09.2021 ve 02.09.2021 tarihlerinde yapılan çevresel gürültü ölçümleri sonucunda hazırlanmıştır.

Bu çevresel gürültü ölçüm raporu, çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz.

#### I. ÖLÇÜMLERE İLİŞKİN GENEL BİLGİLER

Niksar Belediyesi Su Şebekesi Projesi kapsamında Danişment Gazi Anadolu Lisesi Bahçesi Niksar/TOKAT adresinde Enlem: 326503.82 d D Boylam: 4495050.67 m K koordinatlarında (UTM 37 T Projeksiyonu), çevresel gürültü ölçümleri gerçekleştirilmiştir. Firma talebi üzerine 24 saat boyunca çevresel gürültü ölçümleri yapılmış olup, gürültünün ölçüldüğü koordinat ve ölçüm sonuçları aşağıdaki tablolarda verilmiştir.

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#### a) Uydu Görüntüsü



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#### b) Ölçüm Fotoğrafları



Danişment Gazi Anadolu Lisesi Bahçesi

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#### c) Ölçümlerde kullanılan ölçüm cihazı hakkında bilgi (cihaz seri no' su, tipi, modeli ve üreticisi)

Ölçümler, portatif gürültü ölçüm cihazı ile yapılmıştır. Aşağıda cihaz ile ilgili teknik özellikler verilmiştir.

Cihazın Tipi: Tip 1

Cihaz Modeli: SVAN 958

Cihazın Seri Nosu: Cihazın seri numarası 15860, mikrofonun seri numarası 309655' dur.

Cihazın Üreticisi: Svantek Marka

Ölçüm Aralığı: 17 – 140 dBA

Frekans Ağırlığı: A, C, Lineer, İmpulsep

Zaman Ağırlığı: Fast, Slow

#### Svantek SVAN 958 Model Gürültü Ölçüm Cihazı

Cihaz, değişik ölçüm noktalarında ortam seviyesine göre değişik ölçüm aralıkları belirlemesi için uygundur. Cihaz 0,8 ile 20 kHz frekans aralıklarında ve 17 ile 140 dBA ölçüm aralıklarında çalışmaktadır. Cihaz ile eşdeğer gürültü seviyesi (Leq), ortalama ve maksimum gürültü seviyeleri ile ölçüm yapılan sürenin belirli bir yüzdesinde bulunan gürültü seviyeleri hesaplanabilmektedir.

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#### Svantek SVAN 958 Model Gürültü Ölçüm Cihazı Belirsizlikleri

Olçüm Belirsizliği		
Measurement Uncertainty		
1000 Hz 94 dB Kalibrasyon	: ± 0,16 dB	
Calibration at frequency point 1000 Hz 94 dB		
A Frekans Ağırlıklı Elektriksel Test	: ± 0,10 dB	
Electrical Tests of Frequency Weighting		
C Frekans Ağırlıklı Elektriksel Test	: ± 0,10 dB	
Electrical Tests of Frequency Weighting		
Z Frekans Ağırlıklı Elektriksel Test	: ± 0,10 dB	
Electrical Tests of Frequency Weighting		
Seviye Doğrusallığı Testi	: ± 0,10 dB	
Level Linearity Test		
Toneburst Tepkisi Testi	: ± 0,10 dB	
Toneburst Response Test		
Peak G Testi	: ± 0.10 dB	
Peak C Test		
Asın Yük Testi	: ± 0.10 dB	
Overload Indication Yest	X.	
Doğal Gürültü Testi	: ± 0.10 dB	
Saf Generated Noise Test		
1 kHz Frekans Tepkisi Testi	± 0.05 dB	
1 RHz Frequency Response Test		
Frekans Ağırlıklı Akustik Test	: 31,5 Hz ile 2 kHz : ± 0,30 dE	3
Acoustical Tests of Frequency Weighting		

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2 kHz ile 8 kHz : ± 0,50 dB

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## d) Ölçümler yapılırken esas alınan standart veya ölçüm yönteminin aşamaları ile açıklanması (kullanılan standart, ağırlıklama, oktav bant seçimi vb)

Ölçüm metodolojisinde, Çevresel Gürültünün Değerlendirilmesi ve Yönetimi Yönetmeliğinde belirtildiği şekilde, TS ISO 1996-2 ve TS 9315 ISO 1996-1 standartları dikkate alınmıştır.

İşletmede yapılan ölçümler, 1/3 oktav bandında gerçekleştirilmiştir. A-ağırlık ve C-ağırlık bandlarındaki gürültü seviyeleri incelenmiştir.

Çevresel gürültü ölçümlerinin öncesinde ve sonrasında kalibrasyon işlemi yapılmaktadır. Ölçüme başlamadan önce ve sonra cihaz 94 dBA ses seviyesinde kalibre edilmekte olup, 94 dBA seviyesinde okuma yapılmaktadır.

Dışarıda bina yanlarında yapılan ölçümler, binanın maruz kaldığı gürültünün önemli olduğu yerlerde yapılmalıdır. Başkaca belirtilmedikçe tercih edilen ölçüm konumları yüzeylerden 0,5- 1 m uzakta, önemli ses geçiş elemanlarından en az 1-1,5 m uzaktan seçilmelidir. Yansımaların en aza indirilmesi istendiği taktirde ölçümler, mümkünse herhangi bir yansıma yapısından en az 3,5 m uzaklıkta yapılmalıdır. **Niksar Belediyesi Su Şebekesi Projesi** kapsamında yapılan ölçümlerde bu şartlar göz önünde bulundurulmuştur.

Mikrofonun konumu, gürültünün geldiği yönde 45°' lik açıya yakın bir şekilde belirlenmiştir. Rüzgar gürültüsünün mikrofonda ölçümlere tesirini engellemek için mikrofonun koruyucu başlığı kullanılmıştır.

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#### II. ÖLÇÜM SONUÇLARI

24 SAATLİK GÜRÜLTÜ ÖLÇÜM SONUÇLARI							
	öı "	Ölçüm Bitiş Zamanı	Ölçüm Sonuçları				
Ölçüm Yeri/ Konumu	Olçum Başlama		1	A-Ağırlıkl	ama	C-Ağı	rlıklama
	Zamanı	nı		L10	L90	Leq	L <sub>max</sub>
Danişment Gazi Anadolu Lisesi Bahçesi	01.09.2021 11:16	02.09.2021 11:16	70,9	74,6	58,8	76,5	101,2

 $L_{10}$ , yüksek düzey ve kısa süreli gürültülerin ortalama bir ölçümünü verir.

L90 ise zamanın %90 ında aşılan ses seviyesini gösterir.

L<sub>10</sub> ile L<sub>90</sub>, arasındaki fark, gürültü seviyelerinin zamanın yüzde 80''inde geçirdiği alanı gösterir. Belirli bir zamanda, gürültü seviyelerinin standart sapması, istatistiki dalgalanmayı gösterir.



#### Oktav Bant Analizi;

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#### III. ÖLÇÜM SONUÇLARININ DEĞERLENDİRİLMESİ

**MADDE 22 –** (1) İşletme, tesis, atölye, imalathane ve işyerlerinden çevreye yayılan gürültü seviyesine ilişkin kriterler aşağıda belirtilmiştir:

a) Her bir işletme ve tesisten çevreye yayılan gürültü seviyesi Ek-VII' de yer alan Tablo-4'te

#### verilen sınır değerleri aşamaz.

ç) İşletme, tesis, atölye, imalathane ve işyerlerinin faaliyeti sonucu oluşabilecek darbe gürültüsü

#### LCmax gürültü göstergesi cinsinden 100 dBC'yi aşamaz.

#### Tablo-4 Endüstri tesisleri için çevresel gürültü sınır değerleri

Alanlar	L <sub>gündüz</sub> (dBA)	L <sub>akşam</sub> (dBA)	L <sub>gece</sub> (dBA)
Gürültüye hassas kullanımlardan eğitim, kültür ve sağlık alanları ile yazlık ve kamp yerlerinin yoğunluklu olduğu alanlar	60	55	50
Ticari yapılar ile gürültüye hassas kullanımların birlikte bulunduğu alanlardan konutların yoğun olarak bulunduğu alanlar	65	60	55
Ticari yapılar ile gürültüye hassas kullanımların birlikte bulunduğu alanlardan işyerlerinin yoğun olarak bulunduğu alanlar	68	63	58
Endüstriyel alanlar	70	65	60

#### IFC' ye göre sınır değerler aşağıdaki tabloda verilmiştir;

Ahei	Gündüz Zaman Dilimi (07:00-22:00)	Gece Zaman Dilimi (22:00-07:00)
Yerleşim; kurumsal; eğitimsel	55	45
Sanayi; Ticari	70	70

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#### İlgili Yönetmelik Maddeleri Kapsamında Yapılan Değerlendirme

Danişment Gazi Anadolu Lisesi Bahçesi Niksar/TOKAT için belirlenen 1 noktada 01.09.2021 Saat: 11:16 ile 02.09.2021 Saat: 11:16 arasında 24 saat boyunca çevresel gürültü ölçümleri gerçekleştirilmiştir. Ölçümlerle ilgili olarak yapılan değerlendirmeler aşağıdaki gibidir:

Danişment Gazi Anadolu Lisesi Bahçesi Niksar/TOKAT' ta yapılan çevresel gürültü ölçümlerine ilişkin sonuçlar 27601 sayılı, 04.06.2010 tarihli "Çevresel Gürültünün Değerlendirilmesi ve Yönetimi Yönetmeliği" Madde 22.1.a, Madde 22.1.ç' ye göre değerlendirilmiştir. Buna göre;

- Madde 22.1.a kapsamında yapılan değerlendirme sonucunda, 24 saatlik zaman dilimlerinde yapılan ölçümler neticesinde, ölçüm noktasında bulunan değer Tablo 4'te gündüz, akşam ve gece zaman dilimi için verilen sınır değerleri aşmaktadır.
- Madde 22.1.ç kapsamında yapılan değerlendirme sonucunda, ölçüm noktalarında bulunan LC<sub>max</sub> değerleri, **yönetmelikte yer alan sınır değeri sağlamamaktadır.**
- IFC standartlarına göre yapılan değerlendirme sonucunda, ölçüm noktasında bulunan değer **gündüz** ve gece zaman dilimi için verilen sınır değerlerini aşmaktadır.

Ali Kuşçu Mh.Yavuz Selim Cad. No: 50 34083 Fatih/ İSTANBUL, Tel/Fax: 0 212 621 23 40/ 621 23 59, e-mail adresi: info@haliccevre.com, web: www.haliccevre.com Bu belge, güvenli elektronik imza ile imzalanmtr

Bu analiz raporu laboratuara gelen numuneyi/örneklemeyi temsil eder.Bu rapor ve sonuçları Haliç Çevre Analizleri Laboratuvarı'nın izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.Rapor numarasının başında yer alan (R) raporun güncellendiğini belirtir.Analiz yapılan numunede, numunenin alınışından laboratuarımıza teslimine kadar olan prosedürlerin ve bakılması istenilen grup ve parametrelerin belirlenmesinde teknik ve hukuki sorumluluk numuneyi/örneklemeyi alana aittir. Islak imzalı raporlarda imzasız ve kaşesiz raporlar, dijital imzalı raporlarda ise süreç no bulunmayan raporlar geçersizdir. İş bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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#### TÜRKAK TÜRK AKREDİTASYON KURUMU TURKISH ACCREDITATION AGENCY

#### AVL Kalibrasyon Laboratuvarı



AVL Kalibrasyon Laboratuvan
İvedik O.S.B Dericiler Sit. 1385. Sok No: 10 Ostim / Ankara
T: +90 (312) 394 15 50 F: +90 (312) 394 15 53 E: bilgi@avl.com.t

Kalibrasvon Sertifikası

		Calibration Certificate	200101
			02-2020
Cihazın Sahibi Customer Name	:	HALİÇ ÇEVRE LABORATUVARI LTD. ŞTİ. Şeyh Resmi Mahallesi Yavuz Selim Caddesi No: 50 / 1-2-3-4 Fatih / İSTANBUL	
İstek Numarası Order No.	÷	T-1119-008	
Makine / Cihaz Instrument / Device	*	Ses Seviyesi Ölçüm Cihazı Sound Level Meter	
İmalatçı Manufacturer	1	Cihaz / Ön Yükseltici: SVANTEK / Mikrofon: RION	
Тір Туре	2 5	Cihaz: SVAN 958 / Ön Yükseltici: SV 12L / Mikrofon: UC-53A	
Seri Numarəsi Serial number	*** ***	Cihaz: 15860 / Ön Yükseltici: 18547 / Mikrofon: 309655	
Kalibrasyon Tarihi Date of calibration	:	05.02.2020	
Sertifika Sayfa Sayısı	:	10	

Number of pages

Bu kalibrasyon sertifikası, Uluslararası Birimler Sisteminde (SI) tanımlanmış birimleri realize eden ulusal ölçüm standartlarına izlenebilirliği belgeler.

This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the International System of Units (SI).

Kalibrasyon laboratuvan olarak faaliyet gösteren AVL Kalibrasyon Laboratuvan, TÜRKAK'tan AB-0089-K dosya numarası ile TS EN ISO/IEC 17025-2017 standardına göre akredite edilmiştir.

AVL Kalibrasyon Laboratuvan is accredited by TÜRKAK under registration number AB-0089-K for TS EN ISO/IEC 17025-2017 as test laboratory.

Türk Akreditasyon Kurumu(TÜRKAK) deney raporlarının tanınması konusunda Avrupa Akreditasyon Birliği (EA) ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanınma antlaşmasını imzalamıştır.

The Turkish Accreditation Acency (TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation(EA) and of the International Laboratory Accreditation (ILAC) for the Mutual recognation of test reports.

Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.

Mühür / Kaşe Seal Tarih *Dat*e

Kalibrasyon Personeli Calibrated By Onaylayan *Approval* 

06.02.2020

Ayşegül BATMAZ Dijital İmzalı

Younes NEVAYESHİRAZİ Dijital İmzalı

Bu sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. Belge teyidi için sayfalarda yer alan karekodu okutabilirsiniz. This certificate is signed using secure digital signature according to article of law, number 5070. For confirmation, read the QR Code using QR Code reader.



# AVL AKUSTİK VİBRASYON

#### KALİBRASYON LABORATUARI

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1. Cihaza Ait Bilgiler Device to be Calibrated				а в ал
Cihazın Adı Name of the Instrument	: Ses Sev Sound Le	riyesi Ölçüm Cihazı vel Meter	т , ж	
İmalatçısı Manufacturer	: Cihaz / C	Ön Yükseltici: SVAN	TEK / Mikrofon: RIC	DN
Seri Numarası Serial Number	: Cihaz: 1	5860 / Ön Yükseltici	: 18547 / Mikrofon:	309655
Ölçüm Aralığı Measuring Range	: 24 dB -	137 dB		»
Bölüntüsü Scale Division	: 0,1			
Tipi <i>Type</i>	: Cihaz: S	VAN 958 / Ön Yükse	eltici: SV 12L / Mikro	ofon: UC-53A
2. Cihazın Laboratuvara Kabul Tarihi Date of Recipt of Device	: 18.01.2020	)	e S	
3. Kalibrasyon Metodu Calibration Method				
Ölçüm tablolarında belirtilen tolerans değ tarif edilen testlere göre yapılmıştır. Bu Prosedürüne göre yapılmıştır. Ölçümlere	jerler IEC 61672-1 s testler PR.LBBR.50 len önce ses seviyes	tandardından alınmı 1 Elektroakustik Ses si ölçüm cihazı 94 dB	ştır. Ölçümler IEC 6 s Seviye Ölçerleri F 1000 Hz' de kalibre	1672-3 standardında Periyodik Kalibrasyon e edilmiştir.
The tolerance values indicated in test results an described in IEC 61672-3. PR.LBBR.501 Proce measurenment at 94 dB 1000 Hz.	e taken from IEC 61672 dure was used in calibra	1 standard. Sound level tion of the sound level r	meter is calibrated acc neters. Sound level me	cording to tests which are ter was calibrated before
4. Çevresel Şartlar Environmental Conditions				
Ortam Sıcaklığı Ambient Temperature	: 22,5	± 3 °C		
Bağıl Nem Relative Humidity	: 42	± 25 %	2 	
Ortam Basıncı Ambient Pressure	: 901	± 1 mbar		
5. Kalibrasyonda Kullanılan Referans C Reference Equipments Used During Calibration	ihazlar <sup>n</sup>			
Cihaz	İmalatçı	Seri No	Sertifika No	İzlenebilirlik
Device	Manufacturer	Serial No	Certificate No	Traceability
Mikrofon	Brüel & Kjaer	2709959 - 2340	1378	Spektra
Akustik Kalibratör	Brüel & Kjaer	2705957	09071	Spektra
Pistonfon	Rion	37290219	09067	Spektra
Sıcaklık ve Nem Ölcer	Kimo	7122852	193854	AVL

Kalibrasyonlarımızda Spektra CS18 kalibrasyon sistemi ve yazılımları kullanılmaktadır.

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Etikimza Süreç No : holsqsq4n2b1b5d08bcf



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6. Ölçüm Belirsizliği Measurement Uncertainty			
1000 Hz 94 dB Kalibrasyon Calibration at frequency point 1000 Hz 94 dB	: ± 0,16 dB		
A Frekans Ağırlıklı Elektriksel Test Electrical Tests of Frequency Weighting	: ± 0,10 dB		
C Frekans Ağırlıklı Elektriksel Test Electrical Tests of Frequency Weighting	: ± 0,10 dB		
Z Frekans Ağırlıklı Elektriksel Test Electrical Tests of Frequency Weighting	: ± 0,10 dB		
Seviye Doğrusallığı Testi Level Linearity Test	: ± 0,10 dB		
Toneburst Tepkisi Testi Toneburst Response Test	: ± 0,10 dB		3
Peak C Testi Peak C Test	: ± 0,10 dB		
Aşırı Yük Testi Overload Indication Test	: ± 0,10 dB		
Doğal Gürültü Testi Self Generated Noise Test	: ± 0,10 dB		
1 kHz Frekans Tepkisi Testi 1 kHz Frequency Response Test	: ± 0,05 dB		
Frekans Ağırlıklı Akustik Test Acoustical Tests of Frequency Weighting	: 31,5 Hz ile 2 kHz :	: ± 0,30 dB 2 kHz	ile 8 kHz : ± 0,50 dB
7. Kalibrasyon Sonuçları Calibration Results			
7.1. 1000 Hz 94 dB Kalibrasyon Calibration at frequency point 1000 Hz 94 Ses Seviyesi Ölçüm Cihazları / Ses Bas	d <i>B</i> sınç Seviyesi		
Kalibrasyondan Önceki Değer Value Before Calibration	: 94,1 dB		
Kalibrasyondan Sonraki Değer Value After Calibration	: 94 dB		
Sapma Deviation	: 0,10 dB		*



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#### 7.2. C - Frekans Ağırlıklı Akustik Test

Acoustical Signal Tests of a C - Frequency Weighting Ses Seviyesi Ölçüm Cihazları / Ses Basınç Seviyesi

Frekans	Uygulanan	Okunan Ses	Standart	Tepki	C-Ağırlıklı Filtre	Tepki Farkı	Tolerans
Frequency	Applied SPL	Measured Sound Level	Standard Deviation	Response Difference	C-Weighted Filter Characterization	Response Deviation	Tolerance
Hz	dB	dB	. %	dB	dB	dB	dB
31,50	85,07	82,30	0,13	-2,77	-3,00	0,23	±1,5
40,00	84,86	83,10	0,12	-1,76	-2,00	0,24	±1,0
50,00	84,95	83,80	0,09	-1,15	-1,30	0,15	±1,0
63,00	84,94	84,20	0,20	-0,74	-0,80	0,06	±1,0
80,00	84,89	84,40	0,11	-0,49	-0,50	0,01	±1,0
100,00	84,90	84,60	0,21	-0,30	-0,30	0,00	±1,0
125,00	85,02	84,80	0,08	-0,22	-0,20	-0,02	±1,0
160,00	84,98	84,80	0,09	-0,18	-0,10	-0,08	±1,0
200,00	84,99	84,80	0,07	-0,19	0,00	-0,19	±1,0
250,00	85,04	84,80	0,15	-0,24	0,00	-0,24	±1,0
315,00	85,00	84,80	0,04	-0,20	0,00	-0,20	±1,0
400,00	85,00	84,80	0,05	-0,20	0,00	-0,20	±1,0
500,00	84,99	84,80	0,10	-0,19	0,00	-0,19	±1,0
630,00	85,03	84,80	0,05	-0,23	0,00	-0,23	±1,0
800,00	85,03	84,80	0,11	-0,23	0,00	-0,23	±1,0
1000,00	85,03	84,90	0,05	-0,13	0,00	-0,13	±0,7
1250,00	85,03	84,80	0,05	-0,23	0,00	-0,23	±1,0
1600,00	85,03	84,70	0,01	-0,33	-0,10	-0,23	±1,0
2000,00	85,03	84,60	0,02	-0,43	-0,20	-0,23	±1,0
2500,00	85,03	84,60	0,04	-0,43	-0,30	-0,13	±1,0
3150,00	85,02	84,40	0,01	-0,62	-0,50	-0,12	±1,0
4000,00	85,03	84,10	0,01	-0,93	-0,80	-0,13	±1,0
5000,00	85,02	83,60	0,01	-1,42	-1,30	-0,12	±1,5
6300,00	85,05	82,80	0,02	-2,25	-2,00	-0,25	+1,5; -2,0
8000,00	74,04	70,50	0,01	-3,54	-3,00	-0,54	+1,5; -2,5

#### 7.3. 1 kHz de Frekans & Zaman Ağırlıklı Test Frequency & Time Weighted Test at 1 kHz

1 kHz Frekans Tepkisi

Frekans Frequency Hz	Frekans / Zaman Ağırlığı Frequency / Time Weighting	Voltaj <sup>Voltage</sup> V	Okunan Değer Measured Value dB	Sapma Deviation dB
1000,000	A-Fast	0,049922	94,00	Referans Değer
1000,000	C-Fast	0,050019	94,00	0,00
1000,000	Z-Fast	0,049937	94,00	0,00
1000,000	A-Slow	0,049964	94,00	0,00
1000,000	LAeq	0,049949	94,00	0,00

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İşlem Procedure	а <sup>2</sup> а ,	İşlem Sonucu Procedure Result dB	Tolerans Tolerance dB
L <sub>AF</sub> - L <sub>AS</sub>		0,00	±0,2
L <sub>AF</sub> - L <sub>CF</sub>	200	0,00	±0,2
L <sub>AF</sub> - L <sub>ZF</sub>		0,00	±0,2
L <sub>AF</sub> - L <sub>Aeq</sub>		0,00	±0,2

#### 7.4. A - Frekans Ağırlıklı - Elektriksel Test

A - Frequency Weighted Electrical Test

Ses Seviyesi Ölçüm Cihazları / Frekans Ağırlıklı Test

Frekans	Uygulanan	Okunan Ses	Tepki Farkı	A-Ağırlıklı Filtre	Tepki Farkı	Tolerans
Frequency	Applied Voltage	Measured Sound Level	Response Difference	A-Weighted Filter Characterization	Response Deviation	Tolerance
Hz	<u>v</u>	dB	dB	dB	dB	dB
1000,00	0,049945	94,0	Ref. Değer	10 ki sa		
63,00	0,049982	67,9	-26,1	-26,20	0,1	±1,0
125,00	0,049996	77,9	-16,1	-16,10	0,0	±1,0
250,00	0,049990	85,4	-8,6	-8,60	0,0	±1,0
500,00	0,049983	90,8	-3,2	-3,20	0,0	±1,0
1000,00	0,050001	94,0	0,0	0,00	0,0	±0,7
2000,00	0,050000	95,3	1,3	1,20	0,1	±1,0
4000,00	0,049952	95,1	1,1	1,00	0,1	±1,0
8000,00	0,049906	93,0	-1,0	-1,10	0,1	+1,5; -2,5
16000,00	0,049945	87,2	-6,8	-6,60	-0,2	+2,5; -16,0



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#### 7.5. C - Frekans Ağırlıklı - Elektriksel Test

C - Frequency Weighted Electrical Test

Ses Seviyesi Ölçüm Cihazları / Frekans Ağırlıklı Test

Frekans	Uygulanan	Okunan Ses	Tepki Farkı	C-Ağırlıklı Filtre	Tepki Farkı	Tolerans
Frequency	Applied Voltage	Measured Sound Level	Response Difference	C-Weighted Filter Characterization	Response Deviation	Tolerance
Hz	V	dB	dB	dB	dB	dB
1000,00	0,050026	94,0	Ref. Değer			
63,00	0,049987	93,3	-0,7	-0,80	0,1	±1,0
125,00	0,050005	93,9	-0,1	-0,20	0,1	±1,0
250,00	0,050022	94,0	0,0	0,00	0,0	±1,0
500,00	0,050022	94,0	0,0	0,00	0,0	±1,0
1000,00	0,050005	94,0	0,0	0,00	0,0	±0,7
2000,00	0,049974	93,9	-0,1	-0,20	0,1	±1,0
4000,00	0,050027	93,3	-0,7	-0,80	0,1	±1,0
8000,00	0,050011	93,1	-0,9	-3,00	2,1	+1,5; -2,5
16000,00	0,050022	85,2	-8,8	-8,50	-0,3	+2,5; -16,0

#### 7.6. Z - Frekans Ağırlıklı - Elektriksel Test

Z - Frequency Weighted Electrical Test

Ses Seviyesi Ölçüm Cihazları / Frekans Ağırlıklı Test

Frekans	Uygulanan	Okunan Ses	Tepki Farkı	Z-Ağırlıklı Filtre	Tepki Farkı	Tolerans
Frequency	Applied Voltage	Measured Sound Level	Response Difference	Z-Weighted Filter Characterization	Response Deviation	Tolerance
Hz	v	dB	dB	dB	dB	dB
1000,00	0,050023	94,0	Ref. Değer			
63,00	0,049992	94,0	0,0	0,00	0,0	±1,0
125,00	0,050003	94,0	0,0	0,00	0,0	±1,0
250,00	0,050014	94,0	0,0	0,00	0,0	±1,0
500,00	0,050022	94,0	0,0	0,00	0,0	±1,0
1000,00	0,050015	94,0	0,0	0,00	0,0	±0,7
2000,00	0,050034	94,0	0,0	0,00	0,0	±1,0
4000,00	0,050012	94,0	0,0	0,00	0,0	±1,0
8000,00	0,050020	94,0	0,0	0,00	0,0	+1,5; -2,5
16000,00	0,050033	94,0	0,0	0,00	0,0	+2,5; -16,0

Etikimza Süreç No : holsqsq4n2b1b5d08bcf

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#### 7.7. A - Frekans Ağırlıklı - Elektriksel Seviye Doğrusallığı Testi

A - Frequency Weighted Electrical Level Linearity Test

Ses Seviyesi Ölçüm Cihazları / Seviye Doğrusallığı Testi

Frekans	Uygulanan Voltaj	Referans Ses	Okunan Ses Seviyesi	Sapma	Tolerans
Frequency	Applied Voltage	Reference Sound Level	Measured Sound Levels	Deviation	Tolerance
Hz	V	dB	dB	dB	dB
8000,00	0,055859	94,00	94,0	0,0	±0,8
8000,00	0,099340	99,00	99,0	0,0	±0,8
8000,00	0,176680	104,00	104,0	0,0	±0,8
8000,00	0,313970	109,00	109,0	0,0	±0,8
8000,00	0,558250	114,00	114,0	0,0	±0,8
8000,00	0,992740	119,00	119,0	0,0	±0,8
8000,00	1,765700	124,00	124,0	0,0	±0,8
8000,00	3,139400	129,00	129,0	0,0	±0,8
8000,00	3,522200	130,00	130,0	0,0	±0,8
8000,00	3,952100	131,00	131,0	0,0	±0,8
8000,00	4,434400	132,00	132,0	0,0	±0,8
8000,00	4,975300	133,00	133,0	0,0	±0,8
8000,00	5,582400	134,00	134,0	0,0	±0,8
8000,00	6,263200	135,00	135,0	0,0	±0,8
8000,00	7,050400	136,00	136,0	0,0	±0,8
8000,60	7,910300	137,00	137,0	0,0	±0,8
8000,00	0,055834	94,00	94,0	0,0	±0,8
8000,00	0,031427	89,00	89,0	0,0	±0,8
8000,00	0,017652	84,00	84,0	0,0	±0,8
8000,00	0,009944	79,00	79,0	0,0	±0,8
8000,00	0,005590	74,00	74,0	0,0	±0,8
8000,00	0,003134	69,00	69,0	0,0	±0,8
8000,00	0,001769	64,00	64,0	0,0	±0,8
8000,00	0,000996	59,00	59,0	0,0	±0,8
8000,00	0,000552	54,00	54,0	0,0	±0,8
8000,00	0,000302	49,00	49,0	0,0	±0,8
8000,00	0,000162	44,00	44,0	0,0	±0,8
8000,00	0,000235	39,00	39,1	0,1	±0,8
8000,00	0,000036	34,00	34,1	0,1	±0,8
8000,00	0,000057	33,00	33,2	0,2	±0,8
8000,00	0,000053	32,00	32,3	0,3	±0,8
8000,00	0,000048	31,00	31,3	0,3	±0,8
8000,00	0,000047	30,00	30,3	0,3	±0,8
8000,00	0,000034	29,00	29,4	0,4	±0,8
8000,00	0,000033	28,00	28,4	0,4	±0,8
8000,00	0,000031	27,00	27,6	0,6	±0,8



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#### 7.8. Ani Ton Darbe Testi - 4000 Hz

Toneburst Response - 4000 Hz Ses Seviyesi Ölçüm Cihazları / Tune Burst Testi

#### 7.8.1. A-Frekans Ağırlıklı - Hızlı

A- Frequency Weighting- Fast mode

Ton Darbesi	Okunan Ses Seviyesi	Okunan	Standard	Sapma	Tolerans
Toneburst	Measured Sound Level	Measured	Standard	Deviation	Tolerance
ms	dB	dB	dB	dB	dB
	135,00	Ref. Değer	Ref. Değer	-	- 1 2 <b></b> -
200,00	134,00	-1,00	-1,00	0,00	±0,5
2,00	117,00	-18,00	-18,00	0,00	+1,0; -1,5
0,25	107,90	-27,10	-27,00	-0,10	+1,0; -3,0

#### 7.8.2. A-Frekans Ağırlıklı - Yavaş

A- Frequency Weighting- Slow mode

Ton Darbesi	Okunan Ses Seviyesi	Okunan	Standard	Sapma	Tolerans Tolerance	
Toneburst	Measured Sound Level	Measured	Standard	Deviation		
ms	dB	dB	dB	dB	dB	
	135,00	Ref. Değer	Ref. Değer			
200,00	127,60	-7,40	-7,40	0,00	±0,5	
2,00	108,00	-27,00	-27,00	0,00	+1,0; -3	

#### 7.8.3. C-Frekans Ağırlıklı - Hızlı

C- Frequency Weighting- Fast mode

Ton Darbesi	Okunan Ses Seviyesi	Okunan	Standard	Sapma	Tolerans	
Toneburst	Measured Sound Level	Measured	Standard	Deviation	Tolerance	
ms	dB	dB	dB	dB	dB	
	135,00	Ref. Değer	Ref. Değer			
200,00	134,00	-1,00	-1,00	0,00	±0,5	
2,00	117,00	-18,00	-18,00	0,00	+1,0; -1,5	
0,25	107,90	-27,10	-27,00	-0,10	+1,0; -3,0	

#### 7.8.4. C-Frekans Ağırlıklı - Yavaş

C- Frequency Weighting- Slow mode

Ton Darbesi	Okunan Ses Seviyesi	Okunan	Standard	Sapma	Tolerans	
Toneburst	Toneburst Measured Sound Level		Standard	Deviation	Tolerance	
ms	dB	dB	dB	dB	dB	
	135,00	Ref. Değer	Ref. Değer			
200,00	127,60	-7,40	-7,40	0,00	±0,5	
2,00	108,00	-27,00	-27,00	0,00	+1,0; –3	

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#### 7.8.5. Z-Frekans Ağırlıklı - Hızlı

Z- Frequency Weighting- Fast mode

Ton Darbesi	Okunan Ses Seviyesi	Okunan	Standard	Sapma	Tolerans
Toneburst ms	Measured Sound Level dB	Measured dB	Standard dB	Deviation dB	Tolerance dB
	135,00	Ref. Değer	Ref. Değer		
200,00	134,00	-1,00	-1,00	0,00	±0,5
2,00	117,00	-18,00	-18,00	0,00	+1,0; -1,5
0,25	108,00	-27,00	-27,00	0,00	+1,0; -3,0

#### 7.8.6. Z-Frekans Ağırlıklı - Yavaş

Z- Frequency Weighting- Slow mode

Ton Darbesi	Okunan Ses Seviyesi	Okunan	Standard	Sapma	Tolerans <i>Tolerance</i>	
Toneburst	Measured Sound Level	Measured	Standard	Deviation		
ms	dB	dB	dB	dB	dB	
	135,00	Ref. Değer	Ref. Değer			
200,00	127,50	-7,50	-7,40	-0,10	±0,5	
2,00	108,00	-27,00	-27,00	0,00	+1,0; -3	

#### 7.8.7. A-Frekans Ağırlıklı - Maruziyet

A-Frequency Weighting - Exposure

Ton Darbesi	Okunan Ses Seviyesi	Okunan	Standard	Sapma	Tolerans <i>Tolerance</i>	
Toneburst	Measured Sound Level	Measured	Standard	Deviation		
ms	dB	dB	dB	dB	dB	
	135,00	Ref. Değer	Ref. Değer			
200,00	128,00	-7,00	-7,00	0,00	±0,5	
2,00	108,00	-27,00	-27,00	0,00	+1,0; -1,5	
0,25	98,90	-36,10	-36,00	-0,10	+1,0; -3,0	

#### 7.9. Aşırı Yük Testi

**Overload Indication Test** 

Ses Seviyesi Ölçüm Cihazları / Aşırı Yük Testi

Sinyal Tipi Signal Type	Frekans Frequency Hz	Voltaj <sup>Voltage</sup> V	Okunan Ses Seviyesi Measured Sound Level dB	Sapma Deviation dB	Tolerans Tolerance dB
Sürekli	4000,00	7,31	139,60	Ref. Değer	
Pozitif Yarım	4000,00	8,39	140,60	1,00	1,50
Negatif Yarım	4000,00	8,30	140,50	0,90	1,50



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#### 7.10. Peak C Testi

#### Peak C Test

Ses Seviyesi Ölçüm Cihazları / C - Ağırlıklı Peak Seviyesi

Sinval Tini Frekans		Voltaj	Okunan Ses	Okunan	Standard	Sapma	Tolerans
Signal Type	Frequency	Voltage	Measured Sound Level	Measured	Standard	Deviation	Tolerance
-3	Hz	v	dB	dB	dB	dB	dB
Sürekli	8000,00	4,39	130,00	Ref. Değer	Ref. Değer		
Tam	8000,00	4,39	133,40	3,40	3,40	0,00	±2,0
Sürekli	500,00	3,12	130,00	Ref. Değer	Ref. Değer		
Pozitif Yarım	500,00	3,12	132,30	2,30	2,40	-0,10	±1,0
Negatif Yarım	500,00	3,12	132,30	2,30	2,40	-0,10	±1,0

#### 7.11. Doğal Gürültü Testi

Self Generated Noise Test

Ses Seviyesi Ölçüm Cihazları / Doğal Gürültü

Mikrofon takılı değilken ses seviyesi 11,30 dB ölçülmüştür.

The measured sound level while the microphone is not installed is 11,30 dB.

#### 8. Uygunluk Beyanı

#### Statement of Compliance

Ölçüm sonuçları ve ölçüm belirsizliği yukarıda verilmiştir. Kullanıcı bunları dikkate alarak uygunluğuna karar vermelidir. Beyan edilen genişletilmiş belirsizlik değeri standart belirsizliğin normal dağılımı için; yaklaşık % 95 güvenirlik seviyesini sağlayan k=2 kapsam faktörü ile çarpımının sonucudur. Standart ölçüm belirsizliği GUM ve EA-4/02 dokümanlarına uygun olarak belirlenmiştir. Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı bir bölümüdür.

The measurement results and measurement uncertainity were given above. The user have to consider the results and decide compliance of the device. The reported expended uncertainity of measurement is stated as the standart uncertainity of multitude by coverage factor k=2, which for a normal distribution corresponds to covarage of approximately 95%. The standard measurement uncertainty is defined according to the GUM and EA-4/02documents. Measurement results, the expanded measurement uncertainty of measurement and calibration methods, is an integral part of the this certificate.

#### 9. Açıklamalar

#### Remarks

Bu sertifikada bulunan sonuçlar cihazın kalibrasyon tarihindeki durumu kapsar ve uzun dönem kararlığı hakkında bir öngörü içermez.

The result reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of the instrument

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Kısıklı Mahallesi Ferah Cd. No:6 Pk:34692 Üsküdar – İSTANBUL Tel: 0216 523 63 47 - Fax: 0212 243 63 41 e-posta: info@pentaotomasyon.com.tr web: www.pentaotomasyon.com.tr

#### Kalibrasyon Sertifikası



01-21

Certificate of Calibration

<b>Cihazın Sahibi / Adresi</b> Customer / Address	: HALİÇ ÇEVRE TEKNOLOJİLERİ MÜ TİC. PAZ. LTD. ŞTİ. Ali Kuşçu Mahallesi Yavuz Selim Caddesi N	IHENDİSLİK MÜŞAVİRL Io: 50/1-2-3-4 Fatih / İSTANE	İK TUR. VE SAĞLIK HİZM. Bul
İstek Numarası Order No.	: 2100474		
Makine / Cihaz Instrument / Device	: Anemometre		
İmalatçı Manufacturer	: TESTO		
<b>Tip</b> <i>Type</i>	: 410-1		
<b>Seri Numarası</b> Serial Number	: 38444669/411		
<b>Penta Kodu</b> Penta Code	: 2100474/04	<b>Envanter No</b> Customer ID Number	: 288
Kalibrasyon Tarihi Date of Calibration	: 28.01.2021		
Sertifikanın Sayfa Sayısı Number of pages of the certificate	: 3		

Bu kalibrasyon sertifikası, Uluslararası Birimler Sistem'inde (SI) tanımlanmış birimleri realize eden ulusal ölçüm standartlarına izlenebilirliği belgeler. This calibration certificate documents the traceabilty to national standards, which realize the unit of measurement according to the International System of Units (SI).

Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir. The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.

Kalibrasyon laboratuvarı olarak faaliyet gösteren Penta Otomasyon, TÜRKAK'tan AB-0113-K ile TS EN ISO / IEC 17025:2012 standardına göre akredite edilmiştir. Penta Otomasyon accredited by TÜRKAK under registration number AB-0113-K & TS EN ISO / IEC 17025:2012 as Calibration Laboratory"

Türk Akreditasyon Kurumu (TÜRKAK) kalibrasyon sertifikalarının tanınması konusunda Avrupa Akreditasyon Birliği (EA) ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanınma antlaşmasını imzalamıştır. /The Turkish Accreditation Agency (TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation (EA) and of the International Laboratory Accreditation (ILAC) for the Mutual recognation of calibration certificates.

Mühür	Yayımlandığı Tarih	Kalibrasyonu Yapan	<b>Onaylayan</b> / Approval
Seal	Date	Calibrated by	Tarih / Date
N LABOR		Kalibrasyon Sorumlusu	Teknik Müdür
10 10	28.01.2021	Özkan POLAT	Alaettin DUYSAK
a centar X		SN: 37a1836312bc12c8b751	SN: 3796e9334cfaab75aaa9
A A A A A A A A A A A A A A A A A A A		🙊 e-imzalıdır	🙎 e-imzalıdır
18000			

Tel: 0 216 523 63 47 Fax: 0 212 243 63 41 web: www.kalibrasyonlaboratuvari.com.tr

e-mail: info@pentakalibrasyon.com

Bu sertifikadaki sonuçlar, cihazın kalibrasyon tarihindeki durumunu kapsamaktadır. Bu sertifika, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. Sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. İmzasız sertifikalar geçersizdir. This result in this certicate refer to condition of the instrument on the date of calibration. This certificate shall not be reproduced other than in full except with the permission of the laboratory. This certificate is signed using secure digital signature according to article of law, number 5070. Calibration certificates without signature are not valid.





#### 1. Kalibre Edilen Cihaz / Device to be Calibrated

Makine / Cihaz	: A	nemor	netre						
Instrument / Device İmalatçı	: T	ESTO				Тір		<b>:</b> 410-1	
Manufacturer Seri No.	: 3	844460	69/411			Type Envanter No		: 288	
Serial Number <b>Ölçüm Aralığı</b> Measurement range	:	0,4	-	20	m/s	Invertory Number <b>Çözünürlük</b> Resolution	:	0,1	m/s

#### 2. Görsel ve Fonksiyonel Kontroller / Visual and Functional Controls

Gösterge / Indicator	:	Uygun /Acceptable	Sicak Tel / Hot wire	:	-
Pil Yatağı / Battery bed	:	Uygun /Acceptable	<b>Pervane</b> / Propeller	:	Uygun /Acceptable
Prop Giriși / Prop İnput	:	-	Pitot Tüp / Pitot Tube	:	-

Cihazın fiziksel ve fonksiyonel kontrolünde, ölçüm sonuçlarını etkileyebilecek herhangi bir eksiklik ve hasar gözlenmemiştir. / No damage observed on the object that affects measurement results by physically and functionally control.

#### 3. Açıklamalar / Descriptions

#### 4. Kalibrasyon Yöntemi ve Prosedürü / Calibration method or Procedures

Kalibrasyon; karşılaştırma metodu kullanılarak TL-14/09 dokümanlarına uygun olarak yapılmıştır. / Calibration was performed according to TL-14/09 document by using comparison method.

#### 5. Ölçüm Belirsizliği / Measurement Uncertainty

Ölçüm belirsizliği, ölçüm sonuçları ile beraber verilmiştir. Beyan edilen genişletilmiş ölçüm belirsizliği, standart belirsizliğin, k=2 olarak alınan genişletme katsayısı ile çarpımı sonucunda bulunan değerdir ve %95 oranında güvenilirlik sağlamaktadır.

/ The Measurement Uncertainty has been giving with the Measurement Results by the third page. The reported expanded uncertianty of measurement is stated as the standard uncertienty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

6. Çevre Şartları / E	Environmental Co	nditions					
Sicaklik / Temp (	PC): 19,6	Nem /	Hum. (% Rh) :	50,5	Basınç	Pressure (hPa):	99
7. Kalibrasyonda K	ullanılan Refer	ans Cihazlar / F	Reference Device.	s Used in Calib	oration		
Cihaz Adı	Cihaz Kodu	İmalatçısı	Seri No	Sertifi	ika No	İzlenebilirlik	Sert. Tarihi
Device Name	Device Code	Manufacturer	Serial Nr	Certifica	ate Nr	Traceability	Sertificate Date
Rüzgar Hız Sensörü	CN-314	DELTA OHM	20008926	20-369	21	AB-0016-K	09-20

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e-mail: info@pentakalibrasyon.com



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#### 8. Ölçüm Sonuçları / Measuring Results

Referans Hız <i>m/s</i>	Test Hız m/s	Mutlak Hata <i>m/s</i>	Bağıl Hata %	Belirsizlik ± m/s
Reference Instrument	Test Instrument	Deviation	Relative Deviation	Uncertainty
2,66	2,8	0,2	5,3	0,1
5,55	5,4	-0,1	-2,7	0,1
10,34	10,3	0,0	-0,4	0,2

#### 8.1. Bağıl Hata Grafiği / Relative Deviation Graph



#### 9. Uygunluk Beyanı / Declaration of Conformity

Ölçüm sonuçlarının değerlendirilmesi müşteriye bırakılmıştır. / Evaluation of measurement results is left to the customer.

#### 10. Görüş ve Yorumlar / Opinion and Comments

Tel: 0 216 523 63 47 Fax: 0 212 243 63 41 web: www.kalibrasyonlaboratuvari.com.tr e-mail: info@pentakalibrasyon.com

Bu sertifikadaki sonuçlar, cihazın kalibrasyon tarihindeki durumunu kapsamaktadır. This result in this certificate refer to condition of the instrument on the date Benlisediger, güvenli elektronik imza ile imzafanımtr



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#### Kalibrasyon Sertifikası



AB-0113-K S-2100474/04 02-21

Certificate of Calibration

Cihazın Sahibi / Adresi Customer / Address	: HALİÇ ÇEVRE TEKNOLOJİLERİ MÜHENDİSLİK MÜŞAVİRLİK TUR. VE SAĞLIK HİZM TİC. PAZ. LTD. ŞTİ. Ali Kuşçu Mahallesi Yavuz Selim Caddesi No: 50/1-2-3-4 Fatih / İSTANBUL		
İstek Numarası Order No	: 2100474		
<b>Makine / Cihaz</b> Instrument / Device	: Göstergeli Sıcaklık Ölçer		
İmalatçı Manufacturer	: TESTO		
<b>Tip</b> <i>Type</i>	: 410-1		
<b>Seri Numarası</b> Serial Number	: 38444669/411		
<b>Penta Kodu</b> Penta Code	: 2100474/04	<b>Envanter No</b> Inventory Number	: 288
Kalibrasyon Tarihi Date of Calibration	: 4.02.2021		
Sertifikanın Sayfa Sayısı Number of pages of the certificate	: 3		
Pu kalibraayan aartifikaan Ulualararaan	Pirimlar Sistem'inda (SI) tanımlanmış hirimləri	raaliza adan ulusal ölaüm atandartlarına izlana	hilirliði halgalar

Bu kalibrasyon sertifikası, Uluslararası Birimler Sistem'inde (SI) tanımlanmış birimleri realize eden ulusal ölçüm standartlarına izlenebilirliği belgeler. This calibration certificate documents the traceabilty to national standards, which realize the unit of measurement according to the International System of Units (SI).

Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir. The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.

Kalibrasyon laboratuvarı olarak faaliyet gösteren Penta Otomasyon, TÜRKAK'tan AB-0113-K ile TS EN ISO / IEC 17025:2017 standardına göre akredite edilmiştir. Penta Otomasyon accredited by TÜRKAK under registration number AB-0113-K & TS EN ISO / IEC 17025:2017 as Calibration Laboratory"

Türk Akreditasyon Kurumu (TÜRKAK) kalibrasyon sertifikalarının tanınması konusunda Avrupa Akreditasyon Birliği (EA) ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanınma antlaşmasını imzalamıştır. /The Turkish Accreditation Agency (TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation (EA) and of the International Laboratory Accreditation (ILAC) for the Mutual recognation of calibration certificates.

Mühür	Yayımlandığı Tarih	Kalibrasyonu Yapan	<b>Onaylayan</b> / Approval
Seal	Date	Calibrated by	Tarih / Date
N LABOR		Kalibrasyon Sorumlusu	Teknik Müdür
to Par	8.02.2021	Tolga ERENOĞLU	Ertaç AKGÜN
a centa X		SN: 02e90dce9c4526 92c0d8f6	SN: 0226ebddec9c128d3f701f
ASTANBUL		🔗 e-imzalıdır	🔗 e-imzalıdır

Tel: 0 216 523 63 47 Fax: 0 212 243 63 41 web: www.kalibrasyonlaboratuvari.com.tr

e-mail: info@pentakalibrasyon.com

Bu sertifikadaki sonuçlar, cihazın kalibrasyon tarihindeki durumunu kapsamaktadır. Bu sertifika, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. Sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. İmzasız sertifikalar geçersizdir. This result in this certicate refer to condition of the instrument on the date of calibration. This certificate shall not be reproduced other than in full except with the permission of the laboratory. This certificate is signed using secure digital signature according to article of law, number 5070. Calibration certificates without signature are not valid.



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#### 1. Kalibre Edilen Cihaz / Device Under Calibration Makine / Cihaz : Göstergeli Sıcaklık Ölçer

Instrument / Device						
İmalatçı	: TESTO	Model	: 4	10-1		
Manufacturer		Model				
Seri No	: 38444669/411	Envanter No	: 2	88		
Serial Number		Inventory Number				
Kalibrasyon Yeri	Laboratuvarda	Çözünürlük (°C)	:	0,1		
Place of Calibration		Resolution				
Bulunduğu Yer	: -	Ölçüm Aralığı (°C)	:	0	/	70
Place of Object		Range				
Lab. Kabul Tarihi	26.01.2021					
Date of Accept to Lab.						

#### 2. Görsel ve Fonksiyonel Kontroller / Visual and Functional Controls

Cihazın fiziksel ve fonksiyonel kontrolünde, ölçüm sonuçlarını etkileyebilecek herhangi bir eksiklik ve hasar gözlenmemiştir. *No damage observed on the object that affects measurement results by physically and functionally control.* 

#### 3. Açıklamalar / Descriptions

-

#### 4. Kalibrasyon Yöntemi ve Prosedürü / Calibration method and Procedures

Kalibrasyon, TL-14/24 ve TL-16/24 talimatları kullanılarak referans cihaz ile karşılaştırma metoduna göre gerçekleştirildi. *The calibration was performed according to TL-14/24 and TL-16/24 documents by using reference device* 

#### 5. Ölçüm Belirsizliği / Measurement Uncertainty

Ölçüm belirsizliği, ölçüm sonuçları ile beraber verilmiştir. Beyan edilen genişletilmiş ölçüm belirsizliği, standart belirsizliğin, k=2 olarak alınan genişletme katsayısı ile çarpımı sonucunda bulunan değerdir ve %95 oranında güvenilirlik sağlamaktadır.

The measurement uncertainty has been giving with the measurement results by the third page. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

#### 6. Çevre Şartları / Environmental Conditions

Sıcaklık / Temp (°C): 20±5 Nem / Hum. (%rh): 50±20

#### 7. Kalibrasyonda Kullanılan Referans Cihazlar / Reference Devices Used in Calibration

Cihaz Adı	Cihaz Kodu	İmalatçısı	Seri No	Sertifika No	İzlenebilirlik	Sertifika Tarihi
Device Name	Device Code	Manufacturer	Serial Number	Certificate No	Traceability	Certificate Date
Göstergeli Sıcaklık Ölçer	CN-215/1	Delta OHM	18029626 / 16007086	S210014	АВ-0133-К	21.01.2021

Tel: 0 216 523 63 47

Fax: 0 212 243 63 41 web: www.kalibrasyonlaboratuvari.com.tr e-mail: info@pentakalibrasyon.com

Bu sertifikadaki sonuçlar, cihazın kalibrasyon tarihindeki durumunu kapsamaktadır.

This result in this certificate refer to condition of the instrument on the date of calibration.



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#### 8. Ölçüm Sonuçları / Measurement Results

<b>Referans (°C)</b> Reference	<b>Ölçülen (°C)</b> Measured	Sapma (°C) Deviation	Ölçüm Belirsizliği (±°C) Measurement Uncertainty
15,03	15,0	0,0	0,32
21,93	22,0	0,1	0,32
29,92	30,0	0,1	0,32

9. Uygunluk Beyani / Declaration of Conformity

Ölçüm sonuçlarının değerlendirilmesi müşteriye bırakılmıştır. / Evaluation of measurement results is customer's responsibility.

10. Görüş ve Yorumlar / Remarks and comments

Tel: 0 216 523 63 47 Fax: 0 212 243 63 41 web: www.kalibrasyonlaboratuvari.com.tr e-mail: info@pentakalibrasyon.com

Bu sertifikadaki sonuçlar, cihazın kalibrasyon tarihindeki durumunu kapsamaktadır.

This result in this certificate refer to condition of the instrument on the date of calibration.



TÜRK AKREDİTASYON KURUMU

# **AKREDITASYON SERTIFIKASI**

Deney Laboratuvarı olarak faaliyet gösteren,

### HALİÇ ÇEVRE TEKNOLOJİLERİ Mühendislik Müşavirlik Turizm Ve Sağlık Hizmetleri Ticaret Pazarlama Ltd. Şti.

Yavuz Selim cad. No:50 Fatih İSTANBUL 34240 İSTANBUL / TÜRKİYE

TÜRKAK tarafından yapılan denetim sonucunda TS EN ISO/IEC 17025:2017 Standardına göre Ek'te yer alan kapsamlarda akredite edilmiştir.

Akreditasyon No	: AB-0095-T
Akreditasyon Tarihi	: 5 Mart 2008
Revizyon Tarihi / No	: 26 Mayıs 2021 / 021

Bu Sertifika, yukarıda açık adı ve adresi yazılı Kuruluşun TS EN ISO/IEC 17025:2017 Standardına, ilgili Yönetmelik ve Tebliğlere uygunluğunu sürdürmesi halinde , 22 Haziran 2024 tarihine kadar geçerlidir.



milt

G. Banu MÜDERRİSOĞLU Genel Sekreter

Türk Akreditasyon Kurumu (TÜRKAK) ISO/IEC 17025 alanında Avrupa Akreditasyon Birliği (EA) ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile çok taraflı anlaşma (MLA/MRA) imzalamıştır. 5

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#### Akreditasyon Sertifikası Eki (Sayfa 13/32)

#### Akreditasyon Kapsamı



HALİÇ ÇEVRE TEKNOLOJİLERİ Mühendislik Müşavirlik Turizm Ve Sağlık Hizmetleri Ticaret Pazarlama Ltd. Şti.

#### Akreditasyon No: AB-0095-T Revizyon No: 021 Tarih: 26.05.2021

Deneyi Yapılan Malzemeler / Ürünler	Deney Adı	Deney Metodu (Ulusal, Uluslararası standardlar, işletme içi metodlar)
İş Hijyeni	Hidrəzin Analizi	NIOSH -NMAM 3503
Çalışma Ortamında Hidrazin Tayini	Örnekleme: Pompa ile filtreye numune alma Analiz: Spektrofotometrik	
İş Hijyeni Hidrojen Siyanür	Hidrojen Siyanür (HCN) Tayini Örnekleme : Pompa ile sorbent tüpe numune alma Analiz: Görünür Bölge (VIS) Spektrofotometresi	NIOSH-NMAM 6010
İş Hijyeni Karbon Siyahı	Karbon Siyahı Tayini Örnekleme: Pompa ile filtreye numune alma Analiz: Gravimetrik	OSHA ID 196
İş Hijyeni Manyetik Alan	İnsanların Elektrik, Manyetik Ve Elektromanyetik Alanlara (O Hz-1 MHz) Maruz Kalmasının Ölçülmesi	TS EN 50413
İş Hijyeni Aydınlatma	İş Yerlerindeki Aydınlatma/Işık Şiddeti Düzeyinin Ölçümü	COHSR-928-1-IPG-039
lş Hijyeni Gürültü	Çalışma Ortamında Maruz Kalınan Gürültünün Ölçülmesi	TS EN ISO 9612
İş Hijyeni Gürültü	İhmal Edilebilir Düzeydeki Çevresel Düzeltmelerle Yansıtıcı Bir Düzlem Üzerinde Esas Olarak Açık Bir Alandaki İş Mahallinde Ve Belirtilen Diğer Konumlardaki Emisyon Ses Basınç Seviyelerinin Tayini	TS EN ISO 11201
lş Hijyeni Gürültü	Bir İş İstəsyonundaki Ve Benzer Çevresel Düzeltmeler Uygulanmış Belirtilen Diğer Konumlardaki Emisyon Ses Basınç Seviyelerinin Tayini	TS EN ISO 11202
lş Hijyeni Gürültü	Bir İş İstasyonunda Ve Belirtilen Diğer Konumlarda Emisyon Ses Basınç Seviyelerinin Ölçülmesi - Çevresel Düzeltmeler Gerektiren Yöntem	TS EN ISO 11204
İş Hijyeni Gürültü	İşyeri Ortamı Gürültü Ölçümü	İşletme içi metot- "TA.275.Rev.06" (TS ISO 1996-2 / TS ISO 1996-2/T1)
İş Hijyeni Gürültü	Kişilerin maruz kaldığı gürültü düzeyinin ölçülmesi ve işitme kayıplarının tespiti	TS 2607 ISO 1999
İş Hijyeni Gürültü Ölçümü	Kulak yakınındaki ses kaynaklarından gürültü maruziyetinin ölçülmesi (Kulak İçi Gürültü Ölçümü)	ISO 11904-1
Akustik Gürültü	Çevresel Gürültü Düzeyinin (Laeq, Laeqt, Lregt, Lday, Ldan, Levening, LAFNT, LE, Lafmax, Leenmar, Lıdın, Lıden) Tespiti	TS 9315 ISO 1996-1 ve TS 9315 ISO 1996-1/T1

#### Akreditasyon Sertifikası Eki (Sayfa 14/32)

#### Akreditasyon Kapsamı



HALİÇ ÇEVRE TEKNOLOJİLERİ Mühendislik Müşavirlik Turizm Ve Sağlık Hizmetleri Ticaret Pazarlama Ltd. Şti.

#### Akreditasyon No: AB-0095-T Revizyon No: 021 Tarih: 26.05.2021

Deneyi Yapılan Malzemeler / Ürünler	Deney Adı	Deney Metodu (Ulusal, Uluslararası standardlar, işletme içi metodlar)
Akustik Gürültü	Çevresel Gürültü Düzeyinin (Lacq, Lacqt, Lregt, Lday, Ldan, Levening, LAFNT, LE, Lafmay, Leenmay, Lrdn, Lrden) Tespiti	TS ISO 1996-2 ve TS ISO 1996-2/T1
Akustik Gürültü	Sanayi Tipi Yük Taşıtlarının Gürültü Düzeyinin (L¤A, LwA) Tespiti	TS EN 12053+A1
Akustik Gürültü	Çoklu Gürültü Kaynağına Sahip Sanayi Tesislerinde Yapılan Ses Basıncı Düzeyi Ölçümlerinden Ses Gücü Düzeyinin (ΔLs, ΔLr, ΔLα, Lα, Lα, Lw) Tespiti	TS ISO 8297
Akustik Gürültü	Mühendislik Metodu Kullanılarak Gürültü Kaynaklarından Yapılan Ses Basıncı Düzeyi Ölçümlerinden Ses Gücü Düzeyinin (Lw, Lwa) Tespiti	TS EN ISO 3744
Akustik Gürültü	Gözlem Yöntemi Kullanılarak Gürültü Kaynaklarından Yapılan Ses Basıncı Düzeyi Ölçümlerinden Ses Gücü Düzeyinin (Lşıd,τ, ΔLş, K., K., Lşı, Lw) Tespiti	TS EN ISO 3746
Akustik Gürültü	Sesin dışarıda yayılırken azalması Bölüm 2: Genel hesaplama yöntemi	TS ISO 9613-2
Akustik Gürültü	Sesin Alansal Dağılımının Hesaplanması	ISO 13474
İş Hijyeni Titreşim	Tüm Vücudun Titreşime Maruz Kalmasının Ölçülmesi ve Değerlendirilmesi	TS ISO 2631-1 (TS EN 1032+A1 ile birlikte)
İş Hijyeni Titreşim	Kişilerin Maruz Kaldığı, Elle İletilen Titreşimin Ölçülmesi ve Değerlendirilmesi	TS EN ISO 5349-1 TS EN ISO 5349-2
İş Hijyenl Titreşim	Hareketli Makinaların Deneye Tâbi Tutulması ile Titreşim Emisyon Değerinin Tespiti	TS EN 1032+A1
Titreşim	Madencilik Faaliyetleri Sonucunda Oluşan Hava Şoku ve Yer Titreşiminin Ölçülmesi (a,v)	TS 10354
Titreşim	Mekanik Titreşim- Makine Titreşiminin Ölçülmesi ve Değerlendirilmesi Bölüm 5:Hidrolik güç üretim ve pompa depolama tesislerindeki makine setleri titreşiminin ölçülmesi ve değerlendirilmesi	ISO 20816-5
Titreşim	Binalarda titreşimin ölçülmesi ve yapı hasarının tespiti (τr, a,V)	TS ISO 4866
Su	Nehirlerden ve Akarsulardan Numune Alma	TS ISO 5667-6
Su	Göl ve Göletlerden Numune Alma	TS ISO 5667-4
Su	Yeraltı Sularından Numune Alma	TS ISO 5667-11
Su	Yağıştan Numune Alma	TS ISO 5667-8

# EK 3 GÜRÜLTÜ UZMANLIK SERTİFİKALARI ve MEZUNİYET BELGELERİ


# FIZIK MÜHENDISLERI ODASI **BAŞARI BELGESİ TMMOB**



# Sayın Muhammet Enes DURAN (T.C.Kimlik No:27886750676)

TMMOB Fizik Mühendisleri Odası ile Çevre ve Şehircilik Bakanlığı işbirliği ile 01-04 Temmuz 2017 tarihleri arasında Fizik Mühendisleri Odası İstanbul Şube tarafından gerçekleştirilen

"A-2 Tipi Mühendislik Akustiği"

Sertifika Programına katılarak "BAŞARILI" olmuştur.



Belge Kodu: FMO2 Belge No:892 Veriliş Tarihi: 11 Temmuz 2017

ID NUMBER : 27886750676	INIVERSITY	A Start Star		pertaining in	ering		yin AKAN
DIPLOMA NUMBER: 1637.A-038	UBLIC OF TURKEY DOKUZ MAYIS L	NAN	ome entitled to receive	he rights and privileges thereinto ap s of the satisfactory completion of of Engineering	ment of Environmental Engine	2016	Prof. Or. Hüse Rektö Recto
SU202	MHURIYETI REP Ersitesi on	Muhammet Enes DUF	fühendislik Fakültesi Has bec <b>Bache</b>	tendisliği Bölümü an ile tamamlayarak Faculty Lisans	tan bütün yetkileriyle aya hak kazanmıştır. Deparı	01 Temmuz 2016 July 01,	
DMA NO: 1637.A-038 T.C. KİMLİK NO: 2788	TÜRKİYE CU OKUZ MAYIS ÜNİV			Çevre Mü öğrenimini ba	derecesini, dereceye tanı alı		Prof. Dr., Penmi YAZICI Deputy Dean

Bu belge, güvenli elektronik imza ile imzalanıntr

Etikimza Sürec No : holsqsq4n2b1b5d08bcf

CEVRE MÜHENDISLERI ODASI ANKARA ŞUBESİ	BASARI BELGESI BASARI BELGESI	Sayın İLKER CİVİL	Timob Çevre Mühendisleri Odası Ankara Şubesi tarafından 01.06.2013 - 04.06.2013 tarihinde Ankara'da gerçekleştirilen GÜRÜLTU EĞITİM PROGRAMI'na EĞITİM PROGRAMI'na katılarak bu belgeyi almaya hak katanınıştır. ÖZGE/RGEN GÜVENÇ ŞÜBE BAŞKANI	



12 5 Nisan 2013

#20957

YILDIZ

T.C.

TEKNİK ÜNİVERSİTESİ

# **ILKER CIVIL**

2010-2011 EĞİTİM-ÖĞRETİM YILINDA İNŞAAT FAKÜLTESİ ÇEVRE MÜHENDİSLİĞİ BÖLÜMÜNDEKİ ÖĞRENİMİNİ BAŞARIYLA TAMAMLAYARAK

LİSANS DERECESİ

#### ALMAYA HAK KAZANMIŞTIR.

DEKAN

Havrullah AGACCIOGLU

diploma numarasi 56162





REKTÖR

Prof. Dr. İsmail YÜKSEK

Ū

DIPLOMA TARIHI

08.02.2011

-

FIZIK MÜHENDİSLERİ ODASI BAŞARIBELGESİ	Sayın Yusuf KAŞIKÇI (T.C.Kimlik No:50566216124)	TMMOB Fizik Mühendisleri Odası ile Çevre ve Şehircilik Bakanlığı işbirliği ile 24-27 Ekim 2015 tarihleri arasında Fizik Mühendisleri Odası İstanbul Şube tarafından gerçekleştirilen	"A-2 Tipi Mühendislik Akustiği"	Sertifika Programma katılarak "BAŞARILI" olmuştur .		Belge Kodu: FM02 Belge No:732 Verilis Tarihi: 27 Ekim 2015	
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Etikimza Süreç No : holsqsq4n2b1b5d08bcf



#### T.C. BOZOK ÜNİVERSİTESİ FEN-EDEBİYAT FAKÜLTESİ DEKANLIĞI

Diploma No: 532

Tarih: 20.06.2012

# GEÇİCİ MEZUNİYET BELGESİ

Adı Soyadı	: YUSUF KAŞIKÇI
Baba Adı	: HASAN
Doğum Yeri	: KAĞITHANE
Doğum Tarihi	: 25.07.1991
T.C. Kimlik No	: 50566216124
Öğrenci No	: 1610310465
Program	: KİMYA
Mezuniyet Tarihi	: 19.06.2012
Mezuniyet Notu	: 2,58

Yukarıda açık kimliği yazılı olan

#### YUSUF KAŞIKÇI

Fakültemizden diploma almaya hak kazanmıştır. Diploması henüz düzenlenmemiş olduğundan kendisine bu "Geçici Mezuniyet Belgesi" verilmiştir.

r. Seref OKUDUCU

0 2 Agistus 2012

NOT :

Diploma alınırken bu belgenin geri verilmesi zorunludur.
 Mühür ile imza bulunmayan veya silinti, kazıntı olan belge geçerli değildir.



# EK 4 ÖLÇÜM ÇIKTILARI

Ch4 (SLM) P2 (C, Fast) LCF(SPL) [dB]	78,1	Ch4 (SLM) P3 (Lin, Lin) LEPd [dB]	78,1	
Ch4 (SLM) P2 (C, Fast) LCFmin [dB]	63,4	Ch4 (SLM) P3 (Lin, Fast) LTeq [dB]	82,8	
Ch4 (SLM) P2 (C, Fast) LCFmax [dB]	101,2	Ch4 (SLM) P3 (Lin, Fast) Ltm3 [dB]	81,7	
Ch4 (SLM) P2 (C) LCpeak [dB]	112,1	Ch4 (SLM) P3 (Lin, Lin) Lden [dB]	82,6	CM (SLM) 1/3 CCave 1/3 CCLave 1/3 CCLave 400 Hz 56,19 56,19 7/3 CCLave 1/3 OCCLave 1/3 OCCLAVE 1/3 OCC
Ch4 (SLM) P1 (A, Lin) LAeq Ln [dB]	<b>190</b> 58,8	Ch4 (SLM) P3 (Lin, Lin) SEL [dB]	127,5	CM (SLM) 1/3 CCave 1/3 CCLave 315 Hz 6,21 56,21 CM (SLM) 1/3 CCave
Ch4 (SLM) P1 (A, Lin) LAeq Ln [dB]	L10 74,6	Ch4 (SLM) P3 (Lin, Lin) Leq [dB]	78,1	Ch4 (SLM) 1/3 Octave 1/3 Octave 250H2 51,8 51,8 Ch4 (24M) 1/3 Octave 1/3 Octa
Ch4 (SLM) P1 (A, Lin) LEPd [dB]	6'02	Ch4 (SLM) P3 (Lin, Fast) SPL [dB]	80,6	Cha (SLM) 1/3 Cont Ang (AB) 200 At 51,74 51,74 Cha (SLM) 1/3 Cotave 1/3 Cotave 1/3 Cotave 50,92 50,92
Ch4 (SLM) P1 (A, Fast) LAFTeq [dB]	74,9	Ch4 (SLM) P3 (Lin, Fast) Lmin [dB]	64,9	Cha (SLM) 1/3 Contrave 1/3 Contrave 1/3 Contrave 52,28 Cha (SLM) 1/3 Contrave 1/3 Contrave 1/3 Contrave 1/3 Contrave 33,64
Ch4 (SLM) P1 (A, Fast) Ltm3 [dB]	73,9	Ch4 (SLM) P3 (Lin, Fast) Lmax [dB]	105,5	Ch4 (SLM) 1/3 Oct Wer (AB) 1/3 Oct Wer (AB) 1/3 SL (Med (AB) 1/3 AC (Med (AB) 1/3 Oct Wer
Ch4 (SLM) P1 (A, Lin) Lden [dB]	75,1	Ch4 (SLM) P3 (Lin) Lpeak [dB]	114,3	Cria (SLM) 1/3 Oct. Jara (SLM) 1/3 Oct. Jara (SLM) 1/3 Oct. Jara (SLM) Criate 1/3 Oct. Jara 1/3 Oct. Jara 200 Ht 250 Oct.
Ch4 (SLM) P1 (A, Lin) LAE [dB]	120,2	Ch4 (SLM) P2 (C, Lin) LEPd [dB]	76,5	Cr4 (SLM) 1/3 Octave 1/3 Octave 80 Hz 42,2 42,2 Cr4 (SLM) 1/3 Octave 1/3 Octave 1/3 Octave 2000 Hz 50 Octave 2000 Hz
Ch4 (SLM) P1 (A, Lin) LAeq [dB]	20,9	Ch4 (SLM) P2 (C, Fast) LCFTeq [dB]	81,0	Ch4 (SLM) 1/3 Octave 1/3 Octave 61/1/3 61/7 0/7 8 0/7 8 0/7 8 0/7 8 0/7 8 0/7 8 0/7 8 0/7 8 0/7 8 0/7 8 0/7 8 0/7 8 0/7 8 0/7 8 0/7 8 0/7 1/3 0/6 0/7 1/3 0/6 0/7 1/3 0/6 0/7 1/3 0/7 0/7 0/7 0/7 0/7 0/7 0/7 0/7 0/7 0/7
Ch4 (SLM) P1 (A, Fast) LAF(SPL) [dB]	75,4	Ch4 (SLM) P2 (C, Fast) Ltm3 [dB]	79,9	CM (SLM) 1/3 CC A (SLM) 1/3 CC LARG 2 DH2 2 DH2 2 DH2 2 CC A (SLM) 1/3 r>2 CC A (SLM) 2 CC A
Ch4 (SLM) P1 (A, Fast) LAFmin [dB]	54,3	Ch4 (SLM) P2 (C, Lin) Lden [dB]	81,0	CM (SLM) 1/3 OCT Med (SLM) 1/3 OCT Med (Jab) 0 hz 0 hz 33/7 CM (SLM) 1/3 OCT Wed 1/3 OCT WED 1/3 OCT W
Ch4 (SLM) P1 (A, Fast) LAFmax [dB]	98,0	Ch4 (SLM) P2 (C, Lin) LCE [dB]	125,9	Cha (SLM) 1/3 OCT Jone (SLM) 1/3 OCT Jone (SLM) 31.5 Hz 31.5 Hz 31.16 Cha (SLM) 1/3 OCTAVE 1/3 OCTA
Ch4 (SLM) P1 (A) LApeak [dB]	109,6	Ch4 (SLM) P2 (C, Lin) LCeq [dB]	76,5	CM (S.M) 1/3 OCT Area (AB) 25 Hz 25 Hz 25 Hz 23 A3 23 A3 24 (S.M) 1/3 OCT Area 1/3 OCT Area 1/3 OCT Area 27/9 57/79
Elapsed time	[hh:mm:ss] 24:00:00			Ekpsed time (hhrimms) 24:00:00
	Ölçüm Noktası Danişment Gazi Lisesi Bahçesi			Örçim Noktası Danişment Gazi Lisesi Bahçesi





#### Niksar Belediyesi Su Şebekesi Projesi

**Tarih** : 14.12.2021

Sayı :034.21/0336-00

Konu : Çevresel Gürültü Hk.

Bu ölçüm raporu, Niksar Belediyesi Su Şebekesi Projesi kapsamında, 01.09.2021 ve 02.09.2021 tarihlerinde yapılan çevresel gürültü ölçümleri sonucunda elde edilen verilerin firma talebi doğrultusunda, 24 saatlik ölçüm sonuçlarından elde edilen ham veriler üzerinden 1 saatlik Leq değerleri gündüz, akşam ve gece olarak hesaplanmıştır.

Yapılan hesaplamalara ait rapor ekte verilmiştir.

Ek: Rapor



#### I. GENEL BİLGİLER

Niksar Belediyesi Su Şebekesi Projesi kapsamında, 01.09.2021 ve 02.09.2021 tarihlerinde yapılan çevresel gürültü ölçümleri sonucunda elde edilen verilerin firma talebi doğrultusunda, 24 saatlik ölçüm sonuçlarından elde edilen ham veriler üzerinden 1 saatlik Leq değerleri gündüz, akşam ve gece olarak hesaplanmıştır. Ldn 24 saatlik bir süre boyunca ölçülen eş değer gürültü seviyesidir. Avrupa Çevre Ajansı referans alınarak gündüz etkisini yansıtmak için 10 dB lik bir ekleme, akşam ve gece etkisini yansıtmak için sonuçlara 5dB' lik bir ekleme yapılmıştır. Hesaplamaya ait referans alınan Avrupa Çevre Ajansı dokümanına ait link aşağıda paylaşılmıştır.

https://www.eea.europa.eu/help/glossary/eea-glossary/lden

#### II. SONUÇLAR

GÜNDÜZ GÜRÜLTÜ ÖLÇÜM SONUÇLARI					
			Ölçüm Sonuçları (Ortalama)		
Ölçüm Yeri/ Konumu	Olçüm Başlama Zamanı	Olçüm Bitiş Zamanı	A-Ağırlıklama		
			Leq		
Danişment Gazi Anadolu Lisesi Bahçesi	01.09.2021 07:00	01.09.2021 19:00	77,5		

#### ÇGDYY- Ek-VII' de yer alan Tablo-4'e göre Gürültü Ölçüm Sonuçları Tabloları

AKŞAM GÜRÜLTÜ ÖLÇÜM SONUÇLARI					
			Ölçüm Sonuçları (Ortalama)		
Ölçüm Yeri/ Konumu	Olçüm Başlama Zamanı	Olçüm Bitiş Zamanı	A-Ağırlıklama		
			Leq		
Danişment Gazi Anadolu Lisesi Bahçesi	01.09.2021 19:00	01.09.20021 23:00	77,5		



GECE GÜRÜLTÜ ÖLÇÜM SONUÇLARI				
			Ölçüm Sonuçları (Ortalama)	
Ölçüm Yeri/ Konumu	Ölçüm Başlama Zamanı	Ölçüm Bitiş Zamanı	A-Ağırlıklama	
			Leq	
Danişment Gazi Anadolu Lisesi Bahçesi	01.09.2021 23:00	02.09.2021 07:00	70,8	

#### IFC' ye göre Gürültü Ölçüm Sonuçları Tablosu

GÜNDÜZ GÜRÜLTÜ ÖLÇÜM SONUÇLARI					
			Ölçüm Sonuçları (Ortalama)		
Ölçüm Yeri/ Konumu	Ölçüm Başlama Zamanı	Ölçüm Bitiş Zamanı	A-Ağırlıklama		
			Leq		
Danişment Gazi Anadolu Lisesi Bahçesi	01.09.2021 07:00	01.09.2021 22:00	77,2		

GECE GÜRÜLTÜ ÖLÇÜM SONUÇLARI					
			Ölçüm Sonuçları (Ortalama)		
Ölçüm Yeri/ Konumu	Ölçüm Yeri/ Konumu Ölçüm Başlama Ölçi Zamanı Za	Ölçüm Bitiş Zamanı	A-Ağırlıklama		
			Leq		
Danişment Gazi Anadolu Lisesi Bahçesi	01.09.2021 22:00	02.09.2021 07:00	70,8		

#### III. SONUÇLARIN DEĞERLENDİRİLMESİ

MADDE 22 – (1) İşletme, tesis, atölye, imalathane ve işyerlerinden çevreye yayılan gürültü seviyesine ilişkin kriterler aşağıda belirtilmiştir:

a) Her bir işletme ve tesisten çevreye yayılan gürültü seviyesi Ek-VII' de yer alan Tablo-4'te verilen sınır değerleri aşamaz.



#### Tablo-4 Endüstri tesisleri için çevresel gürültü sınır değerleri

Alanlar	Lgündüz (dBA)	L <sub>akşam</sub> (dBA)	L <sub>gece</sub> (dBA)
Gürültüye hassas kullanımlardan eğitim, kültür ve sağlık alanları ile yazlık ve kamp yerlerinin yoğunluklu olduğu alanlar	60	55	50
Ticari yapılar ile gürültüye hassas kullanımların birlikte bulunduğu alanlardan konutların yoğun olarak bulunduğu alanlar	65	60	55
Ticari yapılar ile gürültüye hassas kullanımların birlikte bulunduğu alanlardan işyerlerinin yoğun olarak bulunduğu alanlar	68	63	58
Endüstriyel alanlar	70	65	60

IFC' ye göre sınır değerler aşağıdaki tabloda verilmiştir;

Ahei	Gündüz Zaman Dilimi (07:00-22:00)	Gece Zaman Dilimi (22:00-07:00)
Yerleşim; kurumsal; eğitimsel	55	45
Sanayi; Ticari	70	70

# Firma Talebi Doğrultusunda İlgili Yönetmelik Maddeleri Kapsamında Yapılan Değerlendirme

Danişment Gazi Anadolu Lisesi Bahçesi Niksar/TOKAT için belirlenen 1 noktada 01.09.2021 ve 02.09.2021 tarihleri arasında 24 saat boyunca çevresel gürültü ölçümleri gerçekleştirilmiştir. Ölçümlerle ilgili olarak yapılan değerlendirmeler aşağıdaki gibidir:

Danişment Gazi Anadolu Lisesi Bahçesi Niksar/TOKAT' ta yapılan çevresel gürültü ölçümlerine ilişkin sonuçlar 27601 sayılı, 04.06.2010 tarihli "Çevresel Gürültünün Değerlendirilmesi ve Yönetimi Yönetmeliği" **Madde 22.1.a' ya göre değerlendirilmiştir. Buna göre;** 

• Madde 22.1.a kapsamında yapılan değerlendirme sonucunda, 24 saatlik zaman dilimlerinde yapılan ölçümler neticesinde, ölçüm noktasında bulunan değer Tablo 4'te verilen gündüz, akşam ve gece zaman dilimi için verilen **sınır değerleri aşmaktadır.** 

· IFC standartlarına göre yapılan değerlendirme sonucunda, ölçüm noktasında bulunan değer gündüz ve gece zaman dilimi için verilen **sınır değerlerini aşmaktadır.** 



#### İmza/Onay Sayfası

#### Raporu Hazırlayan

*e-imzalıdır* Kübra Çisil KANAT (Çevre Mühendisi) Raportör <u>Onaylayan</u> *e-imzalıdır* Feyza YALÇIN (Kimyager) Laboratuvar Yöneticisi



### Annex-C: Underground and Surface Service Facilities

(Also available as a separate file)





#### ELECTRICITY NETWORK







NATURAL GAS NETWORK





## Annex-D: 1/5,000 Scale General Layout

(Provided as a separate file)



A1	
ŞEBEKE KARAK	TERİSTİĞİ
S1 (prj. alanı)	= 138.4 hektar
Yoğunluk	= 36.0 kişi/ha
∑N 2047 Toplam Nüfus	= 4982 kişi
∑Q 2047 toplam su ihtiyacı	= 12.87 lt/sn
Quç	= 0.00 lt/sn
EDK Şeb. bölgesi	= 300.00 m
EYK Şeb. bölgesi	= 330.00 m
Beslendiği Depo	= DY3
Depo Krepin Kotu	= 362.00 m
A3-2	
ŞEBEKE KARAK	TERİSTİĞİ
S1 (prj. alanı)	= 64.8 hektar

∑N 2047 Toplam Nüfus Q 2047 toplam su ihtiyacı

A5 ŞEBEKE KARAK	TERİSTİĞİ	Ş
S1 (prj. alanı)	= 3.8 hektar	S1 (p
Yoğunluk ∑N 2047 Toplam Nüfus ∑Q 2047 toplam su ihtiyacı Q uç	= 70.0 kişi/ha = 265 kişi = 0.68 lt/sn = 0.00 lt/sn	Yoğunlı ∑N 204 ∑Q 204 Q uç
EDK Şeb. bölgesi EYK Şeb. bölgesi Beslendiği Depo Depo Krepin Kotu	= 495.00 m = 530.00 m = DM MELİKGAZİ = 586.00 m	EDK \$ EYK \$ A5-BKV A5-BKV

Δ7		
BEKE KARAK	TERİSTİĞİ	ŞEBE
alanı)	= 337.7 hektar	S1 (prj. ala
	= 36.0 kişi/ha	Yoğunluk
oplam Nüfus	= 12 155 kişi	∑N 2047 тор
oplam su ihtiyacı	= 31.41 lt/sn	≥Q 2047 topl
	= 3.90 lt/sn	Quç
bölgesi	= 270.00 m	EDK Şeb. bo
bölgesi	= 312.00 m	EYK Şeb. bö
Depo	= DY2	Beslendiği D
in Katu	226.00 m	Dono Kronin

Ğİ	A3-1 ŞEBEKE KARAKT	ER	İSTİĞİ
.2 hektar	S1 (prj. alanı)	=	65.9 hektar
70 kişi/ha 735 kişi 33 lt/sn	Yoğunluk ∑N 2047 Toplam Nüfus ∑Q 2047 toplam su ihtiyacı Q uc	= = =	36-70-109 kişi/ 4756 kişi 12.29 lt/sn
0 10 511	QUÇ	_	0.00 10511
.00 m .00 m	EDK Şeb. bölgesi EYK Şeb. bölgesi	=	375.00 m 415.00 m
AYVAZ	Beslendiği Depo	=	DM KARABOD
.00 m	Depo Krepin Kotu	=	441.00 m
Ğİ	A4 ŞEBEKE KARAKT	ER	İSTİĞİ
i hektar	S1 (prj. alanı)	=	101.3 hektar
70 kişi/ha 7 kişi I It/sn ) It/sn	Yoğunluk ∑N 2047 Toplam Nüfus ∑Q 2047 toplam su ihtiyacı Q uc	=	36-70-109 k/ha 6426 kişi 16.61 lt/sn 0.00 lt/sn
00			105.00

6) TİĞİ	A6 ŞEBEKE KARAK	TERİSTİĞİ
2 hektar	S1 (prj. alanı)	= 6.1 hektar
6-70 kişi/ha 62 kişi 68 lt/sn .00 lt/sn	Yoğunluk ∑N 2047 Toplam Nüfus ∑Q 2047 toplam su ihtiyacı Q uç	= 36.0 kişi/ha = 218 kişi = 0.56 lt/sn = 0.00 lt/sn
63.00 m 95.00 m	EDK Şeb. bölgesi EYK Şeb. bölgesi	= 415.00 m = 450.00 m
86.00 m	Beslendiği Depo	= DY4

		ŞEBEKE KARAKT	ER	ISTIĞI
	S1	(prj. alanı)	=	53.8 hektar
'ha	Yoğı	unluk	=	36-70 kişi/ha
	ΣN2	2047 Toplam Nüfus	=	3142 kişi
	ΣQ2	2047 toplam su ihtiyacı	=	8.12 lt/sn
	Quç		=	0.00 lt/sn
	EDK	Şeb. bölgesi	=	352.00 m
	EYK	Şeb. bölgesi	=	375.00 m
DUR	A3-1	-BKV - Şeb. Dep. Kk	< =	441.00 m
	A3-1	-BKV - Piyezo. Kotu	=	409.40 m
		A4-BKV (BKV-3	, BK	(V-4)
		ŞEBEKE KARAKT	ER	ISTIGI
	S1	(prj. alanı)	=	43.7 hektar
	Yoğı	unluk	=	36-70-109 k/ha
	ΣN2	2047 Toplam Nüfus	=	2691 kişi
	ΣQ2	2047 toplam su ihtiyacı	=	6.96 lt/sn
	Quç		=	0.00 lt/sn
	EDK	Seb. bölgesi	-	405.00 m

	A6-BKV (BK	V-7)
	ŞEBEKE KARAKT	ERISTIGI
	S1 (prj. alanı)	= 16.1 hektar
I	Yoğunluk	= 36.0 kişi/ha
	∑N 2047 Toplam Nüfus	= 579 kişi
	∑Q2047 toplam su ihtiyacı	= 1.50 lt/sn
	Quç	= 0.00 lt/sn
	EDK Şeb. bölgesi	= 375.00 m
	EYK Şeb. bölgesi	= 415.00 m
	A6-BKV - Şeb. Dep. KK	= 478.00 m
	A6-BKV - Piyezo. Kotu	= 441.48 m

A1		A2		A3-1		
NETWORK CHARA	ACTERISTIC	NETWORK CHARAC	CTERISTIC	NETWORK CHARA	ACTERISTIC	
S1 (prj. area)	= 138.4 hektar	S1 (prj. area)	= 293.2 hektar	S1 (prj. area)	= 65.9 hektar	
Density	= 36 capita/ha	Density	<i>= 36-70 capita/ha</i>	Density	= 36-70-109 capita/l	ha l
$\geq N 2047$ Total population	= 4982 capita	$\geq N 2047$ Total population	= 11 735 capita	$\geq N 2047$ Total population	= 4756 capita	
$\geq Q2047$ Total water need	= 12.87 lt/sn	$\geq Q2047$ Total water need	= 30.33 lt/sn	$\geq Q2047$ Total water need	= 12.29 lt/sn	
QUÇ	= 0.00 lt/sn		= 0.00 lt/sn	QUÇ	= 0.00 lt/sn	
EDK Network Area	= 300.00 m	EDK Network Area	= 312.00 m	EDK Network Area	= 375.00 m	
EYK Network Area	= 330.00 m	EYK Network Area	= 352.00 m	EYK Network Area	= 415.00 m	
Reservoir	= DY3	Reservoir	= DMAYVAZ	Reservoir	= DM KARABOL	DUR
Crepine Elevation	= 362.00 m	Crepine Elevation	= 378.00 m	Crepine Elevation	= 441.00 m	
A3-2		A3-1-BKV (BP	(V-1)	АЗ-2-ВКV (В	3KV-2)	
NETWORK CHARA	ACTERISTIC	NETWORK CHARAC	CTERISTIC	NETWORK CHARA	ACTERISTIC	
S1 (prj. area)	= 64.8 hektar	S1 (prj. area)	= 53.8 hektar	S1 (prj. area)	= 92.5 hektar	
Density	= 36-70 capita/ha	Density	= 36-70 capita/ha	Density	= 36-70 capita/ha	
∑ <i>N2047 Total population</i>	= 2665 capita	∑ <i>N 2047 Total population</i>	= 3142 capita	∑ <i>N2047 Total population</i>	= 3757 capita	
∑ <i>Q2047 Total water need</i>	= 6.89 lt/sn	Σ <i>Q2047 Total water need</i>	= 8.12 lt/sn	∑ <i>Q2047 Total water need</i>	= 9.71 lt/sn	
Quç	= 0.00 lt/sn	QUÇ	= 0.00 lt/sn	Q uç	= 0.60 lt/sn	
EDK Network Area	= 370.00 m	EDK Network Area	= 352.00 m	EDK Network Area	= 352.00 m	
EYK Network Area	= 405.00 m	EYK Network Area	= 375.00 m	EYK Network Area	= 370.00 m	
Reservoir	= DY1	A3-1-BKV - Netw. Tank KF	K= 441.00 m	A3-2-BKV - Netw. Tank k	KK = 431.00 m	
Crepine Elevation	= 431.00 m	A3-1-BKV - Piyezo. Kotu	= 409.40 m	A3-2-BKV - Piyezo. Kotu	ı = 400.24 m	
A4		A4-BKV (BKV-3,	BKV-4)	A5		A5-BKV (
NETWORK CHARA	A <i>CTERISTIC</i>	NETWORK CHARAC	CTERISTIC	NETWORK CHARA	A <i>CTERISTIC</i>	NETWORK C
S1 (prj. area)	= 101.3 hektar	S1 (prj. area)	= 43.7 hektar	S1 (prj. area)	= 3.8 hektar	S1 (prj. area)
Density	= 36-70-109 k/ha	Density	= 36-70-109 k/ha	Density	= 70.0 per/ha	Density
∑ <i>N 2047 Total population</i>	= 6426 capita	∑ <i>N 2047 Total population</i>	= 2691 capita	∑ <i>N 2047 Total population</i>	= 265 capita	∑ N 2047 Total popula
$\Sigma Q2047$ Total water need	= 16.61 lt/sn	∑ <i>Q2047 Total water need</i>	= 6.96 lt/sn	∑ <i>Q2047</i> Total water need	= 0.68 lt/sn	$\Sigma Q2047$ Total water new
Quç	= 0.00 lt/sn	QUÇ	= 0.00 lt/sn	Q uç	= 0.00 lt/sn	QUÇ
EDK Network area	= 425.00 m	EDK Network area	= 405.00 m	EDK Network area	= 495.00 m	EDK Network area
EYK Network area	= 463.00 m	EYK Network area	= 425.00 m	EYK Network area	= 530.00 m	EYK Network area
Reservoir	= DY5	A4-BKV - Netw. Tank KK	= 489.00 m	Reservoir	= DM MELİKGA	ZI A5-BKV - Netw. Ta
Crepine Elevation	= 489.00 m	A4-BKV - Piyezo. Elev.	= 456.89 m	Crepine Elevation	= 586.00 m	A5-BKV - Piyezo.
A6		A6-BKV (BK	V-7)	A7		A
NETWORK CHARA	ACTERISTIC	NETWORK CHARAC	CTERISTIC	NETWORK CHARA	ACTERISTIC	NETWORK CHA
S1 (prj. area)	= 6.1 hektar	S1 (prj. area)	= 16.1 hektar	S1 (prj. area)	= 337.7 hektar	S1 (prj. area)
Density	= 36.0 per/ha	Density	= 36.0 per/ha	Density	= 36.0 per/ha	Density
∑ <i>N 2047 Total population</i>	= 218 capita	∑ <i>N 2047 Total population</i>	= 579 capita	∑ <i>N 2047 Total population</i>	= 12 155 capita	∑ N 2047 Total population
$\Sigma$ $Q2047$ Total water need	= 0.56 lt/sn	∑ <i>Q2047 Total water need</i>	= 1.50 lt/sn	∑ <i>Q2047</i> Total water need	= 31.41 lt/sn	∑ <i>Q2047</i> Total water need
Quç	= 0.00 lt/sn	Quç	= 0.00 lt/sn	Q UÇ	= 3.90 lt/sn	Quç
EDK Network area	= 415.00 m	EDK Network area	= 375.00 m	EDK Network area	= 270.00 m	EDK Network area
EYK Network area	= 450.00 m	EYK Network area	= 415.00 m	EYK Network area	= 312.00 m	EYK Network area
Reservoir	= DY4	A6-BKV - Netw. Tank KK	= 478.00 m	Reservoir	= DY2	Reservoir
Crenine Elevation	= 478 00 m	A6-BKV - Pivezo Flev	= 441.48  m	Crepine Elevation	= 336 00 m	Crepine Elevation





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			280		280	
A1 A2 ŞEBEKE KARAKTERİSTİĞİ ŞEBEKE KARAKTERİSTİĞ					-22i	
S1 (prj. alanı)     = 138.4 hektar     S1 (prj. alanı)     = 293.2       Yoğunluk     = 36.0 kişi/ha     Yoğunluk     = 36.70       ∑N 2047 Toplam Nüfus     = 4982 kişi     ∑N 2047 Toplam Nüfus     = 11.72	hektar kişi/ha	280				600 H
$\sum Q 2047 \text{ toplam su ihtiyaci} = 12.87 \text{ It/sn}$ $Q uç = 0.00 \text{ It/sn}$ $Q uç = 0.00 \text{ It/sn}$ $Q uç = 0.00 \text{ It/sn}$	It/sn t/sn			A AP		A 400°
EDK         Şeb. bölgesi         = 300.00 m         EDK Şeb. bölgesi         = 312.0           EYK         Şeb. bölgesi         = 330.00 m         EYK Şeb. bölgesi         = 352.0           Beslendiği Depo         = DY3         Beslendiği Depo         = DM A	0 m 0 m YVAZ	275		88		56
Depo Krepin Kotu = 362.00 m Depo Krepin Kotu = 378.0	) m	The second secon				
A3-2 SEBEKE KARAKTERİSTİĞİ A3-2-BKV (BKV-2) SEBEKE KARAKTERİSTİĞ S1 (ori alanı) = 64.8 bektar S1 (ori alanı) = 92.5	A3-1 ŞEBEKE KARAKTERİSTİĞİ S1 (pri alapı) = 65.9 bektar	A3-1-BKV (BKV-1) ŞEBEKE KARAKTERİSTİĞİ				
Yoğunluk= 36-70 kişi/haYoğunluk= 36-70 $\Sigma N 2047$ Toplam Nüfus= 2665 kişi $\Sigma N 2047$ Toplam Nüfus= 3757	kişi/haYoğunluk $=$ 36-70-109 kişkişi $\ge$ N 2047 Toplam Nüfus $=$ 4756 kişi	i/ha Yoğunluk = 36-70 kişi/ha ∑N 2047 Toplam Nüfus = 3142 kişi				
$\sum Q 2047 \text{ toplam su ihtiyaci} = 6.89 \text{ It/sn}$ $Q uç = 0.00 \text{ It/sn}$ $\sum Q 2047 \text{ toplam su ihtiyaci} = 9.71$ $Q uç = 0.60$ $\sum D (c - Sch - bilaggi = -270, 00 \text{ m}$	$\Sigma$ Q 2047 toplam su ihtiyacı= 12.29 lt/sn $U$ ç= 0.00 lt/sn $U$ C= 0.00 lt/sn	$\sum Q 2047 \text{ topiam su intivaci} = 8.12 \text{ [t/sn}$ $Q uç = 0.00 \text{ tr/sn}$ $\sum D (z - 252.00)$				
EDK         şeb. bölgesi         = 370.00 m         EDK         şeb. bölgesi         = 352.0           EYK         şeb. bölgesi         = 405.00 m         EYK         şeb. bölgesi         = 370.0           Beslendiği Depo         = DY1         A3-2-BKV - Şeb. Dep. KK = 431.0	D m     EYK şeb. bölgesi     = 375.00 m       D m     Beslendiği Depo     = DM KARABC	EDK         şeb. bölgesi         =         352.00 m           EYK         şeb. bölgesi         =         375.00 m           DUR         A3-1-BKV - Şeb. Dep. KK         =         441.00 m				
Depo Krepin Kotu = 431.00 m A3-2-BKV - Piyezo. Kotu = 400.2	Image: Image:	A3-1-BKV - PiyezoKotu = 409.40 m		P. N. E. B. M. M.		
A5 SEBEKE KARAKTERİSTİĞİ A5-BKV (BKV-5, BKV-6) SEBEKE KARAKTERİSTİĞ S1 (ori alapı) = 3.8 bektar	A4 ŞEBEKE KARAKTERİSTİĞİ S1 <sub>S</sub> (prj. alanı) = 101.3 hektar	A4-BKV (BKV-3, BKV-4) ŞEBEKE KARAKTERİSTİĞİ S1 (prj. alanı) = 43.7 hektar		*801= 20°	23	
Yoğunluk= 70.0 kişi/haYoğunluk= 36-70 $\Sigma N 2047$ Toplam Nüfus= 265 kişi $\Sigma N 2047$ Toplam Nüfus= 262	Yoğunluk= 36-70-109 k/hakişi/ha $\ge N 2047$ Toplam Nüfus= 6426 kişişi $\ge Q 2047$ toplam su ihtiyacı= 16.61 lf/sn	Yoğunluk = 36-70-109 k/h ∑N 2047 Toplam Nüfus = 2691 kişi ∑Q 2047 toplam su ihtivacı = 6.96 dt/sn				
$\sum Q 2047 \text{ toplam su ihtiyaci} = 0.68 \text{ It/sn}$ $Q uç = 0.00 \text{ It/sn}$ $\sum Q 2047 \text{ toplam su ihtiyaci} = 0.68 \text{ Q} uç = 0.00 \text{ It/sn}$	$\begin{array}{c} U = 0 \\ V \le n \\ V \le n \end{array} \qquad	Q uç = 0.00 lt/sn EDK Şeb. bölgesi = 405.00 m		Process		
EDKşeb. bölgesi= 495.00 mEDKşeb. bölgesi= 405.0EYKşeb. bölgesi= 530.00 mEYKşeb. bölgesi= 495.0Beslendiği Depo= DM MELİKGAZİA5-BKV - Şeb. Dep. KK= 586.0	D m     EYK Şeb. bölgesi     = 463.00 m       D m     Beslendiği Depo     = DY5       D m     Depo Krenin Kotu     = 489.00 m	EYK         Şeb. bölgesi         =         425.00 m           A4-BKV - Şeb. Dep. KK         =         489.00 m           A4-BKV - Piyezo, Kotu         =         456.89 m				
Depo Krepin Kotu = 586.00 m A5-BKV - Piyezo. Kotu = 527.					and the state of t	
A7 SEBEKE KARAKTERISTIĞI S1 (ori alanı) = 337.7 bektar S1 (ori alanı) = 337.7 bektar	A6 ŞEBEKE KARAKTERİSTİĞİ 1 (prj. alanı) = 6.1 hektar	Ab-BKV (BKV-7) ŞEBEKE KARAKTERİSTİĞİ S1 (prj. alanı) = 16.1 hektar		8		
Yoğunluk         = 36.0 kişi/ha         Yoğunluk         = 36.0           ∑N 2047 Toplam Nüfus         = 12 155 kişi         ∑N 2047 Toplam Nüfus         = 310	oğunluk         = 36.0 kişi/ha           şi/ha         ≥ N 2047 Toplam Nüfus         = 218 kişi           işi         ≥ Q 2047 toplam su ihtiyacı         = 0.56 lt/sn	Yoğunluk         = 36.0 kişi/ha           ∑N 2047⊺oplam Nüfus         = 579 kişi           ∑Q 2047 toplam su ihtiyacı         = 1.50 lt/sn		A A A A A A A A A A A A A A A A A A A		
$\sum Q 2047 \text{ toplam su ihtiyaci} = 31.41 \text{ It/sn}$ $Q uç = 3.90 \text{ It/sn}$ $EDK \text{ Seb bölgesi} = 270.00 \text{ m}$ $EDK \text{ Seb bölgesi} = 1000 \text{ m}$	Vsn         Q uç         = 0.00 lt/sn           EDK Şeb. bölgesi         = 415.00 m	Q uç = 0.00 lt/sn EDK Şeb. bölgesi = 375.00 m		- Boo		
EDKSeb. bolgesi= 270.00 mlEDKSeb. bolgesi= 405.0EYKŞeb. bölgesi= 312.00 mlEYKŞeb. bölgesi= 435.0Beslendiği Depo= DY2Beslendiği Depo= YM1	EYK Şeb. bölgesi     = 450.00 m       Beslendiği Depo     = DY4       Depo Krepin Kotu     = 478.00 m	EYK         Şeb. bölgesi         =         415.00 m           A6-BKV - Şeb. Dep. KK         =         478.00 m           A6-BKV - Pivezo Kotu         =         441.48 m				
Depo Krepin Kotu = 336.00 m Depo Krepin Kotu = 464.0						

A1 NETWORK CHAR	PACTERISTIC	A2 NETWORK CHARA	CTERISTIC	A3-1 NETWORK CHARACTERISTIC			
S1 (prj. area)	= 138.4 hektar	S1 (prj. area)	= 293.2 hektar	S1 (prj. area)	= 65.9 hektar		
Density $\Sigma N 2047$ Total population $\Sigma Q 2047$ Total water need Q uç	= 36 capita/ha = 4982 capita = 12.87 lt/sn = 0.00 lt/sn	Density ∑ N 2047 Total population ∑ Q 2047 Total water need Q UÇ	= 36-70 capita/ha = 11 735 capita = 30.33 lt/sn = 0.00 lt/sn	Density ∑ N 2047 Total population ∑ Q 2047 Total water need Q uç	= 36-70-109 capita/l. = 4756 capita = 12.29 lt/sn = 0.00 lt/sn		
EDK Network Area	= 300.00 m = 330.00 m	EDK Network Area	= 312.00 m	EDK Network Area	= 375.00 m		
Reservoir	= DY3	Reservoir	= DMAYVAZ	Reservoir	= DM KARABOL	DUR	
Crepine Elevation	= 362.00 m	Crepine Elevation	= 378.00 m	Crepine Elevation	= 441.00 m	-	
A3-2	,	A3-1-BKV (B	KV-1)	A3-2-BKV (B	3KV-2)		
NETWORK CHAR	PACTERISTIC	NETWORK CHARA	CTERISTIC	NETWORK CHARA	ACTERISTIC		
S1 (prj. area)	= 64.8 hektar	S1 (prj. area)	= 53.8 hektar	S1 (prj. area)	= 92.5 hektar		
Density	= 36-70 capita/ha	Density	= 36-70 capita/ha	Density	= 36-70 capita/ha		
∑ <i>N 2047</i> Total population	<i>= 2665 capita</i>	∑ <i>N2047 Total population</i>	= 3142 capita	∑ <i>N 2047</i> Total population	= 3757 capita		
∑ Q2047 Total water need	= 6.89 lt/sn	∑ <i>Q2047 Total water need</i>	= 8.12 lt/sn	∑ <i>Q2047 Total water need</i>	= 9.71 lt/sn		
QUÇ	= 0.00 lt/sn	QUÇ	= 0.00 lt/sn	QUÇ	= 0.60 lt/sn		
EDK Network Area	= 370.00 m	EDK Network Area	= 352.00 m	EDK Network Area	= 352.00 m		
EYK Network Area	= 405.00 m	EYK Network Area	= 375.00  m	EYK Network Area	= 370.00  m		
Reservoir	= DY7	A3-1-BKV - Netw. Tank K	K = 441.00  m	A3-2-BKV - Netw. Tank P	KK = 431.00  m		
Crepine Elevation	= 431.00 m	A3-1-BKV - Piyezo. Kotu	= 409.40 m	A3-2-BKV - Piyezo. Koti	u = 400.24  m		
A4 NETWORK CHAR	ACTERISTIC	A4-BKV (BKV-3) NETWORK CHARA	, BKV-4) CTERISTIC	A5 NETWORK CHARA	ACTERISTIC	A5-BKV (BK NETWORK CHA	V-5, BKV-6) NRACTERISTIC
S1 (prj. area)	= 101.3 hektar	S1 (prj. area)	= 43.7 hektar	S1 (prj. area)	= 3.8 hektar	S1 (prj. area)	= 5.2 hek
Density	= 36-70-109 k/ha	Density	= 36-70-109 k/ha	Density	= 70.0 per/ha	Density	= 36-70 p
∑ <i>N 2047</i> Total population	= 6426 capita	∑ <i>N 2047 Total population</i>	= 2691 capita	∑ <i>N 2047 Total population</i>	= 265 capita	≥ N 2047 Total population	= 262 ca
∑ <i>Q2047</i> Total water need	= 16.61 lt/sn	∑ <i>Q2047 Total water need</i>	= 6.96 lt/sn	∑ <i>Q2047 Total water need</i>	= 0.68 lt/sn	∑ Q2047 Total water need	= 0.68 lt/
Quç	= 0.00 lt/sn	Q uç	= 0.00 lt/sn	Quç	= 0.00 lt/sn	Quç	= 0.00 lt/
EDK Network area EYK Network area	= 425.00 m = 463.00 m	EDK Network area EYK Network area	= 405.00 m = 425.00 m	EDK Network area EYK Network area	= 495.00 m = 530.00 m	EDK Network area EYK Network area	= 463.00 = 495.00
Reservoir	= DY5	A4-BKV - Netw. Tank KK	= 489.00 m	Reservoir	= DM MELİKGA	Zİ A5-BKV - Netw. Tank	KK = 586.00
Crepine Elevation	= 489.00 m	A4-BKV - Piyezo. Elev.	= 456.89 m	Crepine Elevation	= 586.00 m	A5-BKV - Piyezo. Ele	v. = 527.19
A6 NETWORK CHAR		A6-BKV (BK	V-7)	A7	ACTERISTIC	A8	ACTERISTIC
S1 (pri area)	- 61 hekter	S1 (pri area)	- 16 1 hekter	S1 (pri area)	- 3377 hekter	S1 (pri area)	- 86 hekta
Or (pij. alea)	= 0.1 nextar	Density	= 70.7 nexta	Density	= 3007.7 mentar	Density	= 0.0 nexta
Density	= 30.0 pel/lla	$\Sigma N 2047$ Total population	= 50.0 per/na = 579 capita	S N 2047 Total population	= 36.0 per/na = 12 155 capita	> N 2047 Total population	= 30.0  perm
Density $\Sigma N 2047$ Total population	= 218 capita			5 0 2047 Total water need	= 31.41 lt/sn	∑ Q2047 Total water need	= 0.80 lt/sn
Density ∑ N 2047 Total population ∑ Q 2047 Total water need	= 218 capita = 0.56 lt/sn	∑ <i>Q2047</i> Total water need	= 1.50 lt/sn		- 01.11 10011		
Density $\Sigma N 2047$ Total population $\Sigma Q 2047$ Total water need Q uç	= 218 capita = 0.56 lt/sn = 0.00 lt/sn	$\Sigma Q2047$ Total water need $Q u c$	= 1.50 lt/sn = 0.00 lt/sn	Quç	= 3.90 lt/sn	Quç	= 0.00 lt/sn
Density ∑ N 2047 Total population ∑ Q 2047 Total water need Q UÇ EDK Network area	= 218 capita = 0.56 lt/sn = 0.00 lt/sn = 415.00 m	Σ Q2047 Total water need Q UÇ EDK Network area	= 1.50 lt/sn = 0.00 lt/sn = 375.00 m	QUÇ EDK Network area	= 3.90 lt/sn = 270.00 m	Quç EDK Network area	= 0.00 lt/sn = 405.00 m
Density ∑ N 2047 Total population ∑ Q 2047 Total water need Q UÇ EDK Network area EYK Network area	= 218 capita = 0.56 lt/sn = 0.00 lt/sn = 415.00 m = 450.00 m	Σ Q 2047 Total water need Q UÇ EDK Network area EYK Network area	= 1.50 lt/sn = 0.00 lt/sn = 375.00 m = 415.00 m	Quç EDK Network area EYK Network area	= 3.90 It/sn = 270.00 m = 312.00 m	Q UÇ EDK Network area EYK Network area	= 0.00 lt/sn = 405.00 m = 435.00 m
Density \$ N 2047 Total population \$ Q 2047 Total water need Q UÇ EDK Network area EYK Network area Reservoir	= 218 capita = 0.56 lt/sn = 0.00 lt/sn = 415.00 m = 450.00 m = DY4	Σ Q 2047 Total water need Q UÇ EDK Network area EYK Network area A6-BKV - Netw. Tank KK	= 1.50 lt/sn = 0.00 lt/sn = 375.00 m = 415.00 m r = 478.00 m	Q UÇ EDK Network area EYK Network area Reservoir	= 3.90 lt/sn = 270.00 m = 312.00 m = DY2	Quç EDK Network area EYK Network area Reservoir	= 0.00 lt/sn = 405.00 m = 435.00 m = YM1





# Annex-E: "Out of Scope" Decision







Say1 : 50227149/220-03 Konu: ÇED Görüşü

T.C. TOKAT VALILİĞİ Çevre ve Şehircilik İl Müdürlüğü

T.C. Cevre ve Şebircilik Bakanlığı TOKAT ÇEVRE VE ŞEHİRCILİK İL MÜDÜRLÜĞÜ - CED VE CEVRE İZİNLERİNDEN SORUMLU ŞUBE MÜDÜRLÜĞÜ 10/02/2017 17:38 - 50227149-220.03-K.91 09709358

#### DAĞITIM YERLERİNE

İlgi : 30.01.2017 tarihli ve CED-058 sayılı Almer Çevre Denetim Müş. Müh. İş Sağ. Güv. Proje Tic. Ltd.Şti.'nin yazısı. (e-ÇED sistemi 09.02.2017 tarihli ve E-201728 sayılı-69080 Referans No'lu Başvuru)

İlgi 'de kayıtlı dilekçe ile, Avrupa Komisyonu tarafından Avrupa Birliğine Katılım Öncesi Mali Yardım Programı(IPA) altında eş finansmanı sağlanan ve Çevre ve Şehircilik Bakanlığı tarafından yürütülen "Entegre Su Proje Projelerinin Hazurlanması İçin Teknik Yardım Projesi Lot:2" kapsamında yer alan Tokat İli,Niksar ilçesinde bir atıksu arıtma tesisi yapımı ile, içme suyu temin sisteminde gelir getirmeyen su miktarının azaltılması için içme suyu dağıtım şebekesi ve depoların inşaatı ile atıksu ana kollektörlerinin yenileme inşaatlarının yapımının planlandığı belirtilmiştir.

Ayrıca ilgi dilekçe'de Niksar Belediye Başkanlığı tarafından "Atıksu Arıtma Tesisi" projesi için 15.01.2016 tarihli ve 50227149/220.02/E.20167-234 sayılı yazı ile ÇED Gerekli Değildir kararının alındığı belirtilmiş olup, söz konusu proje kapsamında yapılması planlanan diğer atıksu arıtma tesisi altyapı ve içme suyu yapılarının 25/11/2014 tarih ve 29186 sayılı Resmi Gazete' de yayınlanarak yürürlüğe giren ÇED Yönetmeliği kapsamında değerlendirilmesi talep edilmiştir.

İlgi dilekçe ve eklerinin incelenmesi üzerine, Niksar Belediyesi atıksu arıtma tesisi altyapı ve içme suyu yapılarının inşaatı projesi kapsamında atıksu toplama sisteminde 17.376 m atıksu yan toplayıcıları,2.099 m terfi hattı ve 2 adet terfi merkezi inşası; içme suyu toplama sisteminde ise Keltepe (Seher)Suyu kaynağı için 50 m3 kaptaj yapısı ve 335 m boru yenileme ile Sulugöl kaptaj kaynağında 50 m3 kaptaj yapısı inşaatı yapılacağı, İçme suyu isale hatları için 45.208 m cazibeli ve 8.549 m terfili isale hattının maslak ve vantuzlarının yapımı,5 adet depo yapımı ve yaklaşık 11.142 m depolar arası iletim hattı ile 243.660 m içme suyu dağıtım sisteminin yapımının söz konusu olacağı anlaşılmıştır.

Yukarıda bahsi geçen ve detayları ilgi dilekçe ekinde sunulan projenin değerlendirilmesi neticesinde; Niksar Belediyesi tarafından Tokat ili, Niksar İlçesinde yapılması planlanan "Atıksu Yan Toplayıcıları, Terfi Hatları ve Terfi Merkezi; İçme suyu kaynaklarında ise kaptaj yapısı ve boru yenileme ile içme suyu depoları, iletim hatları ve içme suyu dağıtım sistemi yapımı" projesi, 25/11/2014 tarih ve 29186 sayılı Resmi Gazete' de yayınlanarak yürürlüğe giren ÇED Yönetmeliği Listelerinde yer almadığından kapsam dışı olarak

Ancak, planlanan yatırım ile ilgili olarak, 2872 sayılı Çevre Kanunu ile 5491 sayılı Çevre Kanununda Değişiklik Yapılmasına Dair Kanuna istinaden çıkarılan Yönetmeliklerin ilgili hükümlerine uyulması ve diğer mer'i mevzuat çerçevesinde öngörülen gerekli izinlerin alınması, proje ile ilgili değişiklik yapılmasının planlanmaşı halinde Valiliğimize(Çevre ve Şehircilik Müdürlüğü) başvuru yapılması, ekolojik dengenin bozulmamasına, çevrenin korunmasına ve geliştirilmesine yönelik tedbirlere riayet edilmesi gerekmektedir. Bilgilerinizi ve gereğini rica ederim.

> Ali YILMAZ Vali a Çevre ve Şehircilik İl Müdürü

DAGITIM: Gereği; -Niksar Belediye Başkanlığı/TOKAT Bilgi: - Almer Çevre Denetim Müş. Müh. İş Sağ. Güv. Proje Tic. Ltd.Şti, (Cevizlidere Mah. 1220 Sk. No:4C Çankaya/ANKARA)

Bu belge 5070 şayılı elektronik imza kanınnına göre güvenli elektronik imza ile imzalanmıştır.

Adres: Çevre ve Şehircilik İl Müdürlüğü Valilik Konağı 2.Kat TOKAT Telefon : 0 (356) 214 31 39 -0 (356) 214 16 62 Faks : 0 (356) 214 11 05 e-posta : tokat@csb.gov.tr

Bilgi İçin: H.M.DUYUM Çevre Mühendisi Dahili:338

Evrak teyidine http://evrakdogrulama.esb.gov.tr adresInden Belge Num.:50227149-220.03-E.913 ve Barkod Num.:9709358 bilglleriyle erişebilirsiniz.







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# Annex-F: Ministry of Culture and Tourism, Sivas Cultural Heritage Preservation Regional Board Decision





#### T.C.

#### KÜLTÜR VE TURİZM BAKANLIĞI SİVAS KÜLTÜR VARLIKLARINI KORUMA BÖLGE KURULU KARAR

 Toplanti Tarihi ve No : 04.05.2021-347

 Karar Tarihi ve No : 04.05.2021-6809

 Dosya No : 60.04.410

Toplantı Yeri ONLİNE

Tokat İli, Niksar İlçesi, İsmetpaşa Mahallesinde, Niksar su temini ve atık su toplama sistemi ile ilgili LOT-2 işi kapsamında kanalizasyon güzergahlarının 3. Derece arkeolojik sit alanında kalması nedeniyle alt yapı çalışması için gerekli izinlerin verilmesi istemini içeren Niksar Belediye Başkanlığının 01.02.2021 tarih ve 410 sayılı yazısı, 25.02.2021 tarih ve 784 sayılı yazısı, ekleri, 09.03.2021 tarih ve 960 sayılı yazısı ve ekleri, alt yapı uygulamalarına yönelik ilgili Müze Müdürlüğü görüşünü içerir Tokat Valiliği İl Kültür ve Turizm Müdürlüğü'nün 18.03.2021 tarih ve 1231907 sayılı yazısı, DSİ 7. Bölge Müdürlüğü'nün 29.03.2021 tarih ve 1110306 sayılı yazısı, Sivas Kültür Varlıklarını Koruma Bölge Kurulu Müdürlüğü uzmanlarının 06.04.2021 tarihli ve 700904 sayılı inceleme raporu, okundu; dosyasındaki bilgi ve belgeler incelendi.

Yapılan görüşme sonunda; Tokat İli, Niksar İlçesi, İsmetpaşa Mahallesinde, Niksar su temini ve atık su toplama sistemi ile LOT-2 işi kapsamında ekli paftada işaretli kanalizasyon hattı üzerinde Kurulumuzun 10.06.2020 tarih ve 6030 sayılı kararı ile uygun bulunan Geçiş Dönemi Koruma Esasları ve Kullanma Şartları gereğince, ilgili Müze Müdürlüğünce sondaj kazıları yapılıp sonucunun Kurulumuza iletilmesinden sonra talebin degeremini bileceğine karar verildi.



BAŞKAN Dr. Öğr. Üyesi Yalçın KAMIŞ (İmza)

> ÜYE Prof. Dr. Erdal ESER (İmza)

> > ÜYE Bünyamin ER (İmza)

TEMSİLCİ ÜYE Bahattin ÖZTÜRK Niksar Belediyesi Tems. (İmza) BAŞKAN YARDIMCISI Songül GÖZÜKÜÇÜK AYDIN (İmza)

ÜYE Abdulmecid DEMİRKAYNAK (İmza)

ÜYE Ferruh Yılmaz GÜLSER (İmza)

TEMSİLCİ ÜYE Atılgan KAYA Tokat Müze Müdür V. (İmza)









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#### T.C.

#### KÜLTÜR VE TURİZM BAKANLIĞI SİVAS KÜLTÜR VARLIKLARINI KORUMA BÖLGE KURULU KARAR

Toplantı Tarihi ve No : 15.12.2020-330 Karar Tarihi ve No : 15.12.2020-6551 Dosya No : 60.04.56-60.04.401 Toplantı Yeri SIVAS

Tokat İli, Niksar İlçesi, Yusufşah ve Kılıçarslan Mahalleleri'nde onaylı revize koruma amaçlı imar planlı 1. ve 3. Derece arkeolojik sit alanlarında Niksar su temini ve atık su toplama sistemi ile ilgili LOT-2 işi kapsamında içme suyu ve kanalizasyon güzergahlarının kalması nedeniyle alt yapı çalışması için gerekli izinlerin verilmesi istemini içeren Niksar Belediye Başkanlığının 16.09.2020 tarih ve 2798 sayılı yazısı ile 19.11.2020 tarih ve 3596 sayılı yazısı ve ekleri, alt yapı uygulamalarına yönelik ilgili Müze Müdürlüğü görüşünü içerir Tokat Valiliği 11 Kültür ve Turizm Müdürlüğü'nün 10.11.2020 tarih ve 851821 sayılı yazısı, Sivas Kültür Varlıklarını Koruma Bölge Kurulu Müdürlüğü uzmanlarının 01.07.2020 tarihli ve 258705 sayılı inceleme raporu, talebin Kurulumuz arkeolog üyesinin katılım sağladığı toplantıda değerlendirilmesine ilişkin Kurulumuzun 25.11.2020 tarihli ve 6471 sayılı kararı okundu; dosyasındaki bilgi ve belgeler incelendi.

Yapılan görüşme sonunda; Tokat İli, Niksar İlçesi, Yusufşah ve Kılıçarslan Mahalleleri'nde onaylı koruma amaçlı imar planlı 1. ve 3. Derece arkeolojik sit alanlarında Niksar su temini ve atık su toplama sistemi ile ilgili LOT-2 işi kapsamında ekli planda işaretli mevcut yollar üzerinde içme suyu ve kanalizasyon çalışmaları yapılmasının uygun olduğuna, uygulamanın Kurulumuzun 30.07.2013 tarihli ve 1021 sayılı kararı ile uygun bulunan Revizyon Koruma Amaçlı İmar Planı hükümleri gereğince; 1.derece arkeolojik sit alanındaki kazı çalışmalarının iş makinesi kullanılmadan el yordamıyla, 3. Derece arkeolojik sit alanındaki çalışmaların ise lastik tekerlekli hafif tonajlı iş makinesi yardımıyla ilgili müze müdürlüğü uzmanları denetiminde yapılmasına, uygulama sonuçlarının sonra bilgi ve belgeler dahilinde Kurulumuza sunulmasına karar verildi.









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# **Annex-G: Grievance Registration Form**





	Niksar (Tokat) Centrum Drinking Water Network Project				
(Group1			DB SCF-II AF)		
NIKSAR BELEDIYESI	GRIEVANC	E RI	EGISTER	FORM	
Person Filling the Form:			Date:		
Interview Agenda:			Reference No Niksar Munic	o: ipality-0001	
1. INFORMATION ABOUT	THE COMPLAINANT		[		
Name Surname:			How to rece	ive the complaint	
Turkish ID Number:			Phone		
Phone:			Face to face		
Address:			Web-site/ E-M	Mail	
E-Mail:			Other (Explai	n)	
Stakeholder Type					
Public Project Af Institution People	fected Private	Trade Asso	e ciation	NGO	
Interest Industry Groups Associations	Interest Industry Associations Union Media			University	
2. DETAILED INFORMATIC	ON ON THE COMPLAINT				
Description of the Complaint:					
Resolution method requested by the complainant					
Registered Person Name Surname/Signature	Complainant	Name	Surname/Sig	nature	
	202	•	Ć	A.	
	KIYE CUMHURIYETI ILIBAAN I're, şehincilik ve Gölşikıldi bakanlığı		THE WO		



# **Annex-H: Grievance Closure Form**







### Niksar (Tokat) Centrum

**Drinking Water Network Project** 

(Group1 DB SCF-II AF)

#### **GRIEVANCE CLOSURE FORM**

Reference No: Niksar Municipality-0001

1. DETERMINATION OF	CORRECTIVE ACTION	
1		
2		
3		
4		
5		
Responsible Departments		
2. CLOSE OUT THE CO	MPLAINT	
This section will be filled and signed by the complainant in case the complaint stated in the "Complaint Registration Form" is resolved.		
Date:	Name Surname / Signature of the Person	Name, Surname /

ature of the Person **Closing the Complaint** 

Signature of Complainant





# **Annex-I: Consultation Form**





	) Niksar Drinking Wa (Grou	Toka ater N p1 DB	nt) Centrum Network Project SCF-II AF)	
NİKSAR BELEDİYESİ	CONSUL		TION FORM	
Person Filling the Form:			Date:	
Interview Agenda:			Reference No:	
1. INTERVIEW INFORM	ATION			
Name Surname:			Form of Communication	on
Turkish ID Number:			Phone / Free line	
Phone:			Face to face	
Address:		,	Web-site / E-mail	
E-Mail:		1	Other (Explain)	
	Stakeholder Type			
Public     Project       Institution     Affected Perest       Interest     Industry       Groups     Association	Private Enterprise Workers'	Trade Assoc Media	siation NGO	y
2. INTERVIEW DETAILS	3			
Questions about the project:				
Project concerns/feedback:				
Responses to the views expressed above:				
				i.dy
<b>.</b>		k.	R	











# Annex-J: Sample Survey





S	ürdürülebilir şeh Sosyo-ekon Toplu	İRLER PROJESİ (SCP II-AF GROUF IOMİK DÜZEY ARAŞTIRMASI ILUK DÜZEYİ ANKETİ	? 1)
PROJE ADI:			
iL:	İLÇE:	MAHALLE:	ANKET NO:

MGS Proje Müşavirlik Mühendislik Tic. Ltd. Şti., **Sürdürülebilir Şehirler Projesi (SCP II-AF GROUP 1)** kapsamında Proje'nin olası olumlu ve olumsuz sosyal etkilerini tespit etmek amacı ile etki alanında bulunan yerleşimlere yönelik bir çalışma sürdürmektedir. Yürütülen çalışmalar ile Proje'nin olası olumsuz sosyal etkilerini azaltmayı ve olumlu etkilerini güçlendirmeyi hedeflemekteyiz. Sorularımızı yanıtlayacağınız için teşekkürler.

		GÖ	RÜŞME B	LGİSİ		
Gör	üşülen Ad-Soyad:					
Tele	efon:					
Adr	es:					
Un	/an:					
Gör	üşme Tarihi:					
Gör	üşme Yeri ve Saati					
Gör	üşme herhangi bir					
seb	epten yarım					
kalo	dıysa/iptal olduysa					
lütf	en nedenini belirtiniz.					
BÖL	ÜM A: MAHALLE DEMOGRAFİK	BILGILER				
A1. N	lüfus, yaş, cinsiyet ve göç bilgil	eri				
1	Mahallonin Nüfusu	Yaz				
1.		Toplam				
		Dolu				
2.	Hane Sayısı	Boş				
		Toplam				
3.	Son beş yıl ıçınde mahallenizdeki nüfusta bir değişiklik oldu mu	Artti		Azal	ldı	Değişmedi
4.	Nüfustaki bu artma, azalma veya sabitliğin başlıca nedenleri nedir?					
5.	Mahallede konuşulan farklı bir		Var 🗆			
6	dil var mi/varsa sayısı Mahallada farklı hir inanıca		Yok 🗆			
0.	mensup hane var mi? Var ise					
	sayı		Yok 🗆			
7.	Mahallede mülteci (Suriyeli,		Var 🗆			
	ırakıı, Atgan, vs.) var mi? Var ise sayı		Yok 🗆			
8.	Mahallenizin tarihçesi ile ilgili kısaca bilgi verir misiniz?					





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A2. Yaş	Dağılımları (Tabloyu mahallede yaş	şayan yaş g	gruplarına gö	öre doldurun	uz)		
	Yaş Grupları				Oranı		
1.	0-5 yaş arası (okul öncesi)						
2.	6-18 yaş arası (okul çağı)						
3.	19-25 yaş arası (üniversite çağı)						
4	26-40 vas arasi (genc orta vas)						
5	40.64 yas arasi (orta yas)						
6							
BÔI ÜM	B. MAHALI EDEKİ SOSVAL KAVNA						
B1) Făiti	im						
DI/Lgit					Maha	allede voksa	
Sosyo-e	konomik Altyapı			Sayı	En yakın nerede	Eny	yakın yerin nesafesi
		1.	İlkokul				
Okul		2.	Ortaokul				
		3.	Lise				
a)	Okula gitmeyen/gidemeyen çocuk var mı? (ilkokul, ortaokul, lise)						
b)	Mahalledeki okulda kaç öğretmeniniz var?						
c)	Mahallenin yüzde kaçı okuryazar?						
d)	Okul giriş-çıkış saatleri nedir?						
B2) Nüfu	ısun Eğitim Seviyesi (Mahallede ya	şayan bire	ylerin eğitim	durumları ile	e ilgili aşağıdaki tabloy	u doldurunu/	z)
	Eğitim durumu		Sayı			Oran (%)	
1.	Hiç okula gitmemiş						
2.	likokul mezunu						
3.							
4.	Lise mezunu						
BÔI ÜM		SMA7I IK					
C1) Son	5 sene icerisinde asağıdakilerden	kavnaklı c	atısmalar va	sandı mı?		_	
(Birden	fazla cevap verilebilir)			<b>y</b>		Evet	Hayır
1.	Doğal kaynaklarda kesinti (örn. Su,	enerji, han	nmadde, otlat	ma alanı)			
2.	Toprak						
3.	Ekonomik (örn. Çalışma durumu)						
4.	Kültürel farklılıklar						
5.	Aileler arası anlaşmazlıklar						
6.	Diğer (Belirtin)						
7.	Diğer (Belirtin)	<u></u>		<u></u>			
C2) Anla	ışmazlıklar nasıl çözülüyor? (Birde	n fazla cev	/ap verilebili	r)			
1.	Yerel yonetimierin yardımı						
<u>Z.</u>	Mahalla tanlaatilaw						
3.							
4.	Diger (Belirtin)						
C2) Hole			(Rolittin)				
	ı çozunnennış sorunlar varını? (Val	130 SULUIU					





BÖLÜM D: MAHALLENİN SOSYO-EK	ONOMİK DURUMU V	E KAYNAKLARI
D1) Çalışma Durumu ve Ortalama Ge	elir (Mahallenizin 16-5	9 yaş aralığı için aşağıda belirtilen iş gruplarına göre çalışma
durumu nedir?)		
Gruplar		Yaklaşık Sayı
1. Maaşlı-düzenli çalışanlar (Sigortalı)		
<ol><li>Çiftçilik / Hayvancılık yapanlar</li></ol>		
<ol><li>Kendi işi olan / Esnaf</li></ol>		
4. Öğrenci		
5. İşsiz		
6. Günlük Yevmiyeli		
7. Emekli		
D2) Son 5 sene içinde iş olanakları:		
1. 🗖 Arttı	2. 🛛 Azal	dı 3. 🗖 Aynı kaldı
D3) Hane başı ortalama gelir nedir		
		TL
D4) Son 5 sene icinde ortalama gelir		
1 🗌 Arttu	2 🗌 Azal	dı 3 🗌 Avnı kaldı
D5) Ekonomik Faalivetler (Mahalleniz	zde en önemli 5 geci	n kavnačini čnem sirasina göre belirtiniz)
1		
2		
3		
0. 1		
5		
6		
0.		
7. D6) Tenrok Sebinliži ve Terro		Alan (dänüm)
Do) Toprak Sampligi ve Tarim		Alan (donum)
1. Mara Alan		
2. Werd Aldri		
3. Ultilati		
<b>J.</b> Şaliis <b>6</b> Tapuquz Tarım Araziai		
0. Tapusuz Tahihi Arazisi		
		Alon (dönüm)
		Aldii (dollulii)
1.		
2.		
3.		
4. E		
5. 6		
0.		
1.		
8. 0		
9.		
10. D0) Mahallada Vatiatinilan Daakaa Ua		
D8) Manallede Tetiştirilen Başlıca Ha	iyvanlar	Seur
Hayvan		Sayı
1.		
2.		
<u>э.</u>		
4.		
5.		
0.		
1.		
δ.		





_				Mah	allede yoksa
So	syo-Ekonomik Altyapı	Sayı	En	yakın nerede?	En yakın yerin uzak mesafesi
1.	Sağlık ocağı				
2.	Jandarma/karakol				
3.	Kütüphane				
4.	Dukkänlar (Bakkal, kasap, firin vb.)				
5.	Postane				
6.	Kahvehane				
7.	Lokanta				
8.	Turistik tesisler (otel, pansiyon, kamp yeri)				
9.	Muhtarlık ofisi				
10.	Hastane				
11.	Finansal (ör: bankalar, ATM'ler, döviz büroları)				
12.	Cami				
13.	Kooperatif/Dernek				
14.	Minibüs hattı				
15.	Tren				
16.	Taksi	_			
17.	Pazar yeri (ve ne zaman kuruluyor?)	_			
18.	Diğer				
D1	)) Mahallede Bulunan Altyapı İmkanları				
		Var		Yok	Kaynak/sistem beli
1.	Elektrik altyapisi				
2.	lçme suyu kaynagı				
3.	Kullanım suyu kaynagı				
4.	Sulama suyu kaynagi				
5.	Kanalizasyon sistemi				
6.	Isinma kaynagi				
1.	Evsel atik toplama sistemi				
8.	Sabit telefon				
9.					
10.					
11.	nsiall yui				
12. BÖ					l 
E1					
С1)	Dogar Tuller			Neler helirtin	
			Evet		
	1. Mahallenizdeki/çevrenizdeki arazide gu	<u>da veya sağlık</u>	□ Havir		
	amaçlı toplanan bitki, çiçek ve ağaç va	r mı?	□ Fikri		
			vok		
			D Fvet	Neler belirtin	
	<ol><li>Bölgenize özgü <u>bitki ve/veya hayvan tü</u></li></ol>	irleri var mı?	□ Fikri	1	
			vok		
BÖ	LÜM F: MAHALLE SORUNLARI		, <b>)</b> • · ·		
F1)	Mahalle Sorunları (Su anda mahallenizde o	lan cevresel, so	syal ve ekon	omik sorunları bel	irtin.)
1.	Cevresel Sorunlar (cevre	,, <b>e</b> e			
	kirliliği, hayvan ve bitki türlerinin				
	zarar görmesi, toz, gürültü, su				
	yetersizliği, altyapı yetersizliği				
	gibi)				
2	Ekonomik Sorunlar (gelir ve				
۲.	istihdam sorunları)				
			-		
3.	Sosyal Sorunlar (eğitim, sosval				











Hassas Grupların belirlenme	sine yönelik sorular	Evet	Hayır	biliy	yor musunuz?
	-			Biliyorun	n Bilmiyorun
Mahallenizde yalnızca hayırse	verlerin yardımları ile				
Mahallenizde vasavan göcebe	ler / meysimlik olarak				
gelip çadırlarda yaşayanlar va	mi?				
Mahallenizde hane reisinin çoc	cuk olduğu (anne veya				
baba vefat etmiş, evin büyük o	ğlu veya kızının hane				
reisi oldugu) hane var mi? Mahallonizdo vasovan ovsizlor	(ovi olmovan, ov disinda				
verlerde vasavan) var mi?	(evi olinayan, ev ulşında				
Mahallenizde hayatını kazanm	ak için mahallenizden				
mevsimlik göç eden var mı?					
Mahallenizde zihinsel/ engelli l	kimseler var mi?				
Mahallenizde bedensei engelli Mahallenizde hane reisinin kar	kimseler var mi? tin olduğu (evin erkeği				
vefat etmis, hasta veva evi terl	( etmis) hane var mi?				
Mahallenizde yalnız yaşayan y	aşlılar var mı? (70 yaş ve				
üstü)					
BOLUM G: PROJE'NIN ETKI	LERININ BELIRLENMESI		Evet is	o novodon bilai	adinildi?
		Evet	Evet is	se hereden bligt	eainiiai?
Proje'ye ilişkin bilgiye sahip mi	siniz 🛛	Havir			
Mahalle sakinleri projeden hab	erdar mı? Haberdar ise ger	nel olarak görüş	leri ne yönde?		
□ Bilgileri yok □Olumlu	□Olumsuz □Fikri	yok	•		
	al babardar almak istorsini:				
Proje ile ilgili gelişmelerden na	SII Haberuar Ulimak islersiini	Z'?			
Proje ile ilgili gelişmelerden na □ Telefon □ E-posta	Broşür/bilgilendirici n	z? nektup 🗆 Y	üzyüze görüşme	□ Mesaj	Bilgilendirilmek
Proje ile ligili gelişmelerden na	Broşür/bilgilendirici n	z? nektup DY	üzyüze görüşme	□ Mesaj	Bilgilendirilmek
Proje ile ilgili gelişmelerden na □ Telefon □ E-posta istemiyor Projenin inşaat aşamasında m	Broşür/bilgilendirici n Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o	z? nektup	üzyüze görüşme peklemektesiniz? Pr	☐ Mesaj ojenin işletmeye	Bilgilendirilmek geçmesiyle birlikte bu
Proje lie ligili gelişmelerden na □ Telefon □ E-posta istemiyor Projenin inşaat aşamasında m olumsuz etkilerde bir artış bekl □ Olumsuz etki beklenmiyor □	Broşür/bilgilendirici n ☐ Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz? ☐ cevresel etkiler □ ekonor	z? nektup □ Y Ilumsuz etkiler t nik etkiler □ so	üzyüze görüşme beklemektesiniz? Pr sval etkiler □ kültür	Mesaj ojenin işletmeye e	Bilgilendirilmek geçmesiyle birlikte bu
Proje lie ligili gelişmelerden na Telefon E-posta istemiyor Projenin inşaat aşamasında m olumsuz etkilerde bir artış bekl Olumsuz etki beklenmiyor E Belirtiniz.	Broşür/bilgilendirici n     Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz?     çevresel etkiler □ ekonor	z? nektup D Y lumsuz etkiler t nik etkiler D so	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür	☐ Mesaj ojenin işletmeye el etkiler	Bilgilendirilmek geçmesiyle birlikte bu
Proje lie ligili gelişmelerden na Telefon E-posta istemiyor Projenin inşaat aşamasında m olumsuz etkilerde bir artış bekl Olumsuz etki beklenmiyor D Belirtiniz. Projenin inşaat aşamasında m	Broşür/bilgilendirici n Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz? cevresel etkiler  ext{ekonor} ahalleniz üzerindeki olumlu	z? nektup	üzyüze görüşme peklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors	☐ Mesaj ojenin işletmeye el etkiler unuz? İşletme dö	Bilgilendirilmek geçmesiyle birlikte bu onemine geçilmesi ile
Proje lie ligili gelişmelerden na     Telefon E-posta     istemiyor     Projenin inşaat aşamasında m     olumsuz etkilerde bir artış bekl     Olumsuz etki beklenmiyor E     Belirtiniz.     Projenin inşaat aşamasında m     birlikte bu olumlu etkilerde bir artış	□ Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz? □ çevresel etkiler □ ekonor ahalleniz üzerindeki olumlu artış yaşanacak mı?	z? nektup	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors	Mesaj ojenin işletmeye e el etkiler unuz? İşletme dö otkilor	Bilgilendirilmek geçmesiyle birlikte bu onemine geçilmesi ile
Proje lie ligili gelişmelerden na □ Telefon □ E-posta istemiyor Projenin inşaat aşamasında m olumsuz etkilerde bir artış bekl □ Olumsuz etki beklenmiyor □ Belirtiniz. Projenin inşaat aşamasında m birlikte bu olumlu etkilerde bir a □ Olumlu etki beklenmiyor □ Belirtiniz.	Broşür/bilgilendirici n     Broşür/bilgilendirici n     ahalleniz üzerinde ne gibi o     iyor musunuz?     çevresel etkiler □ ekonor     ahalleniz üzerindeki olumlu     artış yaşanacak mı?     çevresel etkiler □ ekonomi	z? nektup	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors ral etkiler □ kültürel	☐ Mesaj ojenin işletmeye el etkiler unuz? İşletme dö etkiler	Bilgilendirilmek geçmesiyle birlikte bu inemine geçilmesi ile
Proje lie ligili gelişmelerden na     Telefon E-posta     istemiyor     Projenin inşaat aşamasında m     olumsuz etkilerde bir artış bek     Olumsuz etki beklenmiyor     Belirtiniz.     Projenin inşaat aşamasında m     birlikte bu olumlu etkilerde bir a     Olumlu etki beklenmiyor     Belirtiniz.     Proje sahasında yabancı işçi (	Broşür/bilgilendirici n     Broşür/bilgilendirici n     ahalleniz üzerinde ne gibi o     iyor musunuz?     ⊊evresel etkiler □ ekonor     ahalleniz üzerindeki olumlu     artış yaşanacak mı?     çevresel etkiler □ ekonomi     yerel olmayan) istihdam edi	z? nektup □ Y Iumsuz etkiler b nik etkiler □ so etkileri neler ol k etkiler □ sosy Imesi konusunc	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors ral etkiler □ kültürel la ne düşünüyorsun	Mesaj ojenin işletmeye  el etkiler unuz? İşletme dö etkiler uz?	Bilgilendirilmek geçmesiyle birlikte bu onemine geçilmesi ile
Proje lie ligili gelişmelerden na     Telefon E-posta     istemiyor     Projenin inşaat aşamasında m     olumsuz etkilerde bir artış bek     Olumsuz etki beklenmiyor E     Belirtiniz.     Projenin inşaat aşamasında m     birlikte bu olumlu etkilerde bir a     Olumlu etki beklenmiyor Belirtiniz.     Proje sahasında yabancı işçi (	Broşür/bilgilendirici n □ Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz? □ çevresel etkiler □ ekonori ahalleniz üzerindeki olumlu artış yaşanacak mı? çevresel etkiler □ ekonomi yerel olmayan) istihdam edi	z? nektup □ Y Iumsuz etkiler t nik etkiler □ so etkileri neler ol k etkiler □ sosy Imesi konusuno	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors ral etkiler □ kültürel la ne düşünüyorsun	Mesaj ojenin işletmeye e el etkiler unuz? İşletme dö etkiler uz?	Bilgilendirilmek geçmesiyle birlikte bu onemine geçilmesi ile
Proje lie ligili gelişmelerden na □ Telefon □ E-posta istemiyor Projenin inşaat aşamasında m olumsuz etkilerde bir artış bekl □ Olumsuz etki beklenmiyor □ Belirtiniz. Projenin inşaat aşamasında m birlikte bu olumlu etkilerde bir a □ Olumlu etki beklenmiyor □ Belirtiniz. Proje sahasında yabancı işçi (	□ Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz? □ çevresel etkiler □ ekonor ahalleniz üzerindeki olumlu artış yaşanacak mı? çevresel etkiler □ ekonomi yerel olmayan) istihdam edi	z? nektup   Y Iumsuz etkiler b nik etkiler   so etkileri neler ol k etkiler   sosy Imesi konusunc	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors ral etkiler □ kültürel la ne düşünüyorsun	Mesaj ojenin işletmeye e el etkiler unuz? İşletme dö etkiler uz?	☐ Bilgilendirilmek geçmesiyle birlikte bu inemine geçilmesi ile
Proje le ligili gelişmelerden na Telefon E-posta istemiyor Projenin inşaat aşamasında m olumsuz etkilerde bir artış bekl Olumsuz etki beklenmiyor E Belirtiniz. Projenin inşaat aşamasında m birlikte bu olumlu etkilerde bir a Olumlu etki beklenmiyor E Belirtiniz. Proje sahasında yabancı işçi ( Proje inşaatında çalışacak işçi	Broşür/bilgilendirici n Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz?  çevresel etkiler  ekonor ahalleniz üzerindeki olumlu artış yaşanacak mı? çevresel etkiler  ekonomi yerel olmayan) istihdam edi lerin bölgede nasıl bir etkisi	z?         nektup       □ Y         Iumsuz etkiler b         nik etkiler □ so         etkileri neler ol         k etkiler □ sosy         Imesi konusunc         olacağını düşü	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors ral etkiler □ kültürel la ne düşünüyorsun nüyorsunuz?	☐ Mesaj ojenin işletmeye el etkiler unuz? İşletme dö etkiler uz?	Bilgilendirilmek geçmesiyle birlikte bu binemine geçilmesi ile
Proje ile ilgili gelişmelerden na     Telefon E-posta     istemiyor      Projenin inşaat aşamasında m     olumsuz etkilerde bir artış bek     Olumsuz etki beklenmiyor E     Belirtiniz.      Projenin inşaat aşamasında m     birlikte bu olumlu etkilerde bir a     Olumlu etki beklenmiyor Belirtiniz.      Proje sahasında yabancı işçi (     Proje inşaatında çalışacak işçi	Broşür/bilgilendirici n Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz?  çevresel etkiler  ekonor ahalleniz üzerindeki olumlu artış yaşanacak mı? çevresel etkiler  ekonomi yerel olmayan) istihdam edi lerin bölgede nasıl bir etkisi	z? nektup □ Y Iumsuz etkiler b nik etkiler □ so etkileri neler ol k etkiler □ sosy Imesi konusunc olacağını düşü	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors ral etkiler □ kültürel la ne düşünüyorsun nüyorsunuz?	☐ Mesaj ojenin işletmeye el etkiler unuz? İşletme dö etkiler uz?	Bilgilendirilmek geçmesiyle birlikte bu onemine geçilmesi ile
Proje ile ilgili gelişmelerden na     Telefon E-posta     istemiyor     Projenin inşaat aşamasında m     olumsuz etkilerde bir artış bek     Olumsuz etki beklenmiyor E     Belirtiniz.     Projenin inşaat aşamasında m     birlikte bu olumlu etkilerde bir a     Olumlu etki beklenmiyor      Belirtiniz.     Proje sahasında yabancı işçi (     Proje inşaatında çalışacak işçi     Arazi kayıplarının geçim kayna	Broşür/bilgilendirici n Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz? cevresel etkiler i ekonor ahalleniz üzerindeki olumlu artış yaşanacak mı? çevresel etkiler i ekonomi yerel olmayan) istihdam edi lerin bölgede nasıl bir etkisi iğını nasıl etkilemesini bekli	z? nektup □ Y Iumsuz etkiler b nik etkiler □ so etkileri neler ol k etkiler □ sosy Imesi konusunc olacağını düşü yorsunuz?	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors val etkiler □ kültürel la ne düşünüyorsun nüyorsunuz?	☐ Mesaj ojenin işletmeye el etkiler unuz? İşletme dö etkiler uz?	☐ Bilgilendirilmek geçmesiyle birlikte bu onemine geçilmesi ile
Proje ile ilgili gelişmelerden na Telefon E-posta istemiyor Projenin inşaat aşamasında m olumsuz etkilerde bir artış bekl Olumsuz etki beklenmiyor D Belirtiniz. Projenin inşaat aşamasında m birlikte bu olumlu etkilerde bir a Olumlu etki beklenmiyor D Belirtiniz. Proje sahasında yabancı işçi ( Proje inşaatında çalışacak işçi Arazi kayıplarının geçim kayna	Broşür/bilgilendirici n Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz? cevresel etkiler i ekonor ahalleniz üzerindeki olumlu artış yaşanacak mı? çevresel etkiler i ekonomi yerel olmayan) istihdam edi lerin bölgede nasıl bir etkisi iğını nasıl etkilemesini bekli	z? nektup □ Y Iumsuz etkiler b nik etkiler □ so etkileri neler ol k etkiler □ sosy Imesi konusunc olacağını düşü yorsunuz?	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors ral etkiler □ kültürel la ne düşünüyorsun nüyorsunuz?	Mesaj ojenin işletmeye i el etkiler unuz? İşletme dö etkiler uz?	Bilgilendirilmek geçmesiyle birlikte bu inemine geçilmesi ile
Proje ile ilgili gelişmelerden na I Telefon E-posta istemiyor Projenin inşaat aşamasında molumsuz etkilerde bir artış beki Olumsuz etki beklenmiyor E Belirtiniz. Projenin inşaat aşamasında molumlu etki beklenmiyor Belirtiniz. Proje sahasında yabancı işçi ( Proje inşaatında çalışacak işçi Arazi kayıplarının geçim kayna	Broşür/bilgilendirici n Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz? cevresel etkiler i ekonor ahalleniz üzerindeki olumlu artış yaşanacak mı? çevresel etkiler i ekonomi yerel olmayan) istihdam edi lerin bölgede nasıl bir etkisi ğını nasıl etkilemesini bekli	z?         nektup       □ Y         Iumsuz etkiler       I         nik etkiler       so         etkileri neler ol       k etkiler         k etkiler       sosy         Imesi konusunc       olacağını düşü         yorsunuz?       I	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors ral etkiler □ kültürel la ne düşünüyorsun nüyorsunuz?	☐ Mesaj ojenin işletmeye el etkiler unuz? İşletme dö etkiler uz?	☐ Bilgilendirilmek geçmesiyle birlikte bu onemine geçilmesi ile
Proje ile ilgili gelişmelerden na □ Telefon □ E-posta istemiyor Projenin inşaat aşamasında m olumsuz etkilerde bir artış bekl □ Olumsuz etki beklenmiyor □ Belirtiniz. Projenin inşaat aşamasında m birlikte bu olumlu etkilerde bir a □ Olumlu etki beklenmiyor □ Belirtiniz. Proje sahasında yabancı işçi ( Proje inşaatında çalışacak işçi Arazi kayıplarının geçim kayna Yol kullanımından kaynaklanan	Broşür/bilgilendirici n Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz? cevresel etkiler 🗆 ekonori ahalleniz üzerindeki olumlu artış yaşanacak mı? çevresel etkiler 🗆 ekonomi yerel olmayan) istihdam edi lerin bölgede nasıl bir etkisi ğını nasıl etkilemesini bekli	z? nektup □ Y Iumsuz etkiler b nik etkiler □ so etkileri neler ol k etkiler □ sosy Imesi konusunc olacağını düşü yorsunuz?	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors ral etkiler □ kültürel la ne düşünüyorsun nüyorsunuz?	☐ Mesaj ojenin işletmeye el etkiler unuz? İşletme dö etkiler uz?	Bilgilendirilmek geçmesiyle birlikte bu onemine geçilmesi ile
Proje le ligili gelişmelerden na         □ Telefon       □ E-posta         istemiyor         Projenin inşaat aşamasında m         olumsuz etkilerde bir artış bekl         □ Olumsuz etki beklenmiyor I         Belirtiniz.         Projenin inşaat aşamasında m         birlikte bu olumlu etkilerde bir artış         Belirtiniz.         Proje olumlu etki beklenmiyor I         Belirtiniz.         Proje sahasında yabancı işçi (         Proje inşaatında çalışacak işçi         Arazi kayıplarının geçim kayna         Yol kullanımından kaynaklanar	Broşür/bilgilendirici n Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz? cevresel etkiler i ekonor ahalleniz üzerindeki olumlu artış yaşanacak mı? çevresel etkiler i ekonomi yerel olmayan) istihdam edi lerin bölgede nasıl bir etkisi ğını nasıl etkilemesini bekli	z? nektup □ Y Iumsuz etkiler b nik etkiler □ so etkileri neler ol k etkiler □ sosy Imesi konusunc olacağını düşü yorsunuz? klemektesiniz?	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors ral etkiler □ kültürel la ne düşünüyorsun nüyorsunuz?	☐ Mesaj ojenin işletmeye el etkiler unuz? İşletme dö etkiler uz?	Bilgilendirilmek geçmesiyle birlikte bu onemine geçilmesi ile
Proje le ligili gelişmelerden na         □ Telefon       □ E-posta         istemiyor         Projenin inşaat aşamasında m         olumsuz etkilerde bir artış bekl         □ Olumsuz etki beklenmiyor □         Belirtiniz.         Projenin inşaat aşamasında m         birlikte bu olumlu etkilerde bir artış bekl         □ Olumsuz etki beklenmiyor □         Belirtiniz.         Proje sahasında yabancı işçi (         Proje inşaatında çalışacak işçi         Arazi kayıplarının geçim kayna         Yol kullanımından kaynaklanan         Mahallenizde başka yatırım pro	Broşür/bilgilendirici n Broşür/bilgilendirici n ahalleniz üzerinde ne gibi o iyor musunuz? cevresel etkiler i ekonor ahalleniz üzerindeki olumlu artış yaşanacak mı? çevresel etkiler i ekonomi yerel olmayan) istihdam edi lerin bölgede nasıl bir etkisi iğını nasıl etkilemesini bekli n ne gibi etkiler olmasını be ojesi bulunmakta mı?	z? nektup   Y Iumsuz etkiler b nik etkiler   so etkileri neler ol k etkiler   sosy Imesi konusunc olacağını düşü yorsunuz?	üzyüze görüşme beklemektesiniz? Pr syal etkiler □ kültür acağını düşünüyors ral etkiler □ kültürel la ne düşünüyorsun nüyorsunuz?	☐ Mesaj ojenin işletmeye i el etkiler unuz? İşletme dö etkiler uz?	Bilgilendirilmek geçmesiyle birlikte bu inemine geçilmesi ile
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