



SAKARYA GAS FIELD DEVELOPMENT PROJECT

CONTRACT NO: SC26-PRJ-PU-CNT-00179

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

Chapter 12 - Environmental and Social Management Plan

COMPANY Doc. No. SC26-OTC-PRJ-EN-REP-000026



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DEFINITIONS

COMPANY	Turkish Petroleum - Offshore Technology Center (TP-OTC)
CONSULTANT	WSP Golder Associates Turkey Ltd. Şti. (GOLDER)
PROJECT	Sakarya Gas Field Development (SGFD) Project
PROJECT OWNER	TPAO
PROJECT EXECUTOR	TP-OTC
ESMS	Environmental and Social Management System of the Company set forth to comply with IFC PSs and Equator Principles (EP) which comprises Health and Safety, Environment, Social and Security aspects including labor requirements.

ABBREVIATIONS

Abbreviation	Definition
AF	Associated Facility
AoI	Area of Influence
BOTAŞ	Turkish Petroleum Pipeline Corporation
HSSE	Health, Safety, Social and Environment
EIA	Environmental Impact Assessment
EP	Equator Principles
EPCI	Engineering, Procurement, Construction and Installation
EPRP	Emergency Preparedness and Response Plan
E&S	Environmental and Social
EPRP	Emergency Preparedness and Response Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMPs	Associated E&S sub-management plans
ESMS	Environmental and Social Management System
ETL	Energy Transmission Line
EU	European Union
FMS	Fiscal Metering Station

Abbreviation	Definition
GIIP	Good International Industrial Practices
IFC	International Finance Corporation
KPI	Key Performance Indicator
MEG	Mono-Ethylene Glycol
MoC	Management of Change
N-CF	Non-Conformity
N-CP	Non-Compliance (N-CP)
OBS	Observation
OHS	Occupational Health and Safety
OPF	Onshore Processing Facility
PETKİM	Petkim Petrochemical Holding Corporation
RSA	Regional Study Area
SEP	Stakeholder Engagement Plan
SGFD	Sakarya Gas Field Development
SOP	Standard Operating Procedure
SO₂	Sulphur Dioxide
SPS	Subsea Production System
SURF	Subsea Umbilical, Risers and Flow Lines
TPAO	Turkish Petroleum Corporation
TP-OTC	Turkish Petroleum Offshore Technology Center
TÜPRAŞ	Turkish Petroleum Refineries Corporation

12.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

12.1 Introduction

This Environmental and Social Management Plan (ESMP) identifies and presents the framework and the strategy for implementing and improving the Environmental and Social Management System (ESMS) of the Sakarya Gas Field Development Project (SGFD Project or the Project), planned by Turkish Petroleum Corporation (TPAO or Project Owner) to extract, transport to shore and process the natural gas discovered in the Sakarya Gas Field, in the exclusive economic zone of Turkey, off the Western Black Sea Region. Turkish Petroleum Offshore Technology Center (TP-OTC or Project Executor), 100% owned by TPAO will be conducting Project Management and Engineering, Procurement, Construction, and Installation (EPCI) for the Project.

The ESMP is an integral part of the ESIA as it is a system setting document for the Project and its contractors and represents a commitment towards environmental and social sustainability applied to the Project's entire life cycle. The ESMP is an overarching document developed in accordance with the corporate Parent (TPAO) and Subsidiary Company (TP-OTC) Integrated Management System (IMS) policies and TPAO Sustainability policy, including the SGFD Project specific HR Policy and Procedure, with the commitments included in the Environmental and Social Impact Assessment (ESIA) and, more broadly, with the Turkish regulatory framework relevant to the Project as well as with the E&S Standards that apply to the Project. These include the IFC Performance Standards (IFC PS) and IFC General and Sector Specific Environmental, Health and Safety (EHS) Guidelines, and Equator Principles (EP) IV. The Project ESMP consists of several sub-management plans as demonstrated further in Table 1, in which the ESIA mitigation measures are reflected and compliance with applicable Project legislation, standards and limits are ensured.

The ESMS of SGFD Project defined within this ESMP, is developed and under continuous improvement to ensure the appropriate management of environmental and social risks to meet the objectives set by existing TPAO/TP-OTC policies and directives regarding E&S. Environmental and social management system at all phases is required to meet national, international standards, best practices, and Projects' documents and requirements. Referring to the integrated policies, there are targets to achieve the Projects with zero waste, zero incidents, and full respect for human including vulnerable groups. While implementing the SGFD Project ESMS as defined within the scope of this ESMP, the integrated management system of TPAO/TP-OTC, which are namely based on the Plan-Do-Check-Act Cycle as illustrated below is adhered to throughout the Project lifecycle.



Figure 12-1: ISO 14001:2015 Plan-Do-Check-Act Cycle (PDCA) (IFC, 2015)

Plan: Confronts identifying and analysing the risks and objectives

Do: Means developing and implementing a potential solution

Check: Measuring how effective the solution was, and analysing whether it could be improved

Act: Confronts implementing the improved solution.

There are nine elements of ESMS that helps to assess, control and continually improve the E&S performance as part of the PDCA cycle, The Project ESMP has to be in compliance with these elements.



Figure 12-2: Elements of ESMS (IFC, 2015)

The E&S mitigation measures defined in the ESIA process were transposed into a Commitments Register (Chapter 12.9) serving as a tool which informs this ESMP as well as the associated ESMS planning and

processes to be implemented at the various levels of the Project organization to ensure that the Project requirements, regulations and standards are met.

A key objective of the ESMP is to “operationalise” the E&S (including occupational health and safety) commitments and mitigations as identified in the ESIA to ensure that the Project (including construction, operation, and decommissioning) is undertaken in a way to minimise the negative impacts on the physical, biological, and social environments in the Project-affected area.

More specifically, the ESMS defined within this ESMP will:

- Establish environmental and social management standards that comply with or surpass Good International Industrial Practices (GIIP) and reasonable community expectations
- Adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize and restore E&S impacts
- Develop and implement policies, plans and procedures to integrate E&S aspects within the overall project management framework throughout its lifecycle
- Facilitate the implementation of management plans as defined by the ESIA for the avoidance, minimisation and control of E&S impacts
- Inform Project personnel about their responsibilities with respect to E&S issues and to monitor the manner in which those responsibilities are implemented
- Train project personnel, contractors and community representatives, as necessary, in relevant environmental and social procedures, actions, and monitoring programmes
- Establish a monitoring programme to assess the effects of residual impacts on the environment and monitor the ESMS performance and
- Provide for periodic system audits and identify corrective actions, if necessary, to reach the planned objectives.

The Project ESMP includes a set of associated E&S sub-management plans (ESMPs) as listed in Table 12-1, which have been prepared for addressing specific E&S issues. The ESMPs will provide details of the actions that will be taken by TP-OTC during the construction phase and, later, during operations to mitigate and manage Project’s E&S impacts and risks. This ESMP outlines how the Project will monitor, how external contractors will address and manage E&S risks and impacts generated by their activities in line with the mentioned standards. The Project ESMP also includes tools for auditing and monitoring the Project’s performance and communicating monitoring outcomes to stakeholders.

Additional details related to the operation phase of the Project are expected to be developed in due course. Accordingly, this Project ESMP will be subject to revisions before the start of operations to encompass and consider any new information relevant to the management of E&S impacts and risks. The purpose of this ESMP is to define:

- The scope of the ESMS during the construction and operation phases
- The standards applied to the Project ESMS during the construction and operation phases
- Responsibilities and commitments, for the implementation of the ESMS

- The framework for the definition and implementation of the mitigation measures applicable to the Project
- The framework for the definition, implementation and management of the monitoring activities and
- The framework for the review of the environmental and social performance and of the adequacy of the ESMPs.

The Project ESMP will apply to normal operating conditions during the construction and operation activities. Emergency situations resulting from unplanned events will be addressed in a specific Emergency Preparedness and Response Plan (EPRP), also an element of the ESMS.

Although TP-OTC will have full control and ultimate responsibility on the construction and operations of the Project, a number of contractors will be retained for carrying out different activities that will have to maintain their own ESMS, while incorporating the Project ESMPs into their own project-specific ESMP aligned with the provisions included in this Project ESMP and in the ESIA developed for the entire Project.

12.2 Project Description

The Sakarya Gas Field is located within the Sakarya Gas Field Block C26 in the western Black Sea Region, approximately 155 km offshore Filyos (Zonguldak), Turkey. The Sakarya Gas Field is the first deep-water gas field discovery and the biggest natural gas reserve in the country. It is anticipated that 30% of the domestic natural gas demand will be met by the SGFD Project with the first production from the field planned in the first quarter of 2023.

The SGFD will allow to extract, transport to shore and process the natural gas discovered in the Sakarya Gas Field and the natural gas reserves to be discovered through the ongoing exploration. The Project consists of three main units, including the subsea production facility in Sakarya Gas Field, in the exclusive economic zone of Turkey, the onshore production facility in Filyos Industrial Zone in the Çaycuma district of Zonguldak province, and the marine and coastal transition subsea pipelines and umbilical laying connecting these two units.

The Project investment will be realized in two phases, Phase 1 and Phase 2:

- Under **Phase 1**, natural gas to be produced with the Subsea Production System (SPS) from 10 wells in Sakarya Gas Field will be transported to the onshore through a 16-inch (40.64 cm) diameter carbon steel pipeline, processed at the Onshore Production Facility (OPF). In addition, 10.75-inch (27.3 cm) Monoethylene glycol (MEG) pipeline and an umbilical will be installed to operate the production system. In Phase 1, the daily production capacity will reach a maximum of 10 million standard m³.
- Under **Phase 2**, the natural gas whose production will continue in Sakarya Gas Field will be connected to the SPS with up to 30 additional wells, transported to onshore with pipelines and processed in the OPF. With Phase 2, production will be realized from a total of up to 40 wells. A pipeline with a diameter of 24 inches (60.96 cm) or above will be needed to transport the gas produced in Phase 2. It is expected that the MEG pipeline to be installed in Phase 1 will be sufficient for both phases.

Once processed at the onshore production facility, the gas will be measured at a Fiscal Metering Station (FMS) and offloaded to the national grid via a ~36 km onshore pipeline. Both the FMS and the onshore pipeline are designed, constructed, and operated by Petroleum Pipeline Company (BOTAŞ) and, in line with the OECD and IFC Performance Standards definition, have been considered as Associated Facilities (AF) to the main Project.

Because TPAO/TP-OTC and BOTAŞ are under the jurisdiction of same Ministries, their governing structure is different. They are working as autonomous due to the legislative responsibilities of each company clearly defined

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as separate. As, their management systems are independent from each other, a protocol to enable collaborative management of the environmental, health, safety and social (EHSS) issues for the SGFD is being prepared. In the meantime, considering that some construction works have already begun at the time of writing this document, it has been agreed among all parties involved in the Project to address the FMS and the onshore pipeline section through a high-level E&S Assessment Report to identify key environmental and social risks and a Management and Corrective Action Plan with a list of site-specific mitigations measures focused on the construction phase of both the pipeline and the FMS¹. BOTAŞ' has an ESMS aligned with ISO Management Systems and several Project-specific documents to address environmental and OHS issues. However, the documentation is independent of each and requires an overarching document that covers the FMS and the ~36 km onshore pipeline. As construction is ongoing and to achieve compliance with the requirement of PS1, it has been agreed that the as an AF to SGFD, the SGFD ESMP and the associated sub-management plans and procedures will be expanded to include the BOTAŞ Project, as required.

The key project components under Phase 1 include three main units:

- Subsea Production System (SPS) in Sakarya Gas Field
- Onshore Production Facility (OPF) and
- Two offshore pipelines for gas transportation from field to OPF and MEG transportation from OPF to field, and an umbilical, all including shore crossings

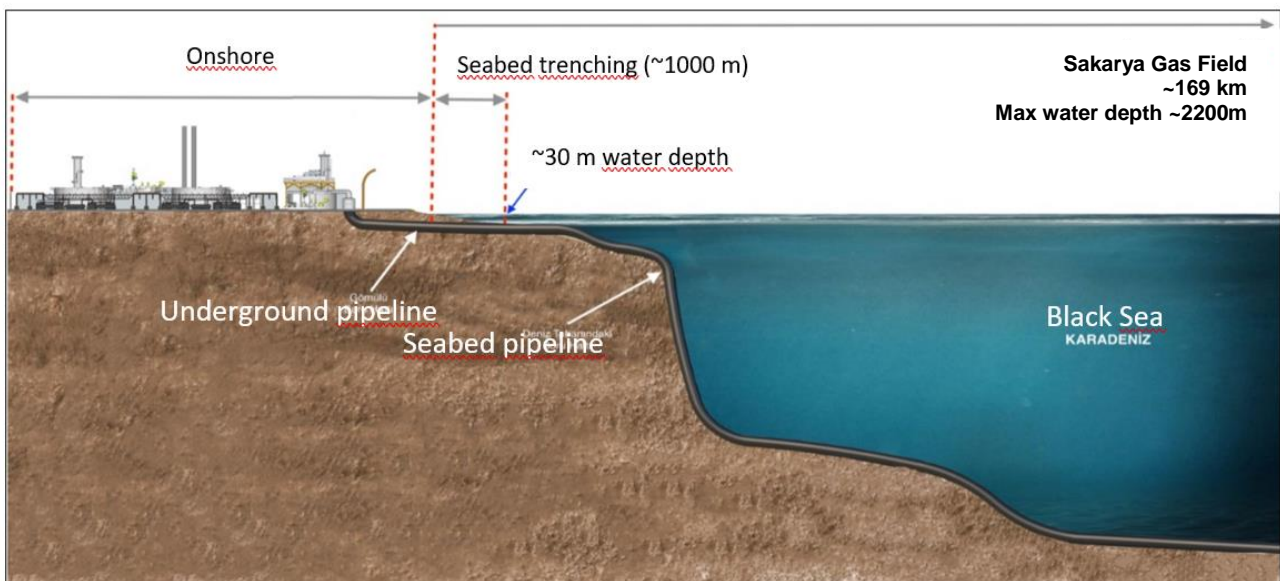


Figure 12-3: Illustration of Main Project Units

Details on each Project components/units are provided in the ESIA:

- Chapter 3.2 - Subsea Production Facility (SPS) Unit
- Chapter 3.3 – Subsea Pipelines and Umbilical, including shore crossings (SURF)

¹ See ESIA Appendix A

- Chapter 3.4 -Onshore Processing Facility (OPF) Unit:
- Chapter 3.5 - Transformer Station and Energy Transmission Line and
- Chapter 3.6- Construction Camp sites and Permanent Lodgings

The present ESMP deals with the Phase 1 of the Project, whose detailed description is included in Chapter 3 of the ESIA. Project location map is given in Figure 12-4.A layout showing the main components of the SGFD Project and BOTAŞ FMS and onshore pipeline is presented in Figure 12-5.

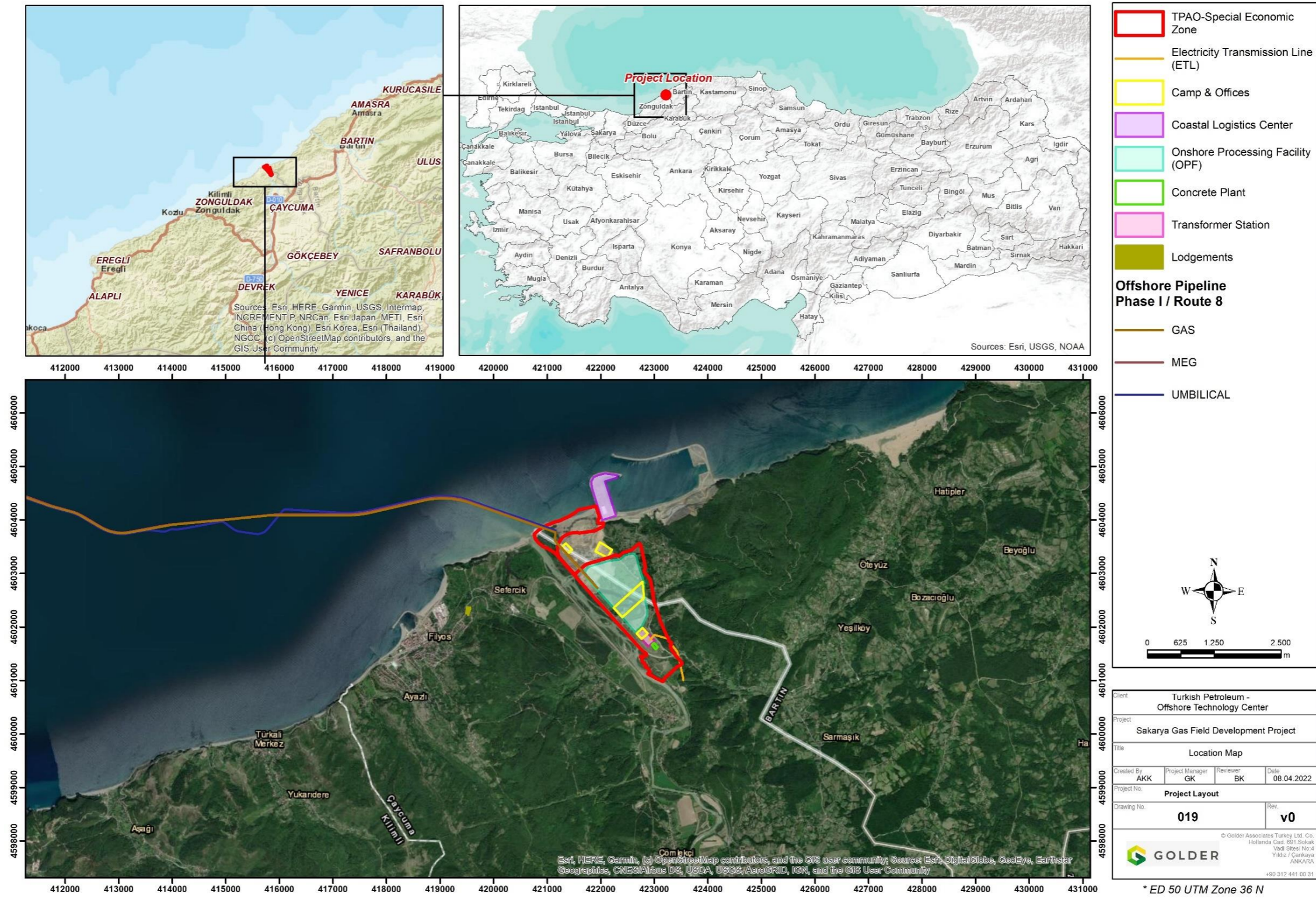


Figure 12-4: Site Location Map

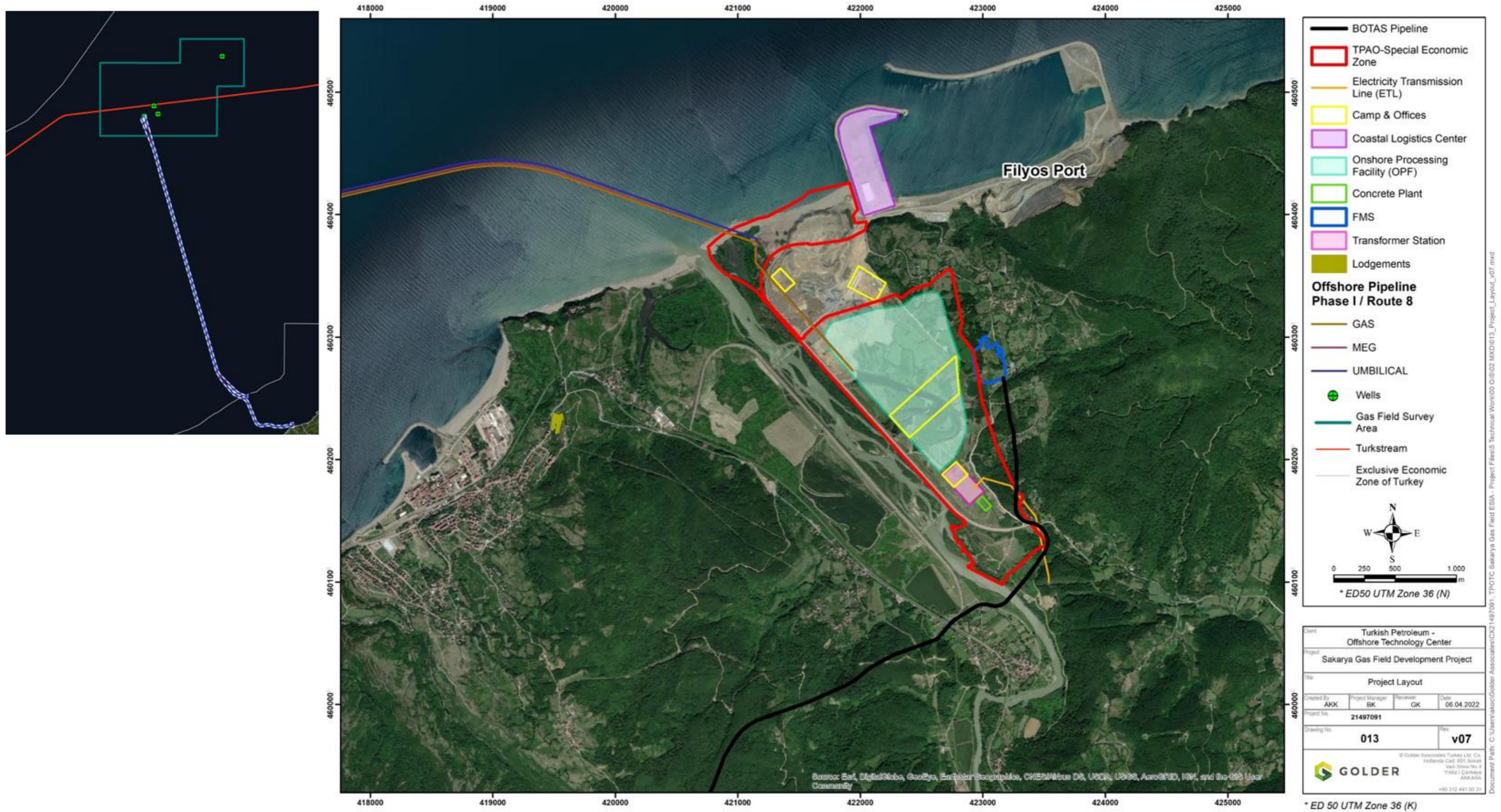


Figure 12-5: Sakarya Gas Field Development Project, BOTAS FMS and Pipeline Layout

12.3 Background on TPAO/TP-OTC

TPAO has been established in 1954 to perform hydrocarbon exploration, drilling, production, refinery and marketing activities on behalf of the Turkish Republic with the Law No. 6327. TPAO continued exploration, production, refining, marketing and transportation activities until 1983 as an integrated oil company, acting as a state-owned exploration and production oil company. In 1983 the relevant legislation framework was changed and TPAO has merged 17 oil&gas and petrochemicals companies such as PETKİM, TÜPRAŞ and PETROL OFİSİ².

TP-OTC was founded on 12 March 2019 upon a Resolution of the Board of Directors of the main company TPAO, which conducts and supports petroleum and natural gas exploration and production activities at the seas of Turkey. The name TP-OTC was registered on 2 April 2019 following this resolution, and the Company was structured specifically for the conducting of maritime operations³. TP-OTC, 100% owned by TPAO, will be conducting Project Management and EPCI for the Project. The Figure below represents the Company structure and the key roles for the management and development of the Project.

² <https://www.tpao.gov.tr/en/about-tpao>

³ <https://tp-otc.com/en/about-us/>

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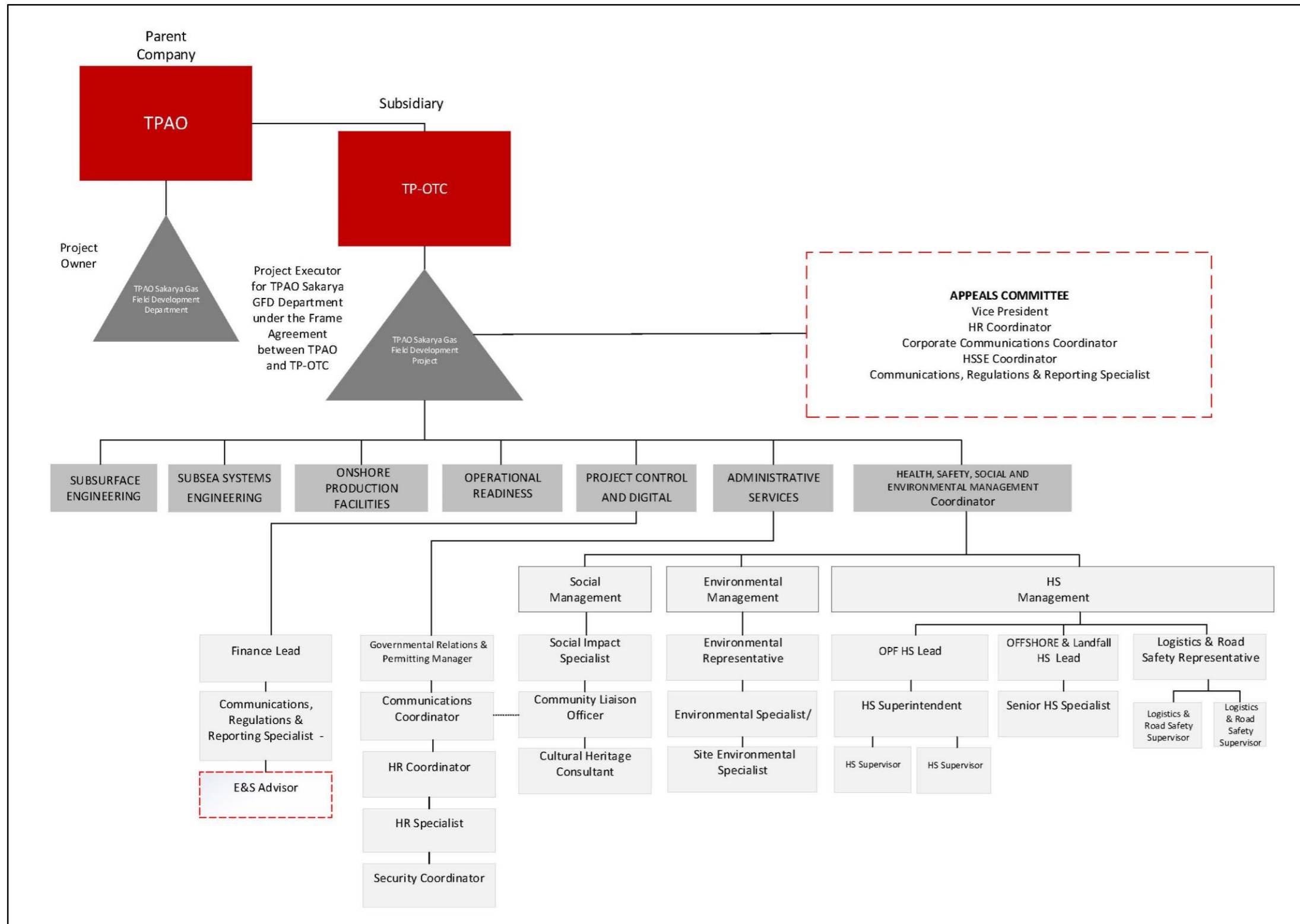


Figure 12-6: Organization Chart

12.4 Legal, Regulatory and Policy Framework

This section provides an overview of the national and international regulatory framework, including policies, standards and requirements that underpin the -ESMP and are applicable to the Project during the construction and operation phases. In the presence of multiple standards coming from different regulatory sources, the Project is expected and aims to attain whichever is more stringent amongst national standards and other internationally recognized requirements. Because the Project is seeking finance from a pool of international financial institutions, the Project is also expected to meet the IFC PSs, associated Guidance Documents, IFC Sectoral and General EHS Guidelines, EP IV.

The most stringent standards amongst those applicable have been adopted as Project Standards against which the -ESMP performance will be measured. A detailed overview of the standards applicable to the Project is provided in the ESIA – Chapter 2 – Regulatory Framework. A list of regulations currently in force and applicable to the context of the Project are outlined in Appendix B of the ESIA. A preliminary list of potentially applicable limits and criteria derived from the applicable requirements are presented in Appendix C for each environmental component.

The following sections provide an overview of the key requirements.

12.4.1 Applicable Turkish Legislation

The Turkish legal framework for environmental protection was developed in line with national and international initiatives and standards, and some of them have been revised recently to be harmonized with the EU Directives in the scope of pre-accession efforts of Turkey to the EU. The Turkish Environment Law No. 2872 dated 1983 set the general framework of the environmental requirements for the protection of the environment. It has a comprehensive structure that has a holistic and integrated vision for the environment. “Polluter pays” and “user pays” principles and carrying capacity concepts form the basis of regulatory tools in the Environmental Law. The Law is supported by numerous regulations and decrees prepared / updated in the process of alignment with EU legislation.

12.4.2 Applicable International Legislation

Turkey is a party to many international agreements regarding multiple social and environmental subjects. These are listed in ESIA – Chapter 2 - Regulatory and Policy framework and their applicability is discussed further in the relevant chapters of this ESIA. Turkey has also ratified a number of international European, United Nations, and ILO conventions on several topics including labour conditions and human rights.

The following international standards are also applied to the Project:

- Equator Principles IV (2020)
 - Principle 1: Review and Categorization
 - Principle 2: Environmental and Social Assessment
 - Principle 3: Applicable Environmental and Social Standards
 - Principle 4: Environmental and Social Management System and Equator Principles Action Plan
 - Principle 5: Stakeholder Engagement
 - Principle 6: Grievance Mechanism
 - Principle 7: Independent Review
 - Principle 8: Covenants

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- Principle 9: Independent Monitoring and Reporting
- Principle 10: Reporting and Transparency.
- IFC Performance Standards (2012):
 - Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
 - Performance Standard 2: Labour and Working Conditions
 - Performance Standard 3: Resource Efficiency and Pollution Prevention
 - Performance Standard 4: Community Health, Safety, and Security
 - Performance Standard 5: Land Acquisition and Involuntary Resettlement
 - Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
 - Performance Standard 7: Indigenous Peoples (not applicable to the Project)
 - Performance Standard 8: Cultural Heritage
- IFC General EHS Guidelines (2007)
- IFC EHS Guidelines for Onshore Oil and Gas Development (2007)
- IFC EHS Guidelines for Offshore Oil and Gas Development (2015)
- IFC EHS Guidelines for Electric Power Transmission and Distribution (2007)
- IFC EHS Guidelines for Shipping (2007)
- Performance Indicators and Monitoring, Documents Pertaining to Human Rights (2012)
- Other IFC Guidelines:
 - IFC’s Good Practice Note on Addressing Grievances from Project-Affected Communities (2009)
 - IFC’s Good Practice Note on Managing Contractors’ Environmental and Social Performance (2017)
 - IFC’s Good Practice Handbook on Use of Security Forces: Assessing and Managing Risks and Impacts (2017)
 - IFC’s Introduction to Health Impact Assessment (2009)
 - IFC and EBRD’s Guidance Note on Workers’ Accommodation: Processes and Standards (2009)
 - IFC’s Good Practice Handbook on Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets (2013) and
 - Interim Advice for IFC Clients on Supporting Workers in the Context of COVID-19.

12.5 ESMP

The Project ESMP (this document) is structured to present the pillars of the ESMS that TPAO/TP-OTC has established for the SGFD Project, referring to the existing overarching integrated management system documents and consisting of the newly prepared documents:

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- Corporate Policies and Directives such as Integrated Management System Policy of TPAO&TP-OTC in compliance with ISO 9001, ISO 14001 and ISO 45001, HR Directive of TP-OTC, Sustainability Policy of TPAO,
- Project specific HR Policy and Procedure
- Risks and impacts identification process (the ESIA)
- Management of Change (MoC) procedure of the Project
- Environmental and Social Management Plan (ESMP) (this document) including the ones listed in Table 1.
- Organisational Capacity and Competency (Figure 4)
- Communication to and engagement with stakeholders (Project SEP as disclosed on the TP-OTC website)
- Emergency Preparedness and Response
- Monitoring and review.

The selected contractors and subcontractors are required to develop their own ESMPs incorporating the requirements of the Project ESMPs defined and prepared as per the ESIA requirements. They have to follow these documents, including E&S plans and procedures while working for the Project. Such plans and procedures are reviewed and approved by TP-OTC for construction and operations to assess their alignment with the Project ESMS.

The following sections of this chapter include an overview of the elements that constitute the Project ESMS.

12.5.1 Environmental and Social Policies

TP-OTC is committed to developing an overarching Project-specific ES policy to provide a strategic direction for all Project’s activities. The policy will build upon the existing sustainability policy adopted by TP-OTC at corporate level. The policy will be consistent with the National legislative requirements and the applicable standards. TP-OTC will ensure that all employees across its Project organization are familiar with the policy and procedure. The Policy requirements will also be extended to Contractors, through a contractually binding agreement.

12.5.2 Risks and Impacts Identification Process

E&S aspects and impacts associated with the Project have been identified and evaluated as part of the ESIA process as summarized in Figure 3. Details on full impact assessment methodology used are provided in the ESIA – Chapter 5 – Methodology.

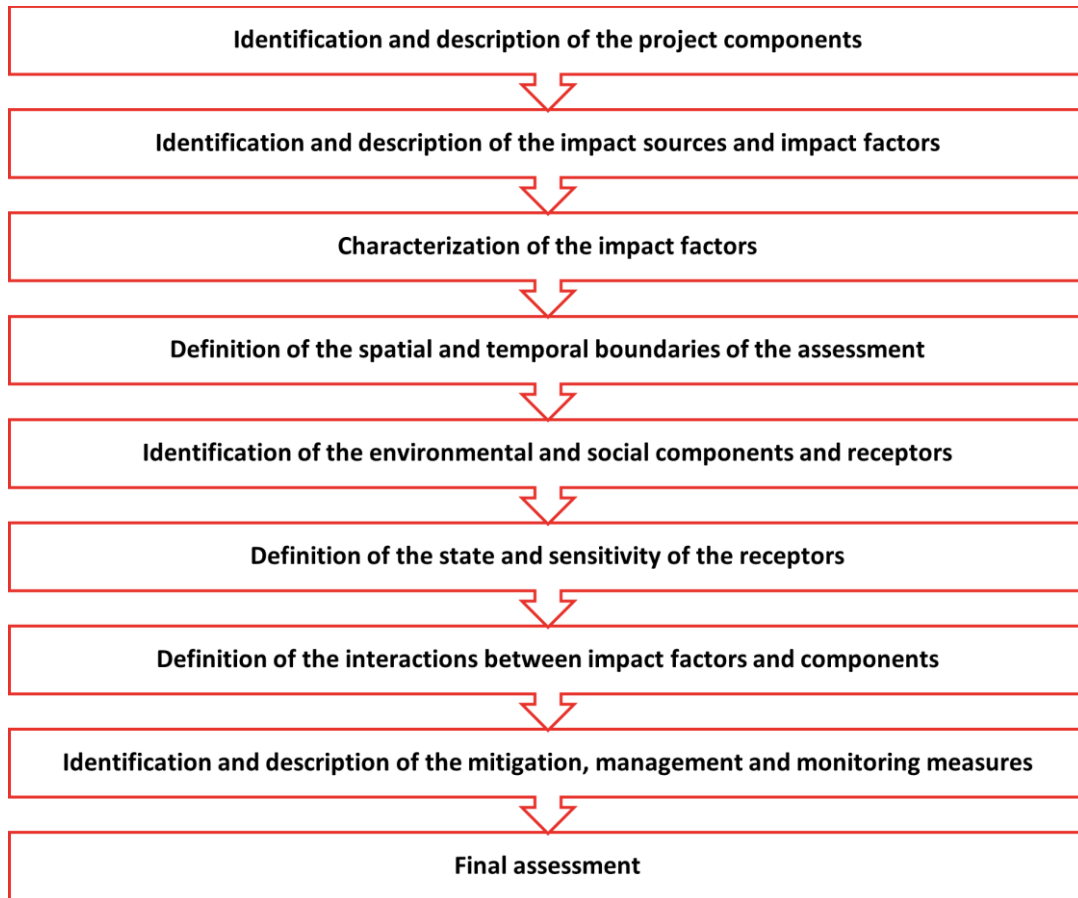


Figure 12-7: Impact Assessment Approach

The ESIA resulted in the identification of E&S risks and potential impacts’ factors for which specific mitigation measures were identified to mitigate the effects of the impact factors. The ESIA was prepared in accordance with both National Regulations and applicable international standards. The ESIA process included the following steps:

- Review of available Project and environmental and social documentation
- Gap Analysis Study with a preliminary independent opinion on the Project’s E&S risks/aspects as well as the adequacy of the assessments carried out and the plans and procedures developed to manage the impacts from the Project in compliance with applicable IFIs’ E&S Policies and Standards. The results of the initial Gap Analysis Study identified the need for additional baselines and to re-evaluate the outcomes of the national EIA carried out to achieve full compliance with lenders’ standards
- Site visits to the SGFD Project and associated facility to see the different project areas and meet/work close with the TP-OTC team
- Onshore biological and physical baselines and offshore baselines surveys have been performed for physical (air quality, noise and vibration measurements at sensitive receptors, soil, groundwater, surface water, sediment, seawater quality sampling) and biological (aquatic fauna, flora, terrestrial fauna, benthic, eDNA) components to provide an understanding of the environmental context in the Regional Study Area (RSA) and in the Area of Influence (Aol) of the Project prior to its realization

- Biodiversity Action Plan and Biodiversity Management Plan for the onshore dune area to define the appropriate actions (mitigation measures) for dealing with potential impacts to biodiversity during the site preparation and construction phases of the Project in this area
- Separate preliminary mitigation reports have been prepared for the construction activities in the coastal water and in proximity of the coastal lake/pond and Filyos river area and along the route of the energy transmission line to allow the implementation of the Project according to the schedule
- A Stakeholder Engagement process has been carried out including community level surveys, fisheries surveys, focus group discussions, key informant interviews
- A high-level E&S Assessment Report⁴ relevant to the Fiscal Metering Station (FMS) and the 36 km onshore pipeline developed and under the responsibility of BOTAŞ that according to IFC PS1 are Associated Facilities of the SGFD Project and as such need to comply with the same lenders' requirements. The high-level E&S Assessment Report identified key environmental and social risks and a Management and Corrective Action Plan with site-specific mitigations measures focused on the construction phase of both the pipeline and the FMS
- The ESIA report: an ESIA report has been prepared and finalized in August 2022. The ESIA report includes the results of the ESIA process carried out as well as an assessment of Project's adverse and positive impacts and includes mitigations measures that will be the basis for the preparation of ESMPs, a component of the Project's ESMS. The ESIA report includes a Non-Technical Summary (NTS) prepared for disclosure.

12.5.3 Management of Change

The SGFD Project develops a system comprising adequate tools and procedures for the identification of future risks and impacts that may result from Project changes and be different or additional to those that have already been identified in the ESIA. Such risks and impacts are managed via the TP-OTC SAP MoC process screens. MoC process consists of injury/health, environment, damage etc related risks & impacts, which are assessed on 1-5 level scale (Starting from 1-Insignificant to 5 Catastrophic/Severe)

Specifically, TP-OTC develops a standalone MoC Procedure occur during the Project development and the like. The purpose of the MoC is to evaluate the impacts of changes in the Project and track the necessary information to effectively manage the consequences of the change on environmental and social components inside the Project's area of influence. The key principles of the MoC will include:

- Manage permanent, temporary and urgent/emergency changes to procedures or process equipment
- Provide for screening tools and procedures for an evaluation of the proposed change and of its consequences in terms of E&S risks and impacts in the area of influence of the Project
- Provide for procedures to assess impacts and risks generated by the change and to evaluate if they could generate additional risks and impacts than those identified in the ESIA process. In case of differences, the MoC will have to provide additional or enhanced mitigations to be included in the ESMPs to mitigate the risks associated to the change

⁴ See ESIA Appendix A

- Include provisions for communication of the proposed change and its consequences / new management requirements to personnel whose job tasks may be affected by the change and who may require training prior to implementing the change
- Monitor that all critical documentation remains up to date with changes as they are implemented.

TP-OTC will have to structure its 1-5 level scale MoC assessment process and compiling changes under below specified significance level:

- **Level III: Higher significance**, where a significant change, outside the ESIA scope/study area, is reasonably likely to have significant adverse impacts which are not mitigated by the existing ESMP and mitigation measures. An addendum to the ESIA, and a formal submission and approval process, may then be required and triggered. Changes in the Project standards will also fall within this category. Level III changes will also require revise / updating the ESMP and the ESMS
- **Level II: Moderate significance**, where the change is deemed to be material to the ESIA findings and is inside the scope/study area covered by the ESIA. This may require minor changes to the ESMP and additional surveys or environmental and social assessments, as needed and
- **Level I: Minor significance**, where the change is largely deemed to be immaterial to the ESIA findings and does not affect the Project’s ability to meet E&S performance requirements through the existing ESMP and ESMS. This change may require limited or no additional environmental or social study or survey activities.

For level III and II changes, likely requiring an ESMP update, all necessary stakeholders will need to be notified of such changes. Workers or other parties that have a role in implementing measures to manage the effects of any changes will have to be trained to understand the change implications and their ability to respond.

12.5.4 Environmental and Social Management Plans

TP-OTC has developed a set of ESMPs and procedures consistent with their policies and commitments, addressing the environmental and social impacts and relevant mitigation measures identified in the ESIA for each component. The full set of ESMPs that will be prepared and implemented for fulfilling the commitments undertaken by the Project are presented in the table below with the relevant IFC PSs that each will contribute to comply with.

Table 12-1: ESMPs

Relevant IFC PS	Plans / Procedures
IFC PS1 5-24: Assessment and Management of Environmental and Social Risks and Impacts	<ul style="list-style-type: none"> ■ ESMP - (this document) ■ Training Plan ■ Stakeholder Engagement Plan
IFC PS2: Labour and Working Conditions	<ul style="list-style-type: none"> ■ Human Rights Management Plan ■ Camp Site Management Plan ■ Offsite Accommodation Plan ■ Labor Management Plan ■ Contractor Management Plan ■ Human Resources Procedures

Relevant IFC PS	Plans / Procedures
	<ul style="list-style-type: none"> ■ Covid-19/Pandemic Management Plan ■ Retrenchment Plan
IFC PS3: Resource Efficiency and Pollution Prevention IFC EHS Guidelines	<ul style="list-style-type: none"> ■ Resource Efficiency Management Plan ■ Pollution Prevention Plan (e.g., air, noise, wastewater, soil, ground water contamination, hazardous material management, etc.) ■ Waste Management Plan ■ Reinstatement Management Plan ■ Soil Management and Erosion Control Plan
IFC PS4: Community Health, Safety, and Security IFC EHS Guidelines	<ul style="list-style-type: none"> ■ Influx Management Plan ■ Traffic Management Plan ■ Community Health, Safety and Security Management Plan ■ Emergency Preparedness and Response Management Plan
IFC PS5: Land Acquisition and Involuntary Resettlement	<ul style="list-style-type: none"> ■ Livelihood Restoration Plan
IFC PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	<ul style="list-style-type: none"> ■ Biodiversity Management and Reinstatement Plan
IFC PS7: Indigenous Peoples	<ul style="list-style-type: none"> ■ Not applicable
IFC PS8: Cultural Heritage	<ul style="list-style-type: none"> ■ Cultural Heritage Plan (including Chance Find Procedure)

The ESMPs will be implemented:

- across the TP-OTC Project organization, including, contractors, subcontractors and primary suppliers over which TP-OTC has control or influence
- inside the Project Area of Influence including the associated facilities (as defined by IFC PS1: “facilities that are not funded as part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable”).

ESMPs will provide the objectives of the document, the reference legal requirements, roles and responsibilities for its implementation, links to other management plans as necessary, a list of the mitigation measures, monitoring and reporting requirements, identify qualitative or quantitative Key Performance Indicators (KPIs) and measures to be used to monitor the effectiveness of the mitigation measures identified during the impact assessment process, training requirements as needed.

Besides a similar structure, the level of detail and complexity of each management plan will be commensurate with the expected impacts and risks of the Project as identified in the ESIA. Each management plan will include the mitigation measures identified in the relevant sections of the ESIA and will be disclosed to the stakeholders as provided by the SEP. The ESMPs will be shared with all contractors to ensure they will develop their own

equivalent management plans, procedures and work instructions aligned with the ESMP with additional mitigation measures specific to their activities, as needed.

12.6 Organisational Structure and Competency

12.6.1 Resources, Roles, Responsibility and Authority

The implementation of the ESMS requires that all Project parties involved (TP-OTC, contractors, and subcontractors) in the development of the Project (both construction and operation phases) define dedicated organizational structures with clearly identified responsibilities for managing Environmental and Social (including Health & Safety aspects as per IFC PSS) aspects. Illustration of the organization chart showing Project Parties is given in Figure 12-6. An overview of the key roles and positions is outlined below. These are to be considered general descriptions that TP-OTC will further articulate and expand in due course, identifying the exact number and nature of positions and staff to be employed.

Table 12-2: Roles and Responsibilities

Role	Overall responsibilities	Specific responsibilities
TP-OTC Management	<ul style="list-style-type: none"> ■ Provide strategic E&S direction across the Project. ■ Oversee and monitor the implementation of the ESMPs. ■ Approve contractor's document / plan / procedure prepared and ensure they are aligned with the TP-OTC ESMS requirements. ■ Monitor that sufficient and qualified resources are allocated for the ESMS implementation. ■ Monitor that clear and specific roles and responsibilities are defined at all levels of the organisation involved in the plan implementation. 	<ul style="list-style-type: none"> ■ Ensure that sufficient and qualified resources (including financial) are allocated across the different work streams to ensure an effective implementation of the mitigation measures included in the ESMPs. ■ Ensure that all contractor(s) are qualified to carry out their tasks and have in place an effective ESMPs aligned with those developed by TP-OTC. ■ Ensure that qualified specialists are appointed to supervise E&S aspects on the ground. ■ Sign off this ESMP -and the related ESMPs as well as those developed by contractors and subcontractors' plans.
TP-OTC Site Personnel (Supervisors)	<ul style="list-style-type: none"> ■ Monitor that Project -ESMP documentation is maintained and implemented. ■ Work with contractors to monitor that their Project specific ESMP is in-line with the Company ESMS and this ESMP and support when gaps are identified. ■ Monitor the implementation of the ESMP by contractors. 	<ul style="list-style-type: none"> ■ Provide day-to-day advice and guidance on all Project E&S requirements, including to contractors. ■ Conduct training and awareness programmes with personnel involved in the ESMP implementation, as needed. ■ Monitor that this Framework and related ESMPs are up to date and appropriate to the nature and scale of the Project's activities and ensure they are implemented effectively. ■ Ensure HSSE audits are carried out across the different construction areas to ensure contractors effectively implement the mitigation measures identified. Maintain records of all non-conformances raised and take appropriate actions to

Role	Overall responsibilities	Specific responsibilities
		<p>ensure corrective measures are implemented.</p> <ul style="list-style-type: none"> Collect and perform QA/QC review of all monitoring data and develop performance monitoring reports (including those provided by specialized contractors) for Management, stakeholders, and Lenders.
Contractors and Subcontractors Management	<ul style="list-style-type: none"> Ensure that each contractor has in place an -ESMP aligned with the SGFD Project ESMP and relevant management plans commensurate to the risks associated to the contractor's activities. Monitor the ESMP implementation and check performance. Follow up on on-compliance identified until their closure. 	<ul style="list-style-type: none"> Ensure the workforce is trained for the specific tasks assigned and implement the HSSE requirements included in the ESMPs and in line with contractual arrangements. Provide relevant monitoring data and reports of the monitoring activities carried out as requested by TP-OTC. Propose changes and integrations to the monitoring activities included in this manual and in the related ESMPs if they do not fit the specific activities carried out.
All employees and contractors	<ul style="list-style-type: none"> Be aware of the requirements included in the different management plans as needed by the relevant work task assigned. 	<ul style="list-style-type: none"> To comply with environmental management requirements. Report on any activities which represents a deviation from or a non-compliance with the ESMS requirements. Implement the mitigation measures identified in the ESMPs during execution of the works.

Job-specific roles and positions together with job descriptions and responsibilities will be further described within the individual ESMPs. In alignment with the requirements of IFC PS1, TP-OTC will ensure that job-specific training (see next section on *Training, Awareness and Competence* for additional details) will be in place to ensure that all employees are qualified and aware of the policies and procedures. Likewise, TP-OTC will require that contractors and subcontractors have appropriate training for all their employees operating on the Project. Such training will include a minimum the following:

12.6.2 Training, Awareness and Competence

TP-OTC will provide appropriate HSSE training programmes to all their managers and employees commensurate with the tasks they are assigned to ensure that:

- All staff is aware of the HSSE risks associated to the Project and of the need to implement the ESMP, the requirements therein, and that failure in the implementation of these requirements may lead to significant HSSE impacts and a breach in the commitments taken by the SGFD Project to be aligned to Lenders' requirements
- Staff with direct responsibility for the Project's HSSE performances have the adequate knowledge, skills, and experience to perform their duties and are familiar with the applicable laws, regulations relevant to their job task

- Staff possess the knowledge, skills, and experience to implement the specific measures and actions required under the ESMPs.

Contractors will also be required to develop training and awareness procedures and a training programme for their personnel as well as for their subcontractor’s personnel. The procedure shall identify training needs, training planning and training execution as well as include specific instruction for developing and maintaining an updated HSSE training program. The training programmes will include several levels of competency and training as a function of individual personnel HSSE responsibility and involvement. Contractor training programmes will be subject to approval by TP-OTC to ensure they are adequate for the different tasks assigned.

12.7 Stakeholder Engagement

12.7.1 Engagement Process and Disclosure of Information

According to IFC PS1, an effective stakeholder engagement is needed to avoid and minimize the social risks and to monitor that the Project has a long-term social license to operate. Stakeholder engagement is a key element in building strong, constructive, and responsive relationships which are essential for the successful management of a project’s environmental and social risks and impacts. The key function of an effective stakeholder engagement is to inform stakeholders about the potential E&S impacts related to the project through appropriate disclosure of information, to ensure their perceptions of the proposed development are as accurate as possible, to consult with them to obtain feedback, and to provide a mechanism for resolving any concerns or complaints they might have. Stakeholders may be external or internal to TPAO and TP-OTC and may be defined as individuals or groups who are:

- Directly or indirectly affected by the Project
- Interested in the Project and its activities
- Able to influence the Project and the expected results.

The stakeholder engagement process helps to:

- identify and involve all stakeholders potentially affected by the Project
- ensure a good understanding of the Project activities and potential impacts/benefits
- identify issues early in the Project cycle that may pose risks to the Project or its stakeholders
- ensure that mitigation measures are appropriate (implementable, effective, and efficient)
- establish a system for long-term and mutual communication between the Project and stakeholders that benefits all parties.

TP-OTC started engaging with Project’s stakeholders before the ESIA process. Prior to public participation meeting held during the national EIA process, briefing meetings were held by the General Manager of TPAO with selected local authorities. Consultants were also recruited to strengthen stakeholder engagement and open an independent dialog channel. The stakeholder’s identification process was performed by TPAO and TP-OTC employees supported by Project consultants during direct meetings with authorities, key stakeholders, and representatives of local communities. Detailed information on stakeholder engagement activities performed and planned are presented in the SEP and included:

- Publication about planned activity (which is the legal definition for the project) through regional and local newspapers and the Project website
- Public hearings in a frame of public discussion procedure

- Consultations with public authorities at national, regional, and local level.

The SEP outlines a systematic approach to stakeholder engagement to support TP-OTC in developing and maintaining strong and constructive relationships with the stakeholders and in addressing their concerns about the Project. The SEP and its implementation fall under TP-OTC responsibility. In particular, the SEP for the construction phase includes:

- provisions for the disclosure to the affected communities of relevant information on:
 - The purpose, nature and scale of the Project
 - The duration of proposed Project activities
 - Potential risks / impacts and relevant mitigation measures
 - The stakeholder engagement process envisaged going forward and
 - A Grievance Mechanism consistent with IFC PS1 requirements scaled to the risks and impacts of the project.
- Provisions for a stakeholders' consultation and participation process appropriate for the potentially affected communities, their decision-making process and the needs to reach / include disadvantaged or vulnerable groups
- Documents to demonstrate how the feedback from stakeholders' consultation and participation has been included into TP-OTC management decision-making process and used to identify specific mitigation measures, as needed
- The provision of periodic reports to the potentially affected communities to update on progresses on the implementation of the ESMPs, also addressing eventual grievances received
- an internal Grievance Mechanism for all TP-OTC employees and contractors and
- an external Grievance Mechanism with a procedure providing a framework for receiving, recording, and facilitating resolution of concerns raised by affected communities.

The SEP is considered a living document and will be regularly monitored, reviewed and updated by TP-OTC throughout all stages of the Project implementation to ensure:

- it remains fit for the purpose at each phase of the Project
- it addresses the outcomes of stakeholders' consultation activities
- it addresses the grievances received from stakeholders.

The internal communication amongst the various functions and roles and the different Project parties is addressed in this ESMP.

12.7.2 Internal Grievance Mechanism

The Project will maintain an effective grievance mechanism for its employees and workers engaged by third parties consistent with IFC PSs 1 and 2 to collect grievances and concerns across the workforce. TP-OTC will ensure that all workers directly and indirectly employed are informed about the channels (formally – written and informally - spoken) to submit grievances. The mechanism shall include a framework for receiving, recording, answering, and facilitating resolution of workers' concerns and grievances with particular reference to labour

and OHS issues. All concern received will be registered in the Grievance Register by the HR department that will track all grievances up to closure.

Contractor will be required to either develop their own internal “Grievance Mechanism” or instructed on how to use / rely on the process developed by TP-OTC.

12.7.3 External Grievance Mechanism

Stakeholders’ analysis and planning have been provided in the SEP describing the activities to be implemented by TP-OTC to monitor that a full participatory process is established and that all relevant stakeholders, including potentially affected communities and any possibly disadvantaged or vulnerable group, are involved in the engagement process throughout the entire Project life cycle. TP-OTC will develop an external grievance mechanism dedicated to stakeholders where opinions and complaints can be submitted by individuals or groups at all stages of the Project through e-mail, phone, letter or through the website.

Contractors and subcontractors will not be required to develop an external grievance mechanism and will be asked to direct any external opinions and complains to the TP-OTC.

12.7.4 Emergency Preparedness and Response

TP-OTC and contractors will establish and maintain a Site Emergency Preparedness and Response Plan (EPRP), to be developed in accordance with IFC EHS Guidelines - 3.7 Emergency Preparedness and Response). The EPRP will be prepared to respond to emergency situations associated with the Project to prevent and mitigate any harm to people and/or the environment. The EPRP shall address at least the following emergency conditions:

- Life and fire safety including natural disasters
- Incidents at sea
- Leaks or spills of hazardous chemicals/hazardous substances in construction areas and the sea
- Transportation of hazardous chemicals/ waste inside the working areas and off-site on public roads
- Attacks and sabotage to the construction sites
- Natural events such as landslides, flooding, etc. and
- First aid emergency procedures and cases.

The EPRP shall include detailed information for the following basic elements:

- Applicable legislation requirements and reference and contact details of local government agencies (e.g., police, emergency rescue, harbour authority)
- Identification of emergency situations and scenarios that may occur during routine activities or because of unplanned events, and communities and individuals that may be impacted
- Definition of emergency response standard operating procedures (SOP) for specific type of events
- Roles and responsibilities for the implementation of the EPRP
- Equipment, tools and resources to manage emergency preparedness and response
- Communication procedures, including awareness campaigns to potentially affected communities and local government agencies

- Training for workers on EPRP requirements to ensure an effective response to emergency situations
- Minimum requirements for the EPRPs to be developed by contractors and subcontractors for their job-specific needs
- Periodic emergency drills, involving workers and affected communities as needed to increase awareness and verify the effectiveness of the response to emergency situations.

The EPRP will have to be periodically reviewed and revised, as necessary, to reflect possibly changes during the construction phase.

12.8 ESMS Audit, Monitoring, Review and Performance Reporting

A Monitoring Programme will be developed to monitor compliance with ESMS, ESMPs, and relevant regulatory requirements, national and international. The main objectives of the monitoring programme will be to:

- Identify any new E&S impacts derived from the Project activities/works and to identify proper mitigation measures
- Follow up on status of action and performance in managing and mitigating previously identified E&S impacts
- Follow up on status of stakeholder grievances and how they were resolved
- Monitor HSSE activities undertaken by contractors and overall Project's HSSE performances.

Monitoring will be performed by TP-OTC qualified staff and contractors, and results will be included in reports that will determine the severity of non-compliances, as well as recommended remedial actions.

12.8.1 Environmental and Social Monitoring

Detailed E&S mitigation and monitoring actions will be included in the Project specific ESMPs, consistent with the commitments included in the ESIA. The Management Plans will provide the relevant information to monitor/measure the HSSE performance and conformity with ESMS requirements. The extent of monitoring will be commensurate with the Project's HSSE risks and impacts and with relevant obligations/requirements.

The scope, frequency, methodologies, and responsibilities (split between TP-OTC and contractors) of such monitoring and measurement, as well as reporting needs, will be indicated in the Management Plans and will depend upon the nature and scope of the monitoring activities identified, in accordance with applicable Project requirements (ESIA commitments, IFC PSs and Turkish Regulations). Monitoring will also consider and be adjusted according to requirements and specific requests by relevant regulatory authorities. TP-OTC will be ultimately responsible for collecting and processing the information related to monitoring activities carried out by contractors and for developing, updating and managing the tools for data collection and processing.

12.8.2 HSSE Monitoring

All contractors will be required to develop an HSSE monitoring program commensurate with their activities and relevant risks identified in compliance with the requirements defined in Chapter 12.4. The HSSE monitoring programme will confirm the effectiveness of prevention and control strategies and of the Project HSSE procedures through a set of KPIs. The HSSE monitoring program to be developed by each contractor will have to include, as a minimum:

- Periodical meetings
- Site inspections, findings and corrective actions reports

- Internal audits and corrective actions
- Corrective action reports for the external audits conducted by TP-OTC and Authority

12.8.3 Evaluation of Compliance

TP-OTC will monitor and evaluate compliance with the ESMS through internal auditing to ensure compliance with:

- The regulatory requirements and permits set by the Turkish legislation;
- IFC PSs;
- Commitments undertaken by TP-OTC in the ESIA and other E&S – related documents; and
- ESMPs requirements.

Each contractor will be required to implement a similar system for the evaluation of compliance of its operation and TP-OTC will supervise the implementation of this process. Any misalignment with the above requirements will lead to “Non-Compliance situations” defined with the following ranking:

- **Level 1 Non-Compliance (N-CP):** evidence of a complete deviation or non-fulfilment of the requirements that can lead to significant impacts on TP-OTC operations (e.g., interruption of operations, serious E&S or OHS consequences, reputational risks, etc.) and whose resolution has to be managed in coordination with external bodies (i.e., authorities). These N-CPs will have to be immediately communicated to TP-OTC HSSE Coordinator as part of the management review process. The HSSE Coordinator will identify the appropriate preventative actions/corrective actions (PA/CAs) and require approval from TP-OTC Management. The N- N-CPs and the PA/CAs implemented will be disclosed to stakeholders during the periodic engagement activities. Level 1 deviations will also require immediate communications to the Lenders
- **Level 2 Non-Compliance (N-CP):** evidence of a complete deviation or non-fulfilment of the requirements that can lead to limited impacts on TP-OTC operations and whose resolution does not involve external parties and could be managed in coordination with other internal managers (e.g., contractors). These N-CPs will have to be immediately communicated to TP-OTC HSSE Coordinator as part of the management review process. The HSSE Coordinator will identify the appropriate PA/CAs and require approval from TP-OTC Management. Level 2 deviations will need to be communicated to the lenders as part of periodic communications
- **Level 3 Non-Compliance (N-CP):** partial deviation or non-fulfilment of the requirements with limited impacts on TP-OTC operations and whose resolution can be managed directly by the HSSE Coordinator. These N-CPs will be addressed directly by HSSE Coordinator through appropriate PA/CAs. Progresses will be communicated to TP-OTC Management as part of the management review process. No communication to the lenders will be required and
- **Observation (OBS)** issues that are not a breach or deviation to requirements that may need specific actions to improve performance and achieve full compliance.

N-CPs and OBSs can be identified by TP-OTC during formal audits / site inspections at any time during the construction and the operation phases and by reporting the observed HSSE concern to the work lead and the HSSE Coordinator who will evaluate and eventually confirm the level of severity assigned and take actions, accordingly.

A PA/CAs process will be established to address each non-compliance situation and evaluate root causes to prevent recurrence. Contractors will be required to implement a similar system for addressing N-CPs relevant to their operations.

12.8.4 HSSE Reporting

HSSE reports will be developed aligned with national, international and Project reporting requirements by TP-OTC. All contractors and sub-contractors will be responsible for reporting periodically to TP-OTC. The inspections findings will be reported weekly by contractors and sub-contractors including the corrective actions. In addition, there will be a monthly HSSE statistics report, in which HSSE KPIs are reported such as OHS incidents, environmental incidents, social grievance etc.

All Project personnel (TP-OTC employees and contractors) will be responsible for reporting incidents (including near misses) and hazards to their immediate supervisor. Incidents will be subject to an investigation and incident reports will be developed aligned with national and international reporting requirements.

In case of severe incidents, TP-OTC and each contractor will be responsible to instruct/provide injured employees with:

- Immediate medical assistance and medical evacuation, if required
- Employee assistance programs
- Notification and contact with their family or next of kin
- Direct access to communications (such as phones).

12.8.5 Performance Records

TP-OTC will maintain records demonstrating ESMS performance and conformity/compliance to the requirements set in the ESMP and in the national and international regulations. Relevant records will be maintained under responsibility of the HSSE Coordinator. Examples of documents are:

- Reports of internal HSSE audits & inspections
- Reports of -external HSSE audits
- Non-conformities, corrective/preventive actions form
- Minutes of the management review meetings
- Reports of HSSE monitoring, including analytical certificates
- Records of grievances submitted
- Records of incidents and relevant investigations
- Communication with the authorities
- Communication to stakeholders and of stakeholder engagement activities carried out
- Any other relevant document providing evidence of the ESMS performance.

Contractors will be required to implement a similar system and provide results to TP-OTC.

12.8.6 Inspection & Audit

TP-OTC will provide an inspection & audit program including the audit schedule, frequency, objectives and responsibility of auditors. This program will be implemented periodically and effectively

- Correct implementation of HSSE and HR Policies and of the provisions included in the ESMPs
- Correct implementation of Contractor's Management Plans (descending from TP-OTC ESMPs requirements)
- Compliance to the national regulatory requirements, to the ESIA commitments, to the IFC PSs and
- Alignment of contractors with their contractual obligations.

HSSE inspection will be established by TP-OTC to ensure all HSSE activities are compliant in the worksite. Site HSSE inspection will be carried out on weekly basis by each Contractor and sub-contractor on the construction site.

Inspections & Internal audits will be performed to monitor ESMS performance by internal audit teams of TPAO/TP-OTC as monthly basis. -

External audits -will be performed by National Authorities, ESIA Consultant / ESDD Visit, Lenders' Environmental & Social Consultant and Integrated Management System Monitoring to assess:

- Project compliance with Turkish regulatory requirements (legislation and relevant permits), ESIA commitments, IFC PS
- Correct implementation of TP-OTC ESMS, including policies, manual, ESMPs, procedures and conformity to the requirements set therein.

12.8.7 Management Review

TP-OTC Management will review the performance of the ESMS on a periodical basis (e.g., quarterly during construction and annually during operation) to monitor its adequacy to the Project activities and effectiveness. The HSSE Coordinator will be responsible for convening a management review meeting in case of:

- Major Non-Compliances (i.e., Level 1 and Level 2)
- Serious injuries/fatalities involving TP-OTC employees, contractors, third parties, project assets, etc.
- Significant changes to the design of the Project that trigger the management of change procedure
- Grievances with potential to impact media or to result in a claim and
- Significant changes to the regulatory framework.

Input documentation/information to support the management review process will include at least:

- Internal/external audit reports and records of non-compliances.
- Incident reports and HSSE statistics
- Progress on preventive/corrective actions
- Update on actions from the last management review meeting
- HSSE monitoring reports

- Grievances records / update on stakeholders' engagement activities.

The HSSE Coordinator will be responsible for issuing the minutes of the management review meeting with actions agreed, measures adopted and related responsibilities. This may require changes to the ESMS documentation, including policies, procedures and SOPs, ESMPs, as needed.

HSSE Coordinators from the main contractors might be invited to attend these management review meetings if actions needed will affect their operations. All contractors will be required to implement a similar management review system in relation to their operation and report progresses to TP-OTC HSSE Coordinator.

12.9 Commitments Register

All mitigation measures to address potential project impacts identified in the ESIA package have been captured into a Commitments Register (given below) that includes tables with relevant mitigation and monitoring measures for each of the environmental and social components. The Commitments Register is part of the ESIA package and could be used as a tool that consolidates the applicable mitigation measures and monitoring activities defined in the ESIA package during Project construction and operation phases

Table 12-3: Mitigation measures and monitoring actions for the social components

Component	Phase	Project action	Mitigation measures	Monitoring measures
POPULATION AND DEMOGRAPHY	Construction	General onshore engineering/construction works	<p>Hire as many unskilled and semiskilled workers as possible, locally. This will reduce the influx of Project workers not native to the Project area, and it will maximize local employment In case non-local Turkish workers are hired, they will be incentivized to live in Çaycuma or Zonguldak rather than in the villages surrounding the Project</p> <p>Provide accommodation to all nonlocal Project workers in strategic locations, preferably within the Project fence line Accommodation will meet IFC/ EBRD worker accommodation guidelines Workers' Accommodation: Processes and Standards, 2009</p> <p>Accommodation should be fully contained with meals, entertainment, medical clinic. -workers will not need to go into communities and if they pass through communities to get to the site at the beginning and end of their shift, they should be discouraged from interacting negatively with community residents</p> <p>Code of Conduct will be applied and all Project workers are required to abide by, to include expected behaviour in local communities;</p> <p>Provide cultural awareness training as an on-boarding requirement to all non-local workers, and in particularly foreign workers, in order to prevent cultural clashes with regards to dress codes, food consumption, etc.</p> <p>Implement and disseminate a community level grievance mechanism, through which local community members can submit concerns and complaints about influx and related negative impacts</p> <p>Engage regularly with mukhtars</p>	<p>Community grievances register and performance indicator records in accordance with grievance mechanism to be produced for the Project</p> <p>Stakeholder Engagement and consultation register and records in accordance with the Stakeholder Engagement Plan to be produced for the Project</p> <p>Percentages of the local employees reported annually (which will be a KPI for ESMS to be prepared for the Project)</p> <p>Population figures of the settlements according to TURKSTAT data</p>
	Operation	Plant/infrastructure operation onshore	<p>Increasing business entity competition through creating the local institutions necessary for faster development and structural adjustment</p> <p>Give emphasis to local processing of agricultural products, agroindustry, and other "clean" sections of the economy that will benefit from location benefits obtained from proximity to the market</p> <p>Identifying communities that can perform as the region's most efficient service, manufacturing, and commercial products</p>	<p>Community grievances register and performance indicator records in accordance with grievance mechanism to be produced for the Project</p> <p>Stakeholder Engagement and consultation register and records in accordance with the Stakeholder Engagement Plan to be produced for the Project</p> <p>Percentages of the local employees reported</p> <p>Population figures of the settlements according to TURKSTAT data and the consultations with the Mukhtars</p>

<p>ECONOMY AND EMPLOYMENT</p>	<p>Construction</p>	<p>General onshore engineering/construction works</p>	<p>The Project will implement human resource policies and procedures in compliance with the IFC PS-2: Labour and Working Conditions. Such policies are expected to provide more predictable employment opportunities for direct and indirect employees as well as outline benefits, contract conditions and workplace conditions</p> <p>The Project will enhance local employment through a preferential employment policy which prioritizes jobs for qualified local people. Hiring preference criteria will prioritise settlements directly affected by the current activities of the Project.</p> <p>Formal, and transparent recruitment process will be implemented to provide equal opportunity to the applicants.</p> <p>The Worker Grievance mechanism will be established and implemented.</p> <p>Labour management plan will be implemented to cover the following topics.</p> <p>TP-OTC will adopt and implement a Human Resources Policies and Procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this Performance Standard and national law.</p> <p>TP-OTC will require its contractors and subcontractors to adopt and implement human resources policies and procedure aligned with TP-OTC's policies and procedure and with this plan. TP-OTC will perform periodic audits of its contractors and subcontractors to ensure that the policies and procedures are adopted and implemented.</p> <p>TP-OTC will strictly prohibit discrimination against any worker or applicant for employment on the basis of race, religion, gender, sexual orientation, gender identity or expression, national origin, age, disability, veteran's status or any other characteristic protected by law.</p> <p>Turkish Labour Law forbids discrimination due to race, language, gender, political views and opinion and religion. In accordance with the equal treatment principle covered in article 5 of the Turkish Labour Law, employers should treat part time workers with the same rights as full time workers and indefinite period workers to definite period workers unless there are genuine reasons for not doing so. As TP-OTC will comply with the Turkish Labour Law and will base the employment relationships on the principle of equal opportunity and fair treatment, the Turkish standards will fulfil the requirements of PS2 with regard to ensuring non-discrimination.</p> <p>The employment of children (i.e., persons below the age of 18) for the Project will not be permitted. The same requirement will be applicable to Project contractors and subcontractors.</p> <p>Periodic audits of contractors and subcontractors will be performed by TP-OTC to ensure that no employment of children occurs.</p> <p>The employment of forced labor (i.e., any work not voluntarily performed and that is exacted from an individual under threat of force or penalty) for the Project will not be permitted. The same requirement will be applicable to Project contractors and subcontractors.</p> <p>Periodic audits of contractors and subcontractors will be performed by TP-OTC to ensure that no forms of forced labor occur.</p> <p>Besides the grievance mechanism for the overall TPAO and TP-OTC, a separate Workers Grievance Redress Mechanism (WGRM) will be established, developed and implemented for the Project workers including contractors' and subcontractors' workforce at sites. WGRM will be designed specifically to record and track of the process of "grievances," "complaints," "feedback," or another functionally equivalent term expressing the workers' concerns or complaints. Workers will be able to raise their complaints relating to their work environment or work conditions. The persons responsible for the WGRM will be the HR Specialist from HR Department.</p> <p>A simplified tender process should be applied for the local suppliers,</p>	<p>Employment agreements made with contractors and subcontractors</p> <p>Training Records (training materials, participant list, training planning, photos)</p> <p>Records (contracts, employee register)</p> <p>Incident records</p> <p>Grievance Records</p> <p>Collective Agreements (if any)</p> <p>Employment agreements made with contractors and subcontractors</p> <p>Employment records (contracts, employee register)</p> <p>Grievance Records</p> <p>Annual reports of the government</p> <p>Market prices</p>
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Component	Phase	Project action	Mitigation measures	Monitoring measures
			<p>If required, training shall be given to local suppliers on how to submit a bid after the supplier assessment process,</p> <p>Equal tender process will be applied</p> <p>Equal procurement opportunities will be provided to local small businesses through the Local Procurement Plan,</p> <p>Before the procurement, local suppliers will be identified and if required,</p> <p>Capacity development will be applied including training on OHS and HR.</p> <p>The Project will assess inflationary impacts through its regular stakeholder engagement and consultation. If feedback includes comments about a rise in prices, a more formal monitoring system will be set up to monitor prices for staple goods on a regular basis. If inflation can be linked to the Project, the Project will consider targeted support programs.</p> <p>The Project will purchase at market rate the goods and services, land, and labor it procures.</p>	
	Operation	Plant/infrastructure operation onshore	<p>To ensure the diversification of routes and resources in the supply of oil and natural gas, taking into account the increasing demand and import dependency</p> <p>To contribute to regional and global energy security</p> <p>To be a regional trade center in energy</p> <p>To consider social and environmental impacts in the context of sustainable development in every phase of the energy chain</p> <p>Labor management plan will be implemented <i>(please refer to mitigation measures for Economy and employment, construction phase.)</i></p> <p>In accordance with IFC Performance Standard 2 on Labour and Working Conditions, the Project shall establish human resource policies and procedures. Such regulations are anticipated to offer direct employees more stable employment opportunities. more specifically</p> <p>The Project's hiring procedure will follow an equal opportunity process and be structured, official, and transparent in order to find new hires that possess the required levels of training, expertise, and knowledge. The paper outlines the procedures for new hires, job openings, interviews, and reference checks.</p> <p>Plans for labor management and contractor management will be crucial in attempting to maximize local employment prospects and guarantee a fair distribution of work to all adjacent towns. Locals who meet the qualifications will be given preference for employment.</p> <p>Settlements that are directly impacted by the Project's ongoing activities will be given priority in hiring. Turkish citizens will always take precedence over foreigners, who will only be utilized in situations where Turkish citizens are unable to provide the necessary expertise and experience. A variety of regional skill-development initiatives will be supported by the Project.</p> <p>The Worker Grievance Procedure, which intends to give every employee a uniform mechanism for resolving employment complaints not covered by other current human resources policies and programs, will be put into use.</p> <p>The Project is committed to prioritize procurement of goods and services from businesses in the Project Area where these they can ensure that prices are competitive, quality can be maintained, and periodicity of supply can be maintained</p>	

Component	Phase	Project action	Mitigation measures	Monitoring measures
LAND USE PATTERNS	Construction	General onshore engineering/construction works	<p>The expropriation process and compensation process will be conducted in accordance with Turkish law, managed by relevant governmental bodies</p> <p>The Project will ensure that engagement and consultation will be conducted and that compensation will be provided in accordance with IFC PS 5.</p> <p>The Project will conduct a census of all people affected by the expropriation process, in order to confirm the number of affected households and persons. An asset survey will be conducted to confirm the number, type, and qualities of the properties affected.</p> <p>The Project external/community grievance mechanism will be available to submit grievances related to the expropriation process and economic displacement caused.</p> <p>The Project will continue to prioritise those affected by Project land acquisition and expropriation for the recruitment of Project jobs.</p>	<p>Completion audit</p> <p>Grievance Records</p> <p>Compensation records</p>
	Operation	None	No impacts are expected during the operation phase	Some monitoring and livelihood restoration activities may continue during the operation phase, as a prosecution of activities started during construction

Component	Phase	Project action	Mitigation measures	Monitoring measures
INFRASTRUCTURES AND SERVICES	Construction	Material transportation	<p>Define the transport needs of the Project and identify the routes that will be used, keeping in mind social and environmental constraints, so to use the less impacting routes available. Organize vehicle journeys so to optimize the transport of materials and reduce unnecessary trips.</p> <p>Identify speed limits in construction areas and in public roads and ensure that they are respected by drivers.</p> <p>Identify sensitive receptors (e.g. schools) within the AoI and identify additional road safety measures in proximity to these receptors.</p> <p>Perform traffic safety awareness campaigns targeted at local communities and vulnerable groups, such as children and elderly, that may be increasingly involved in road accidents.</p> <p>Ensure that vehicles are equipped with all safety devices such as seat belts, mirrors, safety signals etc.</p> <p>Periodically check all vehicles to ensure that they are properly maintained and that all the safety devices are working properly.</p> <p>Verify and register of all traffic related incidents and periodically revise road safety measures based on lessons learned.</p> <p>Implement targeted measures to reduce traffic related incidents that may be caused by the Project.</p> <p>Implement the Traffic Management Plan, with indication of the measures that shall be enforced to reduce impacts generated by traffic and to increase safety for workers and local communities. The Plan will include the measures indicated above and additional measures that may emerge from engagement with stakeholders.</p>	<p>Verification that the transport needs of the Project are defined, and that routes and vehicle journeys are organised so to minimize impacts</p> <p>Verification that the Traffic Management Plan is developed and implemented</p> <p>Verification that alternative routes, construction area crossings and road closures for each construction spread have been defined in collaboration with local authorities and local communities</p> <p>Verification of the number, type and outcomes of meetings performed with local authorities and local communities; verification of the number, type and outcomes of additional mitigation measures identified;</p> <p>Verification of number, type, attendance and outcomes of stakeholder engagement activities</p> <p>Verification of the number of disruptions to local infrastructures caused by Project activities.</p> <p>Verification of the number of grievances received and percentage of grievances resolved positively.</p> <p>Verify the amount of water consumed for the different uses</p> <p>Monitor waste disposal practices and management as per Water and Waste Management Plan provisions.</p>
		General onshore engineering/construction works	<p>Define alternative routes, construction area crossings and road closures for each construction spread in collaboration with local authorities and local communities, to identify solutions that are less impacting as possible on local communities.</p> <p>Discuss with local authorities and local communities specific measures to ensure that disruption to mobility and transport is reduced to the extent possible.</p> <p>Within the context of the SEP inform local authorities, local communities on the progress of activities and in particular on the schedule of activities that will entail closures/limitations of roads and interruption of infrastructure networks; possible changes to limit impacts on local communities will be agreed and implemented.</p> <p>Implement the Stakeholder Engagement Plan and ensure that appropriate resources and budget are dedicated to engagement. Periodically revise the stakeholder mapping and the plan based on progress of activities</p> <p>Monitor water requirements during the construction phase and periodically liaise with the water supplier to ensure that water needs for the Project does not create shortages for other activities and local communities, particularly in summer and during dry periods.</p> <p>Implement water saving strategies, particularly to reduce consumption of water for civil uses among workers. Provide indications on water saving initiatives to workers during induction and periodic training.</p> <p>Implement Waste Management Plan that includes an identification of the waste disposal facilities for the Project and selects those that are less impacting from an environmental and social standpoint and closest to the Project location.</p> <p>Identify strategies to ensure that waste is recovered and recycled to the extent possible, so to reduce the need of sending it to landfills. Provide indications on waste reduction and waste recycling initiatives to workers during induction and periodic training.</p>	

Component	Phase	Project action	Mitigation measures	Monitoring measures
	Operation	Plant/infrastructure operation onshore	<p>Implement water saving strategies, to reduce water consumption to the extent possible. Provide indications on water saving initiatives to workers during induction and periodic training.</p> <p>Implement the Waste Management Plan that includes an identification of the waste disposal facilities for the Project and selects those that are less impacting from an environmental and social standpoint and closest to the Project location.</p> <p>Identify strategies to ensure that waste is recovered and recycled to the extent possible, so to reduce the need of sending it to landfills.</p> <p>Define the transport needs of the project and identify the routes that will be used, keeping in mind social and environmental constraints, so to use the less impacting routes available.</p> <p>Organize vehicle journeys so to encourage collective transport systems among workers and to reduce unnecessary trips.</p> <p>Implement the Traffic Management Plan, with indication of the measures that shall be enforced to reduce impacts generated by traffic and to increase safety for workers and local communities. The Plan will include the measures indicated above and additional measures that may emerge from engagement with stakeholders.</p> <p>Implement the Stakeholder Engagement Plan and ensure that appropriate resources and budget are dedicated to engagement. Periodically revise the stakeholder mapping and the plan based on progress of activities</p>	<p>Verification that the transport needs of the Project are defined, and that routes and vehicle journeys are organised so to minimize impacts</p> <p>Verification that the Traffic Management Plan is developed and implemented</p> <p>Verification that alternative routes, construction area crossings and road closures for each construction spread have been defined in collaboration with local authorities and local communities</p> <p>Verification of the number, type and outcomes of meetings performed with local authorities and local communities; verification of the number, type and outcomes of additional mitigation measures identified</p> <p>Verification of number, type, attendance and outcomes of stakeholder engagement activities.</p> <p>Verification of the number of disruptions to local infrastructures caused by Project activities.</p> <p>Verification of the number of grievances received and percentage of grievances resolved positively.</p> <p>Verify the amount of water consumed for the different uses</p> <p>Monitor waste disposal practices and management as per Water and Waste Management Plan provisions</p>

HEALTH ISSUES AND FACILITIES	Construction	<p>Onshore construction activities (vegetation clearing, site levelling and grading, material transportation, stockpiles, batching plant etc.)</p> <p>Offshore excavation (trenching) and sediment storage, offshore pipeline laying</p>	<p>Perform a health screening of all workers prior to beginning of work and on a periodic basis.</p> <p>Provide all necessary PPEs to workers, based on their position.</p> <p>Provide induction training and periodic training to all workers on Health & Safety aspects and on communicable diseases, particularly sexually transmittable diseases, to all workers.</p> <p>Identify local health facilities located in the AoI and assess capacity for treating incidents that could occur due to construction activities. If necessary provide support for ensuring additional capacity.</p> <p>Implement the Occupational Health and Safety (OHS) Management Plan compliant with national regulations, IFC standards and OHSAS18001 standard. The Plan will include the measures indicated above and additional measures that may emerge from engagement with stakeholders.</p> <p>Implement the COVID-19 Management Plan that will identify additional measures necessary to manage the ongoing COVID-19 Pandemic among workers and local communities.</p> <p>Implement the Community Health, Safety and Security Management Plan. The Plan will include the measures indicated above and additional measures that may emerge from engagement with stakeholders.</p> <p>Implement the Emergency Preparedness and Response Management Plan.</p> <p>Within the context of the SEP inform local authorities, local communities and health facilities on the progress of activities and in particular on the schedule of activities that will entail closures/limitations of roads and interruption of infrastructure networks; possible changes to limit impacts on local communities will be agreed and implemented.</p> <p>Implement the Stakeholder Engagement Plan and ensure that appropriate resources and budget are dedicated to engagement. Periodically revise the stakeholder mapping and the plan based on progress of activities.</p> <p><i>For additional mitigation measure, please see Air quality, Infrastructures and services and Noise and vibration sections.</i></p>	<p>In addition to the monitoring measures listed in Air quality, Noise and vibration and Infrastructure and Services, the following monitoring measure shall be implemented to assess the true effects of the project on health issues and facilities during the construction and verify the effectiveness of the mitigation measures.</p> <p>Verification of the percentage of drivers that have been provided with induction training on traffic safety</p> <p>Verification of number of speed limit infractions identified among drivers</p> <p>Verification of number and location of sensitive receptors identified and of number and type of additional road safety measures enforced</p> <p>Verification of number, location, attendance and outcomes of traffic safety campaigns performed</p> <p>Verification of percentage of vehicles equipped with all safety devices</p> <p>Verification of number and outcome of periodic checks performed to vehicles to ensure that they are properly maintained and that all the safety devices are working properly.</p> <p>Verification of the number, location and attendance of training activities to inform students on Project related risks to health and safety and measures to be implemented, particularly on the issue of road safety.</p> <p>Verification that the traffic incidents register is compiled correctly and that lessons learned measures are implemented</p> <p>Verification that the Traffic Management Plan is developed and implemented</p> <p>Verification of the percentage of workers that are subject to health screening</p> <p>Verification of the percentage of workers that are provided with appropriate PPEs, based on their position</p> <p>Verification of the percentage of workers that are provided with induction training and periodic training on Health & Safety aspects</p> <p>Verification of the assessment of local health facilities located in the AoI and of their capacity for treating incidents that could occur due to construction activities</p> <p>Verification that the Occupational Health and Safety (OHS) Management Plan is developed and implemented, in compliance with national regulations, IFC standards and OHSAS18001 standard</p> <p>Verification that the COVID-19 Management Plan is developed and implemented</p> <p>Verify number, type and outcomes of training and awareness raising campaigns among local communities on health and safety risks that may be caused by the Project</p> <p>Verify the number, type and outcomes of targeted measures to reduce traffic related incidents that may be caused by the Project</p> <p>Verification of the number, type and outcomes of targeted measures implemented to ensure the protection of vulnerable groups like elders, people with disabilities and children from risks that may be caused by the Project</p> <p>Verification that the Community Health and Safety Management Plan is developed and implemented</p>
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Component	Phase	Project action	Mitigation measures	Monitoring measures
				Verification that the Emergency Preparedness and Response Management Plan is developed and implemented Verification of the cooperation and coordination activities performed with local health facilities to minimize impacts on health centres Verification of the number, type and outcomes of support activities implemented for vulnerable groups Verification of number, type, attendance and outcomes of stakeholder engagement activities.

	Operation	Plant/infrastructure onshore operation	<p><i>For the mitigation measures, please refer to the Air quality, Noise and vibration and Infrastructure and services measures during operation phase.</i></p>	<p>In addition to the monitoring measures listed in Air quality, Noise and vibration and Infrastructure and Services, the following monitoring measure shall be implemented to assess the true effects of the project on health issues and facilities during the construction and verify the effectiveness of the mitigation measures.</p> <p>Verification of the percentage of drivers that have been provided with induction training on traffic safety</p> <p>Verification of number of speed limit infractions identified among drivers</p> <p>Verification of number and location of sensitive receptors identified and of number and type of additional road safety measures enforced</p> <p>Verification of number, location, attendance and outcomes of traffic safety campaigns performed</p> <p>Verification of percentage of vehicles equipped with all safety devices</p> <p>Verification of number and outcome of periodic checks performed to vehicles to ensure that they are properly maintained and that all the safety devices are working properly.</p> <p>Verification of the number, location and attendance of training activities to inform students on Project related risks to health and safety and measures to be implemented, particularly on the issue of road safety.</p> <p>Verification that the traffic incidents register is compiled correctly and that lessons learned measures are implemented</p> <p>Verification that the Traffic Management Plan is developed and implemented</p> <p>Verification of the percentage of workers that are subject to health screening</p> <p>Verification of the percentage of workers that are provided with appropriate PPEs, based on their position</p> <p>Verification of the percentage of workers that are provided with induction training and periodic training on Health & Safety aspects</p> <p>Verification of the assessment of local health facilities located in the AoI and of their capacity for treating incidents that could occur due to construction activities</p> <p>Verification that the Occupational Health and Safety (OHS) Management Plan is developed and implemented, in compliance with national regulations, IFC standards and OHSAS18001 standard</p> <p>Verification that the COVID-19 Management Plan is developed and implemented</p> <p>Verify number, type and outcomes of training and awareness raising campaigns among local communities on health and safety risks that may be caused by the Project</p> <p>Verify the number, type and outcomes of targeted measures to reduce traffic related incidents that may be caused by the Project</p> <p>Verification of the number, type and outcomes of targeted measures implemented to ensure the protection of vulnerable groups like elders, people with disabilities and children from risks that may be caused by the Project</p> <p>Verification that the Community Health and Safety Management Plan is developed and implemented</p>
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Component	Phase	Project action	Mitigation measures	Monitoring measures
				Verification that the Emergency Preparedness and Response Management Plan is developed and implemented Verification of the cooperation and coordination activities performed with local health facilities to minimize impacts on health centres Verification of the number, type and outcomes of support activities implemented for vulnerable groups Verification of number, type, attendance and outcomes of stakeholder engagement activities.

Component	Phase	Project action	Mitigation measures	Monitoring measures
CULTURAL HERITAGE AND ACHAEOLOGY	Construction	Site levelling and grading	<p>Filyos 1st Degree Archaeological Site No mitigations measures are required.</p> <p>Sazköy 3rd Degree Archaeological Site</p> <ul style="list-style-type: none"> Necessary information and training should be provided to the personnel to raise awareness about the archaeological site In particular, truck/truck drivers should be informed that the materials that are considered as waste should not be dumped into the area, that these areas are protected areas by the relevant law. If it is determined that the excavation material near the site overflows to the site after the site is determined as boundaries, this material will need to be removed Measures should be taken to prevent access to such areas (i.e., by marking the archaeological site with signs similar to "no entry, sensitive zone") Boundaries of the site should be confirmed and measures should be taken to prevent possible physical interventions in the site Human and vehicle traffic along the boundaries of the area should be minimized <p>3rd Degree Archaeological Site No mitigations measures are required.</p> <p>Sazköy Cemetery</p> <ul style="list-style-type: none"> Cemetery boundaries should be determined together with Museum Directorate and take precautions against possible expansions within the scope of the Project since it is very close to the welcome center area Since the pathway leading to the welcome center and the cemetery is shared, it is necessary to limit the use of the aforementioned pathway, and at this point, certain rules should be introduced for vehicle drivers <p>Derecikören Ancient Bridge In case the usage of the bridge is planned in order to access Project site, speed-reducing applications can be made, and speed can be reduced at this point with the signs to be placed on the road with the approval of relevant authority of the highways.</p> <p>Intangible Cultural Heritage</p> <ul style="list-style-type: none"> Mobility of public and vehicles in the region during the planned activities should not be prevented It should be ensured that transit routes are left for uninterrupted access to areas regularly visited by the public Contractors and subcontractors should be trained on the code of conduct, including their approach to relations with local communities, during the employment phase and at regular intervals throughout the Project Information should be provided to contractors and subcontractors on any site-specific sensitivity/issue (e.g., festival locations, dates, events, etc.) regarding intangible cultural heritage. <p>General</p> <ul style="list-style-type: none"> The Cultural Heritage Management Plan and Chance Finds Procedure prepared within the scope of the Project should be implemented throughout the Project. In case of chance find, all work must cease at the location where discovery is made and a temporary buffer zone around the chance find will be put in place. Cultural Heritage/Archaeological Monitoring Specialist will informed site management and museum archaeologist immediately. Chance find site will be properly secured with flagging, no-entry signs etc. Protection of site: chance find should not be moved, removed or further disturbed In particular, all operators and Project workers assigned to land preparation works should receive training on project requirements, protection of cultural and archaeological heritage, laws and regulations regarding archaeological and cultural heritage, Cultural Heritage Management Plan and Chance Find Procedure 	Archaeological monitoring by an archaeologist is required for construction activities to be carried out near the identified cultural heritage finds

Component	Phase	Project action	Mitigation measures	Monitoring measures
	Operation	None	Considering the nature of the Project no impacts are expected on the onshore cultural heritage component during the operation phase.	No monitoring measures are required during construction phase

ECOSYSTEM SERVICES (FISHERY)	Construction	Offshore excavation (trenching) and sediment storage	<p>All vessels will be compliant with MARPOL.</p> <p>Outdated engines to be avoided in favour of recent and well-maintained ones.</p> <p>In case of any leakage fishers will be informed.</p> <p>All vessels used to be compliant with MARPOL.</p> <p>Outdated propellers to be avoided in favour of recent and well-maintained ones, possibly anti-cavitation.</p> <p>Regular and timely engagement with local fishermen and other users of local harbours and ports in order to discuss and agree on Navtex area.</p> <p>Timely communication of the security zone to local fishermen and other users of local harbours and coordinating the practical consequences of such security zone.</p> <p>Regular and timely communication to local fishers and other users of local ports and harbours about construction activities and the routes and frequency of Project vessels.</p> <p>Impact on fishers' livelihoods will be continuously monitored and if negative impacts are found as a consequence of the Project, then fishermen will be compensated in accordance with the Offshore Livelihood Restoration Plan.</p> <p>Light emissions will be focused within the Project Area boundaries.</p> <p>As far as practicable, no intense light has to be aimed directly towards the freshwater habitats within and in proximity of the Project Area.</p>	<p>Marine Traffic Management in cooperation with Port Authority</p> <p>Grievance Records</p> <p>The number of affected fishers</p> <p>Nature of compensation for all the affected fisheries by the Project.</p> <p>Measures for improving livelihood standards of fisheries</p> <p>The number of conflicts between fisheries</p> <p>The number of conflicts between fishers and workers before and during the restriction process</p> <p>The number of vulnerable fishers faced with decreasing living standards.</p> <p>The number of grievances registered through the grievance mechanism.</p> <p>The number of grievance cases addressed.</p> <p>Percentage of closed grievances where PAPs indicate their satisfaction with the grievance process.</p> <p>The number of persons engaged during the implementation of the Project focused on women fishers (if any).</p> <p>Number of Fishing Cooperatives involved during the implementation process.</p> <p>The number of beneficiaries from the livelihood improvement programmes</p> <p>The number of contracts signed.</p> <p>The number of fishers received cash compensation for fuel in the period.</p> <p>Regular continuous monitoring at the wastewater treatment plant</p> <p>Results of water samplings</p>
		<p>Offshore pipeline laying</p> <p>Pipeline hydrotesting</p>	<p>Lights will be mounted as low as practicable.</p> <p>Downward-facing lights will be used to manage horizon glow. Louvered bollards, low height flat beam technology luminaires, poles and structure mounted fittings are acceptable.</p> <p>Shielded light fittings and directional lights will be used to manage light spill.</p> <p>Use of artificial light will be limited to what required to maintain a safe working environment during construction activities past sunset and before sunrise.</p> <p>Unnecessary lighting will not be used, including lights in unused areas, decorative lighting, or lighting that is brighter than needed for the task being carried out.</p> <p>Where practicable, timers and motion sensors will be used to turn off lights when not in use (e.g., sunset switch on, timer off for lighting used for walkways, car parks, and roads).</p> <p>Hydrotest fluids discharged deep sea to be compliant with the relevant standards for deep sea discharges, Minimize the volume of hydrotest water offshore by testing equipment at an onshore site prior to loading the equipment onto the offshore facilities.</p> <p>Use the same water for multiple tests.</p> <p>Reduce the need for chemicals by minimizing the time that test water remains in the equipment or pipeline.</p> <p>Carefully select chemical additives in terms of dose concentration, toxicity, biodegradability, bioavailability, and bioaccumulation potential.</p>	

Component	Phase	Project action	Mitigation measures	Monitoring measures
	Operation	Plant/infrastructure onshore operation	<p>Wastewater effluents to be compliant to national and international standards.</p> <p>All vessels used to be compliant with MARPOL.</p> <p>Outdated engines to be avoided in favour of recent and well-maintained ones.</p>	<p>Regular continuous monitoring at the discharge points in the Filyos river as illustrated in hydrology and surface water impact assessment will be useful also for plankton as a consequence.</p> <p>Water samplings (i.e., by Niskin bottle at the chlorophyll-a peak, quantified by probe) and zooplankton samplings (i.e., WP2 net), with subsequent plankton community identification, to be performed along a transect starting from the Filyos river mouth and directed offshore following the predominant current direction before the first wastewater discharge into the river (in two opposite seasons, if practicable with the project timings). Results to be used in case of exceeding the thresholds (see the next bullet point).</p> <p>In case of exceeding the thresholds defined in Annex B at the discharge points, water samplings (i.e., by Niskin bottle at the chlorophyll-a peak, quantified by probe) and zooplankton samplings (i.e., WP2 net), with subsequent plankton community identification, to be performed along a transect starting from the Filyos river mouth and directed offshore following the predominant current direction immediately after the detection of the exceeding and in the opposite season (e.g., summer and winter) in the same sampling stations as per seawater. Results to be compared with the previous bullet point and among them.</p> <p>Seasonal water samplings (i.e., by Niskin bottle at the chlorophyll-a peak, quantified by probe) and zooplankton samplings (i.e., WP2 net), with subsequent plankton community identification, to be performed along a transect starting from the Filyos river mouth and directed offshore following the predominant current direction in the same sampling stations as per seawater. Results to be compared among them.</p>
ECOSYSTEM SERVICES (MARINE TRAFFIC)	Construction	<p>Offshore excavation (trenching) and sediment storage</p> <p>Offshore pipeline laying</p>	<p>Regular and timely engagement with local fishermen and other users of local harbours and ports in order to discuss and agree on manoeuvring routes and areas.</p> <p>Timely communication on Navtex restrictions and other users of local harbours and coordinating the practical consequences of such security zone.</p> <p>Regular and timely communication to local fishers and other users of local ports and harbours about pipeline construction activities and the routes and frequency of Project vessels.</p>	<p>Marine Traffic Management in cooperation with Port Authority</p> <p>Grievance Records</p>
	Operation	None	Limited vessel movements will occur during operation. These movements will not significantly change the number or composition of marine traffic in the region.	No monitoring measure is required for marine traffic during operation phase
ECOSYSTEM SERVICES (TOURISM)	Construction	<p>Offshore excavation (trenching) and sediment storage</p> <p>Offshore pipeline laying</p>	Develop a schedule that avoids high traffic on the road accessing the beach. If not possible, design the schedule for moving the machineries earlier in the morning so that main traffic would be avoided.	<p>Grievance Records</p> <p>Tourism statistics</p> <p>Stakeholder engagement records (mainly the owners/operators of touristic facilities)</p>
	Operation	None	no impacts are expected on the tourism component during the operation phase.	No monitoring measure is required for tourism during operation phase

Component	Phase	Project action	Mitigation measures	Monitoring measures
VISUAL AESTHETICS	Construction	Vegetation clearing Site levelling and grading General onshore engineering/construction works	<p>Limits of clearing and construction areas will be clearly marked or fenced in order to avoid impacts outside this area</p> <p>All vehicles will drive on designated routes unless otherwise authorized, and off-road driving will be strictly prohibited</p> <p>To allow for vegetation recovery those structures and service roads built for construction purposes only in previously vegetated areas should be removed after construction activities are terminated</p> <p>Reinstatement of topsoil in the landfall construction area to enhance natural habitat restoration</p> <p>Artificial lighting will be used only where necessary for safety and security reasons and for construction purposes. Light will be directed only where necessary, to reduce light spillage in other areas</p> <p>Lighting systems that reduce light pollution and glare effects will be used</p> <p>If necessary, agreements will be taken with surrounding receptors and local communities to identify and implement measures to reduce unwanted lighting</p> <p>Visual impacts will be discussed with surrounding receptors and local communities to identify and implement measures to reduce visual impacts during the construction phase</p> <p>The use of artificial and vegetations screens will be considered to reduce visibility of the Project from external viewpoints</p> <p>The colour of buildings and structures will be selected so to ensure that they blend as much as possible in the landscape context</p>	<p>Monitoring for vegetation cover and recovery of construction areas and the 100 m AoI around the general Project area to be carried out at completion of works and in the following two years, annually.</p> <p>Monitoring of landfall area should follow the indications provided in the relative BAP (Golder, 2022a).</p> <p>Verification of number, type, attendance and outcomes of stakeholder engagement activities.</p> <p>Verification of the number of grievances received and percentage of grievances resolved positively.</p> <p>Verification of the effectiveness of revegetation activities at the end of the construction phase.</p>
	Operation	Plant/infrastructure operation	<p>Artificial lighting will be used only where necessary for safety and security reasons and for construction purposes. Light will be directed only where necessary, to reduce light spillage in other areas</p> <p>Lighting systems that reduce light pollution and glare effects will be used</p> <p>If necessary, agreements will be taken with surrounding receptors and local communities to identify and implement measures to reduce unwanted lighting</p> <p>Visual impacts will be discussed with surrounding receptors and local communities to identify and implement measures to reduce visual impacts during the construction phase</p> <p>The use of artificial and vegetations screens will be considered</p>	<p>Verification of number, type, attendance and outcomes of stakeholder engagement activities.</p> <p>Verification of the number of grievances received and percentage of grievances resolved positively.</p>

Table 12-4: Mitigation measures and monitoring actions for the onshore Physical and Biological components

Component	Phase	Project action	Mitigation measures	Monitoring measures
SOIL AND SUBSOIL	Construction	<p>Site levelling and grading</p> <p>General onshore engineering/construction works</p>	<p>Project-specific Soil Management and Erosion Control Plan will be implemented.</p> <p>To prevent off-site sediment movement, erosion control measures including geotextile filters, drainage channels, settling structures, etc. will be implemented as needed prior to the start of construction operations.</p> <p>Wherever possible, land preparation and construction activities shall be re-scheduled during extreme weather conditions to avoid risk of erosion.</p> <p>Dikes and drainage channels will be established to prevent loss of soil and runoff to water bodies around the excavated material storage areas.</p> <p>Topsoil (if required) and subsoil removal studies will be completed in compliance with the Regulation on Control of Excavated Soil, Construction and Demolition Wastes issued on March 18, 2004 at Official Gazette no: 25406 and other international practices.</p> <p>Topsoil and subsoil loss will be minimized with appropriate equipment, plan, procedure, and schedule. Also, unnecessary soil stripping will not be carried out during construction activities to minimize disturbance to vegetation, ground species and soils.</p> <p>The topsoil (if required) will be carefully removed up to its determined depth and stored at topsoil storage areas to be used for the closure activities.</p> <p>If some construction areas need to be located onto vegetated and uncontaminated land, the topsoil will be temporarily removed and properly stockpiled to be used for landscaping in the stripped areas upon completion of the works as required by the Regulation on Excavation, Construction and Demolition Wastes issued on March 18, 2004 at Official Gazette no.25406.</p> <p>Filling material will be purchased from licensed quarries.</p> <p>Excess excavated material, if any, will be disposed at licensed storage/recycling facilities as required by the Regulation on Excavation, Construction and Demolition Wastes issued on March 18, 2004 at Official Gazette no.25406. In case a licensed facility cannot be found, the Client will identify parcels, for which usage rights will be obtained from the respective right holders as per the requirements of the applicable legislation. Environmental and social assessment studies as per Management of Change Procedure will be implemented during selection and entry to the off-site excavated material storage sites. Criteria such as selecting brownfields, that are not used for agricultural or grazing purposes and having a sufficient distance to settlement areas and will be considered in the selection of excavated material storage sites.</p> <p>Project-specific Pollution Prevention Plan and Waste Management Plan will be implemented to ensure that the amount of release and spills can be taken under control before reaching substantial amounts that may potentially affect the quality of soil.</p> <p>The areas, where the hazardous materials (chemicals, liquids etc.) storage tanks located (i.e., hazardous material storage areas), will be designed and constructed to avoid potential contamination into the soil (paved areas with sufficient secondary containment, proper drainage systems, storage as per Safety Data Sheet (SDS) requirements etc.). Also, the Project will comply with relevant legal and project safety requirements to avoid leakages from hazardous materials (chemicals, liquids etc.) storage facilities on-site</p> <p>The temporary waste storage areas will be constructed based on the requirements listed in the Regulation on Waste Management issued on April 02, 2015 Official Gazette no: 29314 and GIIP.</p> <ul style="list-style-type: none"> The area will be separate from the facilities and buildings, away from human traffic. 	<p>Periodic site inspections will be carried out to ensure that the planned construction site boundaries are not expanded, erosion control measures are in place</p> <p>Periodic inspections of subcontractors in order to ensure no uncontrolled dumping of excavated material</p> <p>Periodic visual site inspection of stormwater and wastewater drainage networks, in order to verify their integrity and functionality</p> <p>Periodic site inspections will be carried out and reported to identify any possible leakages</p> <p>Periodic site inspections will be carried out in order to identify any possible damage in the hazardous materials storage areas and waste storage areas</p> <p>Trainings on spill response, use of containment and clean-up material for the workers (including the subcontractors' workers) will be recorded</p> <p>Periodic site inspections will be carried out to ensure adequate amount of spill-response material such as spill-kits and metal trays will be present at the site and in each heavy machinery and records will be kept</p> <p>Routine maintenance programme will be set-up and maintenance records will be kept for all vehicles and machinery/equipment</p> <p>Licenses and permits of quarries and excavation material storage/recycling facilities will be recorded</p> <p>Waste management practices of the subcontractors will be monitored by means of document review (e.g. permits, waste recycling/disposal agreements) and visual checks at the work sites</p>

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<ul style="list-style-type: none"> • There will be a suitable space for the licensed vehicles to receive the wastes. • Storage area will have all kinds of precautions against possible fires (fire extinguisher, etc.). • Hazardous wastes and non-hazardous wastes will be stored separately, having different entrance doors. • In order to protect the compartment where hazardous waste will be stored from precipitation, the top and four sides will be covered. The compartments where non-hazardous wastes will also be covered from precipitation. • Storage area will be closed, the entrance door will be lockable (kept locked) and the authorized the staff will have the keys. • The contact information of the personnel in charge of the waste storage area and warning signs will be posted at the temporary storage areas. • Adequate drainage system will be provided to collect any leakages. • The floor will be covered with concrete, the edges of the floor will be raised with concrete walls/parapets for hazardous waste compartment. • In order for the concrete to be impermeable, cured concrete with a minimum thickness of 25 cm will be applied or the concrete to be used for this purpose will be in C30 (STS) standard. If this condition is not met, impermeability will be ensured by laying a of at least 1 mm between the concrete and the soil floor. • Wastes will be stored separately from each other, in tanks and containers. Labels indicating the type of waste will be placed for each type of waste. • Removal of wastes will be ensured in appropriate frequencies so that storage capacities at the temporary waste storage areas/storage compartments are not exceeded. Hazardous wastes (except medical waste) will be temporarily stored at the waste storage areas for a maximum duration of 6 months and non-hazardous waste for a maximum duration of one year. <p>Industrial Waste Management Plans for all temporary waste storage area established by contractors (including hazardous and non-hazardous waste) will be submitted to the relevant Provincial Directorate of MoEUCC as per the format defined by the MoEUCC.</p> <p>Temporary Waste Storage Permit will be obtained from the related Provincial Directorate of MoEUCC for temporary waste storage sites at the site generating hazardous waste of more than 1,000 kg per month.</p> <p>Hazardous Materials and Hazardous Waste Compulsory Liability Insurance will be executed as per the relevant provisions of the Regulation on Waste Management for the hazardous waste temporary storage areas/containers regardless of the amount of hazardous waste stored</p> <p>As per the Circular entitled 'COVID-19 Measures for the Waste Management of Single Use Masks, Gloves and Other Personal Hygiene Materials':</p> <ul style="list-style-type: none"> • Masks, gloves and other personal hygiene material wastes generated at the offices, dormitories and work sites will be collected separately. • Waste bins will be placed at the entrances and exits of the office buildings, dormitories, cafeterias and at common areas across the accommodation facilities and work sites. • The waste bins will be labelled explicitly. • Waste bags will not be mixed with other wastes and the waste bags will be transported to a designated temporary storage area by securing them in a second bag via tightly closing. • The wastes will be kept at designated temporary storage areas out of reach of other people and animals for at least 72 hours and then will be delivered to the municipality to be managed under 'other' domestic waste category. • The temporary waste storage areas will be kept closed at all times and secured appropriately. • The wastes generated in potential site quarantine/isolation units and at the site infirmaries will be managed as 'medical waste' and wastes generated from these areas will not be mixed with other wastes. <p>Waste reuse/recycling/recovery/disposal agreements with the Municipality and licensed recovery/disposal firms will be executed for the management of hazardous and non-hazardous waste.</p>	

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<p>Official waste declarations for all waste generated will be submitted to the online system of MoEUCC, starting from January each year until the March at least.</p> <p>Waste storage out of the designated storage areas will be prohibited. Wastes generated in the interim storage areas will be transferred to the temporary storage area</p> <p>Regular maintenance of vehicles and machinery/equipment will be undertaken to ensure that leakages of oil/fuel or any other hazardous material is prevented</p> <p>Impervious (concrete etc.) surfaces will be designated for the refuelling and maintenance of the machinery/vehicles. If it is not possible according to the nature of the Project, all refuelling tankers and all heavy machinery used at the site will have drip trays, and these trays will be placed under the pipe connection points to prevent accidental leakage to the soil during refuelling operations Generators will be equipped with drip trays and to be checked regularly to prevent soil contamination</p> <p>Secondary containments, ponds and drip trays will be checked regularly, especially during extreme weather conditions</p> <p>Portable spill containment and clean-up materials (spill kits) will be made available and easily accessible at the construction site, instructions on how to use spill containment and clean-up materials will be included in the kits</p> <p>Training on spill response, use of containment and clean-up material (spill kits) will be provided to works (including the subcontractor workers)</p> <p>In case of a spill/leakage incident on-site, contamination levels will be identified by means of sampling and analyses studies to be conducted by accredited laboratories and the results will be compared with baseline concentrations of the related parameters to plan corrective actions where necessary</p> <p>No wastewater discharges of any type to land will be allowed. Polluted water (if any generated as a result of accidental leakages) will be properly collected or managed to prevent the soil pollution</p> <p>Pumps and transmixers will be washed only at the concrete plants, concrete slurry will not be discharged into environment</p> <p>Septic tanks will have a leakproof report, and necessary measures will be taken to prevent them from deforming in extreme weather conditions</p> <p>Accidental spills and leakages will be managed through implementation of the Emergency Preparedness and Response Plan.</p>	

Component	Phase	Project action	Mitigation measures	Monitoring measures
	Operation	Plant/infrastructure onshore operation	<p>Project-specific Pollution Prevention Plan and Waste Management Plan will be implemented to ensure that the amount of release and spills can be taken under control before reaching substantial amounts that may potentially affect the quality of soil.</p> <p>The areas, where the hazardous materials (chemicals, liquids etc.) storage tanks located (i.e., hazardous material storage areas), will be designed and constructed to avoid potential contamination into the soil (paved areas with sufficient secondary containment, proper drainage systems, storage as per Safety Data Sheet (SDS) requirements etc.). Also, the Project will comply with relevant legal and project safety requirements to avoid leakages from hazardous materials (chemicals, liquids etc.) storage facilities on-site</p> <p>The temporary waste storage areas will be constructed based on the requirements listed in the Regulation on Waste Management issued on April 02, 2015 Official Gazette no: 29314 and GIIP (for details please refer to Soil and subsoil, mitigation measures, construction phase).</p> <p>Industrial Waste Management Plans for all temporary waste storage area established by contractors (including hazardous and non-hazardous waste) will be submitted to the relevant Provincial Directorate of MoEUCC as per the format defined by the MoEUCC.</p> <p>Temporary Waste Storage Permit will be obtained from the related Provincial Directorate of MoEUCC for temporary waste storage sites at the site generating hazardous waste of more than 1,000 kg per month.</p> <p>Hazardous Materials and Hazardous Waste Compulsory Liability Insurance will be executed as per the relevant provisions of the Regulation on Waste Management for the hazardous waste temporary storage areas/containers regardless of the amount of hazardous waste stored</p> <p>As per the Circular entitled 'COVID-19 Measures for the Waste Management of Single Use Masks, Gloves and Other Personal Hygiene Materials' (for details please refer to Soil and subsoil, mitigation measures, construction phase).</p> <p>Waste reuse/recycling/recovery/disposal agreements with the Municipality and licensed recovery/disposal firms will be executed for the management of hazardous and non-hazardous waste.</p> <p>Official waste declarations for all waste generated will be submitted to the online system of MoEUCC, starting from January each year until the March at least.</p> <p>Waste storage out of the designated storage areas will be prohibited. Wastes generated in the interim storage areas will be transferred to the temporary storage area</p> <p>Regular maintenance of vehicles and machinery/equipment will be undertaken to ensure that leakages of oil/fuel or any other hazardous material is prevented</p> <p>Impervious (concrete etc.) surfaces will be designated for the refuelling and maintenance of the machinery/vehicles. If it is not possible according to the nature of the Project, all refuelling tankers and all heavy machinery used at the site will have drip trays, and these trays will be placed under the pipe connection points to prevent accidental leakage to the soil during refuelling operations Generators will be equipped with drip trays and to be checked regularly to prevent soil contamination</p> <p>Secondary containments, ponds and drip trays will be checked regularly, especially during extreme weather conditions</p> <p>Portable spill containment and clean-up materials (spill kits) will be made available and easily accessible at the construction site, instructions on how to use spill containment and clean-up materials will be included in the kits</p>	<p>Periodic site inspections will be carried out to ensure that the open drains are free of sediments and accumulation of sediments at the sediment traps does not prevent the run-off flow</p> <p>Periodic visual site inspection of stormwater and wastewater drainage networks, in order to verify their integrity and functionality Periodic site inspections will be carried out and reported to identify any possible leakages</p> <p>Periodic site inspections will be carried out in order to identify any possible damage in the hazardous materials storage areas and waste storage areas</p> <p>Trainings on spill response, use of containment and clean-up material for the workers (including the subcontractors' workers) will be recorded</p> <p>Periodic site inspections will be carried out to ensure adequate amount of spill-response material such as spill-kits and metal trays will be present at the site and in each heavy machinery and records will be kept</p> <p>Routine maintenance programme will be set-up and maintenance records will be kept for all vehicles and machinery/equipment.</p>

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<p>Training on spill response, use of containment and clean-up material (spill kits) will be provided to works (including the subcontractor workers)</p> <p>In case of a spill/leakage incident on-site, contamination levels will be identified by means of sampling and analyses studies to be conducted by accredited laboratories and the results will be compared with baseline concentrations of the related parameters to plan corrective actions where necessary</p> <p>No wastewater discharges of any type to land will be allowed. Polluted water (if any generated as a result of accidental leakages) will be properly collected or managed to prevent the soil pollution</p> <p>Pumps and transmixers will be washed only at the concrete plants, concrete slurry will not be discharged into environment</p> <p>Septic tanks will have a leakproof report, and necessary measures will be taken to prevent them from deforming in extreme weather conditions</p> <p>Accidental spills and leakages will be managed through implementation of the Emergency Preparedness and Response Plan.</p>	
AIR QUALITY	Construction	<p>Onshore construction activities (vegetation clearing, site levelling and grading, material transportation, stockpiles, batching plant etc.)</p> <p>Offshore excavation (trenching) and sediment storage, offshore pipeline laying</p>	<p>In order to reduce the air emissions from the construction machinery and equipment, the following actions will be implemented during the construction phase:</p> <ul style="list-style-type: none"> • Provide PPE to workers on site, such as dust masks where dust levels are likely to be excessive • Locate activities and rock / earth stockpiles away from sensitive receptors (natural or residential) • Moisturize, cover, seed or fence stockpiles to prevent wind whipping • Keep stockpiles for the shortest possible time • Consider the prevailing wind direction when siting stockpiles to reduce the likelihood of affecting sensitive receptors • Slow down or cease the dust generating work under strong winds, such as reducing work activities or using water spray to reduce dust dispersion. • Minimise amounts of material handling and avoid double handling • Seal or re-vegetate completed earthworks as soon as reasonably practicable after completion • Ensure all vehicles carrying loose or potentially dusty material to or from the site are fully sheeted • Enforce speed limits and reduce vehicle movements and idling on site • Use water suppression for control of loose materials on paved or unpaved road surfaces <p>Where dust levels may still cause a nuisance (despite measures above) water or other control measures such as chemical bonding agent (non-toxic), or aggregate may be required as additional measures to control dust.</p> <p>The following actions will be implemented to reduce generation of dust in the construction area:</p> <ul style="list-style-type: none"> • vehicle engines and other machinery will be kept turned on only if necessary, avoiding any unnecessary emission 	<p>Regular (daily) visual monitoring to ensure that the dust mitigation measures are in place</p> <p>Routine maintenance programme will be set-up and maintenance records will be kept for all vehicles, machinery/equipment, and vessels</p> <p>Periodic inspection of subcontractors to ensure that all vehicles, construction machinery and vessels used on site evidence regular maintenance schedule in line with regulatory requirements</p> <p>Maintaining a logbook by recording any exceptional incidents that cause extra dust or gas emissions, either on- or offsite, and the action taken to resolve the situation in the log book</p> <p>Air quality monitoring of NOx, SO2 and PM10 at the closest sensitive receptors during peak time of construction activities, and also in case of grievance.</p>

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<ul style="list-style-type: none"> machinery and equipment will be periodically checked and maintained to ensure their good working condition all equipment and machinery must be maintained for compliance with standards and technical regulations for the protection of the environment and have appropriate certifications activities will be conducted trying to use the minimum required number of means at the same time electric small-scale mechanization and technical tools will be used when available and feasible. <p>The following air emissions management strategies are recommended relevant to vessel operations:</p> <p>Application of air quality management procedures (including for GHG emissions) for ship operations while in port areas, such as:</p> <ul style="list-style-type: none"> Validate ship engine performance documentation and certification to ensure compliance with combustion emissions specifications (including NOx, SOx, and PM), within the limits established by international regulations (i.e. MARPOL) Comply with the provisions of "1973 The International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), Annex VI" amended by 1978 Protocol and the provisions of the "Regulation on Reducing the Sulfur Content in Some Fuel Types" entered into force by being published in the Official Gazette No. 27368 on 06.10.2009. When practical and without affecting the safety of vessel navigation, use reduced ship propulsion power in port access areas. For appropriately configured vessels, including port tugs during idling periods, use shorebased power in port where it is available. <p>Application of air quality management procedures to avoid, minimize, and control combustion emissions, including GHG emissions, related to land-based port activities, including:</p> <ul style="list-style-type: none"> Where practicable, design facilities to minimize travel distances and transfer points, for example from ships' off-loading and on-loading facilities to storage areas, and to avoid/minimize re-storage and re-shuffling of cargo (i.e. pipelines). Where practicable, upgrade land vehicle and equipment fleets with low emission vehicles, including use of alternative energy sources, and fuels/fuel mixtures (e.g., vehicle and equipment fleets powered by electricity or compressed natural gas, hybrid locomotives, etc.). Maintain cargo transfer equipment (e.g., cranes, forklifts, and trucks) in good working condition to reduce air emissions. Encourage reduced engine idling during on- and off-loading activities. <p>Ozone Depleting Substances Ozone depleting substances (ODS) such as CFCs and halons may be found on board in refrigeration and fire-fighting equipment and systems. Recommendations to prevent, minimize, and control emissions of ODS include:</p> <ul style="list-style-type: none"> Avoiding installation of firefighting or refrigeration systems containing chlorofluorocarbons (CFCs), in accordance with applicable phase-out requirements Recovery of ODS during maintenance activities and preventing deliberate venting of ODS to the atmosphere. 	
	Operation	Plant/infrastructure onshore operation	<p>The following design measures have been considered for the reduction of potential atmospheric leaks from components and instruments, and releases to atmosphere from vessels and inspection points during maintenance:</p> <p>Flanged manual valves will have flanges integral with valve body and no welding on valve flanges permitted</p> <p>Swing check valves will be provided with limit stops to prevent disc from remaining in open position</p>	<p>Continuous Emission Monitoring Systems (CEMS) will be installed at Indirect Fired Heater, Diesel Generator, LP Steam Boiler and Reciprocating Gas Engine units</p> <p>Routine maintenance programme will be set-up and maintenance records will be kept for all units, machinery/equipment, and vessels</p> <p>The volumes of gas flared for all flaring events should be recorded and reported A logbook should be maintained and any exceptional incidents should be recorded</p>

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<p>By-pass valves will be globe type</p> <p>All (pipeline) fittings will be seamless in construction unless otherwise specified Where welding is used, fittings will be double welded</p> <p>In accordance with API 622 all control valves will undergo fugitive testing to the standard ISO 15848 (2015)</p> <p>Project places upper permissible leak limit of 100 ppm at stem package flange</p> <p>All fillet welds for by-pass installation shall be 100% examined by DP/MO tested and butt weld joints shall be 100% examined by radiography or ultrasonic examination</p> <p>The Project will utilise isolation for the following:</p> <ul style="list-style-type: none"> Valve – Single Block and Bleed (SBB): A single block valve with bleed valve (vent/drain) installed on the same side as the isolated section Valve – Double Block and Bleed (DBB): Double block valve with single bleed valve installed Spectacle Blind: Two discs are attached to each other by section of steel similar to the nose piece of a pair of glasses. One of the discs is a solid plate, and the other is a ring, whose inside diameter is equal to that of a flange. Either can be rotated into the pipe stream. When ring is in stream there is flow when solid plate is moved in place flow is prevented Line Blind: Solid plate that is installed in pipeline which completely prevents flow through pipe Spade Solid plate used to cut off flow in pipeline. <p>All hydrocarbon handling equipment will have facility for spectacle blind, spade/spacer or removable spool. Spectacle blinds shall be used in preference to spaces whenever design allows. Pumps will be fitted with isolation valves (SBB/DBB) on both suction and discharge ends as close to pump inlet/outlet as possible to minimise vapor build up. Eccentric type flat side up reducers will be used to avoid accumulation of gas pockets</p> <p>Control valves, relief valves, pressure instrumentation, and flow instrumentation will be used as an isolation method for the components on the service lines</p> <p>Project vessels/tanks requiring entry, i.e., for inspection/maintenance purposes will have facility for isolation of the vessel from the main process lines. Isolation of the vessel from both inlet and outlet flows will be achieved through installation of valve isolation (single block and bleed or double block and bleed), spectacle blind, line blind, removable nozzle, or spade</p> <p>For closed and open drainage from the vessels/tanks, the following isolation will be used:</p> <ul style="list-style-type: none"> Vessels with Hazardous (Closed) drains will be isolated using manual isolation valve (NC) followed by spectacle blind and then ball valve (NC) arrangement. Non-hazardous (open) drains will use single block valve followed by U-bend and connected to the common open drain header. <p>Isolation equipment will be installed as close as possible to the vessel/tank to minimise amount of gas between isolation point and vessel. Positive isolation will be achieved prior to depressurisation of tank/vessel</p> <p>Pig receiver will use DBB isolation. Each receiver will be fitted with flanged purge connection with isolation valve and check valve</p> <p>The following design considerations have been put forth as given in the Piping design philosophy:</p> <ul style="list-style-type: none"> Protective coating will be applied to pipeline to reduce risk of fracture and accidental releases. 	<p>Periodical ambient air quality monitoring at the sensitive receptors: Monthly monitoring during the first 4 months, to be followed by quarterly monitoring until the first 2 years of operation. The monitoring plan need to be established in accordance with the measurement results. Parameters to be monitored: NOx, SO2, H2S, VOC, O3.</p>

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<ul style="list-style-type: none"> Threaded connections will not be used for process connections (except instrument take-offs after the process isolation valve). Use of flanges on pipe will be kept to a minimum, limited to connecting lines to equipment. <p>Hydrocarbon containing vertical fixed roof tanks' (Rich MEG, Lean MEG and Slop Oil tanks) vent lines will be connected to the LLP flare.</p> <p>Leak Detection and Repair (LDAR) programs will be developed and will be implemented as a part of the management system.</p> <p>The following mitigation measures have been considered in the design of flares:</p> <ul style="list-style-type: none"> Multiple tips ensure smokeless burning under all flow conditions. Operating flare to control odor and visible smoke emissions (no visible black smoke) Flare pilots are of a robust design that have been proven to remain lit in extreme wind and rain conditions Backup supply of pilot fuel via propane bottles to supply up to 8 hours of uninterrupted pilot operation should the fuel gas supply fail. Redundant pilots on every stage of the flare Redundant ignition system (high energy ignition/flame front generator) with automatic pilot relight capability. The following pollution prevention and control measures should also be considered for gas flaring: <ul style="list-style-type: none"> Implementation of source gas reduction measures⁵ to the maximum extent possible Use of efficient flare tips, and optimization of the size and number of burning nozzles Maximizing flare combustion efficiency by controlling and optimizing flare fuel / air stream flow rates to ensure the correct ratio of assist stream to flare stream Minimizing flaring from purges and pilots, without compromising safety, through measures including installation of purge gas reduction devices, flare gas recovery units, inert purge gas, soft seat valve technology where appropriate, and installation of conservation pilots Minimizing risk of pilot blow-out by ensuring sufficient exit velocity and providing wind guards Use of a reliable pilot ignition system Installation of high integrity instrument pressure protection systems, where appropriate, to reduce over pressure events and avoid or reduce flaring situations Minimizing liquid carry-over and entrainment in the gas flare stream with a suitable liquid separation system Minimizing flame lift off and / or flame lick Locating flare at a safe distance from local communities and the workforce including workforce accommodation units Implementation of burner maintenance and replacement programs to ensure continuous maximum flare efficiency Metering flare gas In the event of an emergency or equipment breakdown, or plant upset conditions, excess gas shall not be vented but shall be sent to the flare gas system Flaring volumes should be estimated during the initial commissioning period so that fixed volume flaring targets can be developed <p>For the Hydrogen sulfide (H₂S) emissions, the gas composition did not indicate any significant presence of sulphur and flame-out case has been considered by the HAZOP Analysis to be unlikely because relevant safeguards are in place. Nevertheless, a hydrogen sulfide gas monitoring network</p>	

⁵ As per IFC EHS Guideline on Onshore Oil and Gas Development, measures consistent with the Global Gas Flaring and Venting Reduction Voluntary Standard (part of the World Bank Group's Global Gas Flaring Reduction Public-Private Partnership (GGFR program) should be adopted for flaring and venting options. The standard provides guidance on how to eliminate or achieve reductions in the flaring and venting of natural gas.

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<p>has been installed within the OPF site to facilitate early detection and warning. The location of monitoring stations takes into account the location of emissions sources and areas of community use and habitation</p> <p>Emergency Preparedness and Response Plan (EPRP) involves effective responses to monitoring system warnings and accounts for community health</p>	
NOISE AND VIBRATIONS	Construction	<p>Vegetation clearing</p> <p>Site levelling and grading</p> <p>Material transportation</p> <p>General onshore engineering/construction works</p>	<p>Speed limit applications should be applied throughout site for the Project vehicles that will transport construction materials/equipment</p> <p>Machinery, equipment and vehicles with lower sound power levels and sound reduced models will be preferred</p> <p>Properly refurbished and/or new machinery, equipment and vehicles will be used to the extent possible</p> <p>Maintenance of construction vehicles will be conducted regularly by means of a regular vehicle maintenance and repair program as per the recommendations of the manufacturer</p> <p>Where applicable, silencers will be installed on the exhaust of vehicles</p> <p>Portable barriers and acoustic enclosures will be put around equipment where necessary</p> <p>Where practical, temporary noise barriers will be deployed near sensitive receptors</p> <p>Natural topography will be used to create a barrier against noise where feasible</p> <p>Construction traffic through the settlements will be avoided, whenever alternative routes and/or service roads are available</p> <p>Idling of construction vehicles will be avoided</p> <p>Night-time activities will be avoided where possible</p> <p>Monitoring results will be taken into account in the extent of implementation of mitigation measures</p> <p>since there is no vibration impact observed at the receiving locations for the construction phase, mitigation is not required</p>	<p>Inspection of vehicle/machinery/equipment maintenance records.</p> <p>Site inspections to be conducted to check the construction activities.</p> <p>Monthly noise monitoring at noise sensitive receptors where noise limits are exceeded and additional monitoring in case complaints are received. Monitoring will be carried out specifically at locations and frequency depending on the specific construction schedule, for two consecutive nights where the noisiest activities take place at the most impacted settlements Monitoring frequency can be decreased if 3 consecutive monitoring results comply with Project standards.</p>
	Operation	Plant / Infrastructure operation onshore	<p>Selecting equipment with lower sound power levels</p> <p>Installing silencers for fans</p> <p>Installing suitable mufflers on engine exhausts and compressor components</p> <p>Installing acoustic enclosures for equipment casing radiating noise</p> <p>Improving the acoustic performance of constructed buildings, apply sound insulation</p> <p>Reducing project traffic routing through community areas wherever possible</p> <p>Since there is no vibration impact observed at the receiving locations for the operation phase, mitigation is not required.</p>	<p>Inspection of vehicle/machinery/equipment maintenance records.</p> <p>Site inspections to be conducted to check the operational activities.</p> <p>Monthly noise monitoring during the first quarter, quarterly during the first year and annually for the rest of the operation phase will be conducted at noise sensitive receptors where noise limits are exceeded and additional monitoring in case complaints are received.</p>

Component	Phase	Project action	Mitigation measures	Monitoring measures
HYDROLOGY AND SURFACE WATER	Construction	General onshore engineering/construction works	<p>The drainage system within the construction camp and construction facilities area will be designed to collect the runoff water and discharge it into the Filyos River after proper outlet structures to prevent off-site sediment transport</p> <p>The wastewater from onshore pre-commissioning activities will be discharged to Filyos River by vacuum trucks or through rainwater drainage channels if analyses results are compliant with the Project Standards. If the results are not aligned with the Project standards, the produced wastewater will be transferred to licensed WWTPs by vacuum trucks</p> <p>The hydrotesting lines shall be depressurized immediately after the successful in disposing the test water, maximum care shall be taken not to damage any other structure and/or equipment, etc. Excessive erosion of the temporary back fill materials on the access roads, road itself and/or soil shall be avoided</p> <p>Project-specific Pollution Prevention Plan will be implemented for the management of hydrotest water, backwash wastewater, sewage wastewater, wastes and hazardous materials and implemented during the construction phase of the Project</p> <p>All discharge points would utilize discharge dispersion methods (e.g., controlled rate of discharge and use of energy dissipaters, displacement of geotextile mats or other physical erosion prevention measures) to mitigate erosion. Measures to minimise scour and reduce sediment load will be implemented at locations where hydrotest water is discharged to Filyos River and discharge velocities will be regulated to prevent erosion (e.g., controlled rate of discharge and use of energy dissipaters, displacement of geotextile mats or other physical erosion prevention measures). Where possible, water used in one section of the pipeline will be transferred to adjacent sections upon completion of the hydrostatic test section in order to minimize discharge volume</p> <p>Discharge of wastewater to surface waters will be in compliance with the applicable regulatory requirements given in Appendix C</p> <p>Fueling/refilling and chemical handling activities in close vicinity of the watercourses will be restricted</p> <p>A Project-specific Pollution Prevention Plan and Waste Management Plan will be implemented to ensure that the amount of release and spills can be taken under control before reaching substantial amounts that may potentially affect the quality of soil and potentially that of the nearby water bodies</p> <p>Particular care will be taken on spill containment procedures and materials, and spill/leakage response training of personnel in order to avoid any contamination reaching the freshwater habitats where containment and clean-up procedures would become significantly more complex</p> <p><i>Please refer to Soil and subsoil mitigation procedures for detailed information on spills and leakages</i></p>	<p>Periodic visual site inspection of stormwater and wastewater drainage networks, in order to verify their integrity and functionality</p> <p>Periodic site inspections will be carried out and reported to identify any possible leakages</p> <p>Periodic site inspections will be carried out in order to identify any possible damage in the hazardous materials storage areas and waste storage areas</p> <p>Trainings on spill response, use of containment and clean-up material for the workers (including the subcontractors' workers) will be recorded</p> <p>Sampling and analysis of hydrotest water by accredited laboratories to check whether water quality is suitable for discharge</p> <p>Monthly monitoring of discharge water quality with chemical analysis</p> <p>Monthly monitoring of Filyos River water quality in terms of Flow (Low/med/high), Conductivity (µS/cm), Turbidity (NTU), Temperature (°C), pH, Dissolved Oxygen (mg/L) at the upstream and downstream of the wastewater discharge locations</p> <p>Water samplings and analyses to be performed at the hydrotest discharge point immediately after the hydrotesting activities and by one month after them (i.e., a time interval from a week after to a month after is accepted).</p>
	Operation	Plant/infrastructure onshore operation	<p>The drainage system (including closed drain and open drain) within the facility will be designed to collect the runoff water and discharge it into Filyos River after proper outlet structures to prevent off-site sediment transport. The wastewaters from sanitary facilities, lodging premises, and kitchens, if any, will not be discharged into the open drain.</p> <p>To protect the environment from accidental contaminated water flowing into the river, manually operated sluice gate will be provided before the outfall location of the ditch for examination of stormwater for any contamination.</p> <p>All discharge points would utilize discharge dispersion methods to mitigate erosion (e.g., controlled rate of discharge and use of energy dissipaters, displacement of geotextile mats or other physical erosion prevention measures). Discharge of wastewater to surface waters will be in compliance with the applicable regulatory requirements given in Appendix C.</p>	<p>Periodic site inspections will be carried out to ensure that the open drains are free of sediments and accumulation of sediments at the sediment traps does not prevent the run-off flow</p> <p>Periodic visual site inspection of stormwater and wastewater drainage networks, in order to verify their integrity and functionality</p> <p>Periodic site inspections will be carried out and reported to identify any possible leakages</p> <p>Periodic site inspections will be carried out in order to identify any possible damage in the hazardous materials storage areas and waste storage areas</p> <p>Trainings on spill response, use of containment and clean-up material for the workers (including the subcontractors' workers) will be recorded</p>

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<p>Fuelling/refilling and chemical handling activities in close vicinity of the watercourses will be restricted.</p> <p>Project-specific Pollution Prevention Plan and Waste Management Plan will be implemented for the management of wastewater, waste and hazardous materials and implemented throughout the operation.</p> <p>In addition, as recommended in the Flood Risk Analysis Report of the Project dated January 2022 (Appendix L), increasing berms at the Project Site can provide additional safety to avoid flood that can be occurred in situations where flooding is more than specified from spillways of dams in operation, dam breaking or not cleaning sedimentation from river channels. This can be considered in future according to safety level requested by related institution. Also, in case spreading of flood in the upstream of the Project site is restricted in the possible future studies, the flood risk assessment analysis should need to be renewed. As a result, the suggestions specified in the updated Flood Risk Analysis Report of the Project (Appendix L) should be put into practice.</p>	<p>Analyzes will be carried out quarterly for the treated wastewater at the respective outlet points prior to discharge by accredited laboratories to check compliance with Project standards</p> <p>Analyzes will also be carried out at the frequency specified in the environmental permit document to be obtained from the Provincial Directorate of Environment, Urbanization and Climate Change in accordance with the Environmental Permit and License Regulation. As per the IFC EHS Guidelines, wastewater monitoring should take into consideration the discharge characteristics from the process over time. If the effluent is observed to be highly variable or discharge standards are exceeded, monitoring can be carried out more frequently or through composite methods</p> <p>Treatment plants having a flow rate of 200-500 m3/day will have a sampling manhole and automatic sampling device at the outlet point of the wastewater treatment plant according to the "Regulation on Water Pollution Control"</p>
HYDROGEOLOGY AND GROUNDWATER	Construction	General onshore engineering/construction works	<p>Since SK-3 is in a location affected by Project activities, SK-4 well was constructed instead of SK-3 well as Sazköy's water resource, and Sazköy's water resource will be SK-4 in the next period.</p> <p>The main sources of water supply can be changed according to the aquifer tests conducted in the wells drilled at the west side of the facility and in the wells that are planned to be drilled. For this reason, the study of water sustainability should be repeated accordingly.</p> <p>Worksite will be minimized to the smallest extent possible in order to meet Project's works and activities.</p> <p>The foundations' footprints and depths have been properly dimensioned hence the excavations and the consequent physical-mechanical disturbances will be minimized.</p> <p>The Project will comply with safety requirements to avoid leakages from hazardous chemicals/materials and liquids stored on-site.</p> <p>The areas, where the diesel/fuel storage tanks located (can be named as hazardous material storage areas), will be designed and constructed to avoid potential contamination into the soil (paved areas with sufficient secondary containment, proper drainage systems etc.).</p> <p>Project-specific Pollution Prevention Plan and Waste Management Plan will be implemented to ensure that the amount of release and spills can be taken under control before reaching substantial amounts that may potentially affect the quality of groundwater.</p> <p>The areas, where the hazardous materials (chemicals, liquids etc.) storage tanks located (i.e., hazardous material storage areas), will be designed and constructed to avoid potential contamination into the soil (paved areas with sufficient secondary containment, proper drainage systems, storage as per Safety Data Sheet (SDS) requirements etc.). Also, the Project will comply with relevant legal and project safety requirements to avoid leakages from hazardous materials (chemicals, liquids etc.) storage facilities on-site.</p> <p>The temporary waste storage areas will be constructed based on the requirements listed in the Regulation on Waste Management issued on April 02, 2015 Official Gazette no: 29314 and GIIP (for details please refer to Soil and subsoil, mitigation measures, construction phase).</p> <p>Consultations will be held with State Hydraulic Works and General Directorate of Water Management regarding the hydrogeological studies and groundwater quality and any additional studies will be conducted upon the opinions of these institutions prior to the construction phase.</p> <p>Using the monitored seasonal flowrates and any additional groundwater well data to be drilled in and/or near the Project site, the hydrogeological model should be re-calibrated (if necessary) to re-evaluate groundwater abstraction related consequences prior to the operation period.</p>	<p>Groundwater levels should be continuously and automatically measured by water level loggers that should be inserted within the groundwater wells which should be selected based on the representability of the AoI and in addition to these wells, in the SK-4 (Sazköy water supply well) well. Moreover, the water quality in these wells will be monitored seasonally and trend analyzes will be developed. The data should be reviewed periodically (at least on an annual basis) by TP-OTC and/or an independent supervisor to establish current site conditions and to detect any trends in groundwater quality or levels. If significant trends are observed, then potential causes should be investigated, and corrective measures should be taken, as necessary. During monitoring, the groundwater levels will be monitored continuously by internal transmitters and the monitoring and sampling operations at the monitoring wells based on the EIA commitments will be conducted by an independent company or an accredited laboratory by the Ministry of Environment, Urbanization and Climate Change (MoEUCC) in Turkey.</p> <p>With the monitoring to be carried out within the scope of the project, the established groundwater flow model can be recalibrated, the impact assessment studies can be updated and the monitoring program can be expanded with additional points.</p> <p>Periodic site inspections will be carried out to ensure that the open drains are free of sediments and accumulation of sediments at the sediment traps does not prevent the run-off flow</p> <p>Periodic visual site inspection of stormwater and wastewater drainage networks, in order to verify their integrity and functionality</p> <p>Periodic site inspections will be carried out and reported to identify any possible leakages</p> <p>Periodic site inspections will be carried out in order to identify any possible damage in the hazardous materials storage areas and waste storage areas</p> <p>Trainings on spill response, use of containment and clean-up material for the workers (including the subcontractors' workers) will be recorded.</p> <p>A continuous monitoring system will be provided for treated wastewater at the respective outlet points prior to discharge to check compliance with Project standards.</p> <p>Analyzes will be carried out for the treated wastewater by accredited laboratories at the frequency specified in the environmental permit document to be obtained from the Provincial Directorate of Environment, Urbanization and Climate Change in accordance with the Environmental Permit and License Regulation. As per the IFC EHS Guidelines, wastewater monitoring should take into consideration the discharge characteristics from the process over time. If the effluent is observed to be highly variable, monitoring can be sampled more frequently or through composite methods.</p>

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<p>Maintenance of the vehicles and machinery/equipment (if needed) will be conducted in designated area where there is impermeable surface (concrete floor etc.) and if needed secondary containment system present</p> <p>Portable spill containment and clean-up materials (spill kits) will be made available and easily accessible at the construction site, instructions on how to use spill containment and clean-up materials will be included in the kits</p> <p>Training on spill response, use of containment and clean-up material (spill kits) will be provided to works (including the subcontractor workers)</p> <p>Adequate and properly maintained tanks, paved ground, spill containment materials and proper secondary containment systems with sufficient volume will be provided for fuel/oil storage and for the storage of other fluids and hazardous substances to prevent loss into the soil</p> <p>Wastewater flows from any field activities (i.e., excavations, drillings, re-fuelling and vehicle/equipment washing) will be properly managed</p> <p>Polluted water (if any generated as a result of accidental leakages) will be properly collected or managed to prevent mixing with any water body and the topsoil/soil pollution.</p> <p>Discharge of untreated wastewater, residues or other waste into groundwater or into surface water will be avoided.</p>	
	Operation	Plant/infrastructure onshore operation	As per the mitigation measures of Hydrogeology and groundwater construction phase	As per the monitoring measures of Hydrogeology and groundwater construction phase
FLORA	Construction	<p>Vegetation clearing</p> <p>Site levelling and grading</p> <p>Material transportation</p> <p>General engineering / Construction works</p>	<p>Reinstatement of topsoil in the landfall construction area to enhance natural habitat restoration.</p> <p>Check of vehicles and machinery for evident foreign plant material, soil and seeds on their first entry on site.</p> <p>Trucks coming from the outside the Project area covered with visible amounts of dirt will be washed in a controlled site, where residues will be managed as waste</p> <p>If spreading of invasive species is observed, an appropriate eradication program will be developed and implemented.</p> <p>It was also noticed that within the main TPAO Special -Investment Zone rehabilitation was conducted using planting of eucalyptus trees in rows. Since eucalyptus is considered an invasive alien species in Turkey, it is strongly recommended that further rehabilitation (if any) or restorations of deceased plants (if any) will be carried out with mixed tree species typical of local floodplain woodlands, (e.g., Platanus, Populus, Salix, Ulmus, etc.), in order to align with IFC PS6. A more natural planting scheme is suggested alternating areas with higher density of mixed trees, open areas and depressions in the terrain where temporary ponds could form. An appropriate mix of seeds should be sowed after tree planning in order speed up the revegetation process and ensure ground cover to minimize erosion and sediment runoff.</p> <p><i>Please refer to the mitigation measures listed for the Air quality component for dust management control measures</i></p>	<p>Monitoring for vegetation cover and recovery of construction areas and the 100 m AoI around the general Project area to be carried out at completion of works and in the following two years, annually.</p> <p>Monitoring of landfall area should follow the indications provided in the relative BAP (Appendix M).</p> <p>If detected, presence and spreading of invasive flora, including eucalyptus species, within and around the construction site will be monitored every three months by experts, and, if necessary, extirpation campaign will be put in place in order to avoid the spreading of the invasive species.</p>
	Operation	Plan/Infrastructure onshore operation	<i>Please refer to the mitigation measures listed for the Air quality component for dust management control measures</i>	Inadvertent impacts on natural habitats present around the project area will be monitored annually in order to assess eventual footprint creep outside designated areas, including signs of erosion or

Component	Phase	Project action	Mitigation measures	Monitoring measures
				<p>stagnant water accumulation, functioning of the water run-off management system, dust deposition on vegetation, presence of waste or hazardous substances spill.</p> <p>Areas progressively restored (dune area) will be inspected annually during the vegetative season, in order to allow for prompt corrective actions, if needed. The monitoring will aim to assess the development of the planted/seeded species, the vegetation cover and the presence of stress or erosion signs.</p> <p>If detected, presence and spreading of invasive flora, including eucalyptus species within and around the construction site will be monitored once a year by experts, and, if necessary, extirpation campaign will be put in place in order to avoid the spreading of the invasive species.</p>
FRESHWATER FAUNA	Construction	<p>Vegetation clearing</p> <p>Site levelling and grading</p> <p>Material transportation</p> <p>General engineering / construction works</p>	<p>Dust from material handling, such as conveyors, trucks processing equipment, including storage piles, will be minimized by using covers and/or control equipment (water suppression, bag house, or cyclone) and increasing the moisture content by water spraying.</p> <p>Speed limit for all vehicles will be implemented so as not to generate dust emissions, and all trucks will be properly maintained and travel with covers when carrying material, at all times.</p> <p>Any unpaved internal and access roads will be adequately compacted and periodically graded and maintained, and sprayed with water on an as needed basis to minimize dust from vehicle movements. If water spraying is deemed insufficient, other means of surface treatment (e.g. hygroscopic media, such as calcium chloride, and soil natural-chemical binding agents) of unpaved internal and access roads, and exposed stockpiles using a sprinkler system or a "water-mist cannon" will be implemented.</p> <p>If the topsoil and stockpiles are stored for a long period of time (more than 2 years), they shall be planted with appropriate methods in order to avoid erosion from wind and rain, and to protect the organic matter content.</p> <p>Speed limit applications should be applied throughout site for the Project vehicles that will transport construction materials/equipment.</p> <p>Where possible, noise generating activities will be avoided during quiet times of the day.</p> <p>Machinery, equipment and vehicles with lower sound power levels and sound reduced models will be preferred</p> <p>Properly refurbished and/or new machinery, equipment and vehicles will be used to the extent possible.</p> <p>Maintenance of construction vehicles will be conducted regularly by means of a regular vehicle maintenance and repair program as per the recommendations of the manufacturer</p> <p>Where applicable, silencers will be installed on the exhaust of vehicles</p> <p>Portable barriers and acoustic enclosures will be put around equipment where necessary</p> <p>Where practical, temporary noise barriers will be deployed near sensitive receptors.</p> <p>Natural topography will be used to create a barrier against noise where feasible.</p> <p>Construction traffic through the settlements will be avoided, whenever alternative routes and/or service roads are available.</p> <p>Idling of construction vehicles will be avoided.</p>	<p>Discharge water quality should be monitored monthly with chemical analysis.</p> <p>Inadvertent impacts on natural freshwater habitats present around the construction site will be monitored monthly in order to assess eventual footprint creep outside designated areas, including signs of habitat loss or stagnant water accumulation, functioning of the water run-off management system, dust deposition on vegetation, presence of waste or hazardous substances spill.</p> <p>Accidents involving freshwater wildlife (amphibians) or the observation of live animal or carcasses along the access road or on the construction site will be recorded. Additional mitigation measures to discourage wildlife presence on site and to avoid roadkill will be taken if needed.</p> <p>The monitoring program for aquatic ecosystems and their living organisms, especially endemic species, should be planned twice a year in May and October during construction activities. Monitoring of possible effects on the availability and population status of benthic macroinvertebrates, fish, and amphibians species should be carried out by a Hydrobiologist.</p> <p>For freshwater ecosystems, the monitoring program should include water quality, flow and freshwater biodiversity.</p>

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<p>Care will be taken to select machines and equipment with low noise emissions</p> <p>Night works will be avoided (from 8 pm to 6 am at least), as far as practicable, to reduce impacts to nocturnal freshwater fauna species</p> <p>Particularly noisy activities will be performed during the day and at regular times to promote the habituation of the local fauna to noise and avoid disturbances during critical hours for many species (dusk and dawn).</p> <p>Speed limits and animal crossing signs will be installed on the access road. If necessary, speed limit along the site access road will enforce installing speed bumps and noise stripes on straight sections</p> <p>Appropriate design elements aimed at modifying the behavior of animals (e.g., crossing structures, dry ledges, fencing, right-of way jump outs, etc.) could be installed on the road</p> <p>Avoid the accumulation of stagnant water and organic waste within the construction site and on the roads, that could attract wildlife, properly dispose of waste in a timely and secure manner including animal carcasses</p> <p>Awareness among employees and contractors working on site about the protected species/habitats potentially present in the area will be developed, in order to ensure constant monitoring and promote actions to be taken if wildlife is encountered</p> <p>If freshwater fauna species are encountered (amphibians), employees and contractors will wait until it moves on by itself or they will ask the assistance of the Environmental technician for its safe removal and relocation in a suitable environment</p> <p>Hunting and collection of any wild animal, including fish and invertebrates, by employees and contractors will be strictly prohibited within the Project area.</p> <p>The drainage system within the construction camp and construction facilities area will be designed to collect the runoff water and discharge it into the Filyos River after proper outlet structures to prevent off-site sediment transport.</p> <p>Project-specific Pollution Prevention Plan will be implemented for the management of hydrotest water, backwash wastewater, sewage wastewater, wastes and hazardous materials and implemented during the construction phase of the Project.</p> <p>All discharge points would utilize discharge dispersion methods (e.g., controlled rate of discharge and use of energy dissipaters, displacement of geotextile mats or other physical erosion prevention measures) to mitigate erosion.</p> <p>Measures to minimise scour and reduce sediment load will be implemented at locations where hydrotest water is discharged to Filyos River and discharge velocities will be regulated to prevent erosion (e.g. controlled rate of discharge and use of energy dissipaters, displacement of geotextile mats or other physical erosion prevention measures).</p> <p>Where possible, water used in one section of the pipeline will be transferred to adjacent sections upon completion of the hydrostatic test section in order to minimize discharge volume.</p> <p>Discharge of wastewater to surface waters will be in compliance with the applicable regulatory requirements given in Appendix C.</p> <p>Fueling/refilling and chemical handling activities in close vicinity of the watercourses will be restricted.</p> <p>In case of any parameter exceeding its concentration limit the discharge output should be immediately closed until the issue is properly assessed and resolved.</p>	

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<p>As per the discharge of wastewater cited above, and in addition:</p> <p>The discharge from the pre-commissioning pipeline should be done at a reduced discharge flow to allow for the soil to absorb the majority of the water preventing any wash-off effect on the freshwater fauna in the area.</p> <p>Project-specific Pollution Prevention Plan and Waste Management Plan will be implemented to ensure that the amount of release and spills can be taken under control before reaching substantial amounts that may potentially affect the quality of soil.</p> <p>The areas, where the hazardous materials (chemicals, liquids etc.) storage tanks located (i.e., hazardous material storage areas), will be designed and constructed to avoid potential contamination into the soil (paved areas with sufficient secondary containment, proper drainage systems, storage as per Safety Data Sheet (SDS) requirements etc.). Also, the Project will comply with relevant legal and project safety requirements to avoid leakages from hazardous materials (chemicals, liquids etc.) storage facilities on-site</p> <p>The temporary waste storage areas will be constructed based on the requirements listed in the Regulation on Waste Management issued on April 02, 2015 Official Gazette no: 29314 and GIIP.</p> <p>Industrial Waste Management Plans for all temporary waste storage area established by contractors (including hazardous and non-hazardous waste) will be submitted to the relevant Provincial Directorate of MoEUCC as per the format defined by the MoEUCC.</p> <p>Temporary Waste Storage Permit will be obtained from the related Provincial Directorate of MoEUCC for temporary waste storage sites at the site generating hazardous waste of more than 1,000 kg per month.</p> <p>Hazardous Materials and Hazardous Waste Compulsory Liability Insurance will be executed as per the relevant provisions of the Regulation on Waste Management for the hazardous waste temporary storage areas/containers regardless of the amount of hazardous waste stored</p> <p>Particular care will be taken on spill containment procedures and materials, and spill/leakage response training of personnel in order to avoid any contamination reaching the freshwater habitats where containment and clean-up procedures would become significantly more complex.</p> <p>Waste storage out of the designated storage areas will be prohibited. Wastes generated in the interim storage areas will be transferred to the temporary storage area Regular maintenance of vehicles and machinery/equipment will be undertaken to ensure that leakages of oil/fuel or any other hazardous material is prevented</p> <p>Impervious (concrete etc.) surfaces will be designated for the refuelling and maintenance of the machinery/vehicles. If it is not possible according to the nature of the Project, all refuelling tankers and all heavy machinery used at the site will have drip trays, and these trays will be placed under the pipe connection points to prevent accidental leakage to the soil during refuelling operations</p> <p>Generators will be equipped with drip trays and to be checked regularly to prevent soil contamination</p> <p>Secondary containments, ponds and drip trays will be checked regularly, especially during extreme weather conditions</p> <p>Portable spill containment and clean-up materials (spill kits) will be made available and easily accessible at the construction site, instructions on how to use spill containment and clean-up materials will be included in the kits</p> <p>Training on spill response, use of containment and clean-up material (spill kits) will be provided to works (including the subcontractor workers)</p>	

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<p>In case of a spill/leakage incident on-site, contamination levels will be identified by means of sampling and analyses studies to be conducted by accredited laboratories and the results will be compared with baseline concentrations of the related parameters to plan corrective actions where necessary</p> <p>No wastewater discharges of any type to land will be allowed. Polluted water (if any generated as a result of accidental leakages) will be properly collected or managed to prevent the soil pollution</p> <p>Pumps and transmixers will be washed only at the concrete plants, concrete slurry will not be discharged into environment</p> <p>Septic tanks will have a leakproof report, and necessary measures will be taken to prevent them from deforming in extreme weather conditions</p> <p>Accidental spills and leakages will be managed through implementation of the Emergency Preparedness and Response Plan.</p> <p>Light emissions will be focused within the Project Area boundaries.</p> <p>As far as practicable, no intense light has to be aimed directly towards the freshwater habitats within and in proximity of the Project Area.</p> <p>Lights will be mounted as low as practicable.</p> <p>Downward-facing lights will be used to manage horizon glow. Louvered bollards, low height flat beam technology luminaires, poles and structure mounted fittings are acceptable.</p> <p>Shielded light fittings and directional lights will be used to manage light spill.</p> <p>Use of artificial light will be limited to what required to maintain a safe working environment during construction activities past sunset and before sunrise.</p> <p>Unnecessary lighting will not be used, including lights in unused areas, decorative lighting, or lighting that is brighter than needed for the task being carried out.</p> <p>Where practicable, timers and motion sensors will be used to turn off lights when not in use (e.g., sunset switch on, timer off for lighting used for walkways, car parks, and roads).</p>	
	Operation	Plan/Infrastructure onshore operation	<p>Treated wastewater should be analyzed in accordance with national and international guidelines listed in Appendix C</p> <p>In case of any parameter exceeding its concentration limit the discharge output should be immediately closed until the issue is properly assessed and resolved</p> <p>For other mitigation measures, please refer to the <i>Flora</i> component, construction phase.</p>	<p>Discharge water quality should be constantly monitored with the use of a continuous monitoring system located at the discharge outlet and/or with monthly chemical analysis of wastewater output.</p> <p>The monitoring program for freshwater fauna, especially endemic species, should be planned twice a year (May and October) for at least two years during operation phase. Monitoring of possible effects on the availability and population status of benthic macroinvertebrates, fish and amphibian species should be carried out by a Hydrobiologist.</p> <p>Inadvertent impacts on natural freshwater habitats present around the operation site will be monitored monthly in order to assess eventual footprint creep outside designated areas, including signs of habitat loss or stagnant water accumulation, functioning of the water run-off management system, dust deposition on vegetation, presence of waste or hazardous substances spill.</p> <p>Accidents involving freshwater wildlife (amphibians) or the observation of live animal or carcasses along the access road or on the construction site will be recorded. Additional mitigation measures to discourage wildlife presence on site and to avoid roadkill will be taken if needed.</p>

Component	Phase	Project action	Mitigation measures	Monitoring measures
TERRESTRIAL FAUNA	Construction	Vegetation clearing Site levelling and grading Material transportation General engineering / construction works	Biological pre-construction surveys will be implemented in the areas still to be cleared in order to identify and relocate fauna species	Accidents involving wildlife or the observation of live animal or carcasses along the access road or on the construction site will be recorded. Additional mitigation measures to discourage wildlife presence on site and to avoid roadkill will be taken if needed. Cameratrap traps will serve also as monitoring of fauna within the Project Area, detection records will be analysed regularly and will be used to decide on the implementation of further mitigation measures
			Limits of clearing and construction areas will be clearly marked or fenced in order to avoid impacts outside this area	
			All vehicles will drive on designated routes unless otherwise authorized, and off-road driving will be strictly prohibited	
			Specialist training shall be provided to plant operators and key personnel involved in activities which involve land clearance, materials handling and transport activities which may impact terrestrial fauna (e.g. vegetation, clearing, restoration activities)	
			Topsoil to be stored in designated stockpile areas	
			Reinstatement of topsoil in the landfall construction area to enhance natural habitat restoration	
			Care will be taken to select machines and equipment with low noise emissions	
			Night works will be avoided (from 8 pm to 6 am at least), as far as practicable, to reduce impacts to nocturnal fauna species	
			Particularly noisy activities will be performed during the day and at regular times to promote the habituation of the local fauna to noise and avoid disturbances during critical hours for many species (dusk and dawn).	
			Light emissions will be focused within the Project Area boundaries	
Lights will be mounted as low as practicable				
Downward-facing lights will be used to manage horizon glow. Louvered bollards, low height flat beam technology luminaires, poles and structure mounted fittings are acceptable				
Shielded light fittings and directional lights will be used to manage light spill				
Use of artificial light will be limited to what required to maintain a safe working environment during construction activities past sunset and before sunrise				
Unnecessary lighting will not be used, including lights in unused areas, decorative lighting, or lighting that is brighter than needed for the task being carried out				
Where practicable, timers and motion sensors will be used to turn off lights when not in use (e.g., sunset switch on, timer off for lighting used for walkways, car parks, and roads).				
Check of vehicles and machinery for evident foreign plant material, soil and seeds on their first entry on site				
Trucks coming from the outside the Project area covered with visible amounts of dirt will be washed in a controlled site, where residues will be managed as waste				
If spreading of invasive species is observed, an appropriate eradication program will be developed and implemented				
Wire fences should be used to prevent wildlife to enter the Project Area				

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<p>In locations within the Project Area where wire fencing is not a feasible option entry-exit of terrestrial fauna should be detected via cameratraps to be activated in the night hours during construction</p> <p>Speed limits and animal crossing signs will be installed on the access road. If necessary, speed limit along the site access road will enforce installing speed bumps and noise stripes on straight sections</p> <p>Appropriate design elements aimed at modifying the behavior of animals (e.g., crossing structures, dry ledges, fencing, right-of way jump outs and other one-way structures that allow animals to leave the right-of-way, noise barriers, olfactory repellents) could be installed on the road</p> <p>Avoid the accumulation of stagnant water and organic waste within the construction site and on the roads, that could attract wildlife, properly dispose of waste in a timely and secure manner including animal carcasses</p> <p>Feeding of wildlife or stray cats and dogs will be prohibited on-site and organic waste will be carefully managed and disposed of in order to avoid attraction of wildlife or stray cats and dogs</p> <p>Awareness among employees and contractors working on site about the protected species/habitats potentially present in the area will be developed, in order to ensure constant monitoring and promote actions to be taken if wildlife is encountered</p> <p>If fauna species are encountered, employees and contractors will wait until it moves on by itself or they will ask the assistance of the environmental Specialist/ecologist for its safe removal and relocation in a suitable environment</p> <p>Hunting and collection of wild animals, by employee and contractors will be strictly prohibited within the Project area.</p>	
	Operation	Plan/Infrastructure onshore operation	<p><i>Please refer to the mitigations listed in Terrestrial fauna, construction phase.</i></p> <p>In addition to the mitigation measures already mentioned, attention should also be given to properly store and dispose of organic and food waste on-site. During the operation phase cameratraps will be activated in the night hours for a 30-days period in each season.</p>	<p>Accidents involving wildlife or the observation of live animal or carcasses along the access road or on the construction site will be recorded. Additional mitigation measures to discourage wildlife presence on site and to avoid roadkill will be taken if needed.</p> <p>Cameratraps will also serve as monitoring of fauna within the Project Area, detection records will be analysed regularly and will be used to decide on the implementation of further mitigation measures.</p>

Component	Phase	Project action	Mitigation measures	Monitoring measures
BIRDS	Construction	Vegetation clearing Site levelling and grading Material transportation General engineering / construction works	Biological pre-construction surveys will be implemented in the areas still to be cleared in order to identify and relocate fauna species	Accidents involving birds or the observation of live individuals or carcasses along the access road or on the construction site will be recorded. Additional mitigation measures to discourage bird presence on site and to avoid roadkill will be taken if needed. Monitoring for bird species during construction phase should be carried out twice a year in breeding (May-June) and migration (October-November) months.
			Limits of clearing and construction areas will be clearly marked or fenced in order to avoid impacts outside this area	
			All vehicles will drive on designated routes unless otherwise authorized, and off-road driving will be strictly prohibited	
			Specialist training shall be provided to plant operators and key personnel involved in activities which involve land clearance, materials handling and transport activities which may impact birds (e.g. vegetation, clearing, restoration activities)	
			Monitoring of bird species and their presence in the landfall and ETL construction area at completion of works and in the following one and two years.	
			Care will be taken to select machines and equipment with low noise emissions	
			Night works will be avoided (from 8 pm to 6 am at least), as far as practicable, to reduce impacts to nocturnal bird species	
			Particularly noisy activities will be performed during the day and at regular times to promote the habituation of the local fauna to noise and avoid disturbances during critical hours for many species (dusk and dawn).	
			Light emissions will be focused within the Project Area boundaries	
			Downward-facing lights will be used to manage horizon glow. Louvered bollards, low height flat beam technology luminaires, poles and structure mounted fittings are acceptable	
Shielded light fittings and directional lights will be used to manage light spill				
Use of artificial light will be limited to what required to maintain a safe working environment during construction activities past sunset and before sunrise				
Unnecessary lighting will not be used, including lights in unused areas, decorative lighting, or lighting that is brighter than needed for the task being carried out				
Where practicable, timers and motion sensors will be used to turn off lights when not in use (e.g., sunset switch on, timer off for lighting used for walkways, car parks, and roads).				
Project-specific Pollution Prevention Plan and Waste Management Plan will be implemented during the construction phase of the Project to ensure that the amount of release and spills can be taken under control before reaching substantial amounts that may potentially affect the quality of soil and potentially that of the nearby water bodies				
Particular care will be taken on spill containment procedures and materials, and spill/leakage response training of personnel in order to avoid that any contamination reaches the freshwater habitats where containment and clean-up procedures would also be significantly more complex.				
Speed limits and animal crossing signs will be installed on the access road. If necessary, speed limit along the site access road will enforce installing speed bumps and noise stripes on straight sections				
Avoid the accumulation of stagnant water and organic waste within the construction site and on the roads, that could attract wildlife, including birds, properly dispose of waste in a timely and secure manner including animal carcasses				

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<p>Feeding of wildlife or stray cats and dogs will be prohibited on-site and organic waste will be carefully managed and disposed of in order to avoid attraction of wildlife or stray cats and dogs</p> <p>Awareness among employees and contractors working on site about the protected species/habitats potentially present in the area will be developed, in order to ensure constant monitoring and promote actions to be taken if wildlife is encountered</p> <p>If fauna species are encountered, employees and contractors will wait until it moves on by itself or they will ask the assistance of the Environmental technician for its safe removal and relocation in a suitable environment</p> <p>Hunting and collection of wild animals, by employee and contractors will be strictly prohibited within the Project area.</p> <p><i>Please refer to the mitigations listed for the Soil and subsoil and Hydrology and surface water quality for detailed information on spills and leakages mitigation procedures are</i></p>	
	Operation	Plan/Infrastructure onshore operation	<p>Line marking devices (e.g., marker balls, spirals, and other hanging devices) of the earth wire is recommended to increase its visibility of the line</p> <p>Windows and other wide accesses points to the buildings should be kept closed. If not possible, dissuasion devices should be utilized (e.g., acoustic devices, bird of prey shapes applied on windows, etc.)</p> <p>Treated wastewater should be analyzed in accordance with national and international guidelines listed in Chapter 2</p> <p>In case of any parameter exceeding its concentration limit the discharge output should be immediately closed until the issue is properly assessed and resolved.</p> <p><i>For other mitigation measure please refer to the mitigation measures adopted for Birds, construction phase</i></p>	
HABITATS	Construction	<p>Vegetation clearing</p> <p>Site levelling and grading</p> <p>Material transportation</p> <p>General engineering / construction works</p>	<p><i>Please refer to the mitigation measures listed for the previous components</i></p>	<p><i>Please refer to the monitoring measures listed for the previous components</i></p>

Component	Phase	Project action	Mitigation measures	Monitoring measures
	Operation	Plan/Infrastructure onshore operation	<i>Please refer to the mitigation measures listed for the previous components</i>	<i>Please refer to the mitigation measures listed for the previous components</i>
LEGALLY PROTECTED AREAS AND INTERNATIONALLY PROTECTED AREAS	Construction	Vegetation clearing	Biological pre-construction surveys will be implemented in the areas still to be cleared in order to identify and relocate fauna species	Inadvertent impacts on natural habitats present around the construction site will be monitored monthly in order to assess eventual footprint creep outside designated areas, including signs of erosion or stagnant water accumulation, functioning of the water run-off management system, dust deposition on vegetation, presence of waste or hazardous substances spill.
		Site levelling and grading	Limits of clearing and construction areas will be clearly marked or fenced in order to avoid impacts outside this area	
		Material transportation	All vehicles will drive on designated routes unless otherwise authorized, and off-road driving will be strictly prohibited	Monitoring of birds and flora species and their recovery in the landfall and ETL construction area at completion of works and in the following one and two years.
		General engineering / construction works	Specialist training shall be provided to plant operators and key personnel involved in activities which involve land clearance, materials handling and transport activities which may impact natural habitats (e.g. vegetation, clearing, restoration activities)	Monitoring of landfall area (grey dunes habitat) should follow the indications provided in the relative BAP (Golder, 2022a).
			Care will be taken to select machines and equipment with low noise emissions	If detected, presence and spreading of invasive flora and fauna species within and around the construction site will be monitored every three months by experts, and, if necessary, extirpation campaign will be put in place in order to avoid the spreading of the invasive species.
			Night works will be avoided (from 8 pm to 6 am at least), as far as practicable, to reduce impacts to nocturnal bird species	
			Particularly noisy activities will be performed during the day and at regular times to promote the habituation of the local fauna to noise and avoid disturbances during critical hours for many species (dusk and dawn).	
			Light emissions will be focused within the Project Area boundaries	
			Keep glare to a minimum by ensuring that the main beam angle of all lights directed towards any potential observer is not more than 70°	
			Downward-facing lights will be used to manage horizon glow. Louvered bollards, low height flat beam technology luminaires, poles and structure mounted fittings are acceptable	
			Shielded light fittings and directional lights will be used to manage light spill	
			Use of artificial light will be limited to what required to maintain a safe working environment during construction activities past sunset and before sunrise	
			Unnecessary lighting will not be used, including lights in unused areas, decorative lighting, or lighting that is brighter than needed for the task being carried out	
			Where practicable, timers and motion sensors will be used to turn off lights when not in use (e.g., sunset switch on, timer off for lighting used for walkways, car parks, and roads).	
			Check of vehicles and machinery for evident foreign plant material, soil and seeds on their first entry on site:	
			Trucks coming from the outside the Project area covered with visible amounts of dirt will be washed in a controlled site, where residues will be managed as waste	
			If spreading of invasive species is observed, an appropriate eradication program will be developed and implemented	

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<i>Please refer to the mitigation measures listed for the Air quality component for dust management control measures</i>	
	Operation	Plan/Infrastructure onshore operation	<i>Please refer to the mitigation measures listed in Legally Protected Areas and Internationally Protected Areas, construction phase</i>	<i>Please refer to the monitoring measures listed in Legally Protected Areas and Internationally Protected Areas, construction phase</i>

Table 12-5: Mitigation measures and monitoring actions for the offshore Physical and Biological components

Component	Phase	Project action	Mitigation measures	Monitoring measures
SEAFLOOR MORPHOLOGY	Construction	Offshore excavation (trenching) and sediment storage Offshore pipeline laying	Uncontrolled release of the sediments potentially creating abnormal 3D structures at the temporary and during the backfilling to be avoided The homogeneity of the seafloor to be restored at the baseline conditions during the backfill of the trench	Bathymetric surveys (i.e., by MBES), or alternatively ROV inspections along transects (200 m minimum), conducted in the scope of the project monitoring, whether planned, to be analyzed to assess the effectiveness of the restoration of the seafloor morphology after the backfill of the trench.
	Operation	Plant/infrastructure operation offshore	The pipelines to be buried for the land approach (first 1.4 km from the shoreline)	Bathymetric surveys (i.e., by MBES) and/or ROV inspections conducted in the scope of the project monitoring, whether planned, to be analyzed to inform on the presence of unplanned erosion or accumulation processes
SEDIMENTS	Construction	Offshore excavation (trenching) and sediment storage Offshore pipeline laying	Sediments to be gently placed at the temporary storage area in order to reduce the resuspension Dredged sediments to be stored in mapped sections at the temporary storage area so the backfill operation shall bring back the sediments at the proper location not to disrupt the sediment type distribution (e.g., sediments dredged at 800 m from the shoreline and at a depth of 10 to be brought back in about the same location) Presence of clay to be tolerated but its dominance in the upper layer (i.e., the first 20 cm) to be avoided In order to make the assessment of the sediment quality more meaningful, it would be appropriate to investigate with another 2 or 3 sediment samples near the TCS-3 station, located about halfway through the trench excavation area and increase the number of biological targets to be subjected to the ecotoxicological test, e.g. adding one assay with heterotrophic bacteria or plant organisms, one assay with proper consumers, one assay with prolonged exposure or an endpoint other than mortality – immobility	Sediment samplings (i.e., by grab) and analyses to be performed at both the trench and temporary storage area once completed the construction. Results to be compared with the baseline conditions.
	Operation	None	No impacts generated by the operation phase of the project are expected on the sediments	Since no impacts generated by the operation phase of the project are expected on the sediments, monitoring measures are not required
SEAWATER	Construction		All vessels used to be compliant with MARPOL Sediments to be gently placed at the temporary storage area and during the backfill in order to reduce the resuspension Hydrotest fluids discharged deep sea to be compliant with the relevant standards for deep sea discharges as reported in Annex B Minimize, when possible, the volume of hydrotest water offshore by testing equipment at an onshore site prior to loading the equipment onto the offshore facilities Use the same water for multiple tests, when feasible Reduce the need for chemicals by minimizing as much as possible the time that test water remains in the equipment or pipeline	Water samplings (i.e., by Niskin bottle close to the surface and close to the bottom) and analyses to be performed at both the trench and temporary storage area immediately after the dredging and backfill activities results to be compared with the baseline conditions Water samplings (i.e., by Niskin bottle close to the surface and close to the bottom) and analyses to be performed at the hydrotest discharge point immediately after the hydrotesting activities and by one month after them (i.e., a time interval from a week after to a month after is accepted). Chemicals used for the hydrotest (see 3.0) to be searched and quantified in laboratory In case of leakages during the hydrotest, water samplings (i.e., by Niskin bottle close to the surface and close to the bottom) and analyses to be conducted in correspondence of the leakage point(s) immediately after the leak(s) and by one month after (i.e., a time interval from a week after to a month after is accepted). Chemicals used for the hydrotest (see 3.0) to be searched and quantified in laboratory

Component	Phase	Project action	Mitigation measures	Monitoring measures
			<p>Carefully select chemical additives in terms of dose concentration, toxicity, biodegradability, bioavailability, and bioaccumulation potential</p> <p>Wastewater effluents to be compliant with the relevant standards as reported in Annex B</p> <p>Discharge point to be located at a sufficient water depth (below 25 m)</p> <p>Effluent dispersion modelling to be performed to design the discharge point (e.g., location, need for diffusers etc.) especially if the discharge is not temporary (e.g. operation for more than one year)</p>	
	Operation	Plant/infrastructure operation offshore	<p>Wastewater effluents to be compliant to national and international standards</p> <p>All vessels used to be compliant with MARPOL</p>	<p>Regular continuous monitoring at the discharge points in the Filyos river as illustrated in hydrology and surface water impact assessment will be useful also for the seawater as a consequence</p> <p>In case of exceeding the thresholds defined in Annex B at the discharge points, water samplings (i.e., by Niskin bottle close to the surface and close to the bottom) and analyses to be performed along a transect starting from the Filyos river mouth and directed offshore following the predominant current direction immediately after the detection of the exceeding and by one month after (i.e., a time interval from a week after to a month after is accepted). The exceeded parameter to be searched and quantified in laboratory as minimum</p> <p>Seasonal water samplings (i.e., by Niskin bottle close to the surface and close to the bottom) and analyses to be performed along a transect starting from the Filyos river mouth and directed offshore following the predominant current direction. The same parameters as per the discharge points in the river (as stated in hydrology and surface water impact assessment and reported in Annex B) to be searched and quantified in laboratory. This monitoring coupled with the one reported for hydrology and surface water impact assessment aim at both:</p> <ul style="list-style-type: none"> Monitoring the input of contaminants from the river to the seawater and Discriminating whether the source of the possible pollution (whether present) could be the project itself or other sources (e.g., other wastewater discharges in the area)
PHYSICAL OCEANOGRAPHY	Construction	Offshore excavation (trenching) and sediment storage	No mitigation measures are identified for the impact factor potentially affecting the physical oceanography during construction.	No monitoring measures are required for the physical oceanography during construction
	Operation	None	No mitigation measures are identified for the impact factor potentially affecting the physical oceanography during operation.	No monitoring measures are required for the physical oceanography during construction
UNDERWATER NOISE	Construction	Offshore excavation (trenching) and sediment storage	All vessels used to be compliant with MARPOL	No monitoring measures are required for the underwater noise during construction

Component	Phase	Project action	Mitigation measures	Monitoring measures
	Operation	Plant/infrastructure operation offshore	All vessels used to be compliant with MARPOL	No monitoring measures are required for the underwater noise during operation
PLANKTON	Construction	Offshore excavation (trenching) and sediment storage Offshore pipelines and lines laying Wastewater treatment discharge Pre-commissioning activities (e.g., pipeline hydrotesting, cleaning and gauging)	As per the mitigation measures for the construction phase of Seawater, except for: Sediments to be gently placed at the temporary storage area and during the backfill in order to reduce the resuspension	Regular continuous monitoring at the wastewater treatment plant Water samplings (i.e., by Niskin bottle at the chlorophyll-a peak, quantified by probe) and zooplankton samplings (i.e., WP2 net), with subsequent plankton community identification, to be performed along a transect starting from the discharge point and following the predominant current direction before the first wastewater discharge (in two opposite seasons, if practicable with the project timings) in the same sampling stations as per seawater. Results to be used in case of exceeding the thresholds (see the next bullet point) In case of exceeding the thresholds defined in Annex B at the wastewater treatment plant, water samplings (i.e., by Niskin bottle at the chlorophyll-a peak, quantified by probe) and zooplankton samplings (i.e., WP2 net), with subsequent plankton community identification, to be performed along a transect starting from the discharge point and following the predominant current direction immediately after the detection of the exceeding and in the opposite season (e.g., summer and winter) in the same sampling stations as per seawater. Results to be compared with the previous bullet point and among them Seasonal water samplings (i.e., by Niskin bottle at the chlorophyll-a peak, quantified by probe) and zooplankton samplings (i.e., WP2 net), with subsequent plankton community identification, to be performed along a transect starting from the discharge point and following the predominant current direction in the same sampling stations as per seawater. Results to be compared among them
	Operation	Plant/infrastructure onshore operation	All vessels used to be compliant with MARPOL Wastewater effluents to be compliant to national and international standards	As per the monitoring measures of Plankton construction phase
BENTHIC COMMUNITIES	Construction	Offshore excavation (trenching) and sediment storage Offshore pipelines and lines laying Wastewater treatment discharge	Sediments to be gently placed at the temporary storage area in order to reduce the resuspension Dredged sediments to be stored in mapped sections at the temporary storage area so the backfill operation shall bring back the sediments at the proper location not to disrupt the sediment type distribution (e.g., sediments dredged at 800 m from the shoreline and at a depth of 10 to be brought back in about the same location) Presence of clay to be tolerated but its dominance in the upper layer (i.e., the first 20 cm) to be avoided to favor recolonization Wastewater effluents to be compliant with the relevant standards as reported in Annex B Discharge point to be located at a sufficient water depth (25 m or below 25) Effluent dispersion modelling to be performed to design the discharge point (e.g., location, need for diffusers etc.) especially if the discharge is not temporary (e.g. operation for more than one year)	No monitoring measures are required for benthic communities during construction

Component	Phase	Project action	Mitigation measures	Monitoring measures
	Operation	Plant/infrastructure operation offshore	Since a positive impact is expected, no mitigation measures are required.	Since a positive impact is expected, no mitigation measures are required
FISHES	Construction	Offshore excavation (trenching) and sediment storage Offshore pipelines and lines laying Pre-commissioning activities (e.g., pipeline hydrotesting, cleaning and gauging)	All vessels used to be compliant with MARPOL. Hydrotest fluids discharged deep sea to be compliant with the relevant standards for deep sea discharges as reported in Annex B Minimize, when possible, the volume of hydrotest water offshore by testing equipment at an onshore site prior to loading the equipment onto the offshore facilities Use the same water for multiple tests, when feasible Reduce the need for chemicals by minimizing as much as possible the time that test water remains in the equipment or pipeline Carefully select chemical additives in terms of dose concentration, toxicity, biodegradability, bioavailability, and bioaccumulation potential	No monitoring measures are required for fishes during construction
	Operation	Plant/infrastructure onshore operation Plant/infrastructure operation offshore	Wastewater effluents to be compliant to national and international standards	No monitoring measures are required for fishes during operation
MARINE MAMMALS ⁶	Construction	Offshore excavation (trenching) and sediment storage Offshore pipelines and lines laying	Defined routes to be used for all the vessels A dedicated and trained member of the crew should be in charge to scan the sea surface aboard each vessel during all activities involving the vessels navigating over 10 kn of speed in order to early detect the presence of cetaceans and avoid possible collisions Reduced speed limits of vessel/ship to decrease and/or avoid any risk of injury and mortality to aquatic fauna arising from vessel collisions Feeding or attracting any wild animal shall be strictly prohibited All vessels used to be compliant with MARPOL Anthropogenic noise unnecessary to the work activities only to be avoided to reduce disturbance to marine mammals Work activities to be planned so that noisiest activities are, as much as possible, scheduled not to be performed at dusk and dawn, when marine mammals are more active	A Marine Fauna Monitoring report indicating all the visual and acoustic detections of cetacean species during the construction activities to be prepared A logbook with the occurred vessel collisions with the marine mammals, as well as the near-miss, to be compiled indicating the species involved (or taking diagnostic photographs where identification is not feasible), date and time, coordinates, weather conditions and name of the vessel involved in the event
	Operation	Plant/infrastructure operation offshore	As per the mitigation measures for marine mammals during construction phase	As per the mitigation measures for marine mammals during construction phase and in addition: Cetacean stranding networks to be periodically consulted to verify the absence of suspicious cetacean deaths.
MARINE HABITATS	Construction	All the project actions triggering the impact factors analyzed for the previous physical and biological components may be considered as potentially impacting marine habitats	All vessels used to be compliant with BWM Convention. Water ballast of vessels coming from out of the Black Sea to fully treat ballast water before discharge	The monitoring measures to be implemented for the physical and biological components previously assessed during construction will be useful also for marine habitats

⁶ The same considerations can be made for Critical Habitats.

Component	Phase	Project action	Mitigation measures	Monitoring measures
	Operati on	All the project actions triggering the impact factors analyzed for the previous physical and biological components may be considered as potentially impacting marine habitats	The proper implementation of the mitigation and monitoring measures indicated in the previous sections	The monitoring measures to be implemented for the physical and biological components previously assessed during construction will be useful also for marine habitats

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