THE REPUBLIC OF TÜRKİYE

MINISTRY OF AGRICULTURE AND FORESTRY

GENERAL DIRECTORATE OF STATE HYDRAULIC WORKS

ANTALYA–MANAVGAT RIGHT AND LEFT BANK MODERNIZATION WORKS

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

PREPARED BY

io Environmental Solutions

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Final Draft Report for Stakeholder Consultation

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Submission and Revision List

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Version 0.2 – 06/05/2026 **Final draft report for stakeholder consultation**	Submission of report including revisions following receipt WB's commentary on 06/05/2026 (two additional comments under Section 3 and 8)

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Abbreviations and Definitions

AoI	Area of Influence
BC	Before Christ
Board	Antalya Regional Board for the Preservation of Cultural Assets
C-ESMP	Contractor Environmental and Social Management Plan
CHS	Community Health and Safety
CLO	Community Liaison Officer
DSİ	State Hydraulic Works
E&S	Environmental and Social
EHSGs	General Environmental, Health and Safety Guidelines
EIA	Environmental Impact Assessment
ESF	Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standard
GM	Grievance Mechanism
ha	hectares
INA	Important Nature Areas
KBA	Key Biodiversity Area
km	kilometers
LMP	Labor Management Procedures
MoAF	Ministry of Agriculture and Forestry
OHS	Occupational Health and Safety
PAPs	Project Affected Persons
PMT	Project Management Team
RF	Resettlement Framework
RP	Resettlement Plan
SEA/SH	Sexual Exploitation and Abuse/ Sexual Harassment
SEP	Stakeholder Engagement Plan
SEPA	Specialized Environmental Protection Area
TIMP-2	Türkiye Second Irrigation Modernization Project
TURKSTAT	Turkish Statistical Institute
WB	World Bank

1 Introduction

1.1 Türkiye Second Irrigation Modernization and Water Efficiency Project

Improving irrigation services and performance is one of the priority areas for the Government of Türkiye. Accordingly, the Türkiye Second Irrigation Modernization Project ("TIMP-2") has been developed to be implemented by the General Directorate of State Hydraulic Works ("DSİ") under the Ministry of Agriculture and Forestry ("MoAF"), with financing from the World Bank ("WB").

TIMP-2 consists of three components and those are listed below.

Component 1: Irrigation System Rehabilitation and Modernization

Component 2: Institutional Support, Digital Irrigation and Smart Water Accounting

Component 3: Project Management

Component 1 will finance investment to rehabilitate and modernize DSI's irrigation systems in selected schemes, building on successful activities from the ongoing TIMP. By investing in the reduction of water (evaporation and seepage) losses in the irrigation conveyance and distribution system; increasing the efficiency of water use (by introducing climate-smart irrigation practices and improving drainage); and improving the allocation of water among downstream and upstream farmers, the irrigation subsector will become more resilient to climate change–aggravated water shortages and extreme weather events.

The planned investments within the scope of TIMP-2 Component 1: Irrigation System Rehabilitation and Modernization is expected to enhance irrigation services efficiency through modernization of six existing schemes covering around 71,725 ha.

The Project Development Objective of TIMP-2 is to improve irrigation service delivery and water efficiency in selected irrigation projects.

'Antalya Manavgat Right and Left Bank Rehabilitation Works' is one of the six subprojects proposed under Component 1 of TIMP-2 to enhance irrigation services efficiency through modernization.

The objective of 'Antalya Manavgat Right and Left Bank Rehabilitation Works' is to achieve water savings by rehabilitating the existing irrigation system, improving irrigation efficiency, and optimizing the use of available water resources. The Project also aims to provide more reliable, pressurized irrigation to local communities and farmers, reduce water losses within the systems, and enhance overall irrigation performance.

'Antalya Manavgat Right and Left Bank Rehabilitation Works' is hereafter referred to as the "subproject".

1.2 Rationale of the Environmental and Social Management Plan

The main objective of this Environmental and Social Management Plan ("ESMP") is to assess and address the potential environmental and social risks and impacts associated with the pre-construction, construction and operation phases of the 'Antalya Manavgat Right and Left Bank Rehabilitation Works' which is located at Manavgat district of Antalya province.

The development of the ESMP takes into account the provisions and requirements set out in the WB's Environmental and Social Framework ("ESF"), TIMP-2's Environmental and Social Management Framework ("ESMF") [1], Stakeholder Engagement Plan ("SEP") [2], and Labor Management Procedures ("LMP") [3], as well as

[1] The ESMF of TIMP-2 is disclosed on TIMP-2's web page: https://www.dsi.gov.tr/Sayfa/Detay/1997#
[2] The SEP of TIMP-2 is disclosed on TIMP-2's web page: https://www.dsi.gov.tr/Sayfa/Detay/1997#
[3] The LMP of TIMP-2 is disclosed on TIMP-2's web page: https://www.dsi.gov.tr/Sayfa/Detay/1997#

the World Bank Group General Environmental, Health and Safety Guidelines ("EHSGs") and the EHSGs for Water and Sanitation, in addition to applicable national legislation.

These documents form the basis of the ESMP, and the Contractor selected for the subproject construction shall comply with all relevant provisions and requirements contained therein during subproject implementation.

This ESMP evaluates measures aimed at mitigating and/or eliminating these impacts, and it identifies the responsible parties accountable for planning, implementing and monitoring activities within the scope of the ESMP. These parties will carry out their responsibilities in accordance with national legislation and WB's ESF as well as other reference documents as specified in the ESMP.

Additionally, the ESMP outlines the necessary institutional arrangements, and emphasizes the importance of capacity building to ensure successful implementation of the TIMP-2's ESMF provisions.

The ESMP also provides a summary of stakeholder consultations conducted in preparation of the ESMP and outlines stakeholder identification and analysis and stakeholder engagement program, proposed strategies for engagement, resources and responsibilities regarding engagement as well as grievance mechanism ("GM") following the provisions of TIMP-2's SEP. A subproject specific SEP consistent with the TIMP-2's SEP will also be developed for this subproject by the Contractor.

The measures outlined in this ESMP are designed to safeguard the environment, protect the personnel involved in the construction, and ensure the well-being of the local community against the adverse effects of construction activities. Additionally, the measures in the operation phase encompass elements aimed at environmental and social protection. The measures established by the ESMP for the pre-construction, construction, and operation phases are assessed through the mitigation and monitoring plans defined within the ESMP.

The existing irrigation system at Manavgat which is going to be modernized by this subproject serves agricultural lands by open channels. Most sections of channels are damaged, deemed to require renovation for efficiency.

The environmental and social ("E&S") risk rating is evaluated by the specialists working within DSİ's Project Management Unit ("PMT") through a comprehensive E&S Screening following the provisions of ESMF. As a result of the evaluation, the E&S risk rating of this subproject is determined as 'moderate' due to the following:

- There would be no significant adverse environmental impact,
- Necessary precautions and measures would be taken for protected cultural and/or natural heritage areas,
- Impacts associated with the construction activities would be short-term, reversible, and limited to the subproject site and its immediate surroundings,
- The amount of expropriation is low, and expropriated lands could be used for agricultural purposes after construction works, so that the impact is temporary by its nature.

Upon the evaluation, the E&S management tools are determined as:

- A subproject specific ESMP following the outlined ESMP within ESMF's Annex 2
- A subproject level Resettlement Plan ("RP")

TIMP-2's ESMF also requires that a subproject specific SEP will also be prepared in line with the TIMP-2's SEP and this SEP will among others identify disadvantaged and vulnerable groups.

This ESMP is developed by the io Environmental Solutions (the “Consultant”), contracted by the General Directorate of DSİ.

The ESMP has been developed in accordance with applicable requirements through a combination of field-based assessments and desk-based studies. A comprehensive site survey was undertaken on 11–12 February 2026 to verify existing site conditions, support the establishment of environmental and social baseline conditions, and identify locations of potential sensitivity within the subproject area. Appendix 9 - Photo Log has been prepared to illustrate key areas relevant to the development of this ESMP.

Prior to the field survey, spatial datasets relating to protected cultural heritage assets, key biodiversity areas, and other environmentally sensitive receptors were compiled and reviewed to inform the identification of critical areas. This process was complemented by a review of relevant literature and desktop analyses covering the subproject’s area of influence.

Subsequent to the field survey, the findings from site observations, together with the outcomes of the desk-based studies, were systematically evaluated to characterize baseline conditions and to identify and assess potential environmental and social risks and impacts associated with the subproject.

2 Subproject Description and Area of Influence

2.1 Subproject Description

The Manavgat Right and Left Bank Irrigation Schemes are located within the Antalya Basin, inside the administrative boundaries of Manavgat District of Antalya Province. The main water source, Naras Dam, is located approximately 15 km northwest of Manavgat District.

The Manavgat Right Bank Irrigation Scheme was initially supplied from the Manavgat River in 1984. Following the commissioning of Naras Dam in 2017, irrigation water has been supplied from the dam. With the dam becoming operational, a newly irrigated area of 1,454 ha has been converted to a closed, pressurized system, while the existing 5,412 ha, although supplied from Naras Dam, has continued to operate under the old canal-based (open concrete channel) flood irrigation system.

The Manavgat Left Bank Irrigation Scheme has been irrigating an area of 806 ha with water diverted from the Manavgat River since 1957 through a canal-based system, which has remained in operation to date (noting reductions due to areas open for urban development).

Irrigation schemes on both banks are operated by the Manavgat Irrigation Association.

Currently, 6,218 ha of the Manavgat Right and Left Bank irrigation areas are served by canal-based systems. Under this modernization project, these areas will be converted into a closed, pressurized irrigation system. In addition, together with 416 ha of newly added irrigation areas and 179 ha transferred from the Köprüçay Pumping Irrigation, a total area of 6,813 ha will be irrigated through a piped, pressurized system.

As a summary:

- Manavgat Right Bank Irrigation Area: 5,412 ha
- Manavgat Left Bank Irrigation Area: 806 ha
- From Köprüçay Pumping Irrigation: 179 ha
- Newly added irrigation areas (306 + 110): 416 ha
- Total: 6,813 ha

Under this subproject, agricultural lands located in Sarılar, Yukarı Işıklar, Dolbazlar, Şişeler, Yeniköy, Ilıca, Çolakh, Kalemler, Yavrudoğan, Gündoğdu, Kısalar, Side, Çayyazı, Evrenseki, Çeltikçi, Ulukapı, Şeydiler, Aşağı Işıklar, Doğançam, Aksaz, Demirciler, and Karaöz villages/neighborhoods of Manavgat District, Antalya Province, will be irrigated (See Appendix 8 - Settlements in the Area of Influence).

The construction period of the Project is planned as two years.

Within the scope of irrigation system modernization, materials required for backfilling (bedding and envelope layers) for excavations along the transmission lines will be sourced from the same material quarries previously used for the construction of Naras Dam. The detailed design has not yet been prepared; therefore, the final alignment of irrigation lines, and quantities of excavation and filling material will be determined during the detailed design phase. In the case of change in the proposed alignment of the irrigation pipelines, this ESMP will be revisited to reflect such changes and potential E&S risk and impacts.

Referring to the layout plan of the subproject, the subproject is divided into three sections, namely Section-4, west section of the subproject at the right bank; Section-8, mid-section of the subproject at the right bank; Section-9, easts section of the subproject at the right bank and left bank. An illustration of the sections of the subproject is given in Section 2.3.

The information presented in this section is based on the *"Antalya–Manavgat Right and Left Bank Rehabilitation Technical Report (2020)" and the subproject's E&S Screening Form*.

The alignment of the irrigation pipeline route includes a total of 15 river crossings. For each crossing, aerial solutions will be adopted to avoid any disturbance to the riverbed and associated habitats. Aerial crossings will either involve attaching the pipeline to an existing bridge, where such structures are available, or constructing dedicated support structures to span above the water where no bridge exists. Appendix 1 - List of River Crossings presents each crossing, along with a brief description of the proposed method and corresponding map illustrations. The design shall include detailed drawings for each crossing, taking into account a no-harm approach to riverbeds and riparian habitats.

This subproject is exempt from the national Environmental Impact Assessment ("EIA") regulation, meaning that it is not classified under Annex I or Annex II of the EIA Regulation and not considered having significant E&S risks and impacts. The exemption letter will be obtained by the DSİ 13th Regional Directorate in the upcoming period before the commencement of the subproject construction.

2.2 Associated Facilities

WB ESF describes Associated Facilities as facilities or activities that are not funded as part of the project and, in the judgment of the WB, and are:

a. directly and significantly related to the project; and
b. carried out, or planned to be carried out, contemporaneously with the project; and
c. necessary for the project to be viable and would not have been constructed, expanded or conducted if the project did not exist.

As ESMF requires, all dams relevant to TIMP-2 will be audited by independent experts regarding its safety. The assessment report will be submitted to WB and recommendations delineated within the assessment report will be implemented by DSİ. In this respect, Naras Dam, the water source of the subproject, is evaluated as an Associated Facility for the subproject. Since Naras Dam is operational in 2014 and built following safety standards as well as no shortcoming has been identified in the audits conducted by the Regional Directorate of DSİ annually, DSİ PMT does not anticipate any shortcomings regarding the dam that may lead to remediation. In case of remediation, this ESMP will be revised to reflect E&S risks and impacts in relation to the remediation works of Naras Dam.

Based on the review of available subproject information, no other facilities or activities meeting the above definition have been identified for the subproject. In this context, the subproject does not rely on any external infrastructure or third-party developments that would qualify as Associated Facilities under the ESF.

Accordingly, no E&S risks or impacts linked to Associated Facilities are anticipated at this stage. This determination will be kept under review throughout the subproject implementation, and any future identification of potential Associated Facilities will be assessed in accordance with ESF requirements. Accordingly, this ESMP will be revised to reflect E&S risks and impacts in relation to the Associated Facilities.

2.3 Subproject Area of Influence

The area of influence ("AoI") has been defined based on the spatial extent of potential E&S risks and impacts. The irrigation transmission lines to be constructed are shown by red lines on the map below. Construction activities along these lines may result in potential adverse impacts on soil, water resources, habitat and biodiversity, and ambient air quality, as well as temporary noise generation. Irrigation transmission lines may also cause land expropriation that may affect the livelihood of the landowner/user.

The yellow areas represent the irrigation command areas that will be served by the irrigation lines during the operation phase. These areas are expected to be positively affected by the subproject through improved irrigation services.

Accordingly, the AoI is defined as the subproject irrigation area and a buffer zone extending 0.5 km on each side of the irrigation area as illustrated in Figure 1.

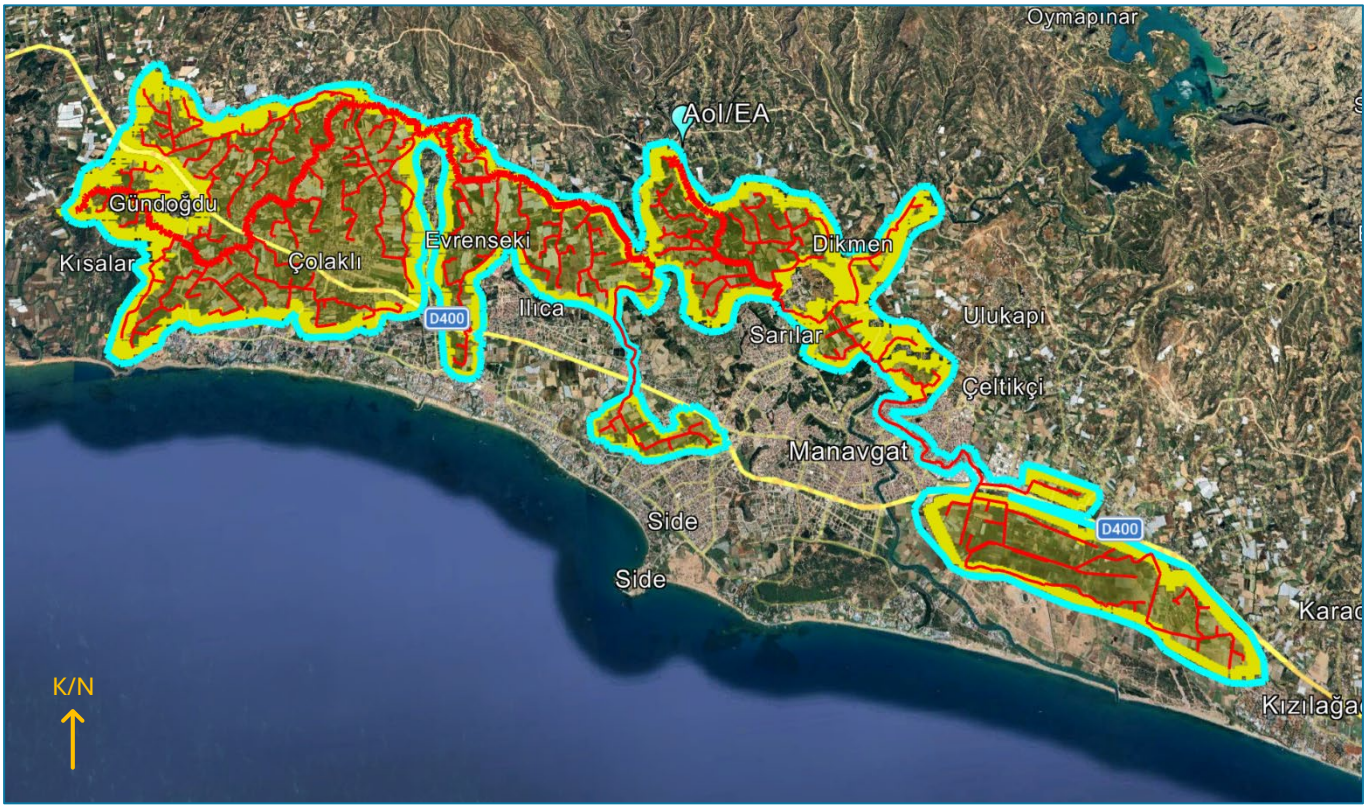

Figure 1. Subproject Area of Influence

In the following maps, E&S components that can be affected due to subproject activities are shown by each section of the subproject. The E&S components considered are listed below.

- Water bodies including rivers and dams
- Cultural heritage sites
- Road infrastructure
- Environmentally sensitive areas including Belek Special Environmental Protection Area ("SEPA"), Alanya Plain Key Biodiversity Area ("KBA") and Kızılot KBA

The subproject area has been delineated into two area types: irrigation areas and non-irrigation areas, referring to the *"Antalya–Manavgat Right and Left Bank Rehabilitation Technical Report (2020)"*.

- The areas defined as irrigation areas correspond to agricultural lands where farming activities are carried out. Irrigation areas are those where subproject activities will be implemented, including the construction of irrigation pipelines, and which will ultimately be irrigated through a modernized irrigation line within the scope of the subproject.

- Non-irrigation areas include other land uses where no agricultural activity is present. These comprise riverbeds, roads, settlements, privately and publicly owned parcels with developments, 1st and 3rd degree archeological sites, archeologically protected areas, and woods that are areas exhibiting natural habitat characteristics. As these areas do not require irrigation, they have been classified as non-irrigation areas. No construction activities will be carried out within these areas, and those areas will not be irrigated within the scope of the subproject.

Following maps also present the irrigation areas in yellow and non-irrigation areas within orange boundaries. Non-irrigation areas exhibiting natural habitat characteristics (woods) are marked with green.

Section-4 of the subproject lies at the west of the subproject at the right bank.

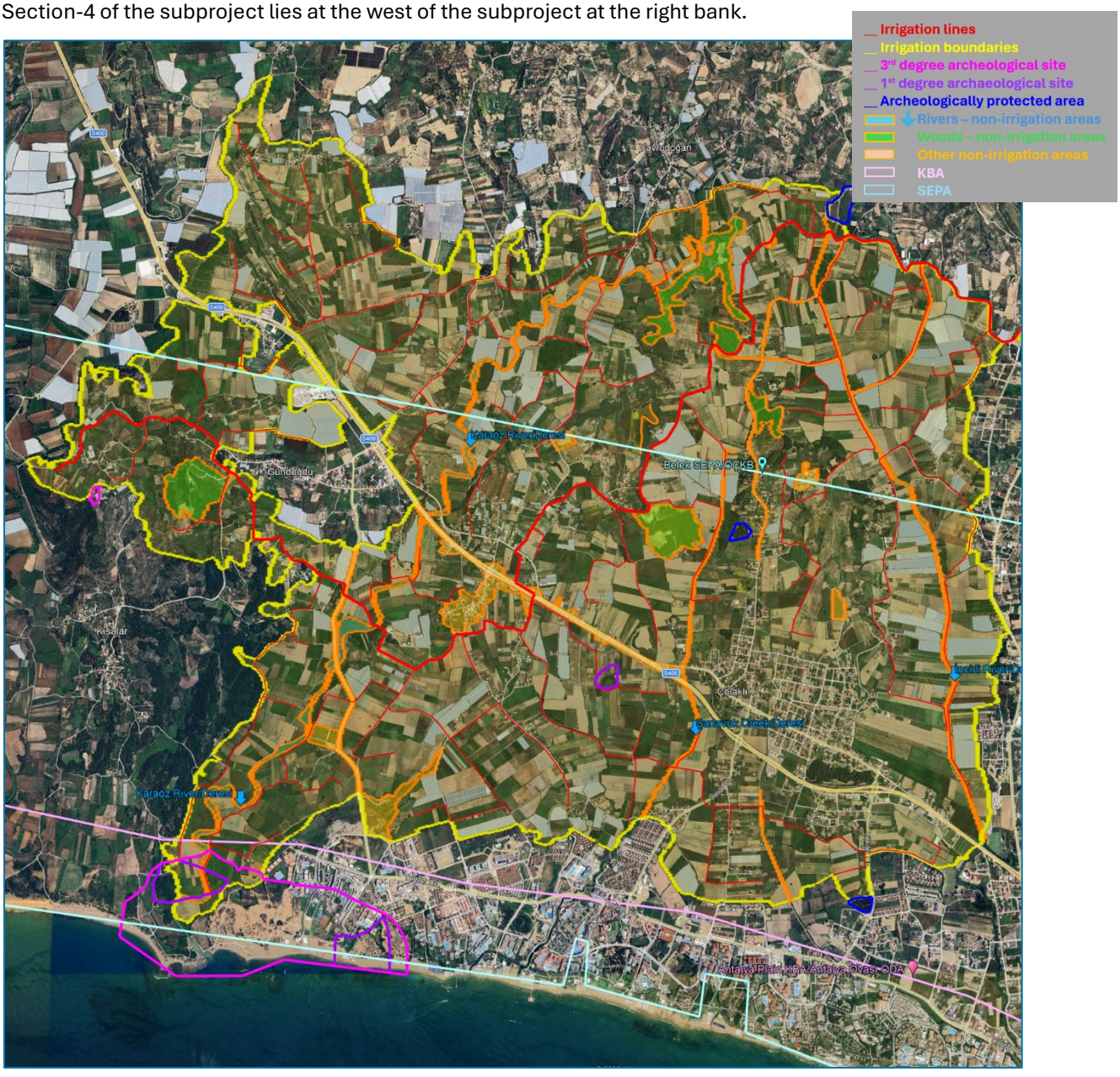

Figure 2. Section-4 of the Subproject

Section-8 of the subproject locates at the mid-section of the subproject at the right bank.

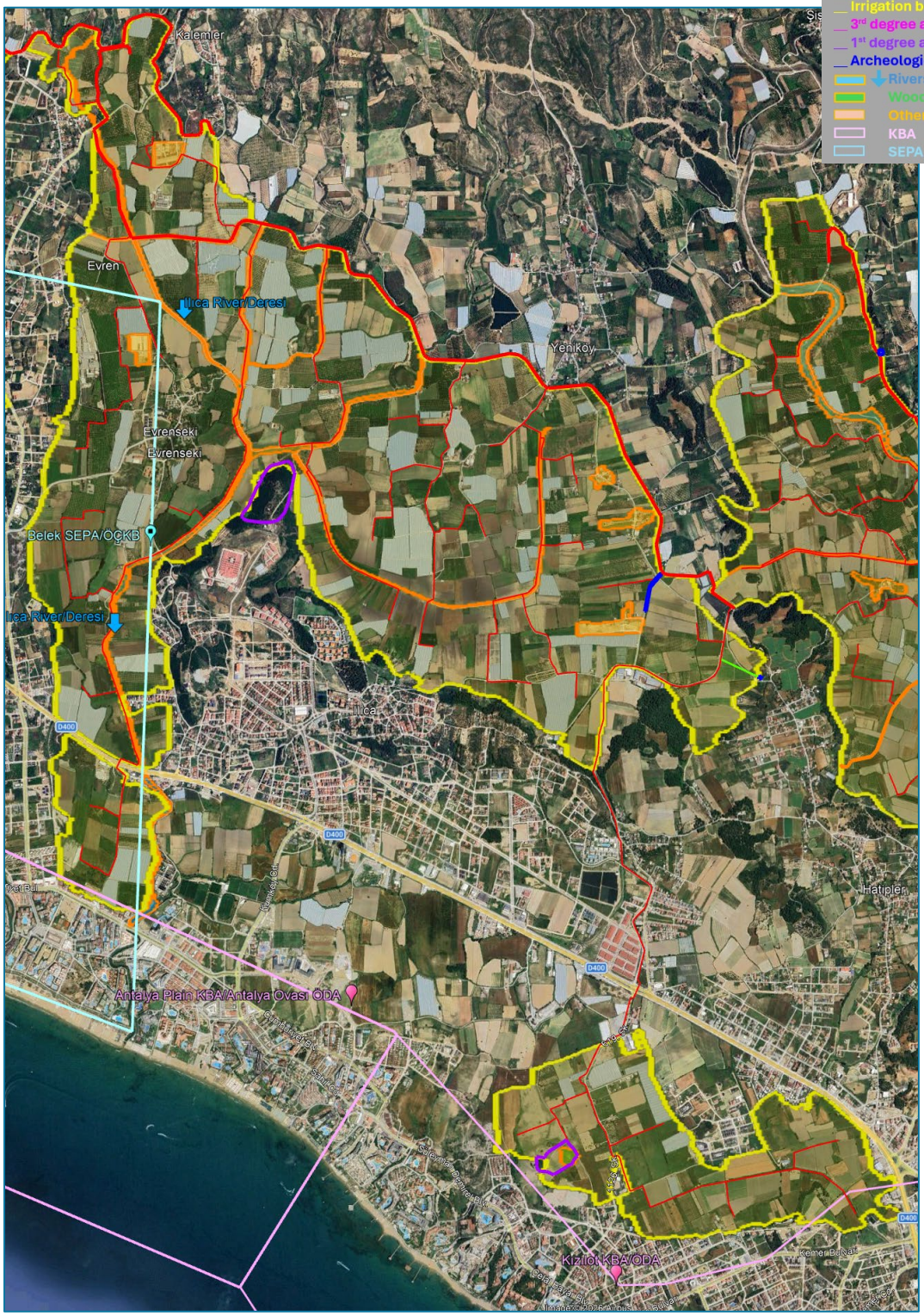

Figure 3. Section-8 of the Subproject

Section-9 lies at the easts section of the subproject at the right bank and left bank.

Figure 4. Section-9 of the Subproject

3 Legal Framework

Subprojects under TIMP-2 is obliged to comply with national legislation and Environmental and Social Standards ("ESSs") outlined within WB's ESF. In instances where discrepancies exist between applicable national legislation and the requirements of the WB ESSs, the more stringent requirement shall prevail. Accordingly, where national regulations differ from, or are less stringent than, the ESSs, the subproject will apply the higher standard to ensure compliance with international good practice.

This approach is intended to ensure that E&S risks and impacts are managed in a manner consistent with the objectives of the ESSs, while also maintaining compliance with national legal and regulatory frameworks.

Major gaps between national legislation and WB ESSs are summarized in Table 1 below together with relevance of the ESSs and measures to bridge gaps. Appropriate measures and procedures are adopted and will be adopted to bridge such gaps and achieve alignment with the more rigorous requirements.

Table 1. Gaps Between National Legislation and WB ESSs

ESS	Relevance	Key Gaps	Measures to Bridge Gaps
ESS1 Assessment and Management of Environmental and Social Risks and Impacts	ESS1 is relevant to the subproject because subproject activities are expected to pose E&S risks and impacts related to (i) land clearance, (ii) water pollution, (iii) production of air, noise and exhaust emissions, (iv) production of construction waste, (v) soil management, (vi) habitat degradation, (vii) labor and working conditions, (viii) OHS hazards and risks, (ix) land and livelihoods caused by permanent and temporary land acquisition or easement restrictions; (x) impacts on informal users of land; (xi) labor and working conditions risks;(xii) community health and safety risks; (xiii) increased sexual exploitation abuse and sexual harassment; (xiv) impacts on cultural heritage and (xv) risks relating to inadequate stakeholder engagement (including vulnerable groups) and grievance management.	Procedures related to social issues are limited within the national legislation and only include generic information based on secondary data collection. There are no definitions of the AoI, solid social baseline, stakeholder definitions, procedures for meaningful stakeholder engagement, social impacts and mitigation measures, cumulative impacts and social and environmental monitoring plan.	Potential E&S risks and impacts will be addressed through this ESMP, subproject level RP, subproject specific SEP as well as TIMP-2's ESMF, SEP, LMP, and Resettlement Framework ("RF"). This ESMP contains definition of AoI, a social baseline study, stakeholder definitions and procedures for meaningful stakeholder engagement (later two will be elaborated within subproject specific SEP), social impacts and associated measures to address the social impacts. An environmental and social monitoring plan is presented accompanied by the Mitigation Plan (see Table 6)
ESS2 Labor and Working Conditions	ESS2 is relevant for the subproject because subproject impacts related to labor and working conditions may include discrimination, child and forced labor, workplace harassment,	Worker risks under construction project arise from the lack of adequate implementation of OHS measures; lack of overtime work related payments; and	Risks and impacts associated with labor and working conditions will be addressed through the subproject specific LMP to be prepared by the Contractors by adopting TIMP-2's LMP.

ESS	Relevance	Key Gaps	Measures to Bridge Gaps
	unequal treatment between men and women, workers' rights, worker dissatisfaction and OHS issues during construction works.	unequal treatment between men and women. Furthermore, under national labor and working conditions legislation, there are no specific requirements for Workers' GM that allow workers to communicate their complaints to their employers.	In addition, OHS risks will be elaborated within Contractor's OHS Management Plan by utilizing a comprehensive risk assessment. Contractor's OHS Management Plan will also include counter measures against risks to ensure safe working conditions together with a clear management and control scheme. Implementation of the OHS Management Plan will be enforced by PMT and Regional Directorate during the implementation of the subproject. The Contractor will be responsible for establishing, maintaining and monitoring GM for its own and its subcontractors contracted workers.
ESS3 Resource Efficiency and Pollution Prevention	ESS3 is relevant to the subproject; (i) since the subproject activities take place in close proximity to water resources and therefore there are risks and impacts of water pollution, (ii) construction works within the scope of the subproject activities will require the use of energy, water and materials such as sand, cement, timber, etc. and will create impacts such as noise, dust, exhaust emissions, waste.	National legislation is generally in line with European Union Directives. However, detailed management plans on certain specific impacts are not required by national legislation. These plans include a perspective on mitigation, monitoring and reporting of impacts.	This ESMP addresses resource efficiency and pollution prevention and management measures to ensure sustainable use of resources and minimization of adverse impacts on human health and the environment, in accordance with applicable national regulations, ESS3 and WB EHSGs. Risk and impact management and mitigation measures together with roles and responsibilities, monitoring and reporting schemes will be further detailed within Contractor's ESMP as well as in topic specific E&S plans to be prepared by the Contractor.
ESS4 Community Health and Safety	ESS4 is relevant to the subproject because the proposed construction works pose potential risks and impacts on community health and safety such as dust, noise, odor and exhaust emissions; traffic and road safety risks due to increased traffic volumes and movements of heavy vehicles; risks of accidents and injuries caused by open trenches or exposed cables; temporary road closures and blockages; potential disruption to local	National legislation covers the requirements of ESS4. However, detailed management plans that include mitigation, monitoring and reporting perspective on some specific impacts are not required by national legislation, such as SEA/SH, labor influx, security personnel. Dam Safety: One or more independent dam safety expert(s) will assess the dam safety of all dams relevant to the subproject. The	Risks associated with the Sexual Exploitation and Abuse/Sexual Harassment ("SEA/SH") are currently assessed as Low. Nevertheless, Code of Conduct for workers, GM involving SEA/SH complaints with particular attention on privacy, and training and awareness sessions for subproject workers and affected communities will be implemented during the implementation of the subproject following the TIMP-2's LMP and Contractor's LMP. This ESMP addresses management and mitigation measures to ensure

ESS	Relevance	Key Gaps	Measures to Bridge Gaps
	communities; increased pressure on public services due to the potential arrival of construction workers and the presence of workers' camps.	assessment reports for all relevant dams must be submitted to the WB. If applicable, based on the recommendations in the dam safety assessment report, DSI will prepare dam safety plans for the dams based on the quality and timing requirements in the ESF.	community health and safety during construction. Risk and impact management and mitigation measures together with roles and responsibilities, monitoring and reporting schemes will be further detailed within Contractor's ESMP as well as Community Health and Safety Plan to be prepared by the contractor. Dam safety will be assessed by independent experts, and assessment report will be submitted to the WB by the DSİ.
ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	ESS5 is relevant to the subproject since subproject activities will result in (i) impacts on land and livelihoods caused by permanent and temporary land acquisition or easement restrictions; and (ii) impacts on informal users of lands, if any.	National legislation is short in the following aspects: (i) There are no provisions for livelihood restoration; (ii) There is no coverage of project affected persons ("PAPs"), including non-titled holders, public land users, squatters and customary owners, or specific provisions for disadvantaged and vulnerable people, community engagement, gender impacts and GMs; (iii) compensation is not fully aligned with replacement cost, as Turkish law deducts depreciation from market value, and excludes cost of registration and transfer taxes; (iv) the Expropriation Law does not cover compensation for common property resources; (v) there are no provisions for continuous consultation and establishment of GM for PAPs.	Subproject specific RPs will address risks and impacts on land and livelihoods as well as on informal users to bridge the gaps between ESS5 and national legislation. GM will be established for PAPs to raise their concerns and complaints during the RP implementation.
ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources	ESS6 is relevant to the subproject as the subproject activities may impact natural habitat and biodiversity elements due to soil extraction and compaction, vegetation clearing and habitat loss, movement of heavy vehicles (creating dust and noise) etc., aquatic habitats may also be affected	National legislation covers the requirements of ESS6. However, detailed management plans that include a mitigation, monitoring and reporting perspective on specific impacts are not required by the national legislation.	ESMF includes specific criteria for site selection to prevent subproject locations from overlapping with sensitive habitats (KBAs, Important Areas, national protected areas, critical habitats, etc.) and subprojects with adverse impacts on such sensitive habitats are excluded through screening through the Exclusion list.

ESS	Relevance	Key Gaps	Measures to Bridge Gaps
	as the subproject structures will be adjacent to the water body. Potential impacts on aquatic habitat elements may include habitat degradation by creating sediment and turbidity in the water, water pollution, riverbed degradation, noise etc.		This ESMP presents findings for subproject locations overlapping protected areas including KBAs and SEPA for this subproject, resulting in absence of critical habitats on the overlapping locations. ESMP also provides habitat assessment to ensure subproject's impacts on habitat types. ESMP addresses natural habitat related risk and impacts as well as potential nests that may be encountered during the construction. In line with the national legislation, at Belek SEPA, the Contractor shall work in accordance with the requirements of General Directorate for the Protection of Natural Assets during both design and construction.
ESS8 Cultural Heritage	ESS8 is relevant since the subproject involves excavation activities. ESMF has exclusion criteria to avoid investments that adversely affect cultural heritage sites, tangible/intangible cultural heritage and cause temporary and/or permanent loss of access in accordance with ESS8 and these sub-projects will not be eligible for financing. DSİ reviewed and revised the alignment of the subproject to exclude any overlap with the registered cultural heritage sites.	National legislation covers most of the requirements of ESS8. However, since ESS8 defines cultural heritage as encompassing both tangible and intangible heritage, Law No. 2863 only covers movable and immovable tangible cultural and natural assets. Furthermore, while national legislation only covers registered cultural assets, ESS8 applies to all cultural heritage, regardless of whether it is legally protected or not.	This ESMP addresses risks on unregistered cultural heritages, either tangible or intangible that may encountered during construction works. Taking into account chance finds, this ESMP provides a Chance Find Procedure, which determines the measures to be taken if any cultural sites/elements are encountered during the construction works.
ESS10 Stakeholder Engagement and Information Disclosure	ESS10 is relevant to the subproject given the need to communicate with beneficiaries and stakeholders on subproject activities that affect their lives.	According to Türkiye's Environmental Impact Assessment (EIA) Regulation, some activities to be carried out within the scope of the TIMP-2 may not be included in the Annex lists of the EIA Regulation. Therefore, the scope of the project activities may be exempt from the national EIA process, meaning that a formal stakeholder participation	TIMP-2's SEP includes consultation activities with key ministries, public institutions and NGOs to determine the institutional communication strategy to ensure interaction with stakeholders. In addition, it includes potential disadvantaged/vulnerable individuals or groups and the tools and methods to be used to interact with these groups as well as measures to be taken to prevent negative impacts on these groups

ESS	Relevance	Key Gaps	Measures to Bridge Gaps
		process is not required according to national laws. This subject is exempt from the EIA regulation, and no stakeholder participation is required per national legislation.	and to ensure that they benefit from the subproject. Additionally, subproject specific SEP will also be prepared in line with the TIMP-2' SEP and this SEP will also identify disadvantaged and vulnerable groups at the subproject preparation stage. Regarding the GM, there is a national GM in Türkiye and DSİ has its own GM, which allows for the detection and resolution of all complaints generated by DSİ activities. The current system will be adopted to create TIMP-2's GM. Subproject specific SEP will also include GM and GM will be operational during the subproject implementation.

4 Baseline Information

4.1 Environmental Baseline

In the following subsections, specific baseline topics have been selected considering the nature, scale, and scope of the subproject. Topics are included where the E&S Screening identified a potential for impact[4].

4.1.1 Water Resources

The Manavgat District is rich in water resources. Naras Dam is located to the northeast of the district, and Manavgat Creek flows downstream of the dam, fed by its releases, and discharges into the Mediterranean Sea to the south. Manavgat Creek is located to the east of the three irrigation areas defined under section-9 of the subproject.

Ilıca Creek, fed by the northern mountains, flows southwards through the Kalemler and Evrenseki neighborhoods and discharges into the Mediterranean Sea. According to the layout plan, the secondary transmission line passes in close proximity to this creek at certain sections within Section-8 of the subproject.

İncirli Creek flows southwards through the Çolaklı neighborhood and discharges into the Mediterranean Sea. Similar to Ilıca Creek, a secondary transmission line runs adjacent to this creek at certain sections of Section-4 of the subproject.

Karaöz Creek is located to the west of Manavgat. Within the Kısalar Neighborhood, a limited portion of a secondary transmission line under Section-4 of the subproject passes near this creek.

All work carried out in proximity to water resources will be implemented with due care. Relevant mitigation measures are presented in Section 5 within the Mitigation and Monitoring Plan.

4.1.2 Road Infrastructure

Road infrastructure is well developed within the subproject area. The main transmission lines are largely aligned with the existing open canal system, along which designated service roads are already in place. In limited sections, the main lines are planned to pass through land parcels (e.g., to the west and south of Gündoğdu Neighborhood). In such cases, in order to avoid additional land acquisition and associated impacts, routing the lines adjacent to existing road infrastructure should be considered during the detailed design stage.

Secondary lines generally run alongside existing secondary roads (some stabilized and some unpaved) or along parcel boundaries. Where road infrastructure is not available, construction activities will be organized by delineating work sections and initiating works from road junction points. Due care will be taken to avoid impacts on adjacent agricultural lands outside the right-of-way.

Given the availability of existing road infrastructure, the subproject is expected to avoid the need for opening new access roads to reach the subproject areas.

4.1.3 Air Quality and Noise

There is no significant industrial development in Manavgat that would result in extensive air or noise emissions in the region.

Ambient air quality is mainly affected by exhaust emissions from private and public transportation, as well as from agricultural machinery. In addition, the use of unpaved roads for transportation and agricultural activities

[4] The ESMF and the Terms of Reference require that physical environment topics be selected from among those identified as potentially affected in the E&S Screening.

generates dust emissions, which become more pronounced during the dry season. Residential heating activities, including the use of coal, wood, and low-quality fuels, contribute to elevated PM_{10} levels, as observed in Manavgat town center during January and February 2024 (the most recent available records). Furthermore, elevated PM_{10} concentrations recorded in mid-April 2024 are likely attributable to Saharan dust episodes affecting the Mediterranean region during that period[5].

Within the subproject area, noise emissions are primarily associated with transportation activities and the use of agricultural machinery. In the town center and along the coastal area, noise emissions related to entertainment and tourism-oriented facilities have also been reported[6].

During subproject implementation, air quality may be temporarily affected by additional exhaust and dust emissions arising from the operation of construction machinery and the transportation of personnel and materials. Similarly, temporary increases in noise levels are anticipated due to construction-related machinery and traffic. These impacts are expected to be temporary, localized, and low in magnitude.

During the site visit, the closest receptors to the proposed irrigation lines are identified as a barn and a farmhouse are located on the western top of the mound known as 1st degree archeological site at Dolbazlar Neighborhood (See Section 4.1.6.2 or 1st degree archeological site at Dolbazlar Neighborhood in Appendix 3 - Cultural Assets Assessment Report and Photo 7 in Appendix 9 - Photo Log). In addition, beehives used for agricultural purposes have been placed on the mound, approximately 50 m north of the proposed irrigation line (See Photo 6 in Appendix 9 - Photo Log). Given these conditions, environmental mitigation measures to control dust and noise shall be strictly implemented in and around this area to ensure minimal nuisance to both the local residents and the bees.

Proposed mitigation measures to prevent and minimize potential impacts on air quality and noise are presented in Section 5 within the Mitigation and Monitoring Plan.

4.1.4 Land Characteristics and Land Use

Along the southern coastline of Manavgat, the area is characterized by intensive tourism development, with hotels and accommodation facilities widely present. Neighborhoods located in the southern part of the district exhibit urban characteristics, accommodating local residents and workers serving tourism-related activities.

On the right bank, areas located to the west of Manavgat, outside the immediate coastal zone, including Kısalar, Çolaklı, Gündoğdu, and Yavrudoğan neighborhoods, largely retain their agricultural character. In the central part of the district, north of Ilıca and Sarılar neighborhoods, agricultural land use predominates. Similarly, Çayyazı and Dikmen neighborhoods, located to the north of the Manavgat town center, are primarily engaged in agricultural activities.

On the left bank, to the east of Manavgat, the Ulualan Plain is located, where agricultural activities are carried out in the Pazarcı, Aşağıışıklar, Demirciler, and Karaöz neighborhoods.

No forest land or designated natural habitats overlap with the subproject area. To the north of Manavgat District, the Taurus Mountains exhibit natural forest characteristics.

[5] Antalya Environmental Status Report, 2024
[6] Antalya Environmental Status Report, 2024

4.1.5 Biodiversity and Protected Areas

4.1.5.1 Habitat Characteristics

As reported earlier, the subproject area has been delineated into two area types: irrigation areas and non-irrigation areas.

Non-irrigation areas comprise areas where no agricultural activity is undertaken and where no irrigation is required. These areas include both modified habitats and areas exhibiting characteristics of natural habitats. No construction activities will be carried out within these areas, and they will not be irrigated as a part of the subproject. Accordingly, they will not be subject to direct impacts associated with construction activities such as stripping, excavation, pipe installation, or backfilling. However, due to their proximity to construction areas, non-irrigation areas may be exposed to indirect impacts, including dust emissions and noise generated during construction activities.

Non-irrigated areas exhibiting natural habitat characteristics: These areas have a hilly topography and are characterized by mixed tree and maquis vegetation (see Figure 5 below). No construction or installation activities will be carried out in these natural habitat areas since those are designated as non-irrigation areas. Therefore, no direct impacts are expected on areas exhibiting natural habitat characteristics. The spatial distribution of these areas is presented in Figure 2, Figure 3, Figure 4.

Figure 5. Non-irrigation Areas Exhibiting Natural Habitat Characteristics

Source: Taken by Tuğçe TÜRECAN, biologist and Derya Erika HATİBOĞLU, environmental specialist during site survey

Non-irrigation areas exhibiting modified habitat characteristics: These areas include roads, settlements, cemeteries, privately and publicly owned parcels with developments (see Figure 6 below). No construction or installation activities will be carried out within these areas, as they are designated as non-irrigation areas. Therefore, no direct impacts are expected on non-irrigated areas. The spatial distribution of non-irrigation areas is presented in Figure 2, Figure 3, Figure 4.

Figure 6. Non-irrigation Areas covered by Developments

Source: Taken by Derya Erika HATİBOĞLU, environmental specialist during site survey

Irrigation areas correspond to agricultural lands where subproject activities will be implemented (see Figure 7), and which will ultimately be supplied with water through the irrigation system. These areas are classified as modified habitats, as ongoing land use for agricultural purposes and human activities have substantially modified their primary ecological functions and species composition. As a result, biodiversity within these areas has already been reduced compared to natural habitats (see Figure 7). The irrigation line alignment passes through these areas; therefore, irrigation areas corresponding to alignment will be subjected to direct impacts associated with subproject activities.

Figure 7. Irrigated Areas Used for Agricultural Purposes

Source: Taken by Derya Erika HATİBOĞLU, environmental specialist during site survey

Subproject activities may cause local, temporary, and indirect impacts on the existing biodiversity through the following pathways:

- Clearing existing vegetation and excavation works along the irrigation lines may lead to temporary habitat loss for small vertebrate and invertebrate species.
- Noise, vibration, and dust emissions generated during construction may cause disturbance to fauna, particularly birds using the area. Dust accumulation on surrounding natural vegetation and agricultural lands may reduce photosynthetic capacity by blocking plant stomata.
- Improper waste management may result in soil and water contamination.
- Increased human activity during construction, in the absence of adequate environmental awareness, may create indirect disturbance and negative impacts on wildlife.

Mitigation measures to address these impacts are presented in Section 5.

4.1.5.2 Protected Areas

As stated in the opinion letter of the Antalya Directorate of Nature Conservation and National Parks (See

Appendix 2 - Opinion Letters Obtained from Authorities);

- The subproject area is not located within the boundaries of National Parks or Nature Parks declared under Law No. 2873 on National Parks,
- The subproject area is not within a protected area under the Wetlands Protection Regulation (Wetland Management Plans),

- The subproject area is not located within a protected area designated under the 2009/10 General Directive on the Protection of Sea Turtles, and
- The subproject area is not within any special areas identified in the Biodiversity Inventory.
- The subproject area falls within the boundaries of Taşağıl State Hunting Ground, Yaylalan State Hunting Ground, and Ulualan General Hunting Ground registered under the Game Hunting Law No. 4915. Provided that the provisions related to state hunting grounds are respected, the subproject does not extend beyond the subproject boundaries, and no activities are undertaken that could fragment or damage wildlife habitats, interfere with biological cycles, or leave solid or liquid waste, and all relevant legislation is adhered to, the Antalya Directorate of Nature Conservation and National Parks has indicated that there is no objection to carrying out the activity.

The opinion letter also notes that certain parts of the subproject area fall within the Belek Special Environmental Protection Area ("SEPA") (see Figure 2, Figure 3 above and below Figure 8). SEPAs are defined as terrestrial, aquatic, and marine zones declared by Council of Ministers decree that are ecologically important at national and global scales, sensitive to pollution and degradation, and critical for the conservation and sustainable management of biodiversity, natural resources, and associated cultural values. In this context, SEPAs constitute legally protected areas[7]. The remainder of this section presents the ecological characteristics and protection status of Belek SEPA.

Part of the subproject area also intersects with the Antalya Plain Key Biodiversity Area ("KBA") and Kızılot KBA[8] (see Figure 2, Figure 3, Figure 4 above and below Figure 8). KBAs are internationally recognized sites contributing significantly to the global persistence of biodiversity, identified using standardized, science-based criteria under the IUCN KBA Standard[9]. These criteria comprise 11 criteria grouped under five categories and are applicable to all taxonomic groups (i.e. species) as well as ecosystems. Broadly, these categories relate to the presence of globally threatened species, geographically restricted biodiversity, ecological integrity, important biological processes, and irreplaceability.

In Türkiye, Important Nature Areas ("INAs") represent nationally identified priority areas for biodiversity conservation, developed primarily by Doğa Derneği[10] in line with approaches established by BirdLife International[11]. INAs are based on the Important Bird Areas framework and have been expanded to cover multiple taxa and habitats, thereby serving as a key input to national conservation planning and environmental assessment processes.

There is a strong conceptual and spatial overlap between KBAs and INAs, as many INAs meet KBA criteria and have subsequently been recognized as KBAs under the global standard. In the context of this subproject, Antalya Plain KBA overlaps with Antalya Plain INA, and Kızılot KBA overlaps with Kızılot INA. For the purposes of this ESMP, these areas are hereinafter collectively referred to as KBAs.

It should be noted that neither KBAs nor INAs constitute legally designated or protected areas; rather, they are internationally and nationally recognized, science-based identification tools used to inform land-use planning, conservation prioritization, and biodiversity assessment studies.

In accordance with the WB ESS6, where a project is located within, or has the potential to adversely affect, areas that are legally protected, officially proposed for protection, or internationally or nationally recognized,

[7] Belek Özel Çevre Koruma Bölgesi, Ministry of Environment, Urbanization and Climate Change, https://ockb.csb.gov.tr/korunan-alanlar-i-56, https://webdosya.csb.gov.tr/db/tabiat/editordosya/belek.pdf, retrieved on 13/04/2026
[8] Doğa Derneği (2006). *Türkiye'nin Önemli Doğa Alanları Kitabı* and https://www.keybiodiversityareas.org/
[9] IUCN (2016). *A Global Standard for the Identification of Key Biodiversity Areas*
[10] Doğa Derneği (2006). *Türkiye'nin Önemli Doğa Alanları Kitabı*
[11] BirdLife International (2014, updated). *Important Bird and Biodiversity Areas: A Global Network*

the project owner is required to ensure that project activities are consistent with the applicable legal protection status and management objectives of such areas.

Therefore, an ecological assessment has been conducted for the sections of the subproject area overlapping with the Antalya Plain KBA and Kızılot KBA, integrating field verification, baseline ecological information, and analysis of current land-use conditions in order to evaluate potential interactions with the ecological values of these KBAs.

The figure below illustrates the subproject area and its overlap with the Belek SEPA, Antalya Plain KBA, and Kızılot KBA boundaries.

Figure 8. Relationship of the Subproject Area with Belek SEPA, Antalya Plain KBA, and Kızılot KBA

4.1.5.2.1 Belek Special Environmental Protection Area

Belek SEPA[12] was declared a SEPA by the Council of Ministers on 21 October 1990. The area stretches along approximately 29 km of coastal dunes and hosts a variety of natural habitat types, supporting numerous endemic, sensitive, and protected species and ecosystems, making it a biodiversity-rich natural system. The region contains a wide range of terrestrial and coastal habitats, including stable and shifting dunes, maquis and forested areas, and seasonal and permanent wetlands. Dominant flora species in these habitats include

[12] Belek Özel Çevre Koruma Bölgesi/Belek SEPA, Ministry of Environment, Urbanization and Climate Change, https://ockb.csb.gov.tr/korunan-alanlar-i-56, https://webdosya.csb.gov.tr/db/tabiat/editordosya/belek.pdf, retrieved on 13/04/2026

Mediterranean plant communities such as *Pinus brutia, Laurus nobilis, Myrtus communis*, and *Cistus creticus*, while aquatic plants such as *Juncus* and *Typha* are present in the wetlands.

One of the most critical biological values of Belek SEPA is the presence of key nesting areas for sea turtles (*Caretta caretta* and *Chelonia mydas*). Nesting is especially concentrated along the beach stretch from the mouth of Acısu Stream to Sarısu Stream, which is considered a first-degree critical breeding area. As no subproject activities are planned along the coastline or within the beach area from Acısu Stream to Sarısu Stream, no impacts on sea turtles are expected.

Under the "Belek Special Environmental Protection Area Management Plan (2023–2027)"[13] prepared by the General Directorate for the Protection of Natural Assets of the Ministry of Environment, Urbanization and Climate Change, zoning has been carried out for Belek SEPA. Sensitive areas were categorized as "Strictly Protected Area" and "Area for Conservation of Natural and Ecological Character," and land use decisions were established according to a conservation-use approach. The subproject area partially overlaps with Belek SEPA, which includes zones designated as "Strictly Protected Area" and "Area for Conservation of Natural and Ecological Character" to the west of Gündoğdu neighborhood.

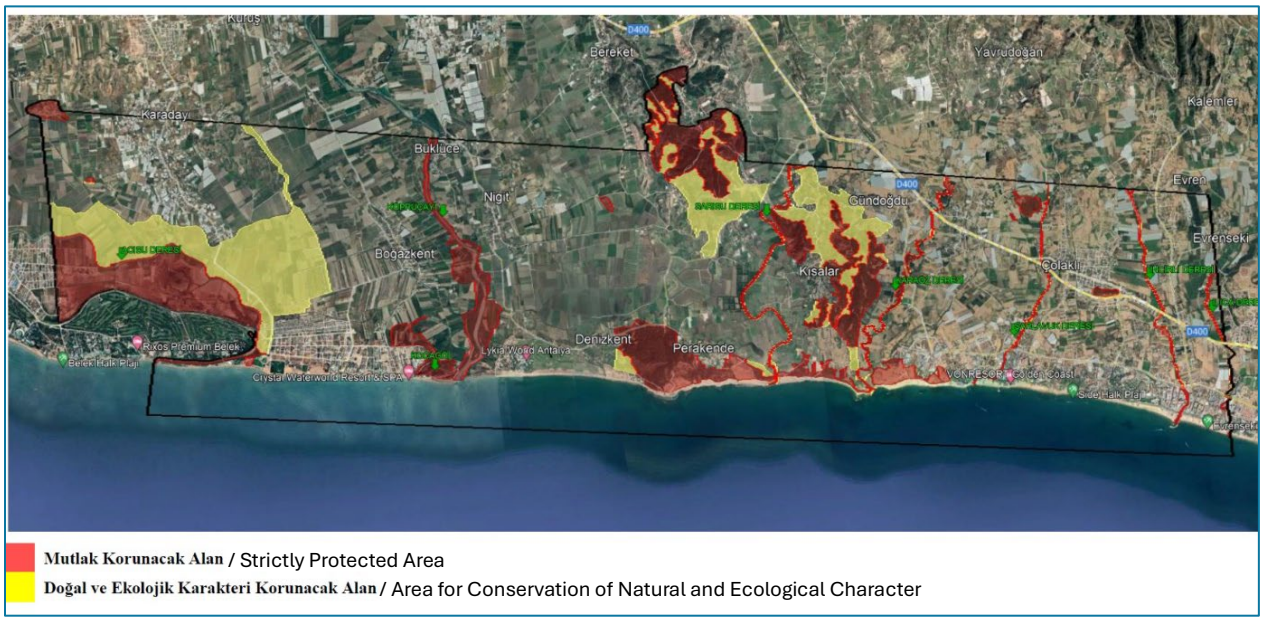

Figure 9. Belek SEPA Zoning Map

Source: Belek Special Environmental Protection Area Management Plan (2023–2027)

The "Area for Conservation of Natural and Ecological Character" refers to areas that possess important habitats due to their biological and geological structures as well as landscape values and therefore have significant ecological importance. These areas are zones where ecosystem-compatible measures are implemented and improved, and where certain activities such as agriculture and daily recreational use may be permitted.

Within the boundaries of Belek SEPA, "Strictly Protected Areas" are zones where strict conservation measures are applied, and human activities are largely restricted. However, the Management Plan allows the development of public-benefit infrastructure under specific conditions, provided that a positive opinion is

[13] Belek Özel Çevre Koruma Bölgesi Yönetim Planı/Belek SEPA Management Plan, Ministry of Environment, Urbanization and Climate Change, https://webdosya.csb.gov.tr/db/tabiat/icerikler/belek-ockb-yonetim-plani-20250205122455.pdf, retrieved on 13/04/2026

obtained from the General Directorate for the Protection of Natural Assets. In this context, infrastructure such as transportation routes and mandatory structures, energy transmission facilities, drinking and domestic water supply lines, wastewater lines, transformers, communication services, and irrigation canals may be constructed where the geographical characteristics of the area and public interest make it impossible to route such infrastructure through alternative corridors.

One of the objectives of the Management Plan is to plan and improve agricultural activities within SEPA to ensure the sustainability of natural resources. The associated implementation objective is to enhance efficiency in agricultural water use within SEPA. In this context, the relevant implementation activity is defined as converting all agricultural areas currently using uncontrolled surface irrigation (open canals) to closed irrigation systems and supporting the adoption of efficient on-farm irrigation methods (e.g. drip irrigation). In this respect, the subproject is aligned with the implementation objective of the Management Plan.

Nevertheless, the Management Plan does not include specific measures beyond general restrictions aimed at the protection and preservation of SEPA; rather, it emphasizes the need for consultation with the General Directorate for the Protection of Natural Assets regarding any proposed developments.

During subproject implementation, all activities will be planned and carried out in accordance with the objectives of the Belek SEPA Management Plan (2023–2027) and in coordination and consultation with the General Directorate for the Protection of Natural Assets.

4.1.5.2.2 Antalya Plain Key Biodiversity Area

Antalya Plain KBA[14] extends from the eastern part of Antalya city center to the coastal area of Ilıca Neighborhood in Manavgat District. The area includes relatively undisturbed natural habitats located on both sides of the Aksu Stream, which flows in a north–south direction. These habitats extend approximately 13 km in length and 5 km in width. The KBA covers a total area of 27,060 ha and is considered significant as it contains the second largest dune system along Türkiye's Mediterranean coast.

Within the scope of the proposed subproject, an irrigation area of 0.36 km^2 located in Kısalar Neighborhood on the western side falls within the boundaries of the Antalya Plain KBA. Approximately 1 km of irrigation pipeline that will supply water to this irrigation area is also located within the KBA (See Figure 10, Overlap-1).

In addition, a 20,625 m^2 irrigation area in Ilıca Neighborhood falls within the boundaries of the KBA. However, the irrigation pipeline that will supply water to this area is located outside the KBA boundaries (See Figure 10, Overlap-2).

[14] Doğa Derneği (2006). *Türkiye'nin Önemli Doğa Alanları Kitabı* and https://www.keybiodiversityareas.org/

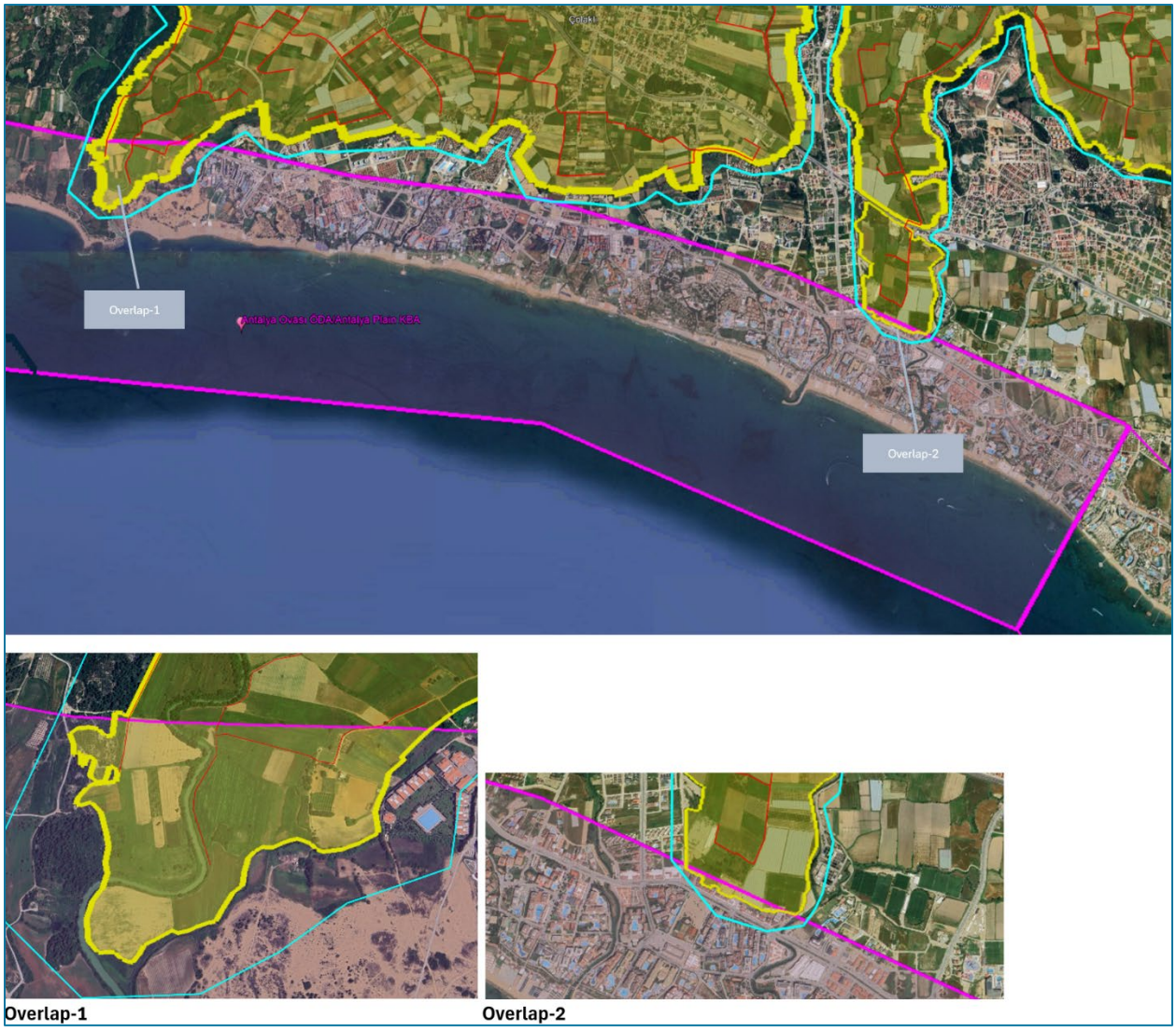

Figure 10. Relationship of the Subproject Area with Antalya Plain KBA

KBA consists of Eastern Mediterranean maquis communities, rocky plant communities, riparian vegetation, red pine (*Pinus brutia*) forests, dune vegetation, dune forests dominated by stone pine (*Pinus pinea*), delta ecosystems, and productive agricultural lands. Maquis communities are generally rich in plant species diversity. Dominant species in these evergreen shrub formations include *Quercus coccifera, Myrtus communis, Erica manipuliflora, Cistus spp., Olea europaea, Arbutus unedo, Pistacia terebinthus, and Pistacia lentiscus*. Species developing on dune hills are generally drought-resistant and tolerant to salinity, including *Pinus pinea, Daphne oleoides, Rhamnus oleoides, Osyris alba, Pistacia lentiscus, Sarcopterium spinosum, Thymelaea hirsuta, Cionura erecta*, and *Polygonum maritimum*.

Bird species breeding in the plain include *Halcyon smyrnensis* (İzmir yalıçapkını), *Himantopus himantopus* (Uzunbacak), *Hippolais olivetorum* (Zeytin mukallidi), *Prinia gracilis akyildizi* (Dikkuyruklu ötleğen), and *Sylvia ruppelli* (Kara boğazlı ötleğen).

The coastal dunes provide nesting grounds for large numbers of loggerhead sea turtles (*Caretta caretta*) and smaller numbers of green sea turtles (*Chelonia mydas*). The Nile softshell turtle (*Trionyx triunguis*) is also present in the area.

Butterfly species recorded in the KBA include the endemic *Maniola megala* (Esmer kelebek), the globally endangered *Lycaena otomana* (Osmanlı ateşi), and regionally threatened species such as *Glaucopsyche alexis* (kara gözlü mavi kelebek) and *Pseudophilotes bavius* (Bavius).

The dragonfly species *Onychogomphus assimilis*, which is globally threatened, is also present in the area.

The ecological characteristics and biodiversity values of the KBA have been summarized above. However, when the current land use and physical conditions of the sections of the KBA overlapping with the subproject area are examined, these areas do not reflect the characteristic natural habitat features of the KBA. Due to long-standing agricultural activities in these locations, the natural vegetation has been significantly altered. Agricultural activities are currently carried out within Overlay-1 and Overlap-2 areas (See Figure 10), and dune vegetation as well as the dominant maquis species described above have not been observed in these areas.

Along the coastal strip extending from Kısalar Neighborhood to Ilıca Neighborhood within the KBA boundaries, numerous tourism facilities, accommodation structures, recreational areas, and associated transportation and infrastructure elements are present. Although coastal dunes still exist in certain sections of the shoreline, Overlay-1 and Overlap-2 areas, where the KBA overlaps with the subproject area, are not located along the coastline. Therefore, no impacts on sea turtle nesting areas are expected.

Some butterfly and bird species reported for the Antalya Plain KBA may potentially occur in the subproject area and its immediate surroundings. However, the sections intersecting with the subproject area do not represent natural wetland, coastal dune, or relatively undisturbed maquis habitats. Instead, these areas are currently used as agricultural land and are already subject to intensive human activities in their surroundings.

The main potential impacts during construction activities include temporary increases in noise, human presence, equipment operation, and excavation or pipeline installation within limited areas. These impacts will be short-term and temporary, and given their limited spatial extent, they are not expected to result in significant habitat loss. Birds and butterflies are highly mobile species; therefore, in response to temporary disturbances such as noise, dust, or human presence, they can move away from the area and temporarily relocate to suitable habitats in the surrounding environment.

Considering the above, the portions of the subproject area located within the KBA boundaries do not represent the relatively undisturbed natural habitat structure defined for the KBA as a whole. Rather, these areas are characterized by landscapes shaped under anthropogenic influence. Therefore, the proposed project activities are not expected to alter the existing ecological conditions of the KBA.

4.1.5.2.3 Kızılot Key Biodiversity Area

Kızılot KBA[15] is located within the boundaries of Manavgat District in Antalya Province. It begins from the coastal strip of Ilıca Neighborhood and extends westward for approximately 35 km along a narrow coastal corridor, reaching Okurcalar Neighborhood and including the Manavgat town center. The KBA covers a total area of 8,135 ha. It includes the Side Ancient City and the delta formed by the Manavgat River. A sandy beach approximately 16 km long extends between the Manavgat River and Karpuz (Alara) Stream.

[15] Doğa Derneği (2006). *Türkiye'nin Önemli Doğa Alanları Kitabı* and https://www.keybiodiversityareas.org/

Within the scope of the proposed subproject, an irrigation area of 66,953 m^2 located in Side (Kemer) Neighborhood falls within the boundaries of the KBA. Approximately 150 m of irrigation pipeline that will supply water to this irrigation area is located within the KBA (See Figure 11, Overlap-3).

In addition, on the western side of the proposed subproject, an irrigation area of 0.32 km^2 located in Doğançam Neighborhood falls within the boundaries of the KBA. Approximately 2.5 km of irrigation pipeline that will supply water to this irrigation area is also located within the KBA (See Figure 11, Overlap-4).

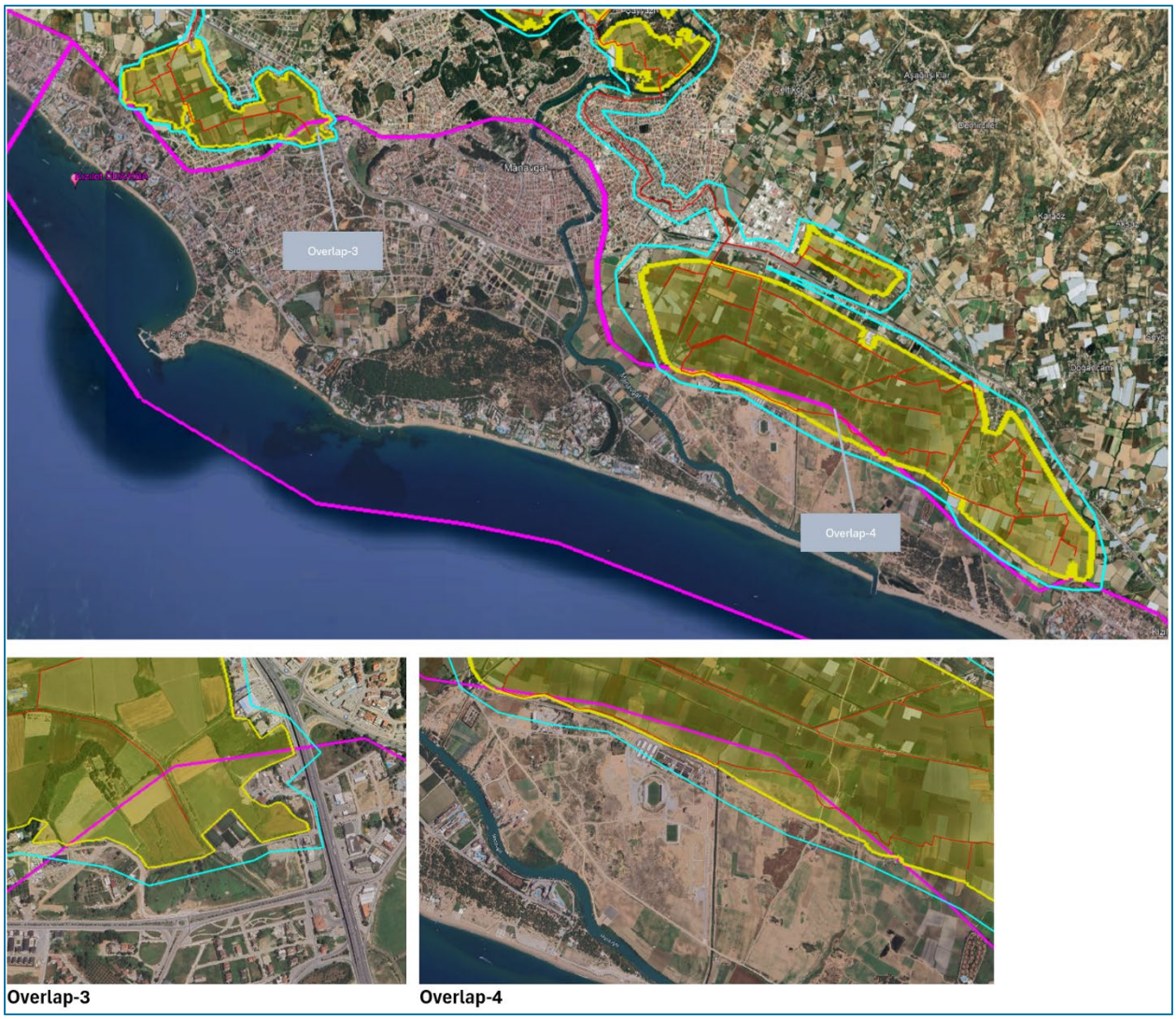

Figure 11. Relationship of the Subproject Area with Kızılot KBA

The KBA consists of dune vegetation, agricultural lands, maquis formations, and red pine (*Pinus brutia*) communities. The eastern part of the area is characterized by dunes composed of fine sand and gravel mixtures. In this section, small dune ridges are covered with dense vegetation, whereas the coastal area west of the Manavgat River has relatively sparse vegetation.

The northern part of the area is particularly important for the plant species *Orobanche sideana*, which is found only in this location worldwide. Other important species present in the area include *Campanula telmessi* and *Centaurea pamphylica*, which are endemic to Türkiye and have restricted distribution ranges.

Kızılot is also one of the sea turtle nesting areas in Türkiye. Both the loggerhead sea turtle (*Caretta caretta*) and the green sea turtle (*Chelonia mydas*) breed in the area.

The butterfly species *Maniola megala* (Esmer kelebek), endemic to Türkiye and characteristic of the Mediterranean biome, is another important species in the area. The dragonfly *Brachythemis fuscopalliata*, which is globally threatened, is also present in the area.

As shown in Figure 11, both overlap areas are currently under intensive agricultural use, consisting of cultivated fields and modified ground conditions. The field observations confirmed that the areas are entirely converted to agricultural land, with no remaining natural habitat features such as dune formations, maquis vegetation, *Pinus brutia* communities, or coastal habitat characteristics.

No occurrence of dune-associated flora or protected plant species such as *Orobanche sideana, Campanula telmessi* or *Centaurea pamphylica* was recorded during the site visit, and the habitat conditions are not suitable for their presence due to long-term land conversion and soil disturbance.

The irrigation pipeline sections also do not intersect coastal habitat zones; therefore, no interaction with sea turtle nesting habitats is anticipated.

Based on the confirmed land use conditions and field verification, the ecological sensitivity of the overlap areas is considered low. Accordingly, significant adverse ecological impacts are not expected from the proposed subproject activities in these sections.

Particular management measure for overlapping areas and nests on the construction corridor

The Contractor shall conduct pre-construction ecological surveys at the overlapping areas and their immediate surroundings to identify any presence of protected plant species or sensitive habitats that may have emerged or been detected after the ESMP site visit and prior to the commencement of construction activities. A competent ecologist shall be engaged to participate in and lead the surveys.

For bird species, particular attention should be given to potential nests located in trees as well as possible nesting sites within reed beds around the existing canal to be modernized (See Appendix 9 - Photo Log). Prior to construction, the Contractor shall conduct pre-construction ecological surveys to identify nests on the construction corridor.

Should any unexpected natural habitat features or protected species be identified during these pre-construction surveys, appropriate mitigation measures shall be developed in consultation with the PMT and Regional Directorate of DSİ and implemented prior to the commencement of construction works, such as adjusting the micro-siting of the pipeline alignment to avoid the affected area, relocating individual plant specimens where feasible under ecological supervision, demarcating and fencing sensitive locations to prevent access by machinery and personnel, and applying construction buffer zones to protect nearby habitat features from disturbance. Where avoidance or relocation is not feasible, additional site-specific protective measures such as controlled excavation methods, manual digging in sensitive sections, and time-bound construction restrictions shall be applied to minimize potential impacts.

The measures specified in Section 5 should be followed.

4.1.6 Cultural Heritage

The sites identified as having archaeological value were assessed using official maps obtained from the relevant authorities and by referring to the opinion letter issued by the Antalya Regional Board for the Preservation of Cultural Assets (hereafter referred to as the "Board") (See

Appendix 2 - Opinion Letters Obtained from Authorities).

The assessment identified a total of 18 areas that are related to the subproject, either because the irrigation line passes within a registered site or is located in proximity to it. Among these, 5 archaeological sites are explicitly referred to in the opinion letter of the Board, as the irrigation line passes directly within the boundaries of the registered sites.

Of the remaining 13 sites, where the irrigation line is located close to but outside the registered boundaries:

- 8 sites are protected areas (either cemeteries or historical monuments),
- 2 sites are 1st Degree Archaeological Sites, and
- 3 sites are 3rd Degree Archaeological Sites.

The full assessment is presented in Appendix 3 - Cultural Assets Assessment Report which includes detailed information on all 18 sites identified as having archaeological value.

Reported earlier, the decision of Board, as stated in the opinion letter, highlights five archaeological sites, which are listed below:

1. In Çolaklı Neighborhood, a 1st Degree Archaeological Site registered by the decision of the Antalya Regional Board for the Protection of Cultural and Natural Assets and Board of the Belek Special Environmental Protection Area, dated 27/02/2003 and numbered 5777 (See Section 4.1.6.1 below),
2. In Dolbazlar Neighborhood, a 1st Degree Archaeological Site registered by the decision of the Antalya Regional Board for the Protection of Cultural and Natural Assets, dated 21/02/2008 and numbered 2189 (See Section 4.1.6.2 below),
3. In Yeniköy and Dolbazlar Neighborhoods, the Protection Area of the Side Water Conveyance System, registered as an Immovable Cultural Property to be Protected by the decision of the Antalya Regional Board for the Protection of Cultural and Natural Assets, dated 20/02/2009 and numbered 2992 (See Section 4.1.6.3 below),
4. In Kısalar Neighborhood, 1st and 3rd Degree Archaeological Site with boundaries finalized by the decision of the Antalya Regional Board for the Protection of Cultural and Natural Assets and the Board of the Belek Special Environmental Protection Area, dated 10/12/2012 and numbered 1206 (See Section 4.1.6.4 below),
5. In Bucakşeyhler Neighborhood, a 3rd Degree Archaeological Site Area registered by the decision of the Antalya Regional Board for the Protection of Cultural and Natural Assets, dated 14/11/2024 and numbered 18593 (See Section 4.1.6.5 below).

The opinion letter indicates further that:

> *Since it is understood that the construction works involve interventions that may cause damage to existing registered site areas and cultural assets (listed above), priority should be given to evaluating alternatives that would allow the route to be passed outside the registered areas. In cases where the development of alternative routes is not possible, the matter may be assessed following the*

submission to our Board of the justifications for this and the implementation details that would ensure minimum intervention in the registered areas. During this period, no intervention shall be carried out within the registered areas.

These five sites are presented in the subsequent subsections, all referenced in the opinion letter of the Board (See

Appendix 2 - Opinion Letters Obtained from Authorities).

During the preparation of this ESMP, the project design team at DSİ revised the alignment to ensure that intersections with the registered cultural heritage sites listed above are avoided. Accordingly, the irrigation pipeline alignment has been redesigned to eliminate any interaction with these sites and to prevent potential impacts on cultural assets, in line with the provisions of the relevant opinion letter.

DSİ PMT shall ensure that the revised alignment is incorporated into the Construction Contractor's tender documents and that chance find procedures are implemented by the Contractor during construction, in coordination with the DSİ Regional Directorate.

4.1.6.1 1st degree archeological site at Çolaklı Neighborhood – Yüksekören Mound/Yüksekören Höyüğü

The irrigation line coincides with the western boundary of the site and is located close to the southern boundary. The following figure presents the location of the site in relation to the irrigation lines and a photograph of the site in question.

Figure 12. 1st Degree Archeological Site at Çolaklı Neighborhood - Yüksekören Mound/Yüksekören Höyüğü

4.1.6.2 1st degree archeological site at Dolbazlar Neighborhood

The proposed irrigation line lies within the site; however, the alignment follows an existing irrigation line that is no longer in use and runs along the southern perimeter of the mound. The following figure presents the location of the site in relation to the irrigation lines and photographs of the area in question.

Figure 13. 1st degree archeological site at Dolbazlar Neighborhood

It is noteworthy that a barn and a farmhouse are located on the western top of the mound. In addition, beehives used for agricultural purposes have been placed on the mound, approximately 50 m north of the proposed irrigation line.

4.1.6.3 Historical Side Water Conveyance System

Approximately 263 m of the irrigation line passes over and then along the alignment of the Historical Water Conveyance System located in Sarılar Neighborhood on Kir Street. The following maps illustrate the location of the Historical Water Conveyance System and the proposed irrigation line along with a photograph.

Figure 14. Historical Side Water Conveyance System Crossing

4.1.6.4 1st and 3rd degree archeological site at Kısalar Neighborhood

Approximately 153 m of the proposed irrigation line lies within a 3rd degree archaeological site, while an additional 190 m lies within a 1st degree archaeological site. The following figure presents the location of the site in relation to the irrigation lines and a photograph of the site in question. The site could not be accessed from either the north or east, as the roads are not in a usable condition.

Figure 15. 1st and 3rd degree archeological site at Kısalar Neighborhood

4.1.6.5 3rd degree archeological site at Bucakşeyhler Neighborhood

Approximately 70 m of the proposed irrigation line lies within a 3rd degree archaeological site. The following figure presents the location of the site in relation to the irrigation lines and photographs of the site in question.

Figure 16. 3rd degree archeological site at Bucakşeyhler Neighborhood

It is noteworthy that the north of the site was disturbed by a natural gas pipeline construction and a case was issued to the firm regarding this disruption.

4.2 Social Baseline

The following subsections presents a summary of the social baseline where a detailed report is given in Appendix 7 - Social Baseline.

4.2.1 Geographical Context

Antalya Province covers 20,591 km^2, representing approximately 2.6% of Türkiye's total surface area. The province is bordered by the Taurus Mountains in the north and the Mediterranean Sea in the south, and by the provinces of Muğla, Burdur, Isparta, Konya, and Mersin. Physical geography is characterized by mountainous terrain (75.9%), plains (12.9%), plateaus (10.7%), and limited highlands (0.5%). Major plains include the Antalya, Finike, Alanya, Kasaba, and Demre plains, which are irrigated by rivers such as Düden, Aksu, Köprü, and Manavgat. The province also contains 25 dams, 9 ponds, and 4 natural lakes.

4.2.2 Population

Antalya's population has steadily increased in recent years, reaching 2,777,677 in 2025, making it the fifth most populous city in Türkiye after İstanbul, Ankara, İzmir, and Bursa. Population growth has been strongly influenced by tourism-related investments and migration linked to employment opportunities.

Manavgat district has also experienced steady growth, with its population increasing from 242,490 in 2020 to 262,576 in 2024 and reaching 266,480 in 2025 according to Turkish Statistical Institute ("TURKSTAT") data. Within the subproject's irrigation area, 22 neighborhoods had a total population of 92636 in 2025 having 46% female population. A full list of settlements in the subproject AoI is given in Appendix 8 - Settlements in the Area of Influence.

4.2.3 Education

Antalya is an important higher education center with five universities. In Manavgat, Akdeniz University operates the Manavgat Tourism Faculty, Manavgat Social Sciences Faculty, and a Vocational School, serving approximately 4,438 students with 44 academic staff.

Across primary and secondary education institutions in Manavgat, there are 171 schools, 1,960 classrooms, 2,902 teachers, and approximately 42,497 students in both public and private institutions.

4.2.4 Public Health Services

Antalya has a well-developed healthcare system with 46 hospitals (18 state, 2 university, and 26 private) and approximately 8,486 active hospital beds.

In Manavgat, there are 7 hospitals (2 state and 5 private) with a total capacity of 454 beds. Healthcare services include 201 specialized physicians, 128 general practitioners and assistants, 106 dentists, 10 pharmacists, and over 1,000 additional health personnel. Bed occupancy rates are slightly below the national average, indicating sufficient health service capacity.

4.2.5 Economy

The economy of Antalya is largely driven by tourism and agriculture, while Manavgat combines agricultural production inland with tourism-based activities along the coast. Tourism plays a particularly significant role in the local economy.

In 2024, Antalya received over 23.4 million foreign tourists, while Manavgat hosted approximately 7 million foreign visitors, accounting for about 27% of Antalya's accommodation-based tourism and a significant share of overnight stays. Manavgat contains 423 tourism facilities, providing 193,042 beds, and records an average tourist stay of 3.97 days, higher than both the national and provincial averages.

4.2.6 Agriculture and Irrigation

Manavgat has 42,336 hectares of agricultural land, producing crops such as tomatoes, cucumbers, oranges, peppers, eggplants, pomegranates, bananas, loquats, carob, and avocados. However, approximately 31% of agricultural land remains fallow, largely due to drought, highlighting the importance of irrigation systems.

In Türkiye, irrigation unions (operating under the supervision of the DSİ) play a central role in the management of irrigation schemes at the local level. Their primary responsibilities include the operation, maintenance, and repair of irrigation infrastructure such as canals, pipelines, pumping stations, and distribution networks, ensuring the reliable delivery of irrigation water to agricultural users. They are also responsible for planning and implementing seasonal water distribution schedules, allocating water equitably among users based on cropping patterns and demand, and collecting irrigation service fees to finance operational costs. In addition,

irrigation unions act as intermediaries between farmers and public authorities, supporting participatory water management and ensuring compliance with technical and administrative regulations set by DSI. They may also undertake minor infrastructure improvements, monitor system performance, and promote efficient water use practices to reduce losses and enhance sustainability in agricultural production.

Following the 2018 reform under Law No. 6172**,** the governance structure of irrigation union changed. Traditional elected boards were abolished, and presidents are now appointed from among civil servants**.**

Among the 22 neighborhoods within the subproject area, the highest number of members are in Çolaklı, Yavrudoğan, Evrenseki, and Dolbazlar, where 362 farmers from Çolaklı, 320 from Yavrudoğan, 258 from Evrenseki, and 212 from Dolbazlar are members of the irrigation association. The remaining 18 neighborhoods each have fewer than 200 members. The neighborhood with the fewest members is Çayyazı, with only one member (see Table 2 below).

Table 2. Agricultural Irrigation Areas in the Subproject Area

Neighborhoods	Number of Members	Total Irrigation Land (ha)	Average Land Size per Parcel Plot (ha)	Average Payment per Farmer (TL/da)
Aksaz	24	33.48	0.81	550.43
Aşağıışıklar	57	84.37	0.55	513.5
Çayyazı	1	0.23	0.23	496
Çeltikçi	37	69.33	0.66	484.69
Çolaklı	362	400.86	0.62	591.39
Demirciler	69	140.37	0.59	490.05
Doğançam	18	43.93	1.02	561.81
Dolbazlar	212	162.73	0.46	551.21
Evrenseki	258	392.57	0.73	638.06
Gündoğdu	115	210.68	1	820.57
Ilıca	80	183.45	1.18	664.29
Kalemler	83	208.69	1.13	645.58
Karaöz	65	167.43	0.7	460.92
Kısalar	34	75.25	0.81	558.64
Sarılar	185	233.62	0.68	590.47
Seydiler	24	152.73	0.95	458.43
Side	28	60.5	1.08	598.78
Şişeler	111	86.51	0.42	577
Ulukapı	40	29.02	0.38	524.6
Yavrudoğan	320	458.37	0.49	591.85
Yeniköy	132	219.18	0.67	565.96
Yukarıışıklar	74	60.6	0.46	579.06
TOTAL	2329	3473.9	-	-

Source: Manavgat Irrigation Union

The land sizes of the 22 neighborhoods benefiting from the irrigation system are not equal, as they vary depending on the total agricultural land within each neighborhood. Therefore, the ranking of the neighborhoods

differs according to the extent of their irrigated agricultural areas. Yavrudoğan has the largest irrigation area, with more than 458 hectares, followed by Çolaklı with over 400 hectares. In contrast, the neighborhood with the smallest agricultural land is Çayyazı, with only 0.23 hectares (see Table 2 above).

Agricultural land parcel sizes vary across neighborhoods. Therefore, the ranking also changes when assessed in terms of average parcel size. Ilıca Neighborhood ranks first with an average of 1.18 hectares per parcel, followed by Kalemler with 1.13 hectares. Çayyazı Neighborhood ranks last, with an average parcel size of 0.23 hectares (see Table 2 above).

Payments to the irrigation association depend on the amount of water used. The type of crop the farmer grows is very important. Farmers who cultivate and produce crops that require a lot of water have to pay more. The size of the irrigated land is also a determining factor. Looking at the average payment per farmer for irrigation, farmers in Gündoğdu neighborhood pay the most, at 820.57 Turkish Lira, while farmers in Seydiler neighborhood pay the least, at 458.43 Turkish Lira. However, overall, there is no significant difference in the amount paid per farmer (see Table 2 above).

According to data from the Manavgat Irrigation Association (see Table 3 below), the vast majority of irrigation is surface irrigation (68.16%). Drip irrigation and sprinkler irrigation are used less frequently. This increases water waste. Irrigation Unit underlines the need to expand the use of pressurized irrigation, drip irrigation, and sprinkler irrigation methods.

Table 3. Land Area by Used Irrigation Types (ha)

Total	Drip	Sprinkler	Surface
3473.9	616.21	489.84	2367.89

Source: Manavgat Irrigation Union

The type of agricultural product produced is also one of the most important factors affecting irrigation. Some agricultural products have high water requirements, while others have low water requirements. Furthermore, the planting, harvesting, and irrigation times of agricultural products vary. Therefore, the most important factor determining when a farmer needs irrigation is the agricultural product being planted. Knowing when agricultural products need water is crucial. An examination of the 22 neighborhoods in the subproject area reveals that the most important products are citrus fruits, corn, bananas, peanuts, and olives. Besides, gardens are very common in the region where vegetables and fruits are produced to be sold at the bazaars.

Table 4. Most Produced Agricultural Products in the Subproject Area

Crop	Irrigation Area (ha)	Percentage to Total Irrigation Area (%)
Garden Crops	616.21	23.56
Citrus	818.57	14.7
Corn	510.84	11.77
Banana	408.97	11.49
Peanuts	399.25	11.31
Olive	392.73	10.49
Others	579.16	16.68
TOTAL	3473.9	100

Source: Manavgat Irrigation Union

During field interviews with village heads, questions were asked to understand the current situation. In addition to questions about agricultural activities, participants were also asked about existing problems and to propose potential solutions.

As a result of the interviews, the following main problems were identified:

- The most frequently mentioned issue is the outdated irrigation infrastructure. It was stated that the water channels are old and that significant water losses occur due to surface irrigation practices. The need for an urgent transition to closed conveyance and drip irrigation systems was emphasized. It was also noted that surface irrigation contributes to mosquito proliferation. Participants further stated that a closed irrigation system would ensure that water resources are more than sufficient for farmers.
- The village heads indicated that they represent the last generation engaged in agriculture and explained that young people are no longer interested in farming. They noted that agricultural laborers are mostly sourced from the Serik region, while additional workers are brought from surrounding villages, although many tasks are still carried out by the farmers themselves.
- Regarding the relationship between tourism and agriculture, it was stated that tourism positively affects agriculture by increasing the market value of products. However, they also highlighted that urbanization, and construction pressures threaten agricultural lands. In addition, young people tend to work in the tourism sector during the season rather than in agriculture, which raises concerns about future labor shortages and the long-term sustainability of farming activities.
- Another key issue is the rising cost of agricultural production. Increases in irrigation, fertilizer, diesel fuel, and pesticide prices are negatively affecting agricultural activities.
- It was requested that stakeholder and information-sharing meetings with the Manavgat Irrigation Union be held more frequently, and that village heads be more actively involved in decision-making processes.

It is important to highlight the increasing pressure on water resources in the region. The months with the highest irrigation demand are May, June, July, August, September, and October. These months also coincide with the peak tourism season and an increase in Manavgat's population, leading to significant pressure on local water resources.

Furthermore, Manavgat has a Mediterranean climate, characterized by reduced rainfall and dry conditions during the summer months. At the same time, the most commonly cultivated crops in the basin require irrigation during this period (see Table 5).

During these months, when demand for drinking and domestic water also increases significantly, competition for water resources intensifies. The overlap between the tourism season and the agricultural irrigation period further increases pressure on water availability. This situation highlights the necessity for careful and sustainable water management.

Table 5. Irrigation Period of the Most Produced Agricultural Products in the Subproject Area

Crop	May	June	July	August	September	October
Garden Crops						
Citrus						
Corn						
Banana						
Peanuts						

Crop	May	June	July	August	September	October
Olive						

Source: Manavgat Irrigation Union

According to information from the basin, the only agricultural activity that uses irrigation outside of the tourism season is greenhouse farming. In greenhouses, irrigation takes place in January, February, March, and April. During these months, the tourism season has not yet begun in Manavgat, and there is no seasonal population increase. For these reasons, promoting greenhouse farming will greatly contribute to the balanced use of water resources throughout the year.

Based on the amount of water consumed during irrigation, the crops requiring the most water were bananas, strawberries, flowers, and vineyards. The least water-intensive crop was vegetable gardens. Therefore, in drought-prone years, drought action plans should be implemented as a result of drought scenarios, and the cultivation of crops requiring less water should be encouraged instead of those requiring the most water during drought years.

5 Environmental and Social Appraisal

Potential E&S risks and impacts expected to arise from the subproject activities have been identified based on the findings of the E&S Screening, available baseline information, and engineering judgment informed by experience from pipeline projects of similar scale and scope as well as proposed E&S risks and impacts within ESMP. The key potential risks and impacts are summarized below.

Improper labor and working conditions

Risks related to shortcomings in labor management may result in non-compliance with applicable labor standards as well as inadequate working conditions for project workers. These risks may include, inter alia, forced labor and child labor (although unlikely in the context of national legal enforcement), discrimination and unequal opportunity in recruitment and employment practices, and excessive overtime beyond legally permitted thresholds.

Additional risks may arise from inadequate implementation of ESS2 provisions related to labor and working conditions, including unclear communication of employment terms, particularly for migrant and temporary workers, and limited understanding of contractual rights and obligations. There is also a risk that workers may not be fully informed of or able to effectively access the Workers' GM, which could limit their ability to raise workplace concerns in a timely and confidential manner without fear of retaliation.

Although SEA/SH risks are assessed as low due to the absence of significant labor influx and the expectation of largely locally recruited workers, risks may still arise from worker interactions with local communities if Codes of Conduct are not adequately implemented and enforced.

While labor-related risks are considered low to moderate given the national regulatory framework and project context, consistent implementation of ESS2 and TIMP-2's LMP-aligned Labor Management Procedures, Codes of Conduct, and Workers' GM will be essential to ensure fair treatment of workers and compliance with ESS2 throughout the subproject lifecycle.

Occupational Health and Safety risks

Construction activities may expose workers to a range of occupational health and safety hazards that could result in unsafe or unhealthy working conditions. Key risks include overexertion and ergonomic injuries caused by repetitive motion, excessive physical effort, and improper manual handling. Slips, trips, and falls at the same level may occur due to poor housekeeping practices such as uncontrolled waste accumulation, loose construction materials, liquid spills, and improper placement of electrical cables and ropes.

Working at height during the use of ladders, scaffolding, or partially constructed structures may create risks of falls from height. Workers may also be exposed to injuries caused by falling materials or tools, or by solid particles ejected from abrasive or other power tools that could affect the head, eyes, and extremities.

The movement of construction vehicles and the operation of lifting equipment during the transport of machinery and materials may create risks of physical contact, spills, dust emissions, and noise exposure. Heavy equipment operators often have limited visibility around their equipment and may not be able to see pedestrians in close proximity. In particular, center-articulated vehicles may present a significant crushing hazard on the outside of a turning radius while in motion.

Additional risks may arise in enclosed or restricted spaces such as excavations, trenches, and ditches, which may also be considered confined spaces where access or egress is limited.

Noise and vibration exposure

Construction activities including excavation works, earthmoving operations, the use of pile drivers, concrete mixers, cranes, and the transportation of equipment, materials, and personnel may generate elevated levels of noise and vibration, potentially affecting both workers and nearby receptors.

Poor air quality

Construction activities may lead to deterioration of air quality, primarily due to fugitive dust emissions generated from excavation works, soil handling, vehicle movement over exposed soil surfaces, and wind erosion from uncovered soil piles. Additional emissions may originate from diesel-powered construction equipment and, where applicable, the open burning of solid waste at construction sites.

Mismanagement of non-hazardous solid waste

Non-hazardous waste generated during construction may include surplus excavation material, scrap wood and metal, small quantities of concrete residues, and typical domestic waste such as office, kitchen, and dormitory waste generated by the workforce. Improper management of these wastes may lead to environmental contamination and visual impacts.

Mismanagement of hazardous waste

Hazardous waste may include contaminated soil encountered during excavation due to previous land use, as well as maintenance-related waste such as oily rags, used oil filters, waste oil, spill cleanup materials, contaminated packaging materials, and pressurized cylinders. Inadequate storage, handling, or disposal of such materials may result in environmental and occupational hazards.

Improper management of hazardous materials and substances

Construction activities involve the storage and use of petroleum-based products such as fuels, lubricants, and hydraulic fluids, as well as other hazardous materials including paints and chemical substances. Accidental releases during storage, handling, transfer, or equipment operation may cause soil and water contamination if not properly managed.

Sanitary wastewater discharges

Construction sites may generate sanitary wastewater depending on the number of workers and the availability of facilities. These wastewater streams may originate from domestic sewage, food service operations, and laundry facilities serving the workforce. Improper management of sanitary wastewater may result in local environmental and public health risks.

Resource inefficiency

Inefficient use or mismanagement of materials, water, and fuel during construction activities may lead to unnecessary resource consumption and increased environmental footprint.

Soil erosion and sedimentation

Land clearing, excavation, and soil handling activities may expose soil surfaces to wind and rainfall, potentially causing soil erosion. Mobilized sediments may enter surface drainage networks, leading to sedimentation that can affect the quality of natural water bodies and associated aquatic ecosystems.

Landslides and flooding

Exposed soil surfaces may become vulnerable to heavy rainfall, potentially triggering localized landslides. In addition, intense precipitation events may lead to flooding in the region, which could affect construction activities and nearby areas.

Community health and safety risks

Construction activities under the irrigation pipeline subproject may generate a range of Community Health and Safety ("CHS") risks and impacts in accordance with ESS4. These risks are primarily associated with the linear and temporary nature of construction works, which may occur in or near rural settlements, agricultural land, access roads, and other community-use areas.

Construction activities may pose risks to nearby communities due to unintentional or intentional intrusion into construction areas. Such risks may include exposure to hazardous materials, contact with contaminated soil or other environmental media, and physical hazards associated with open excavations, trenches, pipe-laying corridors, and partially restored working areas. These hazards may present fall, entrapment, or injury risks, particularly when excavations are left open for extended periods or where adequate physical barriers, signage, and access restrictions are not consistently implemented.

In addition, the movement of construction vehicles and machinery along local and rural roads may increase the risk of traffic-related incidents involving community members, including pedestrians, cyclists, and agricultural vehicles. Given that irrigation pipelines are typically constructed along extended corridors, temporary disruptions to local access routes may also affect community mobility, emergency access, and agricultural activities, potentially increasing exposure to safety risks where alternative safe passage is not provided.

Dust generation, noise, and vibration from trench excavation, backfilling, material transport, and compaction activities may also affect nearby households and community-sensitive receptors. Although these impacts are generally temporary, they may be more pronounced in proximity to settlements, schools, water points, or other community facilities located near the pipeline alignment.

Further risks may arise from the temporary presence of construction sites and worker camps (if established), including increased interaction between workers and local communities. While the scale of labor influx is expected to be limited, unmanaged interactions may still present risks of social tension or unsafe behaviors if Codes of Conduct are not effectively implemented and enforced.

In addition, in line with ESS4 requirements, potential risks of SEA/SH are considered. Although the overall SEA/SH risk is assessed as low due to the expected limited labor influx and predominantly local recruitment of workers, risks cannot be fully excluded. SEA/SH risks may arise from inappropriate interactions between project workers and community members, particularly women, girls, and other vulnerable groups, in situations where Codes of Conduct are not effectively implemented, awareness is insufficient, or grievance and reporting channels are not accessible or trusted. The risk may be heightened in areas where construction activities are conducted in proximity to settlements or where workers have frequent interaction with local populations during or outside working hours.

CHS risks associated with irrigation pipeline construction are considered site-specific, temporary, and generally manageable; however, they require consistent application of ESS4 mitigation measures. These include, inter alia, controlled access to construction areas, physical barriers and signage around excavations, reinstatement or safe covering of trenches where feasible, traffic management measures, community notification and consultation, protection of pedestrian and agricultural access routes, spill prevention and response measures, and regular monitoring of contractor performance. In addition, SEA/SH risks will be mitigated through implementation of Codes of Conduct, worker training, awareness-raising for communities, and accessible, confidential grievance mechanisms, supported by referral pathways where needed.

Infrastructure and equipment design and operational safety

The subproject will include infrastructure investments for the modernization of the irrigation system, primarily involving the replacement of existing open channels with pressurized closed pipeline systems. While such systems improve operational efficiency, potential risks may arise from equipment or system failures, including pipe rupture, pressurized system malfunction, pump or valve failures, and potential impacts of water quality on equipment performance.

Traffic and road safety

Construction activities may lead to an increase in heavy vehicle traffic associated with the transport of construction materials, equipment, and personnel. This increased traffic may elevate the risk of traffic accidents and injuries affecting both workers and local communities.

Disruption of public services

Construction activities may cause temporary disruptions to public services and institutions such as schools, healthcare facilities, and religious establishments. If not properly managed, such disruptions may lead to inconvenience for local communities and potential social concerns.

Land acquisition and impacts on land, crops, and assets

Land acquisition or land-use restrictions associated with the subproject may result in livelihood impacts due to permanent or temporary land acquisition, easement requirements, or restrictions affecting informal land users. The livelihood impacts on PAPs will be comprehensively assessed within the subproject specific RP to be prepared. RP shall follow the provisions of WB ESF and TIMP-2's RF.

Construction activities may also lead to temporary disturbance of neighboring lands due to trench excavation, temporary storage of excavated materials, movement of construction machinery, dust generation, and temporary changes in access or drainage patterns. The eligibility matrix to be developed within the subproject specific RP following the TIMP-2's RF will provide compensation scheme for temporary disturbance of neighboring lands. The Contractor shall follow the RP in terms of temporary disturbance compensation.

Degradation of aquatic and terrestrial habitats and wildlife

Construction activities may cause disturbance to terrestrial and associated wildlife through vegetation clearing, excavation, noise, and increased human presence along the linear construction corridor.

As report under Section 2.1, the alignment of the irrigation pipeline route includes a total of 15 river crossings. For each crossing, aerial solutions will be adopted to avoid any disturbance to the riverbed and associated habitats. Aerial crossings will either involve attaching the pipeline to an existing bridge, where such structures are available, or constructing dedicated support structures to span above the water where no bridge exists. Appendix 1 - List of River Crossings presents each crossing, along with a brief description of the proposed method and corresponding map illustrations. The design shall include detailed drawings for each crossing, taking into account a no-harm approach to riverbeds and riparian habitats.

In case of mismanagement of river crossing works, aquatic habitats may be temporarily affected at river crossing locations, where in-stream works or bank-side excavation may result in localized sediment mobilization. In the absence of adequate control measures, sediment runoff could increase turbidity downstream, temporarily affecting water quality, benthic habitats, and aquatic fauna, and potentially disrupting short-term movement of aquatic species. A particular risk is associated with riparian habitats at river crossing points, where trenching, temporary access road establishment, and machinery movement may lead to disturbance or removal of riparian vegetation, bank instability, and localized alteration of microhabitats.

These areas are ecologically sensitive due to their role as ecological corridors, supporting species movement, soil stabilization, and nutrient exchange between terrestrial and aquatic systems. Even though impacts are expected to be temporary and limited to spatial extent, inappropriate construction practices may increase erosion risk and lead to downstream sedimentation, particularly during high-flow or rainfall events.

Although the subproject is located within or in proximity to KBAs, field observations confirm that the overlapping sections consist entirely of intensively cultivated agricultural land and do not exhibit characteristics of dune systems, maquis vegetation, natural forest formations, or other semi-natural habitat types associated with the ecological values of these KBAs. Accordingly, no direct habitat loss or fragmentation of KBA-associated natural habitats is anticipated within the actual footprint of the works.

Nevertheless, construction activities may still result in temporary disturbance to fauna in the wider landscape, primarily through increased noise, vibration, and human presence along the linear corridor, which may cause short-term displacement of mobile species in adjacent agricultural lands or areas exhibiting natural habitat characteristics.

Hunting activity within and in the vicinity of the subproject area is not considered a significant issue, as the pipeline alignment and overlapping sections are dominated by intensively cultivated agricultural lands with long-term anthropogenic disturbance. These conditions result in limited habitat suitability for wildlife species typically targeted by hunting activities, and no natural habitat features such as forest, wetland, dune, or maquis systems that would support higher wildlife abundance are present within the immediate construction corridor.

These impacts are expected to be localized, temporary, and reversible, and will be managed through standard mitigation measures such as limiting works to the defined construction corridor, minimizing vegetation clearance, implementing erosion and sediment control measures at river crossings (e.g., silt fences, cofferdams or isolated work areas where applicable), controlling construction timing to avoid high-flow periods.

Damage to or loss of access to cultural heritage

Construction activities may inadvertently affect tangible or intangible cultural heritage resources, including historical structures, cultural landscapes, or locally significant heritage elements, if adequate protection measures are not incorporated into project design and implementation.

Chance finds of cultural heritage

Previously unknown archaeological or cultural heritage artifacts may be encountered during excavation or construction activities, requiring appropriate chance find procedures to ensure their protection.

Social inclusion risks

The subproject may present risks of exclusion of disadvantaged or vulnerable individuals or groups from project benefits or decision-making processes if inclusive stakeholder engagement is not adequately ensured.

The E&S risks identified above are typical for infrastructure projects of similar scope and scale and are expected to be manageable through the implementation of appropriate mitigation and management measures to be detailed in the subproject's mitigation and monitoring strategy in the following section.

6 Mitigation and Monitoring Strategy

Following Table 6 provides a comprehensive strategy to address E&S risk and impacts throughout the pre-construction, construction, and operation phases. The table present mitigation measures for each phase including potential risks and impacts, the phase that those are expected and implemented, a monitoring scheme and responsibilities for implementation of mitigation measures and monitoring activities.

Table 6. Mitigation and Monitoring Plan

Abbreviations: P: Preconstruction; C: Construction; O: Operation; Cont.: Continuous, M: Monthly; Q: Quarterly

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
Improper labor and working conditions Risks associated with shortcomings in labor management, forced labor, child labor risks, gender-based violence and harassment, human rights risks, etc.) and other labor issues Shortcomings in SEA/SH management	• Provide workers with information and documentation that is clear and understandable regarding their terms and conditions of employment such as their rights under national labor and employment law (which will include any applicable collective agreements). • Pay workers on a regular basis as required by national law. • Provide workers with adequate periods of rest per week, annual holiday and sick, maternity and family leave, as required by national law. • Submit workers written notice of termination of employment and details of severance payments in a timely manner. • Employ workers on the principle of equal opportunity and fair treatment, and there will be no discrimination with respect to any aspects of the employment relationship. • Provide subproject workers, including specific groups of workers, such as women, people with disabilities, migrant workers and children of working age, with appropriate measures of protection and assistance in line with ESS2 • Allow workers to participate, or seek to participate, in workers' organizations and collective bargaining or alternative mechanisms. • Not employing or engaging child labor under the minimum age of 18. • Not using forced labor, which consists of any work or service not voluntarily performed that is exacted by an individual under threat of force or penalty • Establish Workers' Grievance Mechanism ("GM") and implement. • Train workers about their rights under national labor and employment law regarding the GM upon recruitment and before the implementation of the work. • Ensure workers are aware and comply with the Code of Conduct.	X	X		• Visual inspection of control measures • Employee records • Trainings records • Code of conduct • Records of worker complaints • Social Security Institution's records of all workers • % of accommodation meeting hygiene and safety standards • Access to safe water and adequate sanitation facilities • Waste management compliance rate • Number of H&S incidents in camps • % of workers trained on H&S and Code of Conduct • Number of grievances related to camp conditions (and % resolved on time) • Number of SEA/SH-related complaints (anonymized) and response time • Frequency of camp inspections		X		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	• Ensure that workers are fit for work before they start work, paying special attention to workers with underlying health issues or who may be otherwise at risk. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the subproject specific LMP and Contractor's ESMP. Workers' Accommodation and Labor Influx • Arrange safe drinking water, adequate hygienic material, accommodation, rest and dining areas for the workers. • Accommodation at the subproject site is not allowed. Implement provisions for accommodation standards such as: – Locate accommodation away from sensitive receptors (communities, schools, water bodies) – Restrict informal accommodation in nearby settlements – Control entry/exit of workers through site security systems – Obtain necessary permits and approvals before establishment – Provide adequate space, ventilation, lighting, and temperature control – Ensure safe structural conditions (fire-resistant materials where required) – Separate sleeping, cooking, washing, and sanitation areas – Provide gender-segregated facilities where applicable – Safe potable water supply at all times – Adequate number of toilets and showers – Regular cleaning and maintenance of facilities – Safe wastewater collection and disposal system (e.g., septic tanks or treatment units) – Regular pest control and waste collection – Provision of solid waste bins and segregation where feasible – Food hygiene standards for kitchens/canteens – Regular inspection of accommodation conditions – Fire detection and firefighting equipment (extinguishers, alarms)				• Personnel trained on SEA/SH & Code of Conduct • SEA/SH related grievances (anonymized)				

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	– Clearly marked emergency exits and evacuation routes – Emergency assembly points – First aid kits and access to medical assistance – Safe electrical installations and periodic inspections – Implementation of a Code of Conduct for all workers – Training on SEA/SH, workplace behavior, and community interaction – Zero tolerance for harassment or abuse – Controlled access to accommodation by non-authorized persons – Clear rules on alcohol, drugs, and visitor management – Security arrangements that are non-discriminatory and proportionate – Mechanism for workers' grievances within camps – Awareness programs on community respect and cultural sensitivity – Ensure compliance with EBRD/IFC Workers Accommodation Guideline and WB Group's General EHSGs • Prioritize local hiring (unskilled and semi-skilled labor) where feasible • Define maximum thresholds for non-local workforce if applicable • Coordinate recruitment through transparent, non-discriminatory procedures • Restrict worker movement outside camps during non-working hours where feasible • Establish clear rules for interaction with local communities • Prohibit harassment, illegal activities, and inappropriate behavior • Include explicit provisions on SEA/SH, prohibition of child exploitation, and respectful behavior within Code of Conduct • Implement traffic management plans to reduce interaction risks • Control construction-related nuisance (dust, noise, access disruption)								

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	• Monitor potential social tensions between workers and local population • Prevent pressure on local services (water, health, housing) • Ensure security personnel are trained in human rights and SEA/SH prevention • Apply proportional security measures to avoid community intimidation • Monitor interactions between security staff, workers, and communities • Train workers on human rights and SEA/SH prevention • Elaborate measures within subproject specific LMP SEA/SH prevention • Require all contractors and subcontractor personnel to sign a Code of Conduct that: explicitly prohibits SEA/SH and includes sanctions for violations • Display Code of Conduct summary at site • Conduct mandatory SEA/SH training for all workers: acceptable behavior, reporting mechanisms and consequences of violations • Provide community awareness sessions on rights and reporting options • Ensure strict confidentiality protocols (no disclosure of survivor identity) • Ensure informed consent before any action is taken • Refer cases to qualified service providers • Establish and document referral mechanisms: health services, psychosocial support, legal assistance (if requested by survivor) • Maintain an updated list of local service providers • Ensure rapid and safe referral process • Ensure security personnel are trained on appropriate conduct and SEA/SH prevention • Apply screening (background checks where feasible) for security staff • Avoid use of force and ensure compliance with good international practice on security management								

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	• Ensure security presence does not create intimidation risks, especially for women and vulnerable groups • Restrict worker movement in communities (especially at night) • Provide worker accommodation controls (if camps exist) • Prohibit: sexual relations with minors and transactional sex • Supervise high-risk interfaces (transport, camps, isolated areas) • Elaborate measures within subproject specific LMP								
Occupational Health and Safety ("OHS") Risks like; Overexertion and ergonomic injuries and diseases, i.e. repetitive motion, overexertion and manual use. Slips and falls at the same height are associated with poor housekeeping, i.e. excessive waste dumping, loose building materials, liquid spills and uncontrolled use of electrical cables and ropes on the floor. Falls from heights associated with working with ladders, scaffolding, and partially constructed or demolished structures. Potential falling of materials or tools and jets of solid particles from abrasive or other power tools that could cause injury to the head, eyes and extremities. Vehicle traffic and use of lifting equipment in the movement of machinery and materials on a construction site, i.e. physical contact, spills, dust, emissions and noise. Heavy equipment operators have limited visibility close to their equipment and may not be able to see pedestrians close to the vehicle. Center-articulated vehicles present	• A site specific OHS risk assessment will be carried out and a site specific OHS Management Plan will be developed by the Contractor and then strictly implemented. • The Contractor shall employ a competent OHS Specialist, with at least 10 years of work experience in OHS and proven involvement in at least two projects financed by international financial institutions. The OHS specialist shall be full-time and site based, responsible for overseeing risks and providing recommendations on preventive and protective measures to be implemented on site. The OHS Specialist shall be engaged from the design stage and continue throughout the subproject implementation. • If deemed necessary by the PMT, the OHS team shall be strengthened through the appointment of additional OHS personnel reporting to the OHS Specialist. • In the case of subcontractor engagement, each subcontractor shall employ a competent OHS Specialist with at least 5 years of relevant OHS experience, preferably in similar projects (e.g. pipeline or infrastructure projects). The subcontractor's OHS Specialist shall also be full-time and site based. • Control and precautionary measures against identified risks will be comprehensively elaborated within the OHS risk assessment and OHS Management Plan to be prepared by the Contractor. • Contractors must ensure commitment to monitoring and reporting of OHS and hazardous occupational environments and implement controls to reduce risk in accordance with all applicable regulations and, wherever practicable, regarding accepted best practices. Control and precautionary measures will be elaborated within the OHS risk assessment and OHS Management Plan to be prepared by the Contractor.		x	x	• OHS risk assessment • OHS Management Plan • Presence of OHS specialist/s • Visual inspection of control measures • OHS records • Employee records • Incident statistics and records • Records of worker complaints		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
a significant impact or crushing hazard zone on the outside of a turn while in motion. Enclosed areas and excavations, trenches and ditches; It can also be considered a confined space when access or egress is limited.	• Risk assessment study (job safety analysis) for every activity, including but not limited to equipment use, manual handling, excavations, transportation, pipe lying, backfilling, within the scope of the subproject will be conducted before commencing the works. The risk of injury should be assessed for each hazard, and appropriate controls implemented, including manual handling training as appropriate. Job safety analysis will be working area specific. • Employees will be made aware of any possible OHS risks and will be trained against them properly (Training shall include induction, site-specific, task-specific training). • Visitors will be made aware of OHS risks on site and emergency procedures by means of proper visitor training. • Contractors must ensure immediate response to and timely reporting, analysis and communication of all incidents. • Contractors are obliged to ensure that workers who are temporarily unable to work (for example due to illness, injury, or other reasons) are supported and reinstated into useful, appropriate, and productive jobs as soon as possible, rather than being excluded from employment or left without work. • Contractors must supply suitable and hygienic facilities for personnel. • Contractors must ensure safe control of hazardous substances and reduce the level of exposure to personnel, property and the environment in accordance with the requirements. • Ensure that all personnel and visitors wear or use personal protective equipment (gloves, dust masks, hard hats, boots, goggles) provided if it is necessary to protect them from harm. Contractors are obliged to provide adequate personal protective equipment free of charge to workers. • Ensure that sufficient safety signs are posted in workplaces and travel ways identifying hazards to prevent incidents. • Ensure that all personnel undertake activities where there is a risk of a person falling from one level to another do so in a controlled manner to reduce the risk of personal injury. • For construction involving work at heights, follow these precautions:								

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	– Do as much work as possible off the ground. – Do not allow people with the following personal risks to perform work at height tasks: vision/balance problems; certain chronic diseases such as osteoporosis, diabetes, arthritis or Parkinson's disease; certain medications – sleeping pills, tranquilizers, blood pressure medications or antidepressants; Recent Fall History – having had a fall within the last 12 months, etc. – Allow only those with sufficient skills, knowledge and experience to perform the task. – Check whether the place where work will be done at height is safe. • Ensure use of measures against collapse of trench slopes while pipe lying. • Take precautions when working on or near fragile surfaces. • Clean oil, grease, paint and dirt immediately to prevent slipping. • For work above ground, provide fall protection measures such as safety rigging, simple scaffolding/guardrails. • Contractors will keep the work area clean and free of debris daily. • Provide a first aid kit containing bandages, antibiotic cream, etc. or medical facilities and adequate drinking water. • Store corrosive liquids and other toxic substances in properly closed containers for collection and disposal in appropriately safe areas. • Provide adequate toilet facilities for workers. • Rope off the construction area and protect material stockpiles/storage areas from the public and display warning signs, including in unsafe areas. Do not allow children to play in construction areas. • Ensure structural openings are adequately sealed/protected. • Secure loose or lightweight materials stored on rooftops or open ground. • Suspend all work during heavy rain or any emergency.								

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	• Inspections of the work sites should be carried out daily. Contractors with the participation of its management will undertake weekly inspections of the whole work site.								
Noise and Vibration The operation of pile drivers, excavation and earthmoving equipment, concrete mixers, cranes and the transportation of equipment, materials and people can cause noise and vibration.	• Plan activities in consultation with local communities so that activities with the greatest potential for noise generation are scheduled for periods of the day that will result in the least disturbance. • Enclose the noise generating parts of the work machinery • Ensure maintenance and periodical controls of the work machinery are performed regularly • Use technologically new work machinery as appropriate • Use noise control devices such as temporary noise barriers and deflectors for impact and blasting activities and exhaust silencer devices for internal combustion engines. • Avoid or minimize subproject transportation in community areas. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP and Noise and Vibration Management Plan.	x	x		• Visual inspection of noise control measures • Complaint records • Maintenance and periodical control records		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)
Poor Air Quality Fugitive dust emissions may generate from a combination of on-site excavation and movement of soil materials, contact of construction machinery with bare soil, and exposure of bare soil and soil piles to wind. A secondary emission source may include exhaust from diesel engines of earthmoving equipment, as well as open burning of solid waste on site.	• Minimize dust during material transport and handling, using covers and/or control equipment (water suppression, bag house or cyclone, enclosed truck), due care while unloading. • Minimize dust from outdoor sources, including storage piles, using control measures such as installing guards and covers and increasing moisture content. • Implement dust suppression techniques, such as applying water or non-toxic chemicals, to minimize dust generated by vehicle movements. • Selectively remove potentially hazardous air pollutants such as asbestos from existing infrastructure prior to demolition. • Manage emissions from mobile sources: – Follow manufacturer's recommended engine maintenance schedules. – Instruct drivers on the benefits of driving practices that reduce both crash risk and fuel consumption, including measured acceleration and driving within safe speed limits.		x		• Visual inspection of air quality control measures • Maintenance records • Complaint records • Maintenance and periodical control records		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	– Replace old vehicles with newer, more fuel-efficient alternatives. – Convert high-usage vehicles to cleaner fuels where possible • Implement a regular vehicle maintenance and repair schedule. • Avoid open burning of solid waste (See Solid Waste Mitigation Measures). • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP and Air Quality Management Plan.								
Non-Hazardous Solid Waste Non-hazardous solid wastes generated include excess fill material from grading and excavation activities, scrap wood and metal, and small concrete spills. Other nonhazardous solid wastes include office, kitchen, and dormitory waste.	• Waste Management Planning – Review new waste sources during planning, siting, and design activities, including equipment modifications and process changes, to determine expected waste generation, pollution prevention opportunities, and required treatment, storage, and disposal infrastructure. – Collect data and information on process and waste streams at existing facilities, including characterization of waste streams by type, quantity, and potential use/disposal. – Set priorities based on a risk analysis that considers potential E&S risks during the waste cycle and the availability of infrastructure to manage waste in an environmentally sound manner. – Identify opportunities for source reduction as well as reuse and recycling. – Define procedures and operational controls for onsite storage. – Describe options/procedures/operational controls for treatment and final disposal. • Preventing Waste – Replace raw materials or inputs with less hazardous or toxic substances or with substances whose processing creates lower waste volumes. – Implement a manufacturing process that efficiently converts materials, resulting in higher product output yields, including		x		• Visual inspection of control measures • Waste production and disposal records • Training records • Complaint records		X		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	changing the design of the manufacturing process, operating conditions, and process controls. – Establish good housekeeping and operating practices, including inventory control, to reduce waste from materials that are out of date, out of specification, contaminated, damaged, or in excess of facility needs. – Create purchasing measures that recognize opportunities to return usable materials, such as containers, and prevent over-ordering of materials. • Recycling and Reuse – Evaluate waste generation processes and identification of potentially recyclable materials. – Identify and recycle products that can be reintroduced into the on-site production process or industrial activity. • Collect, temporary store and dispose of non-hazardous waste following national requirements and best practices. • Place waste bin/containers by types to work sites. • Establish a temporary waste collection area at the office site. • Train subproject personnel on waste management procedures. • Prevent dispose of waste to environment. • Check the work area after each shift and collect all waste to transport to temporary waste collection area. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP and Waste and Wastewater Management Plan.								
Hazardous Solid Waste Hazardous solid waste includes contaminated soils potentially encountered on site due to previous land use activities or small amounts of machine maintenance materials such as oily rags, used oil filters, waste oil, cleanup materials spilled from oil and fuel spills, contaminated packaging material,	• Preventing Waste – Minimize the generation of hazardous waste by implementing strict waste segregation to prevent mixing of non-hazardous and hazardous waste to be managed. • Waste Storage – Store waste in a manner that prevents mixing or contact between incompatible wastes and allows inspection between containers to trace leaks or spills. Examples include adequate space between incompatibility or physical separations such as walls or containment curbs.		x		• Visual inspection of control measures • Waste production and disposal records • Education records • Complaint records		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
contaminated rags and pressurized cylinders.	– Store in closed containers away from direct sunlight, wind and rain. – Establish secondary containment systems with appropriate and adequate materials for the captured waste to prevent environmental damage. – Include secondary containment wherever liquid waste is stored in volumes greater than 220 liters. The available volume of secondary containment should be at least 110% of the largest storage container or 25% of the total storage capacity at that location, whichever is greater. – Provide adequate ventilation in areas where volatile waste is stored. – Provide workers with readily available information about chemical compatibility, including labeling each container to identify its contents. – Restrict access to hazardous waste storage areas to appropriately trained personnel. – Clearly define (label) and delimit the area, including documenting its location on a facility map or site plan – Conduct periodic inspections of waste storage areas and document findings. – Prepare and implement spill response and contingency plans to address accidental releases. – Avoid underground storage tanks and underground pipes for hazardous waste. • Transport, Treatment and Disposal – Transportation, treatment and disposal of hazardous waste will be carried out in accordance with the Waste Management Regulation. • Collect, temporary store and dispose of non-hazardous waste following national requirements and best practices. • Place waste bin/containers by types to work sites. • Establish a secure temporary waste collection area for the hazardous waste at the office site. • Train subproject personnel on waste management procedures. • Prevent dispose of waste to environment.								

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	• Check the work area after each shift and collect all waste to transport to temporary waste collection area. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP and Waste and Wastewater Management Plan.								
Hazardous Materials and Substances Construction activities may create potential for release during storage, transfer, or use in equipment of petroleum-based products such as lubricants, hydraulic fluids, or fuels and other hazardous materials such as paints.	• Providing adequate secondary containment for fuel storage tanks and temporary storage of other fluids such as lubricating oils and hydraulic fluids. • Store hazardous materials in designated storage areas having impermeable surface, enclosed and secured. • Use impermeable surfaces for refueling areas and other liquid transfer areas. • Train workers on proper transfer and handling of fuels and chemicals and spill response. • Providing portable spill containment and cleanup equipment on site and providing training in equipment distribution. • Train subproject personnel about spill response, each team will have an appointed and trained spill response personnel. • Check the work area after each shift and collect hazardous material to transport to storage area at office site. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP and Hazardous Materials and Substances Management Plan.		x		• Visual inspection of control measures • Education records • Complaint records		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)
Sanitary Wastewater Discharges Construction activities may involve the generation of sanitary wastewater discharges in varying amounts depending on the number of workers involved. Sanitary wastewater from construction sites may include wastewater from domestic sewage, food service, and laundry facilities serving site workers.	• Separate wastewater streams to ensure compatibility with selected treatment options (e.g. septic system that can only accept domestic sewage). • Separate and pretreat wastewater containing oil and grease (e.g. use of a grease trap) before discharge into sewer systems, particularly at the outlet of kitchen services. • If sewage from the construction site is to be discharged into surface water, treat it to meet national standards for sanitary wastewater discharges. • If sewage from the site is to be discharged into a septic system or to land use as part of a treatment system, treat it to meet		x		• Visual inspection of control measures • Septic tank waste disposal records • Treated wastewater quality analysis records • Education records • Complaint records		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	applicable national standards for sanitary wastewater discharges. • Dispose of sludge from sanitary wastewater treatment systems in accordance with national legal requirements. • Provide adequate portable or permanent sanitation facilities serving all workers on all construction sites. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP and Waste and Wastewater Management Plan.								
Resource inefficiency Borrowing and mismanagement of total material, water and fuel can lead to resource inefficiency.	• Recycle all suitable aggregate materials. • Prefer borrow pits close to construction sites. • Assess most feasible routes for transportation and document within Contractor's ESMP • Track use of resources regularly and record within tracking logs. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP and Resource Efficiency and Pollution Prevention Plan.		x		• E&S monitoring reports		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)
Soil erosion Soil erosion can result from exposure of soil surfaces to rain and wind during land clearing, excavation and excavation activities. Mobilization and transport of soil material can cause sedimentation of surface drainage networks, which can affect the quality of natural water systems and ultimately the biological systems that use these waters.	Sediment mobilization and transportation • To reduce or prevent erosion: – Timing to avoid periods of heavy rainfall (i.e., dry season) whenever possible – Shaping and minimizing the length and steepness of slopes – Mulching to stabilize exposed areas – Immediate revegetation of areas – Designing channels and ditches for post-construction flows – Lining of steep channels and slopes (e.g. use jute matting) • Reduce or prevent off-site sediment transport through settling ponds, silt fences, and water treatment, and modify or suspend activities to the extent possible during heavy rainfall and high winds. • Develop method statements including measures against soil erosion into waterbodies when working close to a waterbody	x	x	x	• Visual inspection of measures • Complaint records • Method statements		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	Clean flow management • Separate or divert clean water flow to prevent mixing water with high solids content (unless otherwise, the contaminated clean water will be treated before release). Structural (slope) stability • Provide effective short-term measures for slope stabilization, sediment control and subsidence control until long-term measures are implemented for the operational phase. • Provide adequate drainage systems to minimize and control infiltration. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP and Soil Management Plan.								
Landslides and Floods Landslides may occur due to the vulnerability of exposed soil to heavy rainfall, and these landslides may cause floods. Floods may occur in the region due to heavy rainfall.	• Develop Emergency Preparedness and Response Plan to address these risks and measures		x		• Preparation of emergency response and preparedness plan • Regular emergency drills and associated reports		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)
General Site Hazards Related to Community Health and Safety Risks may arise from unintentional or intentional intrusions, including potential contact with hazardous materials, contaminated soils and other environmental media, or excavations and structures that may present a fall and entrapment hazard.	• Restrict access to the site through a combination of institutional and administrative controls, focusing on high-risk structures such as open trenches or areas depending on site-specific circumstances, including fencing, signage and communication of risks to the local community. • Strictly avoid open trenches during off work hours • Fence the perimeter of the trenches during work hours • Ensure the construction sites are clearly marked to avoid community access • Leave no tools or equipment on site without security during off work hours • On construction sites, eliminate hazardous conditions that cannot be effectively controlled through site access restrictions, such as closing openings to small, enclosed spaces, providing		x		• Visual inspection of control measures • Complaint records		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	escape routes for larger openings such as trenches or excavations, or locked storage of hazardous materials. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP and Community Health and Safety Management Plan.								
Infrastructure and Equipment Design and Security The subproject will include infrastructure investments for the modernization of the irrigation system and will primarily include infrastructure works such as replacing existing open channels (on the surface/concrete) with pressurized closed channels (pipes); therefore, it may cause medium-level security risks. In addition, it is possible to encounter situations such as the risk of explosion of pressurized system, pump and valve failures, the impact of water quality on equipment.	• The material of closed pipelines must be resistant to water pressure and environmental conditions. Generally, materials such as polyethylene, PVC or steel are preferred. The material selection should be optimized according to the soil structure of the region, climatic conditions and groundwater level. • It is important to install ventilation and discharge valves against pressure changes in closed pipe systems. These valves relieve the system in case of sudden pressure increases or blockages and prevent pipe bursts. • Closed systems must have easy access points for periodic maintenance and repair. • Regular maintenance and inspection programs should be established. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP and Community Health and Safety Management Plan.	x	x	x	• Preparation of such design measures and plans		x		PMT (implementation, monitoring)
Traffic and Road Safety Construction activities can cause a significant increase in the movement of heavy vehicles for the transport of construction materials and equipment, increasing the risk of traffic-related accidents and injuries to workers and local communities.	• Minimize pedestrian interaction with construction vehicles. • Collaborate with local communities and responsible authorities to improve signage, visibility and general safety of roads, especially near schools or other places where children may be present. Collaborate with local communities on education on traffic and pedestrian safety (e.g. school education campaigns). • Coordinate with emergency responders to ensure appropriate first aid is provided in the event of an accident. • Use locally sourced materials whenever possible to minimize transportation distances. Locate relevant facilities such as labor camps near project sites and arrange labor bus transportation to minimize external traffic.		x		• Visual inspection of control measures • Traffic accident records • Complaint records		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	• Take safe traffic control measures, including road signs and flags to warn people of dangerous situations. • Verify the suitability of all drivers and vehicles by checking their documents (driver license, heavy vehicle usage certificates, heavy vehicle regular maintenance documents). • Inform and train all drivers about speed limits, obligations to comply with speed limits, schools on the roads to be used, urban transportation roads, etc. will provide training/toolbox on sensitive points and record them. • Set speed limits in and around the sites for subproject vehicles. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP and Traffic Management Plan.								
Disruption of public services such as education, health and religious institutions Disruptions from construction to education, health and religious institutions can cause social unrest.	• Publish information on the scope and schedule of construction and specific construction activities that cause disruptions or restricted access, as specified in the TIMP-2's SEP. • Implement grievance mechanism, as specified in the TIMP-2's SEP. • Avoid blocking access to public services wherever possible. • Stop construction work that makes noise during prayer times or school hours. • If there are any health facilities close to the construction sites and there are objections, carry out the commitments specified in the TIMP-2's SEP to mutually agree on working hours. • Develop subproject specific Stakeholder Engagement Plan including grievance mechanism procedure reporting Contractor's engagement scheme with public and internal and external grievance management system. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP and Community Health and Safety Management Plan.		x		• Complaint records		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)
Land Acquisition and Land, Crops and Asset Damage on Neighboring Lands	• Avoid involuntary resettlement or, where unavoidable, minimize involuntary resettlement by exploring subproject design alternatives.	x	x	x	• Complaint records • Compensation records			x	Municipality or Special Provincial Administration (implementation)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
Land acquisition or land use restrictions related to the subproject may result in livelihood impacts caused by permanent and temporary land acquisition or easement restrictions, and impacts on informal users of land. Neighboring land disturbance during construction may occur due to trench excavation, temporary storage of excavated material, movement of construction machinery, dust generation, and temporary changes in access or drainage conditions.	• A subproject specific RP in accordance with the RF will be prepared for the subproject, that shall be implemented. • Compensation of all assets, trees and annual crops at full replacement cost as defined under the entitlement matrix, and according to the land survey and asset inventory to be performed on these areas. The Asset Inventory Report will be submitted as an Annex document to the RP. • Compensate of all assets, trees and annual crops at full replacement cost as defined under the entitlement matrix when a land, crops or assets on it is damaged by the Contractor. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP.								Compensation for land, crops and asset damage on Neighboring Lands by Contractor Social specialist of PMT (supervision and monitoring)
Degradation of aquatic and terrestrial habitats and wildlife The construction activities can disrupt terrestrial habitat. River crossings can disturb aquatic and riparian habitat if the system of work is not defined in advance and implemented.	• Consult General Directorate for the Protection of Natural Assets prior to commencement of construction activities about the work methodology within Belek SEPA • Implement measures specified by the General Directorate for the Protection of Natural Assets during implementation Terrestrial habitat • Minimize construction footprint and restrict works to defined work corridor • Clearly mark no-go areas (sensitive habitats, trees, nesting sites) • Conduct pre-construction ecological surveys to identify any presence of protected plant species or sensitive habitats and nests on the construction corridor (see Section 4.1.5.2) – A competent ecologist shall be engaged to participate in and lead the surveys. – Should any unexpected natural habitat feature or protected species be identified during these pre-construction surveys, appropriate mitigation measures shall be developed in consultation with the PMT and Regional Directorate of DSİ and implemented prior to the commencement of construction works. – These shall include adjusting the micro-siting of the pipeline alignment to avoid the affected area, relocating individual	x	x		• Visual inspection of control measures • Pre-construction ecological survey reports • Reported actions in case of identification of protected species • Approved access route maps • % of vehicles complying with designated routes • Number of off-road driving incidents • Schedules of work • Area of vegetation cleared vs approved footprint • Area successfully rehabilitated/restored		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	plant specimens where feasible under ecological supervision, demarcating and fencing sensitive locations to prevent access by machinery and personnel, and applying construction buffer zones to protect nearby habitat features from disturbance. – Where avoidance or relocation is not feasible, additional site-specific protective measures such as controlled excavation methods, manual digging in sensitive sections, and time-bound construction restrictions shall be applied to minimize potential impacts. • Avoid construction of access routes (the proposed lines are accessible) • Schedule works outside breeding/nesting seasons where applicable • Strip topsoil only within approved footprint • Separate and stockpile topsoil (protected from erosion and contamination) • Reuse topsoil for site restoration and rehabilitation • Avoid unnecessary vegetation clearing outside construction zone • Use existing access roads wherever possible • Restrict vehicle movement to designated routes only • Prohibit off-road driving except where strictly necessary • Regular maintenance of machinery to prevent leaks/spills • Limit idling and unnecessary machinery operation • Apply dust suppression (water spraying) during dry conditions • Install erosion control measures (silt fences, bunds, sediment traps) • Stabilize exposed soil promptly after work • Restore disturbed areas progressively (not only at end of project) • Brief workers on no hunting / no wildlife disturbance policy • Prohibit collection of plants or disturbance of fauna • Implement chance find procedure for fauna (e.g. nests, burrows) • Install temporary fencing where sensitive habitats are nearby • Not using work machines and workers more than the job requires.				• Number of erosion/sedimentation incidents • Number of spill or machinery leakage events • Number of biodiversity disturbance incidents • Number of chance finds • % of staff trained on environmental protection measures • Complaint records • Approved detailed crossing designs, structural drawings, and method statements				

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	• Conduct environmental induction for all operators and drivers and the workforce • Appointing a site environmental specialist • Conduct toolbox talks on habitat protection and movement restrictions Aquatic and riparian habitat • For each crossing, aerial solutions will be adopted to avoid any disturbance to the riverbed and associated habitats. • Submit detailed crossing designs, structural drawings and method statement to the DSİ PMT for approval prior to works • Avoid instream work • Use temporary work platforms where required • Prevent sediment-laden runoff from entering watercourses through silt fences, sediment traps, and controlled drainage paths • Position vehicles and equipment such as trailers, excavator, lifting equipment, service vehicles outside the riparian buffer zone • Select the timing of the construction during low-flow periods and off breading season • Avoid open cut trenching • Conduct environmental induction for all operators and drivers and the workforce • Appointing a site environmental specialist • Conduct toolbox talks on habitat protection and movement restrictions • Develop method statements including measures against degradation of aquatic and terrestrial habitats in and around waterbodies when working close to a waterbody. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP and Biodiversity Management Plan.								
Damage or Loss of Access to Cultural Heritage	• For 5 archeological sites listed under Section 4.1.6; DSİ PMT is to ensure that the Construction Contractor tender document	x	x		• Visual inspection • Notification records		x		Contractor (implementation)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
The design of construction activities may not include adequate protection measures for or provide access to intangible and/or tangible local cultural heritage (including historic bridges or other local cultural heritage), or these cultural heritages may be affected by construction activities.	include revised alignment and that the chance find procedures are applied by the Contractor. • While working proximate to the 5 archeological sites listed under Section 4.1.6; chance find procedures are applied by the Contractor. • For 2 archeological sites listed under Appendix 3 - Cultural Assets Assessment Report: Protected Area at Yeniköy and Dolbazlar Neighborhoods – Long Wall/Uzun Duvar and 1st degree archeological site at Side (Kemer) Neighborhood – Aktepe; prior to the commencement of construction works in and around this area, the Contractor shall inform the E&S focal points of the DSİ Regional Directorate. In addition, all construction activities in this area should be carried out under the supervision of Museum Directorate. • For other 11 archaeological sites listed under Appendix 3 - Cultural Assets Assessment Report; in the event of any intervention in the archaeological site/protected area, the relevant Museum Directorate shall be informed. • For intangible cultural heritage that is not protected under national legislation but is locally important and identified during the design or construction phase, the physical footprint of the subproject will be relocated or changed. If this is not possible, a Cultural Heritage Management Plan will be prepared by the Contractor including the views of the local people and construction works will be carried out in line with this Plan. • Elaborate on the procedures, management and mitigation measures, roles and responsibilities, inspection, monitoring and reporting schemes within the Contractor's ESMP. The Contractor's ESMP shall also include the precautions and Change Find Procedure within this ESMP.				• Daily works reports in and around the sites • Complaint records • Records of Chance Findings regarding intangible cultural heritage				E&S Focal Points (control) Environmental specialist of the PMT (monitoring)
Cultural Heritage: Chance Finds Previously unknown cultural heritage may be encountered during construction work.	• Follow the Chance Find Procedure (See Appendix 4 - Chance Find Procedure).		x		• Records of Chance Findings		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
Stakeholder Engagement and Grievance Mechanism: Shortcomings in engagement and consultation, exclusion of disadvantaged or vulnerable individuals/groups, mismanagement of community grievances, absence of sufficient SEA/SH grievance management system	Shortcomings in engagement and consultation • Prepare and implement a subproject specific SEP with: – stakeholder mapping (including vulnerable groups) – engagement methods and frequency – GM – SEA/SH related GM • Use multiple communication channels: face-to-face meetings, local announcements, SMS/WhatsApp, notice boards • Conduct early and continuous engagement (pre-construction and during construction) • Disclose information in clear, non-technical language • Ensure two-way consultation (collect and respond to feedback) • Maintain records of meetings, attendance, and issues raised • Assign a Community Liaison Officer ("CLO") on site Exclusion of disadvantaged or vulnerable individuals/groups • Identify vulnerable groups (e.g. elderly, women, low-income households, seasonal workers) • Apply inclusive engagement methods: small group meetings, household visits, separate consultations if needed (e.g. women-only sessions) • Provide accessible information formats: simple language, visual materials • Ensure equal access to grievance mechanism: no barriers (literacy, cost, mobility) • Monitor participation rates of vulnerable groups • Adapt engagement strategy if gaps are identified Mismanagement of community grievances • Establish and implement a GM: accessible, free of charge, culturally appropriate • Provide multiple grievance channels: phone, email, in-person, grievance boxes • Ensure timely response and resolution • Maintain a grievance log: type, date, status, resolution	x	x		• Number of consultations held • % of planned consultations completed • % of consultations including vulnerable groups • Participation rate of vulnerable groups • Number of targeted engagement activities • Number of grievances received • % grievances resolved on time • Average response time • Number of SEA/SH related grievances (anonymized) • Time to respond/referral of SEA/SH cases		x		Contractor (implementation) E&S Focal Points (control) Environmental specialist of the PMT (monitoring)

Potential Risk and Impacts	Proposed Mitigation Measures	Stage			Monitoring Indicators	Monitoring Frequency			Responsibility for Implementation and Monitoring
		P	C	O		Cont.	M	Q	
	• Communicate construction schedules and disruptions in advance • Implement corrective actions: dust suppression, noise control, traffic management • Regularly report grievance trends and actions taken Absence of sufficient SEA/SH grievance management system • Establish dedicated SEA/SH reporting channels separate from general grievances: confidential phone line and trained focal point (preferably female) • Allow anonymous reporting • Do not require written complaints (verbal reporting acceptable) • Do not investigate SEA/SH cases through standard grievance procedures • Apply a survivor-centered response: respect, confidentiality, non-discrimination Cross-cutting measures • Train project workers on stakeholder engagement and grievance handling • Coordinate with local authorities and community leaders • Periodically review and update SEP and GM effectiveness								

7 Implementation, Monitoring, Reporting and Training

7.1 Implementation Arrangements

The Contractor shall work in accordance with the provisions of this subproject specific ESMP, the TIMP-2's SEP, the TIMP-2's ESMF and in compliance with the WB's ESSs, WB Group's EHSGs and national legislation. This ESMP is an inseparable part of the construction Contractor's contract.

The following is main implementation arrangements to be performed by the Contractor.

- Comply with and implement the E&S mitigation measures as well as national legislation.
- Take all necessary precautions to protect the health and safety of workers and community members and to prevent, minimize or reduce environmental damage resulting from subproject activities.
- Monthly report on E&S performance, namely E&S Monthly Progress Reports, to E&S Focal Points appointed under Regional Directorate.
- Prepare and implement Contractor Environmental and Social Management Plan ("C-ESMP") and other E&S sub-management plans in accordance with E&S risk management tools prepared such as this ESMP and RP.
- Prepare and implement site-specific LMP including Code of Conduct.
- Prepare and implement subproject specific Stakeholder Engagement Plan including Contractor's engagement scheme with public and internal and external GM .
- Ensure that construction-related grievances are received, recorded, reported and resolved and included in E&S Monthly Progress Reports.
- Monitor field activities daily as defined in the C-ESMP in accordance with this ESMP, LMP and TIMP-2's SEP.
- Train its workforce in E&S measures and increase E&S awareness for effective implementation.
- Promptly notify the PMT and E&S Focal Points of any chance findings and serious incidents that may have significant adverse impacts on the environment, affected communities, the public or workers. Prepare an incident investigation report with root cause analysis and corrective action plan within 10 days and submit the report to the PMT.

Contractor will be responsible for implementing the mitigation measures in the E&S risk management documents under the supervision of E&S Focal Points, under the supervision of the PMT. The roles and responsibilities for PMT and E&S Focal Points regarding the implementation arrangements for E&S management are summarized in Table 8 of TIMP-2's ESMF.

The roles and responsibilities of the authorities regarding the land acquisition for the subproject are elaborated in subproject specific Resettlement Plan.

7.2 Monitoring

The Contractor is obliged to perform internal inspections, controls and monitoring regarding its E&S performance.

E&S Focal Points appointed under Regional Directorate will be on-site weekly and are responsible for monitoring, reporting and coordinating with the PMT regarding subproject E&S implementation.

PMT will conduct regular periodic monitoring visits to the sites throughout the construction period, depending on the scope of the subproject. Frequent monitoring may be conducted if necessary to ensure compliance with mitigation measures and resolution of identified issues.

7.3 Reporting

Reporting will include, as a minimum:

- Overall application status of ESMP, LMP, SEP,
- Any E&S issues arising as a result of subproject activities and how they will be addressed or mitigated,
- OHS performance (including incidents and accidents),
- Community consultation updates,
- Public notifications and communications,
- Progress in completing subproject activities, and
- A summary of grievances received, actions taken, and resolution status.

The Contractor will prepare E&S Monthly Progress Reports on E&S performance in accordance with the criteria specified in the relevant tender documents and contracts and submit them to the E&S Focal Points.

The E&S Focal Points will oversee the on-site implementation of the ESMP, LMP, SEP, and submit monthly reports on the E&S performance of the subprojects to the PMT. These reports will additionally include the Contractor's E&S Monthly Progress Reports.

PMT will consolidate these reports at the national level and submit them to the WB as Quarterly E&S Monitoring Reports.

7.4 Training

The Contractor is required to conduct E&S trainings in order for capacity building purposes and effective E&S risk management. The Contractor's E&S team should organize and implement a training campaign including E&S orientation trainings after the employment, prior to the site entry and specific trainings to its workforce. This shall include as minimum:

- Prevention of emergencies and arrangements for emergency preparedness and response, vehicle safety, safe use of vehicles, tools, machinery and equipment, OHS including working at heights,
- Contractual E&S requirements
- Subproject specific ESMP requirements
- C-ESMP requirements
- Diverse and respectful workplaces, SEA/SH, Code of Conduct
- Handling of SEA/SH complaints
- Stakeholder Grievance Mechanism
- Workers' Grievance Mechanism

The training approach of PMT and E&S Focal Points for E&S management are summarized in Table 9 of TIMP-2's ESMF.

8 Stakeholder Engagement

In the following subsections, stakeholder engagement activities conducted during the ESMP studies are documented. This is followed by stakeholder identification and analysis for the subproject, the proposed stakeholder engagement program, and the resources and responsibilities for implementation of the program and external grievance mechanism, in line with TIMP-2's SEP.

A subproject specific SEP consistent with the TIMP-2's SEP will also be developed for this subproject by the Contractor.

8.1 Previous Stakeholder Engagement Activities

During this ESMP development phase, the ESMP Consultant engaged with the representative of the PMT, representative of the DSİ's Manavgat Brach Office under the 13th Regional Directorate of DSİ, mukhtars of the subproject affected settlement and the Manager of the Irrigation Union of the region in order to receive information feeding baseline information for the subproject, thoughts and concerns if applicable regarding the subproject.

After the initial approval of this ESMP by the PMT and the WB, a stakeholder engagement meeting will be held at Manavgat with the participation of subproject affected parties and interested parties for consultation and engagement. The minutes and outcomes of this meeting will be included into this ESMP to finalize the ESMP for final approval.

8.2 Stakeholder Identification and Analysis

The following stakeholders have been identified and analysed for the subproject. These stakeholders include affected parties, other interested parties and disadvantaged/vulnerable individuals or groups in line with the provisions of the ESMF and TIMP-2's SEP. The identified stakeholders in groups of Subproject Affected Parties, Other Interested Parties and Disadvantaged and Vulnerable Groups or Individuals are tabulated below along with rationale for their affection or interest.

Table 7. Stakeholder Groups

Stakeholder Groups	Identified Stakeholders	Relation
Subproject Affected Parties	• People subject to land acquisition/expropriation [land or other affected structure owners, land or other affected structure users (tenants, illegal occupants, users of common areas, etc.)] • Local farmers/agricultural workers • Residents of the settlements where the subproject is implemented • Businesses, business owners, employees in the settlements where the subproject is implemented • Contractor personnel	Affected by the subproject because of actual impacts or potential risks to their physical environment, health, security, cultural practices, wellbeing, or livelihoods. These stakeholders may include individuals or groups, including local communities, community members, and other parties that may be subject to direct impacts from the subproject.
Other Interested Parties	• Governorate • District Governorate • Other related public institutions • Neighborhood Muhtar's Offices	Those are the individuals, groups or organizations with an interest in the subproject, which may be because of the project location, its characteristics, its impacts, or matters related to public

Stakeholder Groups	Identified Stakeholders	Relation
	• Provincial Directorate of Agriculture and Forestry • District Directorate of Agriculture and Forestry • General Directorate of Nature Conservation and National Parks • NGOs – National and local level • Women's Associations • Irrigation Union of the region • Universities • Media Institutions – National and local level	interest. For example, these parties may include regulators, government officials, the private sector, the scientific community, academics, unions, women's organizations, other civil society organizations, and cultural groups. These stakeholders have been identified under other interested parties for the reasons of issuing environmental permits within the scope of construction activities and providing opinions on the activities of district municipalities and district governorships near the construction activity areas and the relevant units & mukhtars affiliated to these institutions.
Disadvantaged and Vulnerable Groups or Individuals	• Women-head household • Women farmers • Elderly farmers • Illiterate farmers/workers • Seasonal agricultural workers • Disabled persons	Disadvantaged and vulnerable people and groups are more likely to be affected by subproject activities and more exposed to risks and impacts than other affected people. They are also more likely to be excluded from, and unable to participate in, mainstream consultation processes. Special measures may therefore be needed to increase the participation of these individuals and groups.

8.3 Stakeholder Engagement Program

Stakeholder participation in subproject processes is ensured through the disclosure of subproject information to stakeholders and through consultation, which enables the collection of stakeholders' views, suggestions, and grievances. Feedback obtained through consultation is evaluated, and where appropriate, improvements are incorporated into subproject processes.

The following sections describe the subproject's approach to information disclosure and stakeholder consultation. In addition, the subproject approach for ensuring that disadvantaged and vulnerable individuals and groups can benefit from stakeholder engagement processes on an equal basis with other stakeholders is presented.

Subsequently, these activities are consolidated into a program and presented under Section 8.3.4 Stakeholder Engagement Program.

8.3.1 Proposed Strategy for the Disclosure of the Information

E&S assessment and management documents of the subproject including this ESMP and other E&S documents prepared by the Contractor will be disclosed on the website of the subproject (websites of both DSİ General Directorate and Regional Directorate).

The information about the grievance mechanism will be provided both on the website of the subproject and in the brochures, bulletins, and newsletters that will be distributed by the Contractor, or on the notices posted

near the construction site, coffee houses and at the office of the mukhtars as well as at the office of the Irrigation Unit of the region.

Regular updates on subproject developments will be published on the website of the subproject.

8.3.2 Proposed Strategy for the Engagement Activities

Within the scope of the subproject, various consultation methods will be used to ensure effective stakeholder engagement, and these consultations will be conducted in a planned manner. The consultations aim not only to provide information to stakeholders but also to collect their views, suggestions, complaints, and concerns.

The main engagement methods to be used are described below:

One to one meeting: This method includes one-on-one, in-person meetings with local communities in settlements affected by the subproject. Basic information about the subproject was provided to participants, and their feedback was recorded directly.

Meetings: These include briefing and evaluation sessions held at the neighbourhood level with broader participation or with governmental authorities who are interested parties. The planned stakeholder engagement meeting will also be included into this category.

Official Correspondence: This method covers correspondence with administrative institutions under the category of other relevant stakeholders, including information requests and opinion-gathering processes. Official correspondence will be maintained with relevant interested stakeholders as needed.

Telephone Calls: This method covers calls made to inform counterparts or to obtain information or opinions when face-to-face meetings with affected or interested parties are not possible. In later stages of the subproject, telephone calls may be conducted in addition to face-to-face meetings to inform affected settlement mukhtars or manager of the Irrigation Union.

Focus Group Meetings: These are participatory meetings held to enable more detailed information exchange with stakeholders sharing similar characteristics (e.g., women engaged in agriculture or particular land users). The use of this method is planned in later stages of the subproject if vulnerable groups are identified. These are structured discussions involving individuals or groups with similar views, interests, or levels of impact. They will be used to obtain in-depth information on specific topics.

All of these methods will be implemented repeatedly throughout the subproject duration, stakeholder participation will be encouraged, and a transparent dialogue with the community will be maintained.

8.3.3 Proposed Strategy for the Inclusion of Disadvantaged and Vulnerable Groups and Individuals

All subproject-related written or printed materials to be handed out at the subproject affected neighborhoods should be accessible to the disadvantaged and vulnerable groups and individuals under the subproject. Such materials should also be prepared easily understandably (non-technical).

Regular consultations will be held with all subproject stakeholders including such disadvantaged and vulnerable groups and individuals to inform them about subproject's impacts, construction schedule and the compensation they will be eligible for due to a subproject-related loss of land or livelihood.

The following methods shall be utilized specific to this stakeholder group:

- Female farmers shall be encouraged to participate in consultation meetings. If necessary, special focus group meetings shall be held. Moreover, female farmers shall be provided with additional training as necessary to inform them about how to Access financial instruments/grants.

- During the design of services and activities targeting individuals who are illiterate (farmers, workers etc.), their needs shall be considered in order to ensure they access the same information as those who are literate. Their participation in stakeholder activities shall also be encouraged.
- Hearing aid devices, accessible platforms and miscellaneous special trainings shall be provided to those disabled in accordance with their needs.
- Considering the lack of information and experience on the side of older farmers when it comes to accessibility, online tools, services and channels of communication, the necessary support shall be provided for the duration of the subproject in order to ensure their participation in the subproject and subproject activities.

The following measures will be taken in order to remove obstacles to full and enabling participation and access to information:

- Information provided face to face or by any other appropriate method specific to disadvantaged and vulnerable groups and individuals (e.g., visually impaired alphabet, sign language),
- Consultations conducted at locations that provide access to disadvantaged and vulnerable groups and individuals; and
- Any written or printed materials related to the subproject prepared in easy to understand (nontechnical) language and distributed as culturally appropriate.

8.3.4 Stakeholder Engagement Program

The stakeholder engagement program proposed to be implemented during the subproject implementation is tabulated in Table 8 below.

Table 8. Stakeholder Engagement Program

Subproject Stage	Target Stakeholder	Topic of Consultation	Methods Used	Responsibilities	Frequency/Timeline
Design	Farmers Irrigation union at the region Mukhtars NGOs at local or national level Practitioners of the guidelines, manuals, standard operational procedures that will be prepared	Scope of the subproject Anticipated E&S risks and impacts of the subproject Proposed mitigation measures	One to one meeting Focus group meetings	DSI including the design contractor	During the design of the subproject, regularly feeding the design scheme
Preparation of Resettlement Plans	Owners and formal or informal users of the lands that will be expropriated. People whose livelihoods will be affected due to subproject activities).	Livelihood assessment	One to one meeting Focus group meetings	DSİ in coordination with Municipalities/ Governorships	During the preparation of RPs
Construction	Owners and formal or informal users of the lands that will be expropriated. People whose livelihoods will be affected due to subproject activities).	Scope of the RPs Entitlements	One to one meeting Focus group meetings Brochures, bulletins, and newsletters	DSİ in coordination with Municipalities/ Governorships	During the implementation of the RPs
	Communities (and businesses) living within the area of influence of the subproject	Information about the subproject activities Potential E&S impacts and measures Timeline Grievance mechanism (“GM”) of the subproject	One to one meeting Focus group meetings Brochures, bulletins, and newsletters	Contractor	Regularly / During the implementation of the subproject
	Mukhtars	Potential E&S impacts and measures	One to one meeting	Contractor	Regularly - biweekly / During the

Subproject Stage	Target Stakeholder	Topic of Consultation	Methods Used	Responsibilities	Frequency/Timeline
	Manager of the Irrigation Union	Timeline Receiving opinions and concerns	Focus group meetings		implementation of the subproject
	Mukhtars Complainant(s) Manager of the Irrigation Union	Subject of grievance	One to one meeting Focus group meetings	Contractor DSİ	Upon grievances

8.4 Resources and Responsibilities for Implementation of Stakeholder Engagement Activities

All technical, operational, and personnel resources required for the implementation of all activities for stakeholder engagement will be directly financed by the Contractor within the scope of the subproject budget. This approach ensures that stakeholder engagement processes are implemented as planned, in a timely manner, and effectively.

An adequate budget will be allocated to carry out the subproject's stakeholder engagement activities. This budget will cover information disclosure, organization of consultation meetings, ongoing engagement with stakeholders, implementation of communication methods, and the provision of all necessary resources to ensure effective stakeholder engagement.

8.5 Grievance Mechanism

The grievance mechanism ("GM") developed within the scope of the subproject has been structured for both internal stakeholders (including the employees of Contractors, Subcontractors, and service providers) and external stakeholders (local community members, subproject-affected parties, and other interested parties).

The main objective of this dual mechanism is to enable all stakeholder groups to safely, accessibly, and transparently communicate their views, suggestions, and complaints regarding the subproject, and to ensure that all submissions are addressed systematically through defined resolution processes.

All views, suggestions, and complaints will be recorded through GM, an evaluation process will be initiated, and feedback will be provided to applicants. All submissions will be handled in line with the principles of confidentiality, impartiality, and transparency, and all processes related to the GM will be coordinated by the Contractor's social specialist under the supervision of the E&S Focal Points and PMT. The GM will be open, free of charge, and accessible to all stakeholders. Views, suggestions, and complaints will be addressed in a fair and transparent manner.

The internal grievance mechanism for will be made accessible to subproject personnel through training, as well as through grievance boxes and displayed contact information at work sites. The external grievance mechanism will be implemented through communication channels that are accessible, reliable, and easily understandable for the local community.

8.5.1 Grievance Management Process

The implementation steps of GM, defining the process from receipt of a views, suggestions, and complaints to its closure, together with the content of each step and the target timeframes are presented below.

Table 9. Grievance Mechanism – Implementation Steps

Step	Explanation for the Activities
1. Receipt and Registration of the Grievance	Opinions, suggestions, or grievances received from external or internal stakeholders, verbally, in writing, or online, are documented on the Grievance Record Form (See Appendix 5 - Grievance Record Form) on the day of receipt and recorded in the Suggestion/Grievance Tracking Log for monitoring.
2. Preliminary Review and Assessment	An initial assessment is conducted by the Contractor's social specialist to determine whether the submission is related to the subproject. If necessary, consultations are held with relevant units. If related, the applicant is informed that the submission has been accepted and the process has commenced. Target timeframe: within 3 business days of receipt. Records are kept in the Tracking Log.

Step	Explanation for the Activities
3. Determination of the Resolution Process	If valid and subproject-related, responsibilities are assigned and the resolution approach is planned. This is coordinated by the Contractor's social specialist in compliance with Project E&S standards and the subproject specific ESMP and TIMP-2's SEP. Target timeframe: within 5 business days of receipt. Records are kept in the Tracking Log.
4. Implementation of the Resolution	The planned resolution is implemented by the responsible parties. The Contractor's social specialist monitors and verifies implementation. Target timeframe: within 15 business days of receipt. Records are kept in the Tracking Log.
5. Provision of Feedback	If the applicant provided contact details, feedback on the resolution and improvements is communicated. If anonymous, the relevant mukhtar associated with the submission is informed. Target timeframe: within 20 business days of receipt. Records are kept in the Tracking Log.
6. Closure and Recordkeeping	Upon completion, the Grievance Closure Form (See Appendix 6 - Grievance Close Out Form) is completed and signed as evidence of agreement with the applicant, formally closing the case. Target timeframe: within 20 business days of receipt. Records are kept in the Tracking Log.
7. Non-Project-Related Submissions	If the submission is not related to the subproject, the applicant is informed accordingly. If anonymous, the relevant mukhtar is informed. Target timeframe: within 3 business days of receipt. Records are kept in the Tracking Log.

8.5.2 Communication Channels

The stakeholder grievance mechanism has been structured to be accessible to all stakeholders, primarily subproject affected parties and disadvantaged and vulnerable groups and individuals as well as other interested parties and internal stakeholders.

Opinions, suggestions, and complaints will be received through the following channels:

- Verbally, during consultation meetings and face-to-face engagements
- Grievance boxes placed at neighborhood headmen's offices and/or common areas within neighborhoods as well as Contractor's offices
- By telephone or e-mail, a telephone number and email address will be designated by the Contractor before the start of the construction and disseminated by the bulletins and flyers to the stakeholders.

Anonymous opinions, suggestions, and complaints will also be accepted and assessed in line with the same principles of confidentiality and impartiality applied to other submissions. However, in the case of anonymous submissions, individual feedback may not be provided.

Appendices

No.	Province	District	Neighborhood
1	Antalya	Manavgat	Sarılar
2	Antalya	Manavgat	Yukarı Işıklar
3	Antalya	Manavgat	Dolbazlar
4	Antalya	Manavgat	Şişeler
5	Antalya	Manavgat	Yeniköy
6	Antalya	Manavgat	Ilıca
7	Antalya	Manavgat	Çolak
8	Antalya	Manavgat	Kalemler
9	Antalya	Manavgat	Yavrudoğan
10	Antalya	Manavgat	Gündoğdu
11	Antalya	Manavgat	Kısalar
12	Antalya	Manavgat	Side
13	Antalya	Manavgat	Çayyazı
14	Antalya	Manavgat	Evrenseki
15	Antalya	Manavgat	Çeltikçi
16	Antalya	Manavgat	Ulukapı
17	Antalya	Manavgat	Şeydiler
18	Antalya	Manavgat	Aşağıışıklar
19	Antalya	Manavgat	Doğançam
20	Antalya	Manavgat	Aksaz
21	Antalya	Manavgat	Demirciler
22	Antalya	Manavgat	Karaöz