Nakkaş Otoyol Yatırım ve İşletme A.Ş

Nakkas Basaksehir Motorway, Turkey (CESMP)

Construction Environmental and Social Management Plan (CESMP)

21 August 2023

Project No.: 0580559

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Signature Page

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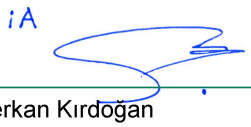

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Acronyms and Abbreviations

AIIB	Asian Infrastructure Investment Bank
BAP	Biodiversity Action Plan
CAP	Corrective Action Plan
CESMP	Construction Environmental and Social Management Plan
CFP	Chance Find Procedure
CLO	Community Liaison Officer
dB Leq	Decibel Equivalent Continuous Sound Pressure Level
DEFRA	Department of Environmental, Food and Rural Affairs
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
EPC	Environmental, Procurement and Construction
EPRP	Emergency Preparedness and Response Plan
ERM	Environmental Resources Management
ERT	Emergency Response Team
ESIA	Environmental and Social Impact Assessment
ESHS	Environmental, Social, Health and Safety
ESMMP	Environmental and Social Management and Monitoring Plan
ESMS	Environmental and Social Management System
E&S	Environmental and Social
EQ	Existing Third-Party Quarry
FFDC	Fabric Filter Dust Collector
GBVH	Gender-Based Violence and Harassment
GC	Grievances Committee
GHG	Greenhouse gas
GIIP	Good International Industry Practice
GM	Grievance Mechanism
HGV	Heavy Goods Vehicle
HIRA	Hazard Identification and Risk Assessment
H&S	Health and Safety
HSE	Health, Safety and Environment
HMs	Hazardous Materials
IAS	Invasive Alien Species
IFC	International Finance Corporation
IFI	International Financial Institutions
ISSG	Invasive Species Specialist Group
IUCN	International Union for the Conservation of Nature
KGM	Karayolları Genel Müdürlüğü (General Directorate of Highways in Turkey)
KPI	Key Performance Indicator
MIC	Maximum Instantaneous Charge
NGO	Non-governmental organisation

NQ	New Quarry
OECD	Organisation for Economic Co-operation and Development
OHS	Occupational Health and Safety
OW	Owners Engineer
PBFs	Priority Biodiversity Features
PM10	Particulate Matter Fraction 10 µm
PR	Performance Requirement
PS	Performance Standard
RAP	Resettlement Action Plan
RoW	Right of Way
SDS	Safety Data Sheet
SEP	Stakeholder Engagement Plan
SEPA	Scottish Environmental Protection Agency
WHO	World Health Organisation
WSA	Waste Storage Area

1. INTRODUCTION

1.1 Background

Several motorways were constructed in the Marmara Region with the aim to decrease the traffic load around Istanbul, including the “Northern Marmara Motorway” (NMM). The NMM was originally comprised of seven sections in total connecting Asia and Europe with an uninterrupted traffic flow and is considered an alternative route to the European Road 80 (E 80 also known as Trans European Motorway (TEM). The first seven sections of the NMM have already been completed and are under operation (see Figure 1-1). Based on the tender process held on 30 June 2020 and the agreement following on 13 April 2021, the 1st Regional Directorate of Karayolları Genel Müdürlüğü (KGM) (General Directorate of Motorways in Turkey) involved an additional section within the scope of NMM which is called “Section 8 – Nakkaş-Başakşehir Motorway” (hereafter called the “Project").

The Project is a new 4-lane dual toll road with a total length of 30,64 km including connection roads and 1619 m long Sazlıdere Cable Stayed Bridge. Nakkaş Otoyol Yatırım ve İşletme A.Ş. (Nakkaş Otoyol A.Ş) - a Special Purpose Vehicle (SPV) under a Build, Operate and Transfer (BOT) contract signed with Turkish Ministry of Transport, General Directorate for Highways (KGM) in 2020 - is responsible for the construction and operation of the Project.

The construction of Nakkaş - Başaksehir Motorway (Section 8) started in August 2021 and has been put on hold since mid-2022.

Figure 1-1 Sections of Northern Marmara Motorway

1.2 Objective

Nakkaş Otoyol A.Ş is planning to seek for financing of the investment costs of the Project by debt and equity under a Project Finance structure involving the European Bank for Reconstruction and Development (EBRD), the Asian Infrastructure Investment Bank (AIIB), Atradius, Standard Chartered Bank, SERV, DZ BANK and Bank of China, Deutsche Bank, Credit Suisse, the Islamic Corporation for the Development of the Private Sector (ICD) and Vakıfbank.

As a major, long-term infrastructure, the Project is considered as Category A by the Lenders and is subject to full Environmental and Social Impact Assessment (ESIA).

Therefore, Nakkaş Otoyol A.Ş appointed ERM GmbH (ERM) to conduct the ESIA in line with Lenders standards described in Section 4.1.

ESIA studies have examined negative and positive, biophysical and socio-economic effects of all components of the Project. During the course of the Impact Assessment, design decisions have been made taking account of the need to avoid, minimise and reduce any negative environmental and social impacts. Where potential adverse have been identified, the ESIA has examined the extent to which these impacts would be mitigated through the adoption of good practice methods of working in line with international standards.

The Project Environmental and Social Management and Monitoring Plan (ESMMP) lays out the numerous obligations of the Project Owner to achieve conformance with the international lender standards. In addition, this Construction and Environmental and Social Management Plan (CESMP) was prepared as a part of Project ESIA Package specifically as a management tool to be used by the Environmental, Procurement and Construction (EPC) Contractor and its sub-contractors & suppliers to implement the environmental and social (E&S) mitigation measures identified in the ESIA report and ESMMP during the construction phase.

The primary objective of the CESMP is to guide the construction phase of the Project and meet the requirements for managing construction-phase risks and impacts identified for the relevant environmental and social aspects, including compliance with National and International legislative requirements as applicable. The CESMP ensures consistency across the development Project site in terms of environmental and social considerations, for the duration of the construction phase.

The construction of the Project started in August 2021 while the preparation of publicly disclosed studies was being carried out:

- Environmental Impact Assessment Report (ESIA);
- Stakeholder Engagement Plan (SEP);
- Resettlement Action Plan (RAP); and
- Environmental, Social, Health and Safety (ESHS) Management Plans.

Nakkaş Otoyol A.Ş paused all construction activities (earthworks, relocation works, structures etc.) as of April 2022 and proceeded with the construction of the “Cable Stayed Bridge Piers” and “Viaduct Piers” which did not require any further land take.

Early Construction Phase works were initiated including earthworks and construction of the Sazlıdere Cable Stayed Bridge. However, construction activities were paused by Nakkaş Otoyol A.Ş in September 2022 to complete ongoing ESIA studies to be fully aligned with international standards. This plan will be updated as per in line with the final ESIA Package and when required according to the requirement of changes on the construction activities.

1.3 Overview of Requirements

1.3.1 International Requirements

The road development Project will be designed, constructed, and operated in a manner which is considered consistent with Good International Industry Practice (GIIP) and the requirements of EBRD (*refer to Section 4.1 for the detail*).

1.3.2 National Requirements

The Project will need to meet the national legislative requirements of Turkey in terms of a range of legislation (*refer to Section 4.2 for the detail*).

1.4 Application and Implementation

The CESMP is applicable to the construction phase of the Project specifically, and the ultimate responsibility for its implementation resides with the appointed EPC Contractor.

As a contractual requirement, the EPC Contractor, sub-contractors & suppliers will be required to demonstrate compliance with their activities against the CESMP.

1.5 Review and Updates

Changes in the Project may occur due to unanticipated situations. Adaptive changes may also occur during the course of the project life cycle. The CESMP, and any associated plans/documents, are therefore intended to be 'living documents' that can be refined and modified as situations change. Nakkas Otoyol A.Ş. will implement a formal 'management of change procedure' to manage changes in the Project that will apply to all project activities.

The CESMP will be regularly reviewed and updated after any change in the context in which the Project operates during the construction phase.

Urgent updates in line with the principle of 'adaptive management' can be the responsibility of the Biodiversity Expert, with support from the HSE Manager, however, any material changes to intervention design, the timing of monitoring activities, etc. should be made in consultation with a third-party consultant to ensure accountability.

Any and all changes made to the CESMP will be made in the master document and revision numbers and dates provided to track version numbers as part of the EPC Contractor's data and document management system. A summary document should also be produced that summarises the important changes made to the document for the different version numbers and who authorised these changes.

1.6 Key References

The following are key documents that were used to inform the development of this CESMP:

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- Ottawa, 2015. Protocol for Wildlife Protection during Construction. August 2015. Ottawa: Planning and Growth Management. Available online at: https://documents.ottawa.ca/sites/documents/files/documents/construction_en.pdf
- SEPA: Scottish Environmental Protection Agency, 2010. *Engineering in the Water Environment: Good Practice Guide: River Crossings.* Second Edition. Available online at: https://www.sepa.org.uk/media/ 151036/wat-sg-25.pdf
- SEPA: Scottish Environmental Protection Agency, 2009. *Engineering in the Water Environment: Good Practice Guide: Temporary Construction Methods*. First Edition. Available online at: https://www.sepa.org.uk/media/150997/wat_sg_29.pdf
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- Western Sydney Airport, 2018. Biodiversity Construction Environmental Management Plan. December 2018. Available online at: https://westernsydney.com.au/sites/default/files/2021-12/WSA00-WSA-00400-EN-PLN-000003%20Biodiversity%20CEMP.pdf
- World Health Organisation (WHO, 2017), Guidelines for drinking-water quality, 4th edition, Available online at: https://www.who.int/publications/i/item/9789241549950
- ESMS Handbook (REC-HSE-EYS-KMO-HB-01)

1.7 List of Associated Plans and Procedures

In the CESMP, key points on a range of topics are addressed, while more comprehensive information is contained in the respective topic-specific management plans and procedures as listed in Table 1-1 . These associated plans need to be read in conjunction with the CESMP and include:

Table 1-1 List of Plans and Procedures

Document Code	Document Name
REC-İSG-ÇYS-PL-01	Health and Safety Plan
REC--HSE-EYS-KMO-PL-06	Emergency Preparedness and Response Plan
REC- İSG-KMO-PR-29	Labour Management Plan
REC-İSG-ÇYS-KMO-PL-16	Camp Management Plan
REC-İSG-ÇYS-KMO-PL-08	Cultural Heritage Management Plan
REC- HSE-EYS-KMO-PR-17	Supply Chain Management Plan
REC-İK-KMO-PL-02	Gender Action Plan
REC-ÇYS-KMO-PL-03	Community Development Plan (under development)
REC-İK-KMO-PL-03	Local Recruitment Plan
REC-İSG-ÇYS-KMO-PL-04	Design Change Management Procedure
REC-İSG-ÇYS-KMO-PL-15	Covid-19 Emergency and Response Plan
REC-İSG-KMO-PL-07	Traffic Management Plan
REC-İSG—ÇYS-KMO-PL-13	Community Health, Safety and Security Plan
REC-İSG-KMO-PL-22	Security Management Plan
REC-İSG-ÇYS-KMO-PL-06	Contractor Management Plan
REC-İSG-KMO-PL-06	Temporary Electricity Plan
REC-HSE-EYS-KMO-PL-04	Air Quality and Emission Control Plan
REC-ÇYS-KMO-PL-06	Biodiversity Action Plan
REC-İSG-ÇYS-KMO-PL-18	Blasting Management Plan
REC-ÇYS-KMO-PL-02	Waste Management Plan
REC-ÇYS-KMO-PL-20	Wastewater Management Plan
REC-İSG-ÇYS-KMO-PL-09	Surface Water and Groundwater Management Plan
REC-ÇYS-KMO-PL-17	Landscape Management Plan
REC-ÇYS-KMO-PL-03	Medical Waste Management Plan
REC-ÇYS-KMO-PL-05	Noise and Vibration Management Plan
REC-ÇYS-KMO-PL-19	Pollution Prevention Plan
REC-İSG-ÇYS-KMO-PL-11	Quarry Management Plan
REC-ÇYS-KMO-PL-10	Soil Management Plan
REC-ÇYS-KMO-PL-15	Habitat Restoration and Recreation Plan
REC-ÇYS-KMO-PR-28	Chance Find Procedure
REC-İSG-ÇYS-KMO--PL-12	Chemical Hazard Management Plan
REC-İSG-ÇYS-KMO-PR-02	Permit to Work Procedure
REC-İSG-KMO-PR-03	Life Critical Operations Control Procedure
REC-İSG-KMO-PR-04	Hazard and Risk Management Procedure
REC-İSG-ÇYS-KMO-PR-05	HSE Training Procedure

Document Code	Document Name
REC-İSG-ÇYS-KMO-PR-06	Accident and Incident Management Procedure
REC-İSG-ÇYS-KMO-PR-07	HSE Discipline Procedure
REC-İSG-ÇYS-KMO-PR-08	Fire Prevention and Protection Procedure
REC-İSG-ÇYS-KMO-PR-09	HSE Monitoring Verification and Evaluation Procedure
REC-İSG-ÇYS-KMO-PR-10	Working at Height Procedure
REC-İSG-KMO-PR-04	Cranes and Lifting Operations Procedure
REC-İSG-ÇYS-KMO-PR-13	Confined Space Procedure
REC-İSG-ÇYS-KMO-PR-14	Personal Protective Equipment Procedure
REC-İSG-ÇYS-KMO-PR-15	Manual Handling Procedure
REC-İSG-ÇYS-KMO-PR-16	HSE Incentive Procedure
REC-İSG-ÇYS-KMO-PR-17	Excavation Works Procedure
REC-İSG-ÇYS-KMO-PR-20	HSE Leadership and Key Performance Procedure
REC-İSG-KMO-PR-08	Electrical Safety Procedure
REC-İSG-ÇYS-KMO-PR-24	Machine and Equipment Procedure
REC-İSG-ÇYS-KMO-PR-12	Worker’s Grievance Mechanism Procedure
REC-İSG-ÇYS-KMO-PR-31	Housekeeping Procedure
REC-İK-KMO-PR-01	Employee Satisfaction Management Procedure
REC-İSG-ÇYS-KMO-PR-33	Operator Competency Assessment Procedure
REC-ÇYS-KMO-PR-40	Contaminated Land Procedure
REC-ÇYS-KMO-PR-39	Water Management Procedure

2. PROJECT DESCRIPTION

2.1 Introduction

The Project is located in western part of İstanbul passing through four districts: Başakşehir, Arnavutköy, Avcılar and Çatalca (see Figure 2-1). The combined population of these four districts in 2020 is estimated to be around 1.5 million[1]. These are densely populated areas with diverse economic and livelihood activities as well as hosting large residential apartment buildings, public service institutions and sports facilities.

The Project will be a new 4-lane dual Motorway and 2x3 lane connecting road which is intended to be used solely by motor vehicles such as automobiles, buses, small and large trucks/lorries, and motorcycles. Special vehicles (such as over-sized transporters), or lorries carrying certain hazardous cargoes will be subject to approval by KGM in accordance with the Turkish motorway regulations applicable for all such motorways. Pedestrians, bicycles, grazing animals, slow-moving farm vehicles and other vehicles that are inappropriate for such a motorway will be prohibited. As a limited access roadway, there will be no traffic-light intersections; entry or exit will be via right-side ramps at newly built interchanges.

There will be no provisions for pedestrians, cyclists, or other vehicles to cross the Motorway at grade. Signs and fences will be erected all along the Motorway to prevent pedestrians from attempting to cross. Instead, the Motorway design provides underpasses, overpasses and culverts to allow safe passage for pedestrians and vehicles, as well as for animal crossings (including wildlife). The underpass locations are designed at or as close as possible to all existing roadways and farm roads/paths. Underpasses will be installed at appropriate locations to facilitate the existing transport routines/passage and to thus avoid any motivation for attempting an illegal crossing of the Motorway itself.

The Project includes a number of elements currently identified as shown in Table 2-1. The different elements will be described in detail in the subsequent parts of this Section.

Table 2-1 Project Key Elements

Project Component	Details
Length of main road	24,17 km
Length of connecting roads	6,47 km
Cross Sections	2x4 lanes for main Motorway and 2x3 for connecting road
Interchanges	10
Cable Stayed Bridge	1,619 m (Length) x 46 m (Width) and Tower Height of 196 m
Overpasses	18
Underpasses	18
Viaducts	5
Culverts	55
Toll Booth	The number of toll booths / plazas has not been specified at the current stage. Hybrid / free flow systems and tollgate toll collection systems will be incorporated in the Project, similar to the other segments of the NMM.
Lighting	Lighting will be provided at cable stayed bridge, intersections, and toll booths. All electrical applications will be powered by local electricity supply. In case of a power cut of the local electricity supply, power for the bridge will be provided from diesel generators.

[1] TUIK Address Based Population Registration System (ADNKS) results, 2020

Project Component	Details
Service Stations/Rest Areas	There are no service stations/rest areas planned as part of the existing road design.
O&M Facilities	There are two O&M facilities planned at KM 36+300 and at 49+200 specifically for Sazlıdere Cable Stayed Bridge. These O&M facilities will also serve as Disaster Recovery centres.

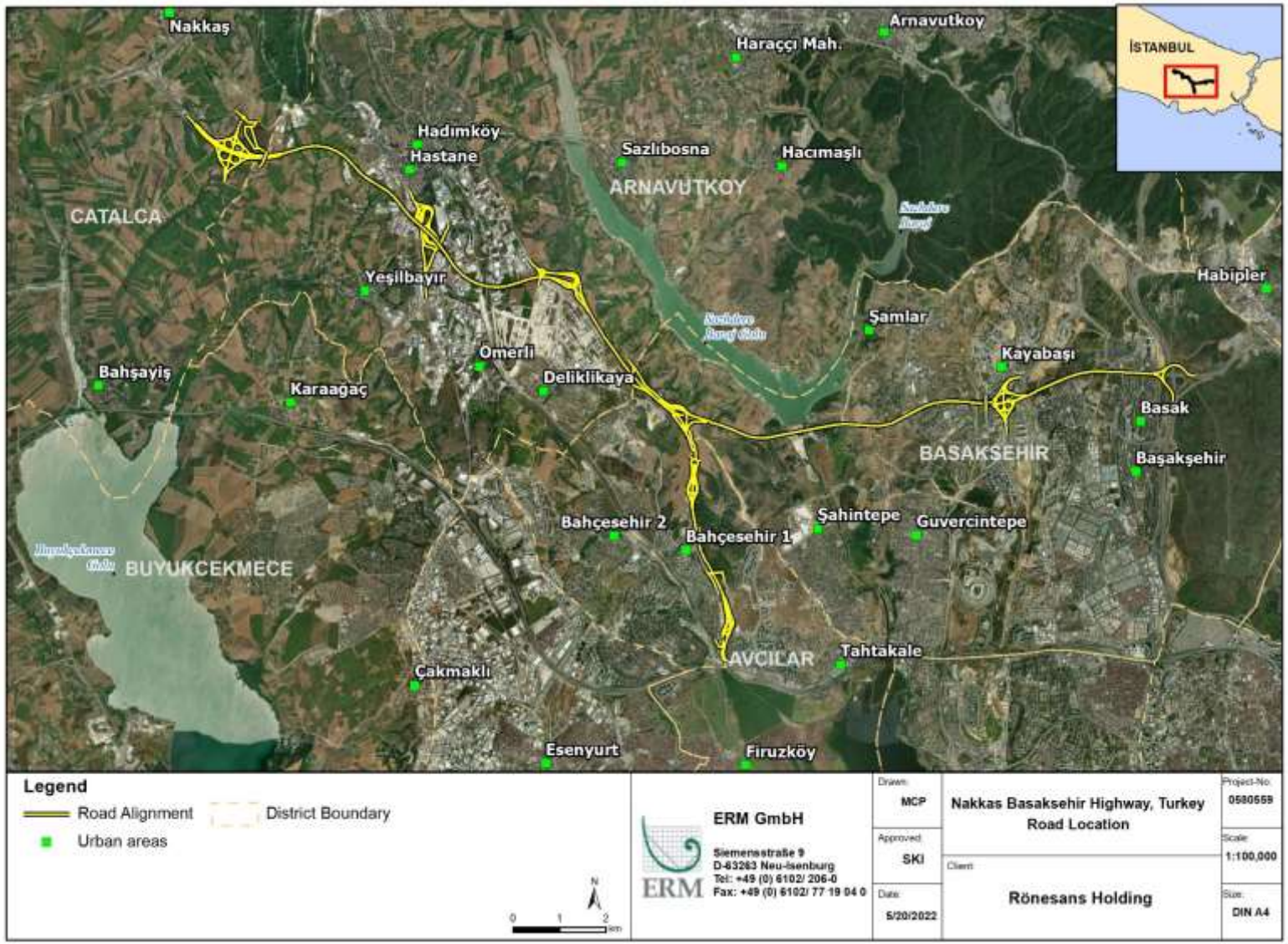

Figure 2-1 Project Location

2.1.1 Temporary Construction Components

Temporary construction components will only be needed during the construction and will be reinstated to its original condition upon completion of the construction activities. Different from Associated Facilities, these components will be financed as part of the Project component and Nakkaş Otoyol A.Ş. will have full control on the environmental and social performances. Therefore, below components are defined as Project components but not Associated Facilities.

These components include (see Table 2-2 and Figure 2-2):

- Construction Camps;
- Quarries and Borrow Pits;
- Concrete Plants;
- Asphalt Plants;
- Mechanical Plants;
- Beam Production Facilities; and
- Surplus Material Dumpsites.

2.1.1.1 Construction Campsites

EPC Contractor has listed two campsites which are already in use (see below). Currently, there are no female employees who use accommodation facilities at either campsite since there is rental assistance provided by EPC Contractor to the female employees. This approach will continue during main construction phase of the Project. However, if needed, separate accommodation will be organised for female employees based on the requirements of the Gender Action Plan (GAP) developed for the Project. Access to the camps is tightly controlled and restricted to the Project workforce and approved visitors to ensure safety and security of project workforce as well as the third parties.

Both camps' wastewater is connected to the existing municipality sewage network, and water is supplied via existing water network as well. Camps' electricity is provided by electrical grid and back-up generators are used in case of failure electrical supply.

Sazlıdere Bridge Campsite

Sazlidere Bridge Campsite is located at KM 51 adjacent to the right of way (RoW) and the site is surrounded by agricultural areas and a greenhouse area. Sazlıdere creek is located 20 m to the east and Sazlıdere Dam is located 320 m to the north of the campsite.

The main purpose of the campsite is to serve for precast production and storage required for construction of Sazlidere Bridge and the Viaducts. The campsite is also used for EPC Contractor and sub-contractors workers accommodation purposes with a maximum capacity of 750 persons.

Olimpiyat Campsite

Olimpiyat Campsite is an existing campsite that is already in use and located at KM 56 used previously by Rönesans during the construction of Başakşehir Çam and Sakura City Hospital Project between 2016 and 2020. The campsite is surrounded by roads (adjacent), residential buildings are located 195 m to the northwest, and Başakşehir Çam ve Sakura Hospital is located 195 m to the southeast. The campsite was designed a in such way that they can accommodate a workforce of approximately 1,100 persons.

2.1.1.2 Quarries and Borrow Pits

Material aggregate (manufactured sand, gravel and crushed stone) for concrete and asphalt, sub-base and fill will be supplied from third-party suppliers in the region based on the availability of material,

quality of materials, technical feasibility, environmental and social considerations, and commercial viability.

Suitable quarries and borrow pits already in use and planned to be used have been identified and are listed in Table 2-2. Nakkaş Otoyol A.Ş will ensure that the EPC Contractor procures the aggregate from licensed and authorised sites or sources. A due diligence will be conducted by the EPC Contractor for the existing quarries to ensure permits are valid and operations are in compliance with national regulations and international guidelines. Relevant suggestions should be made to improve the current standards of the quarries and should be monitored frequently.

Where new quarries and borrow pits need to be opened only for Project needs, Nakkaş Otoyol A.Ş will ensure that the EPC Contractor obtains the necessary permits and licences and conduct any necessary ESIAs in line with Turkish requirements. Nakkaş Otoyol A.Ş. will ensure that the environmental and/or social risks and impacts arising from new quarries and new borrow pits opened and operated by the EPC Contractor are managed and mitigated in accordance with Turkish law, Good International Industry Practice (GIIP) and the objectives of the EBRD Performance Requirements (PRs) and IFC Performance Standards (PSs)[2].

2.1.1.3 Surplus Material Dumpsites

The construction material requirements and the suitability of cut-fill requirements for the Project have not been finalized yet, however, based on the current calculations the estimated excavation and fill volumes of the Project are 19.9 million m^3 in excavations, 3.4 million m^3 in reusage of material and a balance of 16.5 million m^3 of surplus material generated which will need to be dumped. Surplus material dumpsites already used and planned to be used have been identified as listed in Table 2-3.

2.1.1.4 Other Project Components

The EPC Contractor is still in the process of identifying the suitable locations for the below-listed components in consultation with relevant authorities. So far, the below listed potential locations (Table 2-4 have been identified although the final decision has not been given yet by the EPC Contractor.

Once the final decisions are given, all necessary E&S assessments will be conducted in accordance with Turkish regulations and Lender requirements.

[2] Note that the Project will only be able to utilise quarries that are fully licensed and operating in full compliance with the licence requirements and other regulatory obligations. As such, any of the existing quarries or any additional quarries identified in the future (if needed) that are not fully licensed will need to obtain the required licences.

Table 2-2 Quarries and Borrow Pits

No.	Name of the Quarry	Distance to the RoW	New Quarry (NQ) or Existing Third-Party Quarry (EQ)	Currently, Used by the Project?	Area [ha]	What will be used?	Usage Purpose	Duration of Usage by the Project (months)	Amount to be extracted by the Project (million tons)	Permit Date (Duration)	Permit Owner / Type of Permit
1	Ömerli Quarry (Used by concrete supplier AKCANSA)	87 Km	EQ	Yes	243,4	Limestone	Concrete Aggregate (100 years)	42	0,24	27.08.2017-27.08.2037	Koç Hafriyat Ve Madencilik Ltd. Şti. / Mining Operation Permit
2	Cebeci Quarry (Used by REC & concrete supplier AKCANSA)	15,5 Km	EQ	Yes	449,48	Sandstone	Concrete Aggregate, Subbase & Base Corse, Capping Layer, Filter Aggregate, İmprovement Fill, Rock Fill	42	2,75	29.11.2018-29.11.2028	Kuzey Cebeci Madencilik Sanayi Ticaret Anonim Şirketi / Mining Operation Permit
3	Ayazağa Quarry (Used by concrete supplier BOGAZICI BETON)	33 Km	EQ	Yes	160	Sandstone	Concrete Aggregate	42	1,2	23.07.2014-23.07.2034	İstmad Maden İşletmeleri ltd. şti. (Royalty Boğaziçi Beton A.Ş.) / Mining Operation Permit

No.	Name of the Quarry	Distance to the RoW	New Quarry (NQ) or Existing Third-Party Quarry (EQ)	Currently, Used by the Project?	Area [ha]	What will be used?	Usage Purpose	Duration of Usage by the Project (months)	Amount to be extracted by the Project (million tons)	Permit Date (Duration)	Permit Owner / Type of Permit
4	Boğazköy Quarry (Used by REC and potantial usage by pavement supllier DANIS)	12,4 Km	EQ	Yes	75	Sandstone	Subbase & base course, capping layer, filter aggregate, improvement fill, rock fill	33	1,05	24.02.2014-24.02.2024	Dalbay Taş İmalatı Sanayi Ve Ticaret Ltd. Şti. / Mining Operation Permit
5	Çiftalan Quarry (potantial usage by pavement supllier DANIS)	29 Km	EQ	No	60,28	Sandstone	Bituminous asphalt aggregate	24	0,9	05.11.2018-05.11.2023	KGM / Mining Operation Permit
6	Sefaalan Quarry (potential usage by pavement supplier DANIS)	64 Km	EQ	No	24,6	Basalt	Stone mastic asphalt aggregate	30	0,195	13.05.2020-13.05.2030	Koçer Yapı İnş. Mad. Taah. Tic. San.Ltd. Şti./ Mining Operation Permit
7	Hoşdere Borrow Pit (shall be used by REC)	0,4 Km	New Borrow Pit	No	3.55	Limestone	Capping layer, rock fill	33	1,39	Under application evaluation	Not obtained yet

Table 2-3 Surplus Material Dumpsites

No.	Name of the Dumpsite	Distance to the RoW	New Dumpsite or Existing Dumpsite Operated by Third Party	Currently, Used by the Project? (Yes/No)	Area [ha]	Usage Purpose	Duration of Usage by the Project (months)	Amount to be stored by the Project (m3)	Permit Date (Duration)	Permit Owner / Type of Permit
1	Bolluca Dumpsite	14,8 Km	Existing	No	79.09	Unsuitable excavation and surplus materials storage	33	5,300,000	11.04.2022	KGM/Disposal
2	Mahmutbey Dumpsite	8,5 Km	Existing	Yes	3	Unsuitable excavation and surplus materials storage	30	900,000	09.07.2021	KGM/Disposal
3	Pirinççi Dumpsite	8,7 Km	Existing	No	49.2	Unsuitable excavation and surplus materials storage	33	5,000,000	Under application evaluation (expected by September 2022)	Not obtained yet
4	Şamlar Dumpsite	6,5 Km	New	No		Unsuitable excavation and surplus materials storage	33	4,400,000	Under application evaluation (expected by September 2022)	Not obtained yet

No.	Name of the Dumpsite	Distance to the RoW	New Dumpsite or Existing Dumpsite Operated by Third Party	Currently, Used by the Project? (Yes/No)	Area [ha]	Usage Purpose	Duration of Usage by the Project (months)	Amount to be stored by the Project (m3)	Permit Date (Duration)	Permit Owner / Type of Permit
5	Nakkaş Dumpsite	200 m	New	No	6.4	Unsuitable excavation and surplus materials storage	30	900,000	Under application evaluation (expected by December 2022)	Not obtained yet
6	Şahintepe Dumpsite	Adjacent to the RoW at KM 51+400	New	Yes	11,86	Unsuitable excavation and surplus materials storage	10	300,000	Application process has been suspended since the site will not be used for further activities and will be reinstated to original ground conditions. Compensation/Expropriation will be carried out in accordance with Project requirements for the land that has already been used.	Not applicable

Table 2-4 Other Construction Facilities

No.	Name of the Facility	District	Location	Distance to the RoW	New Facility or Existing Facility Operated by Third Party	Currently Used by the Project? (Yes/No)	Area [ha]	Usage Purpose	Duration of Usage by the Project (months)	Expropriation/Rental Status	Permit Date (Duration)	Permit Owner / Type of Permit
1	Sazlidere Campsite, Asphalt Plants, Mechanical Plant, Batch Plant	Başakşehir/ Şahintepe	KM 51+400	200 m	New	Yes (for campsite) No (for plants)	Registration Area: 20.04 Used Area: 14.76	Mobilisation & Camp Area	42	Şahintepe 1446/5 parcel Housing Development Administration of Turkey (TOKİ-Official institutions)- Consent (190.878,44 m2) Emlak Planlama Construction Corp. (EPP-semi-official institution) - Consent (522,79 m2) Artaş İnşaat (Construction Corp.) - Consent (8.790,62 m2) Private Property- Negotiating (36,41 m2)	TOKİ - 30.03.2021 EPP - 02.04.2021 ARTAŞ - 29.06.2021 Private - Negotiating	TOKİ-Official institution- (190.878,44 m2) EPP - Semi-official institution - (522,79 m2) Artaş İnşaat - Construction Corp. (Private) - (8.790,62 m2)
2	Olimpiyat Campsite	Başakşehir/İkitelli-2	KM 55+800	Within the RoW	Existing	Yes	5,5	Mobilisation & Camp Area	42	Under the rule and authority of the state /within ROW	20.04.2021, site access approval date by KGM	REC
3	Yeşilbayır Batch Plant	Arnavutköy/Yeşilbayır	KM 37+500 (North of RoW)	200 m	New	No	Permitted Area: 1,5	Production Of Concrete	24	Yeşilbayır 202/2 ve 4 parcels Housing Development Administration of Turkey (TOKİ-Official institutions)- Consent	31.08.2021	TOKİ-Official institutions
4	İkitelli-1 Asphalt, Mechanical Plant and Beam Production Facility	Başakşehir İkitelli-1	Outside of the RoW	3 Km	New	No	5.3	Production Of Asphalt & Subbase & Production Of Beams	28	İkitelli-1 2125parcel Ministry of National Defense (MSB)-Protocol is in progress (KGM-MSB)	Under application evaluation	Not obtained yet
5	Şahintepe Beam Production Facility	Başakşehir Şahintepe	KM 50+200	300 m	New	No	13.12	Production Of Beams	28	Şahintepe 1473/46, 47, 48, 49, 58, 60, 62, 63 ve 1475/28 ve 29 parcels Başakşehir Municipality - Negotiating	Under application evaluation	Not obtained yet
6	Şahintepe Beam Production Facility	Başakşehir Şahintepe	KM 50+300	300 m	New	No	6.5	Production Of Beams	28	Şahintepe 1476/5, 7, 11, 12 ve 1473/1 parcels Housing Development Administration of Turkey (TOKİ-Official institutions)- Negotiating	Under application evaluation	Not obtained yet

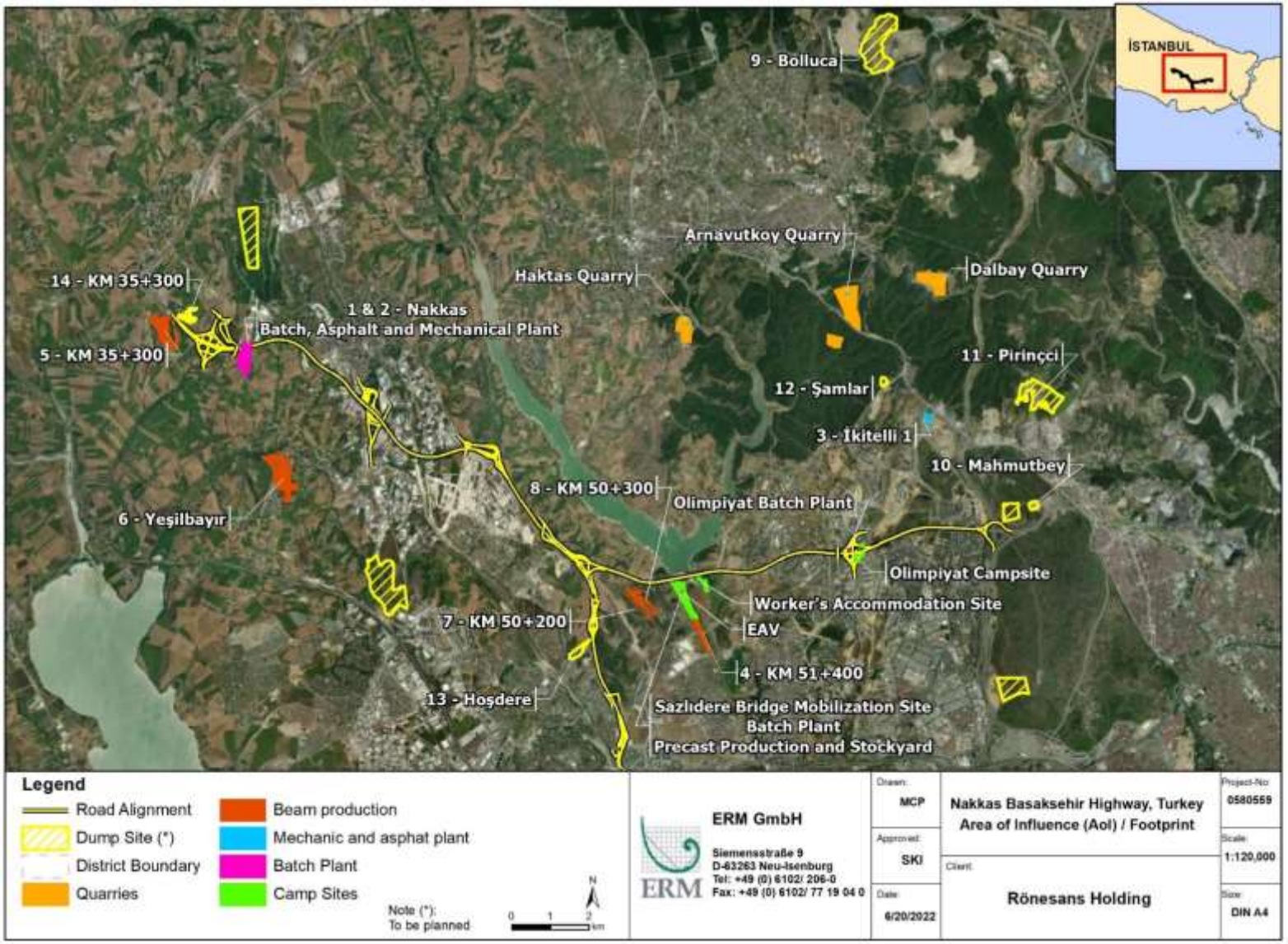

Figure 2-2 Temporary Construction Components

2.2 Existing Infrastructure

The main public utilities to be affected during the construction stage of the Project are:

- Natural gas distribution;
- Electricity network;
- Water and Sewerage;
- Telecom lines; and
- Storm water lines.

2.3 Construction Equipment

Below listed equipment types, quantities and capacities are subject to change to suit the site and Project requirements and to meet the proposed road works program:

- Graders;
- Dozer/Excavator;
- Skid-steer loaders;
- Cranes;
- Trucks/Tippers as required;
- Vibrating Rollers;
- Water Tanker;
- Double Drum Steel Roller;
- Air Compressor;
- Traffic Sign Boards/Signals;
- Small Roller/Plate Compactor;
- Asphalt Batching Plant;
- Asphalt Pavers;
- Pneumatic Tyre Roller (PTR); and
- Liquid Spray Tanker.

2.3.1 Project Activities and Schedule

The Project activities are split into three main phases as indicated in Table 2-5 and are planned to be conducted in line with the Project Schedule.

The overall construction is estimated to last approximately 4 years. The construction activities started in August 2021 and are planned to be completed by end of 2025. The locations where the construction activities are carried out as of May 2022 are presented in Figure 2-3.

Key milestones are:

- Cable Stayed Bridge construction from August 2021 until August 2025;
- Motorway construction from August 2021 until August 2025; and
- Test and Commissioning from the Q3 of 2025 until the Q2 of 2026.

Table 2-5 Project Phases

Phase	Tasks	Status
Pre-Construction Phase	Stakeholder engagement and consultations	Completed
	ESIA studies	Completed
	Resettlement Action Plan preparation	Completed
	Early land acquisition works	Completed
	Geo-hazard/seismic studies	Completed
	Road safety audit	Completed
	Project Design Works	Ongoing
	Soil Surveys	Completed (2021)
	Drilling Works	Completed (2021)
	Surveying Works	Completed (2021)
	Development and Implementation of Resettlement Action Plan	Completed (2023)
	Land Consent and Lease Process in Accordance with Turkish Expropriation Law and EBRD PR5	Ongoing
	Mobilization	Completed (2022), *except for the asphalt plant*
Early Construction Phase	Stayed Cable Bridge Excavation Works	Completed (2022)
	Stayed Cable Bridge Reinforcement Concrete Works	Paused
	Engineering Structures	Paused
	Earthworks	Paused
Construction Phase	Pavement	Not started
	Secondary Works (Electromechanical, Landscape, Signage, Guardrail, Fencing)	Not started
	Test and Commissioning	Not started

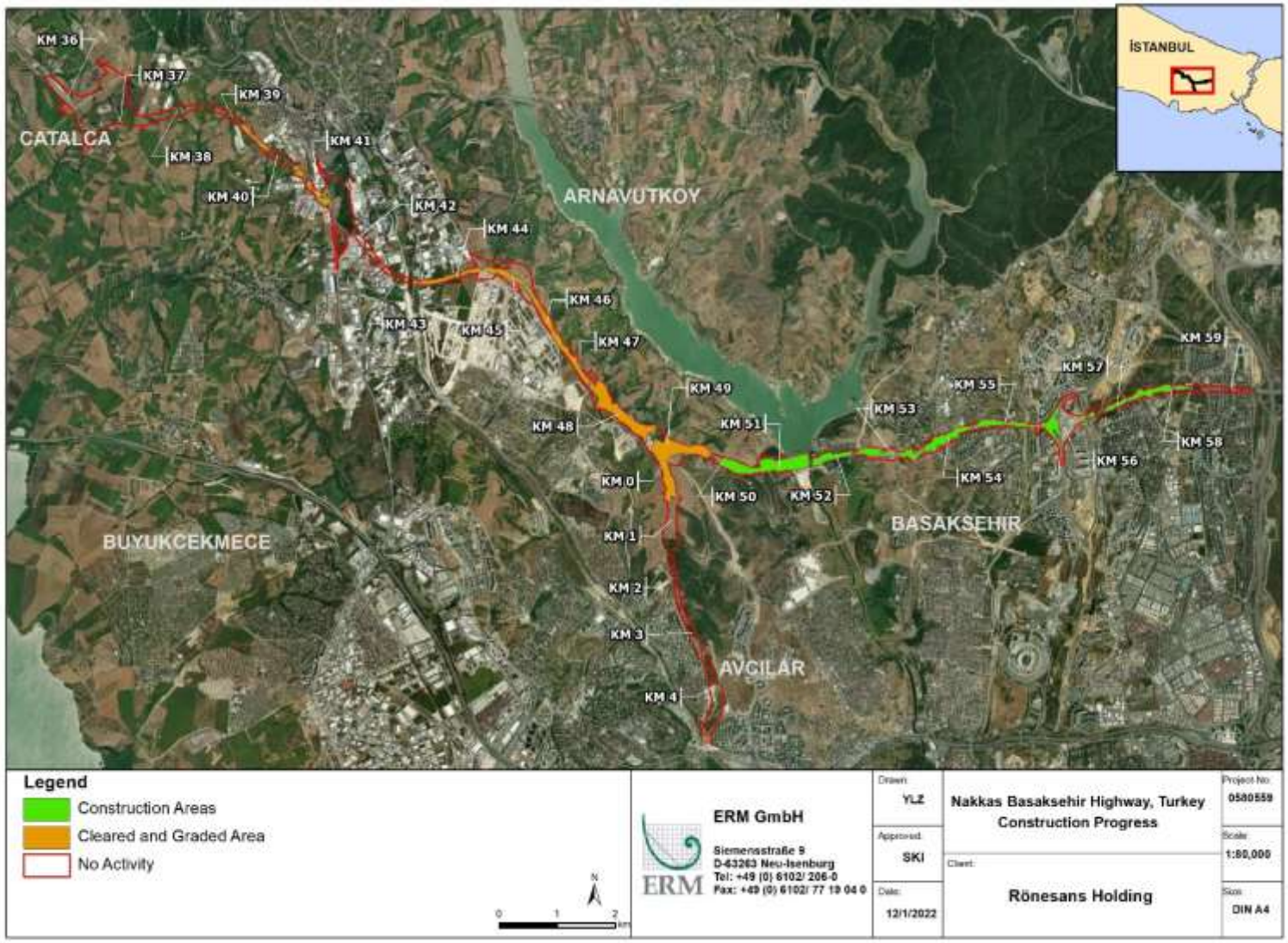

Figure 2-3 Existing Construction Activities as of May 2022

2.4 Summary of Site Conditions

2.4.1 Climate

The Mediterranean climate in Istanbul is characterised by dry, warm summers and mild to cool, wet winters. The average annual precipitation in Istanbul amounts to 728 mm. This corresponds to a monthly average of about 61 mm. The driest months are July and August, with approx. 25 mm of rain. The greatest amount of precipitation occurs in December, with an average of 107 mm.

2.4.2 Air Quality

Whilst in some areas the local air shed can be considered un-degraded, there are sites where the baseline PM_{10} is expected to be degraded due to natural sources of PM_{10} which will drive a high baseline, particularly during the summer as the climate is generally hot and dry.

2.4.3 Topography, Geology and Soils

The geological setting consists of Cenozoic aged (Tertiary, Quaternary) sedimentary rocks and karst landscape with young units which are typically located on the west side of Istanbul and are called "Cover Rocks" by some researchers. The main geological units in the region are the Trakya Formation (shale, greywacke and conglomerate), the Soğucak Formation (limestone), the Ceylan Formation also limestone), the Kıraç Formation (sand/gravel), and alluvial layers of sand-gravel-clay derived from old stream beds.

2.4.4 Natural Hazards

Istanbul is exposed to different kinds of natural hazards. The Istanbul area has potentially rainfall patterns, terrain slope, geology, soil, land cover and earthquakes that make localized landslides an infrequent hazard phenomenon. However, in the Project region, the risk of river flood, urban flood and coastal flood is considered low. Extreme heat hazard is classified as low based on current information. Water scarcity is considered a medium hazard, which means that there is up to a 20% chance of droughts occurring in the next 10 years.

2.4.5 Surface Water

The Project passes just immediately to the south of Sazlıdere Dam (drinking water supply to Istanbul) via a bridge over the Sazlıdere Creek. Domestic and agricultural sources of pollution are the dominant sources of pollution affecting the water quality of the lake. There are several smaller drainage lines and creeks (streams) crossed by the road.

2.4.6 Groundwater

Trakya Formation (Siltstone-Seyl), Ceylan Formation (Claystone-Marn) units are "Semi-permeable Environment (gz)" due to their geohydraulic properties. Küçükçekmece Municipality Catchment: reefal limestones at a distance of 50-100 m from Küçükçekmece Lake and descending to (-4 m) elevation, large karst gaps are crossed, and the water collected in these karstic voids are pumped and transferred to the drinking water supply tanks of the Küçükçekmece Municipality.

2.4.7 Biodiversity and Ecosystems

The proposed route for the Project mainly consists of residential and agricultural habitats. Areas of semi-natural habitats of Mediterranean climate are also scattered along the proposed route. Wheat farming is the predominant activity in the agricultural areas. Natural and semi-natural areas consist of hay-meadows (grassland), wooded riparian habitats associated with rivers/streams, garrigue habitats, and *Spartium junceum* communities. Natural and semi-natural habitats on the motorway route are discontinuous.

No mammal species were directly observed during the fauna field surveys with the exception of the brown rat (*Rattus norvegicus*).

A total of 94 bird species were recorded during the spring and autumn bird migration surveys. One species is listed under the IUCN Red List as globally threatened (VU), 65 are listed on Annex II of the Bern Convention, of which 26 are also Revised Annex I of Resolution 6 of the Bern Convention. Of the species recorded during surveys and listed in Annex II of the Bern convention, 14 were categorized as breeding.

According to Bern Convention Appendices, five amphibian species considered to be potentially present within AoI are listed in Annex II (Strictly protected fauna species), and the remaining four species are in Annex III (Protected fauna species). The European fire-bellied toad is the only species to be listed under the Revised Annex I of Resolution 6 of the Bern Convention.

Common or Mediterranean Spur-thighed Tortoise is listed as Vulnerable by the IUCN and is an Annex II and IV species on the Habitats Directive; and Annex II and Revised Annex I of Resolution 6 of the Bern Convention. It inhabits forest and shrub habitats and was observed in the Project area.

Two species of invasive fish were identified, including Prussian carp (*Carassius gibelio*) and pike-perch (*Sander lucioperca*). No other invasive plants or fauna were recorded during field surveys.

2.4.8 Socio-economic Conditions

Istanbul Province is governed by the Istanbul Metropolitan Municipality (IMM) and has 39 district municipalities and 962 neighbourhoods. Istanbul is the most populated province of Turkey, with a population of 15,462,452 in 2021, constituting 18.49% of the country's total population. It has a life expectancy of 78.7 and a total fertility rate of 1.47, considerably lower than Turkey's 2.2. It is the densest province of Turkey, as the average population density stands at 2,967 persons per km^2 in Istanbul. It is one of the largest agglomerations in Europe and fifth largest city in the world in terms of population within city limits. Istanbul city has a high migration rate from within the country, as only 28% of the city's residents are estimated to be originally from Istanbul.

For further details on the socio-economic conditions in Istanbul, refer to 'Section 5.4 Social Environment' of the ESIA. (ERM, 2022).

2.4.9 Cultural and Heritage Resources

Based on the field studies, in total there are 24 sites that are located within the 1 km impact corridor of Project RoW:

- 2 Historical Areas – Kayabaşı Archaeological Area are located within the RoW;
- 13 Historical Military Bunkers are located within the RoW; and
- 9 Historical Military Bunkers are located outside of the RoW, but within 1 km of the impact corridor.

3. ROLES AND RESPONSIBILITIES

The EPC Contractor is responsible for determining the required number of ESHS personnel to ensure that Project ESHS policies, regulations and standards are met throughout works execution. Figure 3-1 presents the current status of EPC ESHS Organization.

The EPC Contractor's organization will also include 1 Human Resources Chief responsible for recruitment, labour and working conditions management, and 1 Purchasing Chief responsible for the procurement and supply chain management. In case Nakkas Otoyol A.Ş's monitoring of EPC Contractor's ESHS performance indicates insufficient ESHS oversight, compliance assurance resources or practices, Nakkas Otoyol A.Ş is entitled to enforce required corrective actions on the respective EPC Contractor. This may include requiring the EPC Contractor to allocate additional ESHS staff and resources.

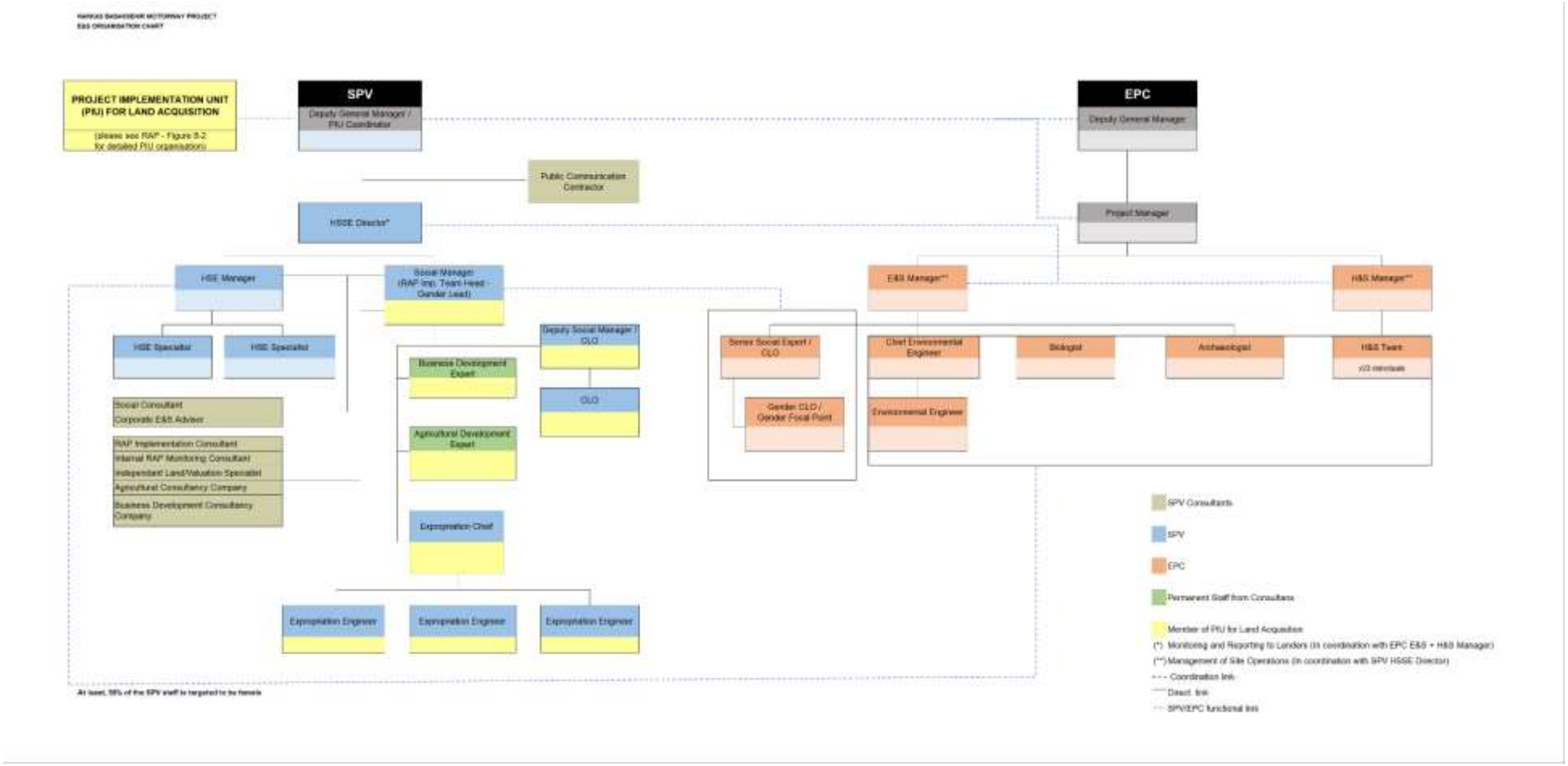

Figure 3-1 SPV & EPC ESHS Organization

Table 3-1 CESMP Roles and Responsibilities

Role	Responsibility
EPC Deputy General Manager	■ Has overall accountability for the Project including delivery in line with applicable national and Lender's standards. ■ Ensure allocation of sufficient resources for the CESMP implementation including for ESHS organisation, permitting, training, equipment, and qualified personnel. ■ Ultimate responsibility for ensuring implementation of required corrective actions including in response to identified ESHS non-compliances or incidents. ■ Periodic review of the CESMP implementation effectiveness in line with the provisions of the Project requirements.
EPC Project Manager	■ Work in coordination and cooperation with E&S and H&S Manager. ■ Has responsibility for the implementation of the Project activities stated in this CESMP. They will be suitably competent and have a strong understanding of construction best practice aligned with national law and applicable Lender requirements. ■ Accountable for overall ESHS performance and making the human and financial resources available to ensure compliance with Project ESHS requirements. ■ Responsible for employment and training management associated with the construction works. ■ Report ESHS performance to Deputy General Manager.
E&S and H&S Managers	■ Responsible for monitoring and assurance of the EPC Contractor's subcontractors ESHS system performance and requirements of the Project. ■ Develop CESMP and other ESHS plans and procedures and assures that Project requirements are considered. ■ Review subcontractors and suppliers ESHS documentation and ensure that they are aligned with Project ESHS requirements. ■ Monitor performance through Key Performance Indicators (KPIs), reports, audits, and meetings. ■ Report ESHS performance to management, SPV ESHS Management, and other related parties. ■ Establish Emergency Response Teams (ERT) and define roles and responsibilities of ERT members. ■ Ensure that all ESHS training needs are identified, provided and recorded. ■ Disclose relevant ESHS information to Project staff and public and coordinate activities for raising awareness.
EPC Senior Social Expert	■ Act as the custodian of the SEP and Grievance Mechanism (GM) specific for the Project and responsible for documentation and updates. ■ Liaise with the relevant NGOs and other stakeholders on a regular basis in line with SEP. ■ Plan the stakeholder engagement activities and ensure they are appropriately implemented by the CLOs deployed along the different sites. ■ Manage and supervise the CLOs including consultants for implementation of the SEP and Project social requirements. ■ Managing labour and working conditions, gender equality, human rights, community safety and security, local procurement and recruitment in line with Lender's standards. ■ Report social performance to Nakkas Otoyol A.Ş Social Manager and other related parties. ■ Manage GM. ■ Responsible for ongoing stakeholder engagement at all levels and monitoring of the overall stakeholder activities. ■ Supervise/monitor and coordinate activities with subcontractors to ensure they comply with the SEP. ■ Especially ensure outreach to vulnerable members of the affected communities through CLOs.

Role	Responsibility
	■ Ensure CLOs report on time and with the expected and agreed points. ■ Receive feedback on social performance and resettlement issues from CLOs. ■ Ensuring that Project's employees are informed and trained on the SEP. ■ Ensuring H&S team reports on time and with the expected and agreed points. ■ Providing resources to ensure that interests of stakeholders are represented and taken into consideration. ■ Managing and coordinating grievances or concerns regarding H&S or environmental issues. ■ Maintain an oversight and monitoring role with regard to resettlement planning and implementation. ■ Manage and supervise the CLOs including consultants for implementation of the Project social requirements. ■ Report social performance to SPV Social Manager and other related parties. ■ Provide the EPC Contractor's Project management team with advice, guidance, and assurance on social topics.
Grievances Committee (GC)	■ The GC is driven internally by Nakkaş Otoyol A.Ş. and EPC Project team and led by the Nakkaş Otoyol A.Ş. Senior Management and has representation from the following teams: ○ Nakkaş Otoyol A.Ş. Senior Management. ○ Nakkaş Otoyol A.Ş. Social Manager. ○ Construction Manager/Project Manager. ○ EPC Senior Social Expert. ○ CLOs. ■ The committee shall have at least (but preferably more) one female member. There may be nominated members from the local Governance bodies (e.g Mukhtars, soil experts/agricultural experts from the local governorate of agriculture) or senior representative from the EPC Contractor/ Sub contractor added to the Committee in specific cases, where any other concerned person with decision making authority in relevance to the grievance or aggrieved party needs to be involved. ■ Main responsibilities of the GC include: ■ Oversight of GM implementation. ■ Solution of grievances. ■ Periodic review of grievances raised by internal and external stakeholders. ■ Review of responses being shared with external stakeholders in an attempt to resolve non-judicial disputes arising out of various matters related to the Project.
Biodiversity Expert	■ Conduct pre-construction ecological surveys to identify location of roosting and resting places. ■ Translocate the identified species. ■ Liaise with NGOs and other stakeholders regarding ecological topics. ■ Monitor the vegetation clearance to ensure that disturbance to habitats are minimised. ■ Provide biodiversity training to all field workers. ■ Inform the workers on important biodiversity species and important areas and advice on best practice patterns of work to avoid harm to local biodiversity. ■ Manage the implementation of BAP and CESMP.
Archaeologist	■ Has been developed Cultural Heritage Management Plan and Chance Finds Procedure. ■ Conduct pre-construction archaeological investigations to identify, investigate and scientifically remove any archaeological deposits encountered. ■ Monitor the ground-disturbing activities and on all construction fronts particularly at archaeologically sensitive areas. ■ Liaise with relevant museum directorate proactively to manage the identified cultural heritage on the RoW.

Role	Responsibility
	■ Manage additional cultural heritage assessment studies including stakeholder engagements in case of a route or design change will be conducted.
Community Liaison Officers (CLOs)	■ Establish and maintain the database of all PAPs (households with particular attention to the ones with vulnerabilities and formal and informal users of the affected parcels) with support from the Expropriation Chief. ■ Engage with the PAPs for the implementation of RAP measures and actions. ■ Implement daily related RAP actions (e.g. grievances, stakeholder information and consultations, etc.) on site under the coordination of the RAP Implementation Team Head and in cooperation with the Expropriation Chief, including engagement with the stakeholders and management of land acquisition related grievances. ■ If received by the Contractor, enter the grievances and feedback relevant to land acquisition in a dedicated database (separate from other Project grievances not relevant to land acquisition) (relevance to be decided by the RAP Implementation Team Head and/or the Expropriation Chief). ■ Lead day-to-day implementation of the SEP and GM, including proactively maintaining regular contact with affected communities through regular community visits, calls or other online engagement to monitor opinions and provide updates on Project activities, and ensuring communication with vulnerable groups in line with the Project SEP. ■ Support Senior Social Expert during planning and implementation of her/his tasks. ■ Contact persons for statutory stakeholders and NGOs. ■ Initiate institutional agreements with statutory stakeholders (e.g., training to be received by PAPs). ■ Set-up and perform meetings on the community level. ■ Be accessible to liaise with affected population per request, especially for vulnerable groups. ■ Assist affected people on issues related to the Project (answer questions about the process, delivery of grievances, information about consultation activities, etc.). ■ Facilitate access of PAPs to third party legal support, if necessary. ■ Advise on avenues for the resolution of conflicts amongst landowners in cases of multiple ownerships. ■ Assist with grievance management. ■ Facilitate the smooth liaison between stakeholders by maintaining regular contact and networking to ensure that project affected people are well informed of their rights and responsibilities set out in national legislation and respective SEP and RAP in particular and other relevant execution plans. ■ Set up and organize meetings with any other agencies or person if so requested, including organizing meeting spaces. ■ Set up and organize particular meetings and focused studies together with women to encourage women's active support to the Project during construction and operation, as well collect views and expectations of women through these meetings. ■ Maintain detailed and accurate records of meetings including agendas, meeting minutes, follow-up/action points in association with other experts. Details of meeting held or cancelled should also be maintained. ■ Prepare and deliver documents; reports, brochures, informative letters, notifications, to all the interested parties and similarly receive documents from both external and internal parties. ■ Ensure that follow up of document approvals by concerned authorities is completed on time and consistently and keep the Project Manager updated as required. ■ Ensure that communities at construction sites are kept abreast of the project developments and communication channels remain open with the communities. ■ Provide governance. ■ Respond to community concerns by ensuring that they are brought to the attention of the Project and facilitate the process of resolving the issue. ■ Acting as focal point for the Project stakeholders in terms of grievances, complaints and requests.

Role	Responsibility
	■ Responsible for ensuring all GM records are captured, issued to relevant departments for resolution and proper close-out as per Project SEP. ■ Assist in the identification of potential implementation problems and bottlenecks, ■ Providing engagement support for individuals with disabilities in accordance with Project definitions, in particular to the RAP. ■ Report to Senior Social Manager on a daily and weekly basis on community issues and the project's performance in relation to those issues. ■ Keep up with the weekly and daily developments of the Project. ■ Mediate issues between the community members and the Project staff. ■ Forward questions about the Project from community leaders and residents to appropriate government authorities and the Project Manager. ■ Create social media strategy. ■ Develop and maintain value add marketing tools, including marketing literature, newsletters, Facebook page, and other external communications. ■ Ensure web designs are in place using modelling tools to publish the documents, information and other presented material during any communal gathering and keep it up to date. ■ Facilitate well prepare and organize trainings consistent with the Project requirements and policies. ■ Report to SPV – Senior Social Manager and EPC – Senior Social Expert on a daily and weekly basis on community issues and the project's performance in relation to those issues. ■ Perform other duties as may be assigned.
H&S Supervisors	■ Develop Project's management plans and procedures. ■ Assist subcontractors and suppliers to develop and implement their site-specific plans and procedures. ■ Monitor implementation of all relevant management plans and procedures, including on site. ■ Track the impacts of the Project against the Project Objectives and Key Performance Indicators as defined in the Management and Monitoring Plans and work with the subcontractors where amendments to the mitigation measures are required. ■ Identify breaches of management plans and recommend corrective actions. ■ Stop work activities in the event of serious breaches of rules that may cause serious impacts on health and safety, environment, and community or on the reputation of the Project. (All workers have the obligation to intervene in case of a dangerous situation and have to report to the supervisor). ■ The Supervisors will be assisted by experts (for example archaeological, ecological, ESHS Monitors and Community Liaison) as necessary in the discharge of their duties.
Environmental Engineer & H&S Inspectors	■ Ensure that all construction personnel (including subcontractors) working or visiting the site understand the health, safety and environmental requirements of the Project and comply fully with them. ■ Make sure that the ESHS risk assessments are performed prior to the activities. ■ Monitor subcontractors' ESHS performance, their compliance to the ESIA and ESHS plans. ■ Report and record the ESHS accidents, incidents to H&S Supervisor. ■ Conduct daily ESHS inspections. ■ Monitor those all personnel (including contractors) has undergone all necessary trainings.
Agricultural Development Expert	■ Lead day to day implementation of agricultural support programmes in line with RAP. ■ Coordinate and work in collaboration with the experts of the external Agricultural Consultancy Company. ■ Report to the SPV – Senior Social Manager.

Role	Responsibility
Business Development Expert	■ Lead business support programmes in line with RAP. ■ Coordinate and work in collaboration with the experts of the external Business Management and Development Consultancy Company. ■ Report to the SPV – Senior Social Manager.
Expropriation Chief	■ Act as the interface between the SPV and the Expropriation Department of KGM 1st Regional Directorate of KGM to follow-up and coordinate the progress of expropriation, court cases, land entry processes, etc. ■ Coordinate other expropriation officers employed and work in coordination with the Project CLOs. ■ Provide support to the RAP Implementation Team Head for the review and management of land acquisition related grievances and identification of the responsible parties (internal and external) for their management. ■ Follow and keep track of the Article 27 and Article 10 decisions of the courts in collaboration with KGM (including the valuation amounts and set-off requirements decided at the end of each process) and identify and report (to Project Management) the cases – if any – in which land seizure value is reduced by the courts at the end of Article 10 process. ■ Compile monthly reports on progress on land acquisition for submission to Social Manager and Corporate Senior Management (for integration to periodical – monthly – Project progress reports to be submitted to KGM by the SPV). ■ Report to the Senior Social Manager.

4. LEGISLATIVE REQUIREMENTS

4.1 International Financing Requirements

Nakkaş Otoyol A.Ş is planning to finance the investment costs of the Project by debt and equity under a Project Finance structure involving several Lenders, such as the European Bank for Reconstruction and Development (EBRD), the Asian Infrastructure Investment Bank (AIIB), Atradius, Standard Chartered Bank, SERV, DZ BANK and Bank of China. Since the Project will be partly financed by EBRD (an International Financing Institution or IFI), the E&S requirements of EBRD must be considered throughout the Project development, which require the Project development to adhere to specific E&S requirements which reflect international best practice. The following standards and guidelines detail the performance requirements and mitigation measures that are typically acceptable and considered to represent GIIP:

- IFC (International Finance Corporation) Performance Standards (IFC, 2012);
- IFC EHS (Environmental Health and Safety) General Guidelines (IFC, 2007);
- IFC Environmental, Health, and Safety Guidelines for Toll Roads (IFC, 2007);
- IFC/EBRD Worker's Accommodation: Processes and Standards (IFC/EBRD, 2009);
- European Bank for Reconstruction and Development (EBRD) Environmental and Social Policy, including Performance Requirements (EBRD, 2019);
- The EBRD's Strategy for the Promotion of Gender Equality (2021 – 2025);
- EBRD Sub-Sectoral Environmental and Social Guidelines (i.e., Building and Construction Activities, 2014);
- Addressing Gender-Based Violence and Harassment: Emerging Good Practice for the Private Sector jointly commissioned by IFC, EBRD, and CDC Group;
- EU environmental, social and occupational health and safety directives (various);
    - EU Directive 2014/52/EU – The EIA Directive;
    - EU Directive 2000/60/EC – The Water Framework Directive;
    - EU Directive 2008/98/EC – The Waste Framework Directive;
    - EU Directive 2006/118/EU – The Groundwater Directive;
    - EU Directive 2009/147/EC – The Birds Directive;
    - EU Directive 92/43/EEC – The Habitats Directive;
    - EU Directive 2008/50/EC – The Ambient Air Quality Directive;
    - EC Directive 2008/96/EC – Road Infrastructure Safety Management Directive; and
    - EU Directive 89/391/EEC – The Occupational Health and Safety Framework Directive.
- AIIB Environmental and Social Standards (ESSs);
- OECD Revised Council Recommendation on Common Approaches on Environment and Officially Supported Credits; and
- Equator Principles IV (2020).

Refer specifically to the relevant section(s) of the ESIA and ESMS for detailed information on the applicable legislation and requirements for the Project.

4.2 National Legislation

Key national legislation of Turkey that is relevant for the Project includes:

- Turkish Environmental Law (No: 2872);
- Labour Law (No. 4857);
- Occupational Health and Safety Law (Law No. 6331) and associated regulations;
- Law on Right to Access to Information (No: 4982);
- Law on the Use of the Right to Petition (No: 3071); and
- Expropriation Law (Law No. 2942, amended in 2001 by Law No. 4650.

Refer specifically to the relevant section(s) of the Environmental and Social Management System (ESMS) (ERM, 2022) for detailed information on the applicable legislation and requirements for the Project.

5. CONSTRUCTION-PHASE RISKS AND IMPACTS

To appropriately manage the Project, an understanding of the potential risks and impacts that may affect the environmental, social, health and safety aspects is required. An Environmental and Social Impact Assessment (ESIA) has been undertaken for the Project. The ESIA identifies the risks and impacts that are anticipated from the Project throughout its various phase (construction phase and operation phase). The ESIA was undertaken according to local requirements as well as International Financial Institutions (IFIs) requirements.

The impact assessment undertaken and recorded in the ESIA report (ERM, 2022) identified the following key construction-phase risks and impacts associated with the Project (with residual impact significance indicated):

- **Climate Change** (minor residual impact significance)
  - Extreme heat
  - Wildfire
  - Flooding
  - Landslides
  - Water scarcity
- **Air Quality** (negligible to minor significance)
  - Air and dust emissions
- **Greenhouse Gas (GHG) emissions** (negligible to major significance)
- **Geology and Soil** (negligible to minor significance)
  - Soil erosion and instability
  - Soil contamination
  - Seismic event
- **Materials and Waste Management** (minor significance)
  - Disposal of surplus excavated material
  - Waste generation
- **Surface Water and Groundwater** (minor to moderate significance)
  - Water quality
  - Accidental events
  - Flash Flooding
- **Noise and Vibration** (minor to moderate significance)
  - Noise impacts
  - Vibration impacts
  - Blasting impacts
- **Landscape and Visual** (moderate to major significance)
- **Biological** (negligible to minor significance)
  - Habitat loss/degradation/fragmentation
  - Species loss
  - Disturbance and displacement of fauna

  - Alteration of hydrological regime
  - Pollution
  - Disturbance, including noise/vibration/visual
- **Economy and Employment** (positive impact)
- **Land and Livelihoods** (minor to moderate impact significance)
  - Loss of residential structures
  - Loss of (or access to) commercial, business and non-residential structures
  - Loss of agricultural and grazing land
  - Storage and handling of waste
  - Waste disposal
- **Labour and Working Conditions** (minor to moderate impact significance)
  - Worker's rights
  - Worker health and safety
  - Gender based violence, harassment, and inequalities
  - Child labour and forced labour in the supply chain
- **Community Health, Safety and Security** (minor to moderate impact significance)
  - Road safety
  - Site trespass and injury
  - Environmental health
  - Increased transmission of communicable diseases
  - Increased risk of gender-based violence and harassment
  - Increased pressure on healthcare
  - Use of security personnel
- **Access to Infrastructure and Services** (moderate impact significance)
  - Disruption to infrastructure and utilities
- **Community Cohesion** (minor to moderate impact significance)
  - Disturbance from the presence of workforce
  - Community severance
  - Unmet expectations of benefits
- **Cultural Heritage** (minor impact significance)
  - Disturbance to tangible cultural heritage

Refer to 'Chapter 6: Environmental and Social Impact Assessment' of the ESIA report (ERM, 2022) for further details on the environmental and social impact assessment.

6. CONSTRUCTION PROCESS AND METHODS

The construction process and particular methods of construction are detailed in Table 6-1 and are arranged in the intended sequence of implementation, as follows:

1 Permits

- Acquisition of all necessary permits / licenses

2 Pre-construction surveys

- Conduct pre-construction surveys

3 Temporary works

- Establish temporary works and facilities

4 Material sources

- Identify sources of construction materials, including quarries

5 RoW clearance

- Stripping of vegetation and soils stockpiling

6 Watercourse crossings

- Culvert installation and backfilling

7 Drainage systems

- Drainage systems installation

8 Concrete batching

- Concrete batching plant specifications

9 Road construction

- Grading, road aggregate and compaction, asphalting

10 Remove temporary works

- Deconstruction and removal of temporary site infrastructure

11 Post-construction rehabilitation

- Rehabilitation and reinstatement of habitat and vegetation

Table 6-1 Construction Process and Methods

Construction Methods	Responsibility	Key Mitigation
1 Acquisition of all necessary permits / licenses		
Apply for all relevant permits and licenses. These must be obtained prior to construction works commencing and valid for the duration of construction. Examples of such permits may include: ■ Air quality permit ■ Building works permit ■ Construction licence ■ Construction works permit ■ Contractor's permit ■ Environmental authorisation/license ■ Noise permit ■ Protected plant species permit ■ Road/bridges permit ■ Residency/works permit(s) ■ Water use permit	*EPC Contractor*	■ n/a
2 Conduct pre-construction surveys		
Pre-construction surveys will be required to finalise construction areas and final levels: ■ It is important that surveys commence prior to the onset of the Site Works (depending on monitoring parameters) to establish suitable baseline conditions for such factors as: Water Quality, Protected Species and Habitat Surveys (flora and fauna), archaeological potential, noise, and dust levels, etc.; ■ Preconstruction surveys will be carried out prior to the RoW clearance to identify roosting and resting places those needs to be relocated outside of the RoW in a suitable location identified by the Biodiversity Expert); ■ Seed collection for endemic/protected plant species will be undertaken ahead of clearing of the RoW; ■ The final locations of site infrastructure will be decided and demarcated on relevant master site maps and on the ground by survey crews; ■ Centre lines and extents of new access roads to be demarcated on the ground, as per construction drawings and final site plans/layout drawings; ■ Intrusive site investigations will be undertaken to inform the detailed design; ■ Deviations from the site plan will need to be formally authorized by both the resident site engineer and Project manager and requires the necessary approval in writing;	*EPC Contractor*	■ Community liaison ■ Worker conduct ■ Noise & vibration controls ■ Pollution prevention ■ Wildlife management ■ Incident reporting ■ Health and safety ■ Cultural heritage resources management

Construction Methods	Responsibility	Key Mitigation
■ Where necessary, pre-construction surveys for protected mammals, reptiles and/or amphibians will be undertaken by a suitably qualified ecologist, with the results used to inform the need to amend the Project and CESMP to include further mitigation if required; ■ Micro siting will be used to avoid areas of greatest biodiversity interest where relevant; ■ Pre-construction archaeological investigations will be conducted to identify, investigate, and scientifically remove any archaeological deposits encountered; ■ Protocols for responding to chance finds will be established including cessation of work for finds and notification of Nakkaş Otoyol A.Ş. and its archaeological consultant, who will advise the appropriate authorities including the Regional Protection Council and Museum; ■ Archaeological sites will be processed/indicated as "historical sensitive area" in all Project documentation, drawings, etc. and notify EPC Contractor and subcontractors about the presence of these sites; ■ Pre-construction surveys will be the responsibility of the EPC Contractor.		
3 Establish temporary works and facilities		
Temporary sites will include the workers camp(s) or construction compound, temporary site offices and parking for vehicles and temporary materials and equipment laydown areas. These will typically be constructed as follows: ■ A traffic management plan will be set up prior to any works commencing; ■ New access road positions and designs are to be finalised and approved prior to construction taking place; ■ Road design to follow GIIP and applicable road safety design parameters; ■ Access roads to follow elevation contours where possible, avoiding steep inclines and declines as far as possible; ■ Single track access roads are to be implemented unless otherwise motivated; ■ Access road width is to be restricted to the minimum width required through sensitive biodiversity areas, habitats, ecosystems or vegetation communities (as and where relevant); ■ The construction area will be demarcated using ranging rods, timber posts and/or high visibility marker tape; ■ Temporary drainage runs and settlement ponds will be installed around the perimeter as necessary to control surface water drainage and manage erosion risk; ■ Temporary compounds/worker camps will be established; ■ Site layout will be planned so that machinery and dust causing activities are located away from sensitive receptors (i.e. residential areas), as far as is possible; ■ Where required, layers of well graded granular material (gravel or crush rock, for example) will be spread and lightly compacted to provide a suitably hardened, level area for site office and storage containers to be placed and for the parking of construction vehicles; ■ A bunded containment area ('bund') of sufficient storage volume will be constructed to provide for the storage of lubricants, oils, fuels, generators, etc. as required; ■ The workers camp/compound will be fenced and secured as necessary;	*EPC Contractor*	■ Traffic management ■ Access control ■ Signage ■ Community liaison ■ Environmental training ■ Worker conduct ■ Noise & vibration controls ■ Dust & air quality controls ■ Erosion & sediment controls ■ Lighting ■ Housekeeping ■ Pollution prevention ■ Wildlife management ■ Pest control ■ Incident reporting ■ Invasive species management ■ Waste management ■ Wastewater management

Construction Methods	Responsibility	Key Mitigation
■ Self-contained portable toilets are to be provided during construction equipped with integrated waste holding tanks, which are to be maintained and serviced on a regular basis by the service provider/contractor; and ■ Water supply will be via a temporary water storage tank filled using a mobile water tanker to source water locally as required.		■ Hazardous substances management ■ Water conservation and management ■ Health and safety ■ Emergency response ■ Cultural heritage resources management
4 Identify sources of construction materials, including quarries		
Whilst it is understood that aggregate quarry facilities will be operated by third parties, the following applies to the EPC Contractor: ■ Quarries providing stone/rock aggregate operated by third parties will need to be identified and contracts in place prior to construction commencing; ■ Materials need to be transported from the quarry to the construction site in an appropriate manner; ■ When designing the quarry transport routes, the EPC Contractor will consider social issues to minimize the impacts from passing through populated areas.	*EPC Contractor*	■ Quarry management ■ Traffic management ■ Noise & vibration controls ■ Dust & air quality controls ■ Pollution prevention ■ Health and safety
5 RoW clearance: stripping of vegetation and soils stockpiling		
■ A traffic management plan will be set up prior to any works commencing; ■ Topsoil and subsoil excavated during road construction will be retained and stockpiled for rehabilitation purposes and/or used to construct perimeter earth berms to direct surface runoff towards drainage as necessary; ■ Vegetation clearance will be performed in winter where possible under supervision of the Biodiversity Expert; and ■ Where blasting activities are required to remove rock outcrops along the RoW, the Blasting Management Plan will be implemented.	*EPC Contractor*	■ Traffic management ■ Community liaison ■ Endemic/Rare plant species management ■ Wildlife management ■ Topsoil management ■ Noise & vibration controls ■ Blasting management ■ Dust & air quality controls ■ Erosion & sediment controls ■ Pollution prevention ■ Waste management ■ Hazardous substances management

Construction Methods	Responsibility	Key Mitigation
		■ Health and safety ■ Cultural heritage resources management
6 Watercourse crossings: culvert installation and backfilling		
Where watercourses (rivers, streams, drainage lines) are crossed, these will require the installation of prefabricated concrete box culverts to maintain flows. The following will be implemented during construction of the road across watercourses: ■ Road-watercourse crossing positions and designs are to be finalised and approved prior to construction taking place within watercourses (streams/rivers/canals); ■ A traffic management plan will be set up prior to any works commencing; ■ Cross watercourses at right angles; ■ Road crossing design to follow GIIP (such as SEPA, 2010: Engineering in the Water Environment: Good Practice Guide: River Crossings) taking into account the sizing of any pipe culverts and placement on the channel bed and not at height; ■ Install suitably sized pre-cast concrete box culverts, portal culverts or piped culverts as necessary to ensure flows continue unimpeded through the watercourse; ■ The Project engineer will determine the required sizing and gradient of the culvert through appropriate flow modelling and design protocols; ■ The installation of the culvert will take place under zero or low flow conditions (dry season); ■ Where zero or no flow construction is not possible, temporary drainage works (such as stream diversions, installation of cofferdams) to be implemented at watercourse crossings to allow for a reasonably 'dry' construction working zone; ■ The culvert will be lowered into place using an excavator or crane with a suitable lifting mechanism; ■ Once the culvert is in position stone backfill will be placed and compacted against the culvert up to the required level above the foundations; ■ Implement suitable erosion control and/or armouring of the stream/river channel downstream of the road crossing to prevent scouring of river/stream channels and banks; ■ The approach to the watercourse will be completed to a formation level which is suitable for the passing of plant and construction equipment required for the installation of the watercourse crossing; ■ All drainage measures along the proposed road will be completed in advance of the works; and ■ Driving within streams or on their banks will be forbidden except if unavoidable to construct a particular structure.	*EPC Contractor*	■ Traffic management ■ Endemic/Rare plant species management ■ Wildlife management ■ Noise & vibration controls ■ Dust & air quality controls ■ Erosion & sediment controls ■ Pollution prevention ■ Waste management ■ Hazardous substances management ■ Health and safety

Construction Methods	Responsibility	Key Mitigation
7 Drainage system installation		
Drainage systems that are established early on will assist greatly in reducing the risk of erosion and sediment pollution. Site development will therefore need to be phased accordingly. These will be installed as follows: ■ Construction of all drainage structures (i.e. culverts, sediment basins, and catch drains) will be carried out as early as possible; ■ Construction of the drainage system will commence at the downstream sections and progress in an upstream direction, ■ Drainage systems must allow for the adequate conveyance of storm water runoff, connecting with other drainage features as necessary; ■ Stilling basins, settlement ponds or similar may be necessary to trap sediment entrained in surface runoff and to control erosion; ■ Drainage systems are to be constructed in conjunction with road and hard stands construction.	*EPC Contractor*	■ Traffic management ■ Noise & vibration controls ■ Dust & air quality controls ■ Erosion & sediment controls ■ Pollution prevention ■ Waste management ■ Hazardous substances management ■ Health and safety
■ **8 Concrete batching plant**		
Mobile / temporary concrete batching plants will be used for the concentrated mixing of concrete required for the construction of the road/bridges and associated infrastructure. The following environmental specifications apply to all batching plants during construction: ■ All batching plants are to be positioned strategically at a sufficient distance from identified watercourses (at least 50m away from rivers/streams/canals where possible); ■ The composition of the plant may vary depending upon the type and composition of aggregates, cement, admixtures for concrete, and various other requirements, such as temperature control of aggregates, mixing water and concrete and the quality of concrete expected from the plant; ■ Cement, sand, aggregates, and stone will be imported by the EPC Contractor from approved and certified local sources; ■ Cementitious materials shall be matched by weight, powdered admixtures by weight and liquid admixtures shall be matched by weight or volume; ■ Arrangement must be made for the measurement of water to the plant through a flow meter or similar; ■ Each batcher shall be equipped with a scale and also with the necessary mechanisms for its operation and shall be capable of accurate catching and mixing; ■ The charging and discharging devices shall be capable of stopping the flow of material within the weighing tolerances specified in terms of applicable standards and designed not to permit the loss of materials when closed (i.e., capable of controlling the rate of flow of material); ■ Concrete batching will be carried out by appropriately qualified operators in accordance with stringent quality and environmental controls, and will be closely supervised throughout;	*EPC Contractor*	■ Batching Plant Management ■ Noise & vibration controls ■ Dust & air quality controls ■ Pollution prevention ■ Hazardous substances management ■ Waste management ■ Water conservation and management ■ Health and safety

Construction Methods	Responsibility	Key Mitigation
■ The plant manufacturer shall provide technical advice and support during the installation, commissioning, and trial runs of the batching plant; ■ Cement bins or silos shall be designed to contain rated capacity loads in terms of cubic meters of gross air volume in addition to metric tons; ■ Cement storage silos need to be fitted with equipment to minimize dust emissions from the silo (a reverse pulse fabric filter dust collector (FFDC), or other dust control technology with an equivalent or better performance is recommended for storage silos); ■ Whatever technology is employed, this needs to be maintained in accordance with the manufacturer's instructions and specifications to ensure adequate and efficient performance and to minimise environmental risks; ■ Raw materials should be loaded into the concrete truck agitators by either a telescopic chute (preferred) or a flexible sleeve to prevent spillage; ■ Spillage can also be potentially avoided by putting in place measures to ensure truck agitators are not overfilled; ■ Wheel-wash facilities should be implemented into design to prevent contaminants from being tracked out of the site by trucks leaving the batch plant; ■ Dust seals are to be incorporated into batch plant design; ■ Earth bunds or berms will be placed around the perimeter of the batching compound as appropriate to ensure segregation of the area, and containment of materials; ■ A lined and bunded concrete washout area will be provided within the batching plant compound to ensure containment of any wash out water; ■ Appropriate drainage and mitigation against siltation/pollution of existing watercourses/drains shall be provided within the batching plant compound; ■ Where possible, the reuse or recycling of water within the batch plant will be performed; ■ Any wet waste concrete is to be recycled back into the batching process, subject to quality requirements and solid concrete is to be crushed to aggregates at an appropriate recycling facility and reused.		
9 Road construction: grading, road aggregate and compaction, asphalting		
Grading and laying of road aggregate prior to asphalting will be done as follows: ■ A traffic management plan will be set up prior to any works commencing; ■ The stripped RoW will be graded to the final base level which will be surveyed and confirmed prior to aggregate delivery; ■ Only suitable, well-graded imported fill material from cuts and other imported material purchased commercially will be spread out and compacted to provide a homogenous surface; ■ The thickness of road aggregate layers will be decided by the Construction Manager based on the characteristics of the material and the desired compaction;	*EPC Contractor*	■ Traffic management ■ Noise & vibration controls ■ Dust & air quality controls ■ Erosion & sediment controls ■ Pollution prevention ■ Waste management ■ Hazardous substances management

Construction Methods	Responsibility	Key Mitigation
■ Roads are to be constructed with a suitable camber to aid in the efficient and effective drainage of surface water runoff; ■ Road batters will generally be sloped be sloped to between 1:1 and 1:2 (depending on depth and type of material, as informed by the Geotechnical Engineers) and will re-vegetated with suitable indigenous species.		■ Health and safety
10 Removal of temporary infrastructure		
Upon completion of the construction-phase of the Project, the workers camp/compound and any other related temporary works and facilities will be decommissioned and removed as follows: ■ Deconstruction and removal of temporary infrastructure and materials from site; ■ Inside buildings will be soft stripped before demolition (walls and windows will be retained in the rest of the building where possible, to provide a screen against dust); ■ Removal and disposal of any waste material or contaminated substances and transportation for proper offsite disposal; ■ Closing of any temporary excavations or trenches by backfilling the area with the material arising during excavation; ■ Landscaping with topsoil as required; and ■ Revegetation as required with rapid growing runner grass species (indigenous grass only).	*EPC Contractor*	■ Noise & vibration controls ■ Dust & air quality controls ■ Erosion & sediment controls ■ Pollution prevention ■ Waste management ■ Wastewater management ■ Hazardous substances management ■ Health and safety
11 Post-construction rehabilitation and reinstatement		
Upon completion of the construction-phase of the Project and removal of temporary infrastructure, rehabilitation and reinstatement of the environment will occur as follows: ■ All excavated material will be re-used (reinstated, landscaped and re-profiled) as part of the site works in a timely manner; ■ Particular attention will be paid to maintaining hydrological continuity and preventing the creation of preferential subsurface flow paths (for instance within backfilled trenches); and ■ Habitat reinstatement and management plan to be compiled and implemented.	*EPC Contractor*	■ Habitat reinstatement ■ Erosion & sediment controls ■ Invasive species management ■ Health and safety

7. CONSTRUCTION-PHASE MITIGATION AND MANAGEMENT MEASURES

The mitigation and management measures in Table 7-1 apply to the construction-phase of the road development Projects and must be implemented as indicated. *Note that key measures pertaining to each aspect of the construction have also been indicated in Table 6-1.*

Table 7-1 List of construction-phase mitigation measures

Mitigation / Management	Timing & Application
1 Health and Safety	At all times, at all locations
2 Housekeeping	At all times, at all locations
3 Lighting	For night work, at all applicable locations
4 Access Control	At all times, at all locations
5 Signage	At all times, at construction camps
6 Community Liaison	At all times, at all locations as relevant
7 Traffic Control	At all times, at all locations
8 Endemic/Rare Plant Species Management	Along construction Row, prior to clearing taking place
9 Wildlife Management	Along construction Row, prior to clearing taking place
10 Pest Control	At all times, at all locations
11 Cultural Heritage Resources Management	Along construction RoW, prior to clearing taking place
12 Noise and Vibration Controls	At all times, at all locations
13 Dust and Air Quality Management	At all times, at all locations
14 Blasting Management	During RoW clearing
15 Pollution Prevention	At all times, at all locations
16 Hazardous Materials Management	At all times, at all locations
17 Spill Response	Where spills occur
18 Waste Management	At all times, at all locations
19 Batching Plant Management	During concrete batching plant setup and operation
20 Topsoil Management	During and after RoW clearing
21 Erosion and Sediment Control	At all times, at all locations
22 Quarry Management	Upon quarry selection and permitting
23 Water Conservation and Management	At all times, at all locations
24 Invasive Alien Species Management	At all times, at all locations
25 Habitat Reinstatement	Upon completion of construction, temporary areas and habitat reinstatement sites identified

7.1 Health and Safety

7.1.1 General health & safety requirements

The following general measures apply at all times for construction crews and employees:

- All site-specific health and safety rules will be communicated to all employees and adhered to at all times as per the Health and Safety Plan;
- Implement the Human Resources Policy to provide worker access to information, conditions of employment, GM for workforce;
- Implement the Camp Management Plan to ensure adequate and appropriate health, safety and hygiene standards are applied to the design and management of accommodation for workers;
- Implement the Supply Chain Management Plan (SCMP) to cover aspects such as worker code of conduct, compliance, monitoring of work force and mitigation of supply chain risks;
- Pre-employment screening protocols will be conducted for all employees including contractors and subcontractors which will include medical checks of SARS CoV 2 history and other diseases appropriate to WHO recommendations, the individual's country of origin and vaccinations;
- Workers will be provided with primary health care and basic first aid at worksites;
- Appropriate PPE to be supplied and worn at all times;
- All work of persons will be subject to an appropriate risk assessment and regular monitoring of health, working conditions, and hours of work;
- All plant / machinery operators will have appropriate training;
- A competent construction foreman is to be present on site at all times;
- Fire extinguishers and first aid supplies will be available at all camp sites and active work areas on a daily basis;
- Access roads are to be maintained in a roadworthy and clean condition at all times;
- No works are to take place unsupervised;
- Open trenches and excavations are to be backfilled at the end of each working day as far as possible;
- Pipe work will be lifted into position manually;
- Drivers of Project vehicles will be trained/briefed about safe driving with respect to other drivers, pedestrians, cyclists and livestock;
- Access to clear and understandable information regarding worker’s labour and working conditions will be provided;
- Reasonable working conditions and terms of employment will be provided;
- A GM will be implemented for the Project’s workers including subcontractor workforce (accessible to all workers, whether permanent or temporary, directly or indirectly employed including contractor workers);
- A Gender Action Plan will be implemented for the Project, including mitigation measures in relation to Gender-Based Violence and Harassment (GBVH) which includes the assignment and training of GBVH focal points (including women) to deal with GBVH related incident and grievances and provide support resources; and

- Employees must be aware that they are responsible for complying with all company safety rules, and that most accidents will be prevented by their safe workplace practices, in this case the following 'Safety Rules' must be known and implemented by ALL EMPLOYEES:

Rule 1	Safety first – if it's not safe, don't do it
Rule 2	Always wear the correct PPE
Rule 3	Identify hazards and manage risks
Rule 4	If unsure, ask first before doing
Rule 5	Drive safely and obey traffic rules
Rule 6	Only operate equipment if trained to do so
Rule 7	Electrical work is a restricted work activity
Rule 8	Working at heights is a restricted work zone and activity
Rule 9	Lifting work is a restricted work zone and activity
Rule 10	Never enter a demarcated restricted access or hazardous area without authorization

For further detailed information, refer to the 'Health and Safety Plan'.

7.1.2 Heat stress

Working at extreme heat conditions can be detrimental to worker health and therefore the following will be implemented:

- Suitably cool drinking water is to be provided for employees;
- Workers are to be instructed to drink small amount of cool water frequently to avoid dehydration;
- Employees will be encouraged to take breaks and hydrate any time they feel necessary;
- A space in a shaded area or an air-conditioned building will be provided for taking breaks.
- Shaded areas during remote outdoor work (e.g., constructing temporary shelters using tarps) will be provided to workers;
- The EPC contractor will ensure that appropriate clothing will be provided and worn by workers, including light-coloured, lightweight, and loose-fitting cotton clothing that allows ventilation of air to the body during extreme temperatures;
- The job will be paced to allow more frequent breaks for fluid intake and sufficient recovery time during period of elevated temperatures; and
- Work changes will be considered to lower the risk of heat stress.

For further information, refer to the ''Labour Management Plan'.

7.1.3 Drinking water

- Drinking water must meet local or WHO drinking water standards, whichever is more stringent, and water quality must be monitored regularly;
- IFC / EBRD guidance states that (dependant on weather conditions and accommodation standards), 80 to 180 litres of water per person per day should be made available;
- Bottled drinking water will be provided for workers while working on the Project should another central water supply not be available;
- Water chemical analysis will be conducted in line with WHO Standards if water (other than bottled) will be provided for human consumption purposes;

- If applicable, label the installations with warnings indicating that the water for the sanitary facilities, like W.C. and basins, is not drinkable;
- Protect drinking water sources at all times so that they meet or exceed applicable national acceptability standards or in their absence the current edition of WHO Guidelines for Drinking-Water Quality;
- All locations of potable and non-potable water tanks onsite will be mapped once available and updated in the Surface Water and Groundwater Management Plan for each Project site;
- All storage tanks onsite will be clearly marked either as potable water or non-potable water in both English and Local language and will be of different colours. In addition, storage tanks for non-potable water will be clearly marked with a sign stating “not for drinking purposes”;
- A water manifest will be used (see Annex B) which details the amount of water (whether potable or non-potable) that is transferred by the tankers to the site and stored onsite. The water manifest will be signed by the tanker operator and Health, Safety and Environment (HSE) and Security Manager accordingly; and
- Based on the water manifests, a monthly report (see Annex C) will be prepared to document the quantities of water consumed onsite (to include potable and non-potable water).

For further information, refer to the ‘Water Management Procedure’.

7.1.4 Worker conduct

- All workers are to be issued a Site Handbook (Code of Conduct) which will need to be adhered to;
- Implement the Labour Management Plan for contractors and sub-contractors; and
- Enforce good behaviour by employees, including pollution control and waste management, prohibition of hunting, trapping, fishing, and general harassment of wild animals.

7.1.5 Incident reporting

- Incidents (such as accidents, fuel/oil/chemical spills, fire, structural damages, pollution) are to be reported to the Site Manager through a formal incident reporting protocol;
- Incident register to be maintained by the Site Manager at the site compound; and
- All incidents are to be investigated and corrective actions documented and implemented as required.

7.1.6 Emergency preparedness & response

- An ’Emergency Preparedness and Response Plan (EPRP) will be developed with a set of specific pre-established procedures for coordination, alert, mobilisation and response to the occurrence or imminence of a particular event, such as natural hazards as for earthquakes, wildfires, flooding and storm surge, landslides, etc.;
- The EPRP will be reviewed and updated on quarterly basis;
- An ERT will be formed, trained and equipped with the necessary and adequate tools and equipment to respond to emergency cases; and
- Emergency drills will take place on a monthly basis throughout the construction phase.

For further information, refer to the ‘’Emergency Preparedness and Response Plan’.

7.2 Housekeeping

- Sensitive vegetation to be retained will be fenced or sign-posted before work commences on site, and as much vegetation as possible will be retained to maintain the integrity of the landscape and the visual screening already present;
- Temporary working areas will be as small as practicable, and areas chosen for the storage of materials will avoid areas of high visual impact to nearby residents/viewers;
- The areas outside of the Project's expropriated construction borders will not be occupied;
- The construction site will be kept tidy and free of litter and debris as far as possible;
- Site compounds and other large areas required for construction will be sited in locations where effects on the local landscape and on viewers can be minimised to the extent possible; and
- Temporary hoardings (site fences) will be introduced to visually screen areas of intense construction activity in close vicinity of visually sensitive areas where moving plant, machinery and vehicles may be a source of visual impact.

7.3 Lighting

- The construction site will only be floodlit when health and safety require and during night Works, so the impacts of temporary lighting upon the night time landscape and upon views are kept to a minimum;
- Position lights down and away from adjacent sensitive natural habitats (particularly where known bat roosts have been identified – for example limestone outcrops and cliffs) and residential buildings where construction works take place at night;
- Use low intensity lights where possible; and
- Replace c. 2.500+ sodium lights with LEDs (incl. temporary lights during construction) which would reduce energy consumption during the Project lifetime.

7.4 Access Control

- Project construction sites will be separated from other areas with appropriate signboards, signs and fences;
- Staff and vehicle access to the area will be limited to the construction site;
- Access to the construction site and all temporary work areas will be monitored and controlled at all times;
- Site safety signage will include a warning stating that recruitment at the construction site will not be permitted and all job advertisements will clearly state no recruitment will be undertaken on the construction site;
- Unauthorized access to explosive materials will be restricted, allowing only qualified personnel in the initiation of the explosives;
- Access within blasting areas will be controlled to prevent presence of livestock or unauthorized persons during blasting, with access controlled until an authorized representative of the operator has reasonably determined that no unusual hazards, such as imminent slides or undetonated charges, exist, and normal access to and travel within the blasting area can safely resume; and
- Undertake a programme of stakeholder engagement and consultation to educate local communities of the risks of blasting and trespassing onto construction sites, the meaning of signs, the risks of playing on or near equipment or entering fenced areas.

7.5 Signage

- The EPC Contractor will ensure that signs are erected around work fronts and construction sites advising people of the risks associated with trespassing and including a warning stating that recruitment at the construction site will not be permitted;
- Blasting signs are to be conspicuously place along the edge of the blast site and area where flying debris may occur;
- Safety signs are to be installed in areas where dust levels are expected to beyond normal conditions that require the mandatory use of appropriate PPE;
- Safety signs are to be installed in areas where noise is expected to exceed 85 decibels and requiring the mandatory use of ear protection in these areas.

For further information, refer to the ''Labour Management Plan', 'Blasting Management Plan' and 'Health & Safety Plan'.

7.6 Community Liaison

- The SEP will be implemented to outline how regular, open and transparent communication with all stakeholders will be undertaken;
- The Project manager/supervisor will need to communicate with the public, local residences and any businesses that may be affected, keeping interested and affected parties up to date and informed both shortly prior to (2 – 3 weeks) and frequently during the construction period;
- Signage will be erected in the weeks prior to any works commencing along and on adjacent roads to the Project area, notifying the public of the construction activity to take place and timing thereof, including contact details of the EPC Contractor;
- Stakeholders will also be able to report directly and transparently to the Project Manager via a GM about their expectations and concerns related to the local economy and employment amongst other Project concerns;
- Blasting schedules will be distributed to the users of the grazing areas, residents and local governments including the name, address and telephone number of the operator; an identification of the specific areas in which blasting will take place; the dates and time periods when explosives are to be detonated; the methods to be used to control access to the blasting areas; and the type of patterns of audible warning and all-clear signals to be used before and after blasting.
- Residents of the local communities will receive a written notification at least 30 days in advance of a nearby blasting as well as two (2) more written reminders, including the blasting schedules (as above).

For further information, refer to the 'Community Health, Safety & Security Plan' and 'Stakeholder Engagement Plan'.

7.7 Traffic Control

A Traffic Management Plan has been developed and will be implemented prior to any works commencing, with a focus on the following:

- Existing access roads and the road construction RoW alignment will be used where possible before consideration of opening up new temporary access roads;
- Dedicated site access roads will that avoid routing through villages will be used;
- Internal haul roads will be kept well maintained and steep gradients will be avoided wherever possible;
- Advance warning will be given of any proposed road diversions and closures;

- Where roads are closed, the EPC Contractor will find local solutions (including diversions if necessary) to be put in place;
- Project traffic routing through community areas will be reduced wherever possible to limit exposure of communities to traffic risks and nuisance;
- Hours of operation for specific equipment or operations (e.g., trucks or machines operating in or passing through community areas) will be limited;
- A GM will be implemented prior to commencement of the construction phase, with all relevant staff fully cognizant of their roles in the grievance resolution process so that quick and effective response is provided to the concerns raised by local stakeholders; and
- Project vehicles will be identifiable (e.g., an easy to read/see sign or symbol on vehicles which shows that they are connected to the Project);
- Speed limit of 50 km/h will be implemented for trucks while travelling to and from construction sites;
- Within buildings and on village roads of poor condition speed will be reduced to 30 km/h;
- Slow driving rules in villages (e.g., 30km/h) will be implemented, particularly near sensitive use areas which will be identified (at least one month) prior to start of construction related activities;

For further information, refer to the 'Traffic Management Plan'.

7.8 Endemic/Rare Plant Species Management

- Prior to RoW clearance, a botanist and supporting team will need to undertake a rare/endemic plant species survey and rescue/translocation exercise for key habitats that will be impacted;
- The threatened/regional endemic/rare plant species have been identified along the construction RoW and measures to rescue and translocate or replace each species are provided in Table 7-2;
- The EPC Contractor will need to appoint any relevant specialists and sub-consultants required to realise the implementation of the plant rescue and translocation / replanting;
- Translocation requires people who understand how to move plants and when to move plants to minimise damage to plants and improve the chances of the project being a success, therefore the team undertaking the translocation exercise must have the necessary experience and the correct equipment to translocate plants (recommended that the National Botanical Gardens in Istanbul / NGO be approached to support this intervention);
- Any relevant permits necessary to collect seed, handle and relocate endemic/threatened plants will need to be obtained before translocation may proceed;
- To undertake plant translocation successfully, knowledge of the target species, its habitat requirements, and ecological interactions is needed;
- Generally, it is recommended that translocation of whole plants be avoided during the flowering periods, as most forbs expend all their resources such that when subjected to stress related with translocation they typically fail to recover and consequently perish;
- Where whole plants are to be relocated, every effort must be made to dig out the entire plant with underground storage organ (bulb or corm) and/or root ball intact and keep these moist during relocation to aid in the recovery of the plant once transplanted;
- Rescued plants are likely to be sensitive to removal and transplanting and are therefore to be handled with care and not to be stored outside of their soil/habitat for more than a few hours (remove and transplant plants on the same day);
- Alternatively, plants are to be planted into suitable containers and housed within a temporary nursery, to prevent drying of the root ball and over-stressing the plant;

- Plants that are removed are to be stored safely and treated according to their specific requirements (to be advised by the botanist/plant translocation specialist appointed to undertake rescue and relocation of plants);
- Transplants are to be planted at receiving sites similar to the donor site habitat, to ensure that plants have a good chance of surviving and/or reproducing successfully;
- Re-planting into the wild must occur sensitively, causing as little damage/disturbance to the natural vegetation and habitat at receiving sites as possible;
- Immediately after being transplanted, species should be adequately watered, noting that different plants require different watering regimes depending on time / season of translocation (each species' watering requirement must be reviewed thoroughly prior to translocating);
- Steps are also to be taken to protect rescued and translocated plants from further disturbance in order to aid/facilitate their re-establishment at the new site (may require temporary fencing off to limit human/livestock disturbance, signage, monitoring, etc.); and
- Monitoring of the areas where plants are translocated to will also need to take place in accordance with the following protocol:
    - The position (geographical coordinates) of rescued plants that have been translocated will be recorded using a GPS device to inform future monitoring of the success of the plant rescue, translocation and protection efforts undertaken;
    - Monitoring of the transplanted species will commence at the completion of planting and then at four-month intervals (thus 3 times a year for the first year);
    - Count the number of surviving and dead plants;
    - Assess plant condition (for example using a numerical scale):
        - 0 is dead
        - 1 is leafless with no sign of re-shooting
        - 2 has small amount of foliage
        - 3 has a substantial amount of foliage
        - 4 is has foliage that is healthy and re-shooting
        - 5 is growing actively and flowering or seeding
    - Note the number of plants flowering and or fruiting (where possible);
    - Taking progressive photographs of selected plant populations from the same position for visual purposes;
    - Following each monitoring exercise, a brief report must be developed that captures the success rate and any identifiable reasons for any plant mortality (Factors to consider when reporting on mortality include handling, planting techniques, the weather, watering regimes, receptor site parameters such as soil, sunlight / shade, invasive alien plants, herbivory, etc.); and
    - basic guidelines useful for evaluating the success of the project include aspects of survival, plant health, growth and signs of reproduction.

Refer to the Biodiversity Action Plan (BAP, ERM 2022) for further details on endemic/rare plant species management actions.

Table 7-2 Threatened/Endemic/Rare plant species requirements

Species Name	Status	Associated Habitat(s)	Comments	Key Actions	Preferred Bulb / Seed Collection Period	Receiving Sites for Plants[3]
Cirsium polycephalum	Regional endemic, Critically Endangered (IUCN)	Black Sea Garrigue, Maquis, *Spartium junceum* fields, Artificial Coniferous Plantations	Able to propagate from seed.	■ Pre-construction survey and seed collection. ■ Collect seed from construction RoW and adjacent natural habitats (*see map in Figure 7-1 for areas to consider*) and propagate replacement plants. ■ Replacement plants to be located within restored/recreated habitats.	August - September	Recreated Black Sea Garrigue and Maquis habitat within the road corridor (***see Section 7.24 'Habitat Reinstatement'***)
Ferulago confusa	Rare, Vulnerable (IUCN)	Black Sea Garrigue, Maquis	Very difficult to propagate from seed.	■ Pre-construction survey. ■ Rescue and transplant whole plants from construction RoW.	July - August	Black Sea Garrigue habitat in areas adjacent to the construction RoW, most importantly the larger contiguous natural habitats in the central project area and the road arm leading to the south (*refer to map in Figure 7-2 for areas to consider, particularly 'Area A' circled in white).* This procedure will be detailed in the 'Habitat Restoration and

[3] Note that suitable intact habitat at receiving sites is a prerequisite for translocation, with limited ecological disruptions to prevent further disturbance of translocated plants (IUCN, 2013). Given that natural habitats (even those that will be cleared along the RoW) are considered to be secondary and degraded, there are very limited to negligible opportunities to translocate species to intact habitats. Therefore, the most suitable semi-intact secondary habitats will be selected as far as possible as areas to receive rescued plants. Suitable receiving sites nearest to the donor site (i.e. the development site/footprint where plant losses are anticipated) are also considered most ideal, as too great a distance could impair genetic variation and potential exchange according to the IUCN (2013).

Species Name	Status	Associated Habitat(s)	Comments	Key Actions	Preferred Bulb / Seed Collection Period	Receiving Sites for Plants[3]
						Recreation Plan' that will be compiled.
Galanthus x valentinei	Regional endemic, Vulnerable (IUCN)	Riparian woodland	Hybrid species that is very difficult to propagate from seed.	■ Pre-construction survey. ■ Rescue and transplant whole plants from construction RoW. ■ Replacement propagation by harvesting plant propagules (e.g. bulbs) of the individual plants that would be lost. ■ Rescue and transplant plant bulbs from construction RoW, these should be kept in shade at +4°C until planted.	April	Mediterranean riparian woodland that would remain untransformed within the road reserve which will be fenced, beyond those affected by culverts. Wooded riparian habitat in areas adjacent to the construction RoW, preferably not far from the impacted areas, as such targeting suitable riparian habitat upstream or downstream of the construction RoW crossing streams in the western study area (*refer to map in Figure 7-2 for areas to consider, particularly 'Area B' circled in white).* This procedure will be detailed in the 'Habitat Restoration and Recreation Plan' that will be compiled.

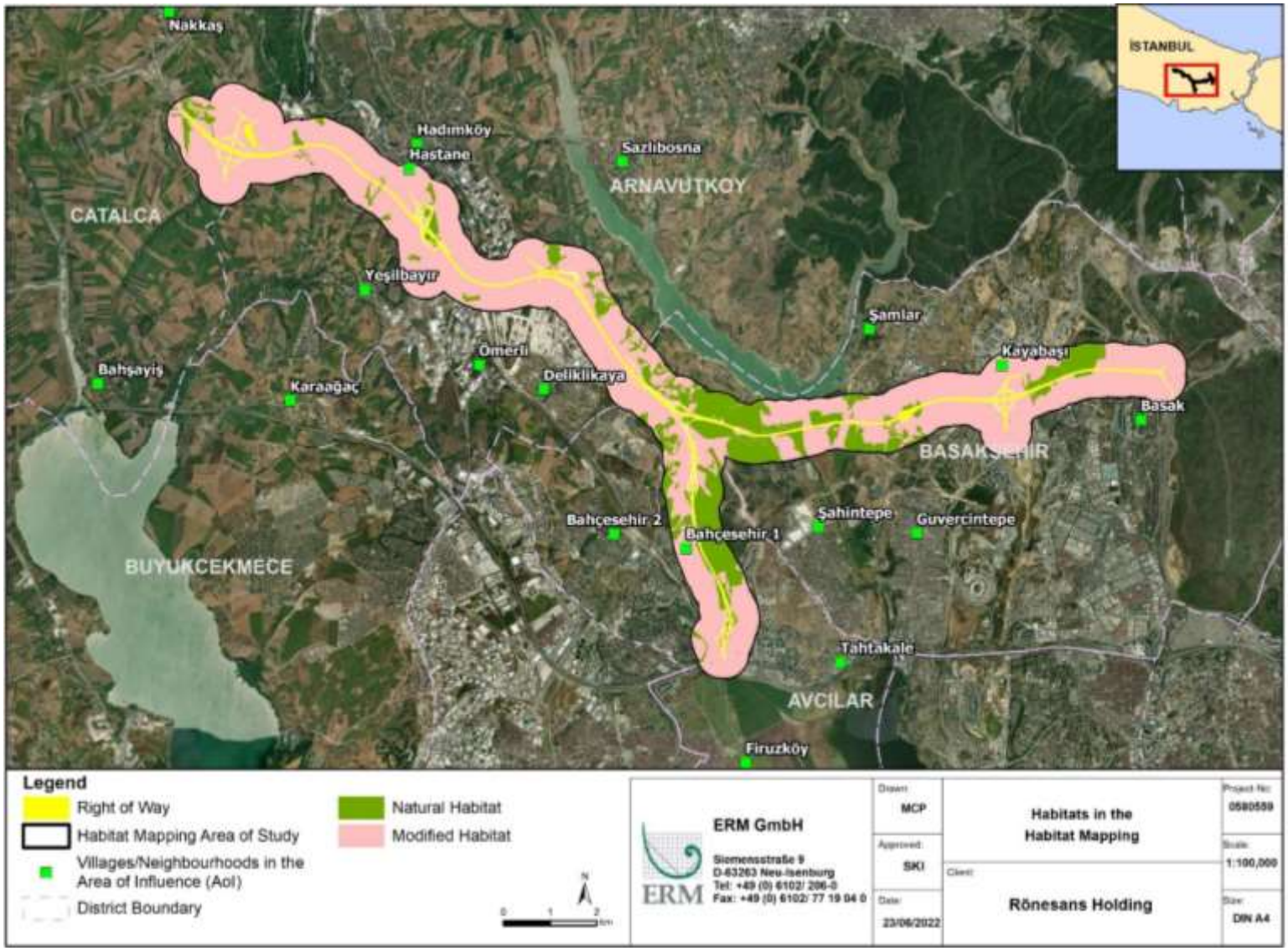

Figure 7-1 Classification of natural vs modified habitats associated with the RoW and adjacent areas

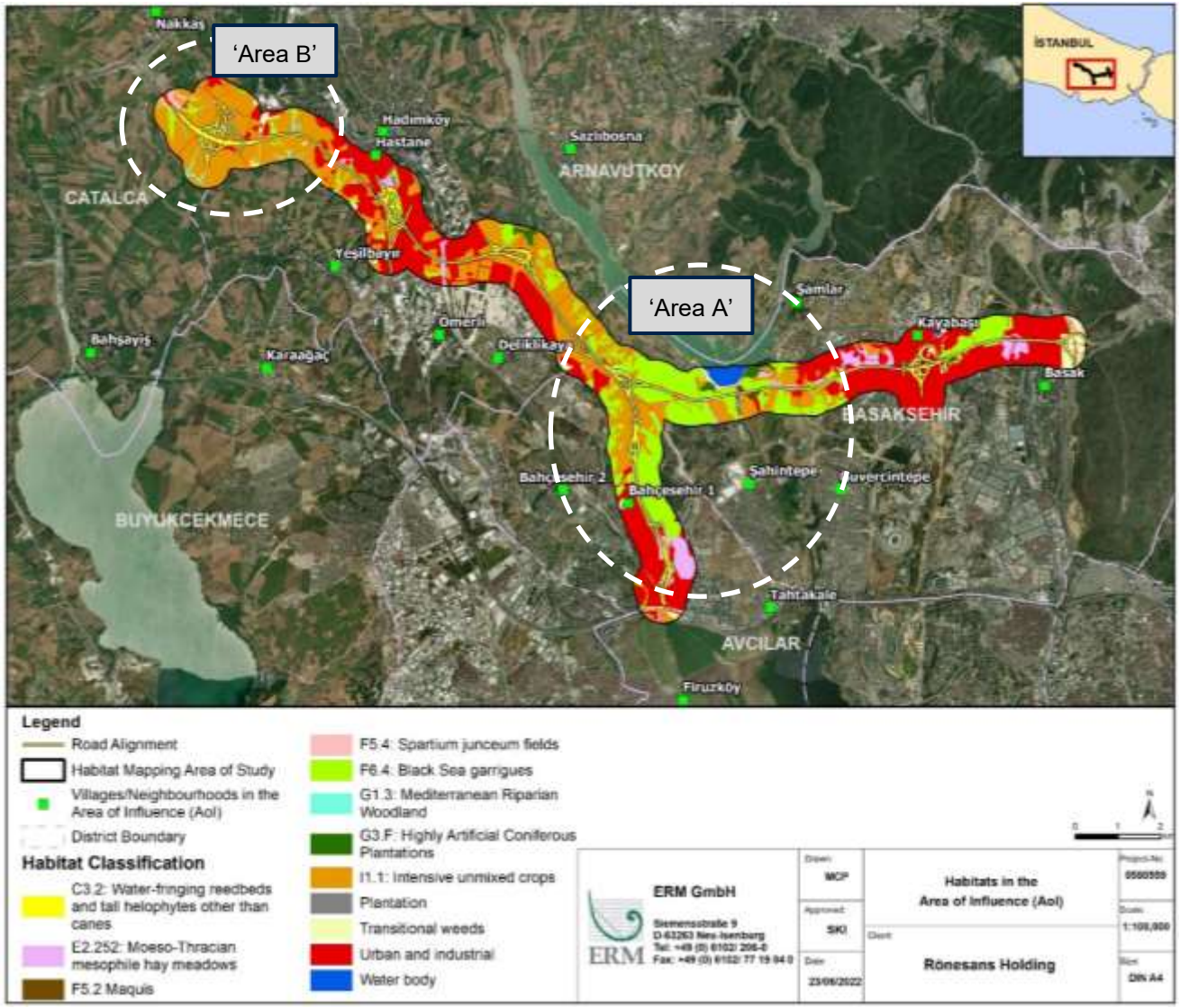

Figure 7-2 Classification of habitats associated with the RoW and adjacent areas

7.9 Wildlife Management

7.9.1 General wildlife controls

- Access controls to be implemented to limit access to areas of high biodiversity sensitivity outside of the construction RoW;
- Restrict vehicles to the use of only authorised access roads;
- Restrict activities to daytime hours when visibility is good to reduce risk of vehicle collisions with wildlife;
- Shepherding protocol to be implemented where road construction takes place, to check areas to be worked in prior to construction and remove or shepherd wildlife found on the construction site to safety in adjoining natural habitat (where these animals cannot safely exit the construction site by themselves);
- Species considered to be dangerous or poisonous/venomous (such as snakes) are to be handled by experienced and trained professionals only;
- During the months of April – June (spring season) which is the important breeding season for fish species, avoid construction activities taking place directly within or in the close proximity of watercourses such as streams;
- Minimize extended human presence near nesting birds during construction and protect sensitive habitat areas adjacent to work areas with temporary barriers or fencing to limit human foot-traffic;
- Implement the temporary fencing off of ditches, trenches and capping of pipes at night time to prevent wildlife movement onto the construction site;
- Excavations are not to be left open overnight, alternatively they will need to be securely covered or a means of escape for any animals that may become trapped will be provided, such as a wooden board or earthen ramp;
- All open excavations will be checked for the presence of animals each morning and immediately prior to backfilling of excavations/trenches;
- Implement measures to reduce the suitability of construction/work areas for key species, such as earthen embankments, bare slopes and temporary topsoil stockpiles, by covering or containing piles of soil, fill, brush, rocks and other loose materials and covering or hydroseeding soil stockpiles and slopes that are to be left temporarily open/exposed for an extended period of time (e.g. exceeding one week);
- Prevent the establishment of active nests during the nesting season on standing plant and temporary facilities and structures by closing opening and vents and checking equipment before operation;
- Examine heavy equipment and plant stored on site before use, particularly after rainfall events when reptile and amphibian movements occur more often, to ensure use will not harm individuals that might be seeking temporary refuge under vehicles for example;
- When a construction zone is adjacent to active animal burrows (such as European souslik / ground squirrels), erect suitable barriers to discourage individuals from moving through or into the construction area;
- When seeding or revegetation is planned in an area adjacent to active animal burrows (such as European souslik / ground squirrel), a vegetative barrier should be considered in the planting to discourage dispersal of wildlife into the construction RoW;
- Non-UV sources of lighting will be used for working sites so as not to attract nocturnal insects and insectivorous bats and other animals that feed on them; and

- Collect and remove waste products and litter from work areas that could attract wildlife to these areas (*see also 'Pest Control' measures in section 7.10*).

7.9.2 Wildlife crossings

- Implement suitable wildlife crossings at appropriate locations, as per the design recommendations in **Annex D** of the CESMP.

7.9.3 Pre-construction wildlife searches

- Before whole-scale stripping of vegetation, cut vegetation in shrubland and scrub down to ground level, starting from the edge of the intact vegetation and clearing 5-10m sections at a time using brush cutters, ensuring all cuttings are raked off and removed from site on the same day they are generated, to avoid creating refugia for wildlife;
- Whilst this is being undertaken, conduct rapid day-time searches for tortoise (Mediterranean Spur-thighed Tortoise), nesting/roosting birds/bats, whilst also flushing out small mammals and reptiles (*see map in Figure 7-3 below for priority locations for pre-construction faunal searches which focus on areas of remaining untransformed habitat where connectivity has also not been critically severed, mainly along the western and southern road arms, excluding areas that have already been cleared/constructed for the road development*);

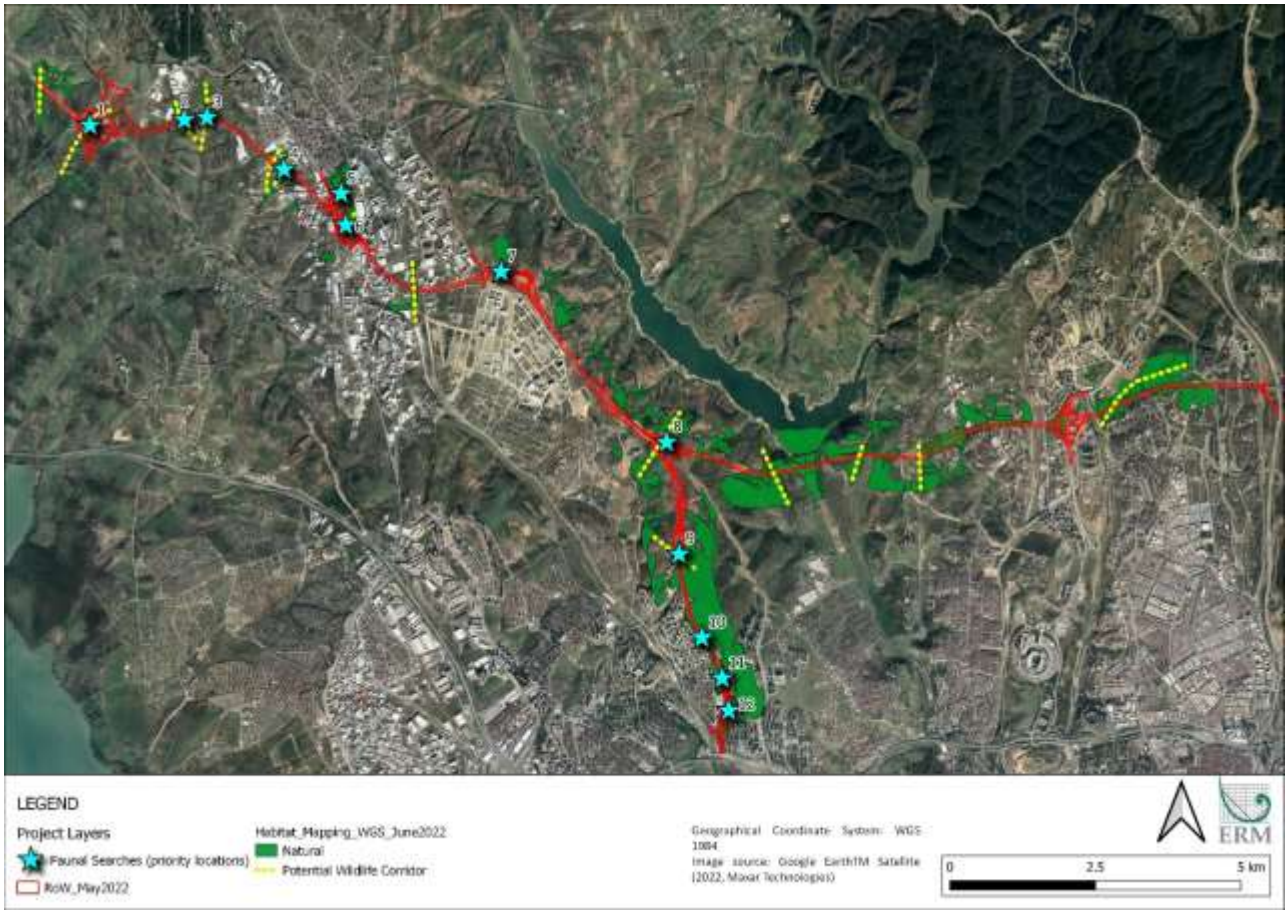

Figure 7-3 Locations for priority faunal searches (pre-construction)

- "Pre-stressing" describes actions taken to encourage wildlife to move away from a site prior to the onset of construction, with common methods that include having one or more people walk the site

while talking loudly or playing loud music, or placing pieces of cloth or other objects that carry a strong human scent into animal dens/large burrows;

- Preferably allow fauna to leave the area and relocate themselves to adjacent habitat without the need for further intervention;
- If no active nests, roosts, or burrows/dens are present, vegetation clearing should be completed within a few days of the initial wildlife checks / inspections;
- Site clearing activities should begin at disturbed areas of the RoW (construction front) and proceeding towards the natural areas, with the goal to ensure that any wildlife within the workspace can retreat into the retained natural areas outside of the construction zone without having to cross any cleared lands;
- Avoid or minimize disturbing or removing cover objects, such as downed trees, rotting stumps, brush piles, stone piles, and leaf litter until these have been checked for animal activity, these can then be removed and relocated to similar suitable adjacent habitat outside of the RoW;
- Searches and pre-stressing activities are to be carried out by teams that have undergone necessary training in sensitively carrying out faunal searches and wildlife flushing exercises, ideally with a team standing in a line with a distance of 3-5m apart and moving progressively through the vegetation to check for animals and nesting activity;
- **Herpetofauna**: Where encountered, reptiles and amphibians will be collected prior to construction and moved to suitable natural habitat outside of the construction area by suitably trained and experience staff, far enough away from the construction zone to limit the chance of them immediately re-entering the RoW;
- When capturing/relocating animals, cover larger animals with a towel or blanket and place in a cardboard box and/or hessian bag, place smaller animals in a cotton bag, tied at the top;
- **Burrowing mammals**: Where animal burrows (e.g., European souslik) are encountered, soil will be stripped using hand tools and any individuals of these species found will be moved / allowed to move by themselves to unaffected habitat outside of the RoW;
- **Bird Nests:** Where bird nests / nesting birds are encountered during faunal searches of trees/shrubs and for any ground-nesting birds:
  - these locations are to be noted on a map or using a GPS,
  - construction will need to be halted temporarily in this area,
  - an ornithologist must be consulted with regards to measures to next steps and the possibility to relocate bird nests to suitable alternative habitat, only after which construction may resume in this area,
  - if unoccupied, inactive nests can be removed and relocated outside of the RoW in suitable habitat,
  - do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season,
  - do not collect, capture, relocate, or transport birds, eggs, young, or active nests without the necessary permits and under supervision of a trained and qualified specialist,
  - bird nests are not to be handled/removed or relocated by construction staff, only by trained specialists,
- **Bat Roosts:** All trees that require felling or pruning as part of the works and any structures, cliffs or caves in the RoW will be assessed for their potential to support roosting bats through a ground-level assessment and where any bat roots are encountered during pre-construction searches, the following will be done:

- roost sites to be noted on a map or using a GPS;
- construction will need to be halted temporarily in this area;
- a bat specialist will need to be consulted to assess the situation and advise on next steps before construction can resume in this area;
- bats are not to be disturbed, handled/removed or relocated by construction staff, only be trained specialists;
- the use of exclusion devices may be considered by the ecologists and can be installed by a qualified individual and recommended to be used for a minimum of seven days (noting that exclusion devices must be temporary and be easily removed following completion of the works) prior to clearing activities involving bat roots (prior to exclusion, ensure that alternate roosting habitat is available in the immediate area);
- bats should only be handled as a last resort; and
- felled trees with evidence of roosting bats (i.e., with suitable cavities showing signs of occupation such as droppings, feeding remains, grease markings), including those which could not be inspected prior to clearing, will be left in situ on the ground for a period of at least 24 hours to allow any bats to vacate the area,

- Alternative roosting and resting sites for birds/bats may need to be provided on a case-by-case basis where nesting/roosting species may be disturbed or removed and need to be relocated and this may include the construction of bat/bird friendly structure such as bat/bird boxes and artificial perching sites in adjacent habitat outside of the RoW (exact requirements and approach to be advised by a wildlife ecologist during pre-construction surveys);
- Species considered to be dangerous or poisonous/venomous (such as snakes) are to be handled by experienced and trained professionals only;
- Ensure that wildlife flushing and rescue procedures are not conducted during an extensive dry period (i.e. drought) as this could be particularly detrimental to certain wildlife and lead to mortality, especially if there is no nearby suitable habitat;
- Avoid clearing activities during the breeding season of key species where possible, as this could disrupt the reproductive success of species populations;
- Any injured animals are to be transported carefully but efficiently to a local vet for treatment as soon as possible;
- After removal of the individuals from the construction RoW, the area that will be disturbed adjacent to natural habitats during construction and at project specific locations should be fenced off appropriately to exclude re-entry by wildlife; and
- A post-clearing report from the ecologist must be compiled that records the details of key actions taken and details of the species, sex, age, general health, and numbers removed/relocated, the date, the relocation areas selected and estimated effectiveness and success of rescue and relocation efforts as well as any complications and further recommendations.

7.10 Pest Control

Construction sites can become centres for wildlife considered pests, due to human activity and the presence of food and waste products generated at construction compounds in particular. The purpose of this procedure is to identify, eliminate or manage pests through appropriate baiting, trapping, spraying, and monitoring.

7.10.1 Key areas and pest types

The key areas where pests can become problematic and require control are likely to include:

- Offices;
- Carparks;
- Gardens;
- Courtyards;
- Kitchen and eating areas;
- Ablution facilities / toilets; and
- Waste disposal facilities (bins).

Common pest types may include:

- Rodents (rats and mice);
- Feral cats, dogs;
- Insects (ants, cockroaches, ants, wasps, bees);
- Snakes; and
- Certain birds that frequent waste sites.

7.10.2 Preventing infestations

The following measures apply to preventing pests or infestations:

- Use of animal proof bins at waste storage sites;
- Proper storage and disposal of organic and inorganic waste as per the Waste Management Plan and Wastewater Management Plan;
- Kitchens and food storage areas to be equipped with lockable doors and cabinets;
- Store food and organic waste (food waste) in areas where these are not likely to attract pests;
- Remove or cover all exposed or unpackaged food items; and
- Ensure good housekeeping is undertaken on a daily basis to ensure a clean work compound so as to reduce the risk of pest/insect infestations.

7.10.3 Controlling pests

The following measures apply to controlling pests:

- Monthly site inspections to be undertaken and findings noted in a Pest Control Logbook;
- Incident reporting to be undertaken in the case of particularly severe infestations or incidents involving dangerous wildlife;
- Eliminate pests such as rodents and insects through baiting;
- Spraying is considered appropriate for wasps / wasp nests;
- Trapping of mammals, reptiles or snakes must be undertaken by external specialists;
- Only carry out pest control procedures that will not put employees or the general public at risk and undertake controls preferably after hours to avoid employee contact;
- Notify employees of any pest control (baiting, spraying, trapping) activities before these take place and preferably limit access to areas during the administering of controls;

- Staff to be made aware of the dangers of any spraying or baiting controls that could be poisonous or detrimental to health;
- Suitable PPE to be worn during control activities;
- Only use pest control measures that will not result in fire or combustion;
- Maintain an up-to-date register of SDSs;
- Pest control chemicals, bait, etc. to be stored in suitable containers or storage areas under strict access control;
- Only qualified persons to administer pest controls as necessary and in line with national legislation;
- Pest Control Log to record the frequency and dose of all pest control substances;
- Follow and adhere to pesticide and/or insecticide manufacturer's directions and instructions at all times;
- Use tamper-proof bait stations and secure these if required;
- Bait types that are not liable to spill are to be preferred;
- Place bait stations in locations that minimise access risk to employees;
- Persons suffering from respiratory problems, allergies or other conditions, who may be aggravated by the treatment material, may need to take additional precautions before re-entry to the treated areas where pesticides or insecticides and sprayed and this may require seeking professional advice;
- Exterior spraying should only be carried out under suitable weather conditions and low usage periods;
- Remove bait stations if not in use; and
- Wash down any working surfaces that may have been exposed through overhead or space treatments.

Special controls:

Certain species of animals that may be considered pests (e.g. snakes, frogs, field mice, monkeys, certain

birds, bees) should not be killed or injured as these could be important species from a biodiversity conservation

perspective and could be potentially poisonous/dangerous if handled:

- In the instance that such species are encountered, they should be directed away from the construction site by carefully moving these to the nearest natural habitat or making noise to scare these animals away from the site;
- Certain wildlife could also be potentially poisonous/dangerous (e.g. snakes) and it is recommended that a qualified professional be called to remove these animals if they continue to persist at the site; and
- If large numbers of bees or beehives/colonies are encountered, a bee specialist will be approached to undertake bee removal.

7.11 Cultural Heritage Resources Management

The management of cultural/heritage resources will be in line with the Cultural Heritage Management Plan and will include the following key measures that will be implemented:

- Conduct pre-construction archaeological investigations by a qualified archaeologist appointed to identify, investigate and scientifically remove any archaeological deposits encountered;

- Implement the Chance Find Procedure (CFP) which includes protocols for responding to chance finds, including cessation of work for finds and notification of Nakkaş Otoyol A.Ş. and its archaeological consultant, who will advise the appropriate authorities including the Regional Protection Council and Museum and expedited procedures for evaluation and treatment of significant chance finds in order to limit impacts to important resources while limiting construction delays;
- Notification of the relevant museum directorate about known cultural heritage sites identified along the RoW and the chance finds in case encountered during Project activities as per the requirements of Law on Preservation of Cultural and Natural Assets (Law No. 2863);
- Cease activities (including blasting) in the vicinity of identified cultural heritage sites before the studies of the related museum directorate are finalised and the official views of the authorities on relevant sites are obtained;
- Liaise with the İstanbul Regional Council No: 1 for the Conservation of Cultural Property to agree on a mitigation strategy for archaeological sites; and
- Indicate the archaeological sites as “historical sensitive area” in all Project documentation, drawings, etc. and notify EPC Contractor and subcontractors about the presence and location of these sites.

7.12 Noise and Vibration Controls

The operation of construction plant, equipment and heavy machinery, is typically a source of potential noise and vibration impacts that can disturb nearby communities and wildlife. The following activities are expected to be a source of excessive noise and/or vibration onsite:

- Borrowing activities
- Blasting
- Erection of facilities
- Excavations (including trenching)
- Grading
- Levelling
- Piling
- Use of various machinery and equipment (e.g. generators, compressors, excavators, loaders, etc.)
- Workers

Construction noise and vibration controls that must be implemented include:

- Activities that take place near residential area or sensitive environmental receptors will be carefully planned (restricted to daytime, taking into account weather conditions, etc.);
- The noise will be restricted to be perceived at nearby buildings from construction to 70 dB Leq during the evening and 65 dB Leq at night as far as practicable for short-term activities lasting not more than 10 days;
- Noise levels from longer term construction activities (longer than 10 days) will be restricted to 55 dB LAeq during the evening, and 50 dB LAeq at night as far as is practicable, or to other standards that have been agreed with the local authority;
- Residents and commercial industries in the vicinity are to be notified in advance concerning construction schedules and activities;
- Buildings located within 50 m of significant sources of vibration ahead of construction works will be identified and the sensitivity of the identified buildings and building occupants to vibration will be

evaluated, including documentation for each of the identified building which will include photographs of buildings sensitive to vibration and results of the sensitivity evaluation;

- Noise complaints will be recorded in a logbook or complaints register, including the date and time of the complaint, name of complainant, nature of the complaint, action taken and follow up;
- Diesel generators will be enclosed within sound proofed containers to minimise the potential for noise impacts;
- Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected where possible;
- All construction plant and equipment to be used onsite will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations;
- Plant with the potential of generating noise or vibration will be placed as far away from sensitive areas as local communities as permitted by site constraints;
- Regular maintenance of plant and machinery will be carried out in order to minimise noise emissions (in particular, attention will be paid to the lubrication of bearings and the integrity of silencers fitted to vehicles/machinery);
- All equipment, machineries and vehicles shall have valid maintenance and inspection certificates and relevant servicing records shall be maintained;
- Vehicles and the mechanical plant will be fitted with effective exhaust silencers and maintained in good working order;
- Compressors will be of the “sound reduced” models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers; and
- Machinery and equipment which are used intermittently, will be shut down during periods when they are not in use;
- Avoid activities that generate high levels of noise at night as far as possible;
- Provide appropriate hearing protection to workers exposed to excessive noise.

For further information, refer to the ‘Noise and Vibration Management Plan’ and ‘Blasting Management Plan’.

7.13 Dust and Air Quality Management

7.13.1 Air quality

Possible emissions during construction that can affect air quality include:

- Emissions from generators that run on hydrocarbons (diesel/petrol fuel);
- Emissions from combustion engines associated with vehicles and construction plant that use diesel or petrol fuel; and
- Any potential burning of organic or inorganic products that can produce fumes/smoke.

The procedure to manage air quality and control possible emissions is as follows:

- Ensure that diesel/petrol generators used onsite comply with national/local emissions limits for diesel or petrol fuelled engines;
- Generators that use fuel are to be located in an appropriate area as far as possible from the site offices;
- Low sulphur content diesel will be used as the preferred fuel source for generators;

- Generators are only to be used when necessary - switch-off generators when not needed;
- Refuelling of vehicles will be done at authorised fuel stations;
- Transportation logistics to be optimised through efficient route planning to avoid congested areas and to promote fuel efficiency and reduce overall emissions;
- Timing of works to be optimised through appropriate traffic management to minimise traffic delays;
- Energy efficiency is to be promoted amongst drivers and workers;
- Fuel efficient vehicles are to be prioritised for transportation purposes;
- Vehicle idling times to be minimised through appropriate and efficient scheduling of construction operations;
- Ensure that vehicles and trucks comply with the limits for exhaust emissions set in terms of applicable national/local laws (Nakkaş Otoyol A.Ş. has a requirement in their sub-contractor agreements specifying the Euro Standards that HGV vehicles need to meet to comply with the applicable emissions standards);
- This may require vehicles with internal combustion engines to be fitted with appropriate filters and emission-reducing equipment to meet standards;
- Nakkaş Otoyol A.Ş. has a requirement that certain pieces of equipment such as cranes used for the Project are no more than 3 years' old which is also applicable for the HGVs as well;
- Develop a regular inspection and scheduled maintenance program for vehicles, machinery, and equipment to be used throughout the construction phase for early detection of issue to avoid unnecessary pollutant emissions;
- All equipment, machinery and vehicles shall have a valid maintenance and inspection certificate and relevant servicing records shall be maintained;
- Maintenance logs and records of emissions testing shall be kept and made available for review;
- Burning of any organic or inorganic materials or any products classified as 'waste' onsite is strictly prohibited and such products must be stored and disposed of correctly as per the Waste Management Plan; and
- All general air quality complaints (including dust) will be recorded using a grievance mechanism and root causes will be identified for further appropriate actions that will be taken to reduce emissions in a timely manner.

7.13.2 Dust

Dust is typically a common source of particulate matter which can also affect air quality at a localized scale general. Factors such as weather conditions, activity type and the nature of the soil will affect rates of dust generation and magnitude. Dust during construction can be generated from many onsite construction activities, including:

- The use of access roads by heavy machinery and vehicles;
- Stripping of vegetation and soils;
- Excavation activities including trenching;
- Stockpiling of soils;
- Grading;
- Transporting of soil, rock and aggregate materials; and
- Backfilling activities.

The procedure to manage dust during construction includes:

- Where practical, compact ground in areas that are heavily used by vehicles and machinery to reduce the potential for mobilisation of loose soil or silt by wind;
- All construction related traffic to maintain speed limits of maximum 30 km/h on all un-surfaced roads, with appropriate speed limit signage provided for these roads;
- Any site access roads with the potential to give rise to dust will be regularly watered, as appropriate, particularly during dry and/or windy conditions;
- Dust suppression by water misting or bowsers / water trucks will operate onsite as frequently as necessary to mitigate dust generation on un-surfaced roads and open areas with bare soils that could generate dust;
- Watering of these areas will be particularly necessary during dry weather conditions and during periods of strong winds;
- Only non-potable water should be considered for dust suppression activities;
- Wastewater may not be reused for dust suppression unless this water has been treated to acceptable levels according to national laws for the use in irrigating lands;
- If water is scarce or unavailable, applicable binding agents will be used (additives);
- Material handling systems and material storage areas will be designed and laid out to minimise exposure to wind;
- The transport of soils or other material, which has significant potential to generate dust, will be undertaken in tarpaulin-covered vehicles (or an equivalent) where necessary;
- Daily inspection of construction sites to be undertaken to identify any potentially significant sources of dust, examine dust measures and their effectiveness;
- Vehicles leaving the construction areas of the site to pass through a wheel cleansing area prior to entering the local public road network;
- Public roads outside the site and along the main transport routes to the site will be regularly inspected for loose soils or debris caused by construction plant/vehicles and cleaned as necessary;
- Implement on a case-by-case basis measures and systems in order to maintain dust levels within permissible limits (informed by dust monitoring results and analyses);
- Dust protection measures (mask or respirator and protective eyewear) to be provided to workers where exposure to airborne dust occurs;
- Doors and windows of temporary offices and similar shall be kept sealed or closed;
- Arrange the site layout in a way that dust causing activities are located as far as possible from offices;
- Encourage good housekeeping – maintain the construction site and access roads free from loose/friable materials;
- Limit or suspend earthworks during extreme weather conditions (e.g., strong winds);
- Ensure that any offloading of materials that could easily be suspended in the air (e.g., powders) is carried out in a manner that reduces dust emissions;
- Use appropriate dust control facilities (e.g., windbreaks, temporary barriers, netting screens, fences or plastic sheets) to contain dust emissions from dusty areas, during excavations and earthworks, and where there is stored material that is liable to cause dust and stockpiled soil;
- Drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment will be minimised and fine water sprays will be used on such equipment wherever appropriate;

- Cutting, grinding or sawing equipment shall be fitted or undertaken in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g., suitable local exhaust ventilation systems, will be used;
- Equipment will be readily available on site to clean any dry spillages, and spillages will be cleaned up as soon as reasonably practicable after the event using wet cleaning methods;
- Ensure periodic washing of vehicles in order to remove any dusty material in a dedicated area such as a vehicle wash-bay;
- Proper management of stockpiles and excavated material through appropriate enclosures and cover;
- Earthworks and exposed areas/soil stockpiles will be re-vegetated to stabilise surfaces as soon as practicable or alternatively hessian, mulches or tackifiers will be used where it is not possible to re-vegetate or cover with topsoil;
- Sand and other aggregates will be stored in bunded areas and will not be allowed to dry out unless this is required for a particular process, in which case it will be ensured that appropriate additional control measures are in place;
- Bulk cement and other fine powder materials will be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and
- Site awareness about dust/air minimization and proper use of vehicles and yard equipment/machineries will be provided to workers (through signage, posters, etc.).

For further information, refer to the ''Air Quality and Emission Control Plan'.

7.14 Blasting Management

Where blasting activities are required to remove rock outcrops along the RoW, the Blasting Management Plan will be implemented:

- An appropriate and detailed protocol that minimises the impacts of controlled blasts on the surrounding area and residents will be drawn up;
- The Maximum Instantaneous Charge (MIC) may be reduced by reducing the number of holes fired at any one time, resulting in airblast levels lowered by 1 dB Linear to 3 dB Linear;
- A pre-blast assessment will be undertaken to manage blast risks and impacts, including a meteorological condition protocol to avoid blasting in unfavourable weather conditions;
- An appropriate charge mass design and loading will be used;
- An appropriate initiation sequence will be applied for each blast to minimise the possibility of hole interaction, i.e., avoid reinforcing effect and aim for a single hole initiation;
- An alternative blast design will be undertaken around identified geological features to avoid face burst and excessive airblast emission;
- An appropriate quality stemming material and stemming height will be used to enable correct confinement of explosive charges and therefore minimise airblast emission; and
- Flyrock control is essential, and the area around the blast site where flying debris may occur will be secured.
- Structural building assessments will be carried out by competent independent experts at the locations where the buildings are within 50 m of significant sources of vibration and blasting prior to the activities at these areas. A documentation will be prepared for each of the identified buildings, which will include photographs of buildings sensitive to vibration and results of the sensitivity evaluation.

- Nakkaş Otoyol and EPC will prepare a plan for cases where houses are or can be damaged due to blasting/vibration; i.e. a building evacuation procedure; and these people will be assisted for temporary or permanent resettlement as per RAP principles. The damage to houses and effectiveness of restoration shall be investigated and confirmed by third party experts.
- Community awareness and emergency preparedness and response planning will be undertaken, including control of third-party access to blasting areas (including animal grazing activities).
- Vibration on commencement of relevant construction activities will be monitored to ensure that the Turkish requirements are met. If the standards are exceeded additional measures will be taken to reduce vibration and if necessary altering the methods of working to use equipment that creates lower levels of vibration

For further information, refer to the 'Blasting Management Plan'.

7.15 Pollution Prevention

The following pollution prevention measures will be implemented as required during construction:

- Only authorised dump sites for inert material (waste rock/soil) may be used and dumping is to be limited to the permitted footprint;
- Material is not to be stored within 50m of watercourses such as rivers and creeks/streams;
- No refuelling activities will take place within 50m of watercourses such as rivers and creeks/streams;
- No grey water runoff or uncontrolled discharges from the site/working areas (including vehicles/machinery wash-down areas) into adjacent or downstream water bodies is permitted;
- Water containing pollutants will be discharged into a temporary storage facility such as a conservancy tank, where appropriate, for removal from site;
- Implement proper waste and hazardous materials management practices in line with GIIP;
- All temporary/portable toilets will be secured adequately to the ground to prevent them from toppling over;
- Discharge of waste from toilets into the environment and burial of toilet waste is strictly prohibited;
- Mixing any chemical substances within rivers/streams is strictly prohibited;
- All freshwater resources such as small ponds, water channels, creeks, dams, etc. will be protected as much as possible during construction;
- Excavated materials will not be dumped within river/stream channels;
- Any damage to downstream property caused by the diversion of overland storm water flows will be repaired;
- All relevant locations and machinery (particularly hydraulic hoses, fuel lines, etc.) will be periodically inspected and any defaults or signs of wear and tear reported for repair as part of a preventative maintenance program;
- The site manager will be notified immediately in the case of any pollution incidents on site such as spills of substances;
- Petroleum product spillages will be immediately cleaned up with appropriate absorbent materials along with remediation of the area as required;
- Contact details for the relevant authorities will be available on site to allow immediate reporting of any oil spills to water to allow a rapid emergency response;
- Spill kits including containment and treatment equipment and materials will be provided at the site, near where equipment is being used;

- All personnel on the site will be familiar with the use of the spill clean-up kit and procedures for the clean-up and disposal of waste;
- Hazardous substances handling will be carried out by suitably trained personnel only;
- No refuelling or maintenance will occur on the construction site and no hazardous substances will be stored on the site;
- Fuel, oil and chemicals (if any) will be kept in a designated secure area that will be locked;
- Regular inspections of construction vehicles will be conducted to identify and repair leaks or damaged fuel/lubricant lines; and
- Copies of SDS (Safety Data Sheet) for all hazardous materials to be maintained onsite in an SDS register.

For further information, refer to the 'Pollution Prevention Plan'.

7.16 Hazardous Materials Management

7.16.1 Types of HMs

During the construction and operational phases of the Project, the following typical hazardous materials (HMs) have been identified as being relevant:

- Lubricants and vehicle oils, grease;
- Fuels for vehicles and generators (petrol and/or diesel);
- Paints, thinners, solvents, coatings, dust suppressant (where applicable);
- Propellants in aerosol cans;
- Adhesives and abrasives; and
- Sewage.

7.16.2 Transport and acceptance

The following measures apply for the sourcing, transport, handling and general management of hazardous materials and substances:

- HMs will be received and stored onsite at the main designated storage area at the construction compound, where after they will be successively transferred to the different onsite work areas, laydown areas, etc. for use onsite during construction;
- The supplier is responsible for delivering HMs safely and appropriately to the site, unless these are sourced offsite and the EPC Contractor himself delivers this to site, in which case the transfer and handling requirements below then apply;
- The following information must be collected by the HSE Officer upon the delivery of hazardous substances/materials to the site, added to the HMs register:
  - producer information (including contact details);
  - material commercial and chemical name;
  - container type and size/volume;
  - delivered and maximum anticipated quantities/volumes/number of containers; and
  - Safety Data Sheet (SDS) for each material/substance.
- The following practices will be applied to prevent uncontrolled releases during the onsite transfer and handling of HMs:

- chemicals and other hazardous materials and substances will be transported using trucks, equipment, and containers in good condition and in compliance with the relevant government regulations regarding the safe transport and handling of hazardous materials and substances;
- visual inspections shall be made of vehicles/containers to check for leaks prior to transportation taking place;
- to reduce the risk of spillage during transportation of hazardous products, these will be transported to and from the site by an appropriately trained and licensed contractor/driver;
- all routes that are or may be used to transport hazardous substances must be assessed for risk; routes with lower risk of accident must be used in preference to routes of higher risk;
- chemicals substances must be transported in appropriate containers, such as plastic or impervious, chemically resistant material to reduce the potential to leak/spill;
- use of dedicated fittings, pipes, and hoses specific to materials in tanks and maintaining procedures to prevent addition of hazardous substances to incorrect tanks;
- use of transfer equipment that is compatible and suitable for the characteristics of the materials transferred and designed to ensure safe transfer;
- regular inspection, maintenance and repair of fittings, pipes, and hoses;
- provision of secondary containment, drip trays or other overflow and drip containment measures, for HMs containers at connection points or other possible overflow points; and
- written procedures for transfer operations that includes a checklist of measures to follow during filling operations and the use of filling operators trained in these procedures.

7.16.3 Storage of HMs

The construction compound will be equipped with the hazardous materials storage area, which may be a portable container capable of being secured and locked, or a dedicated facility constructed of concrete bund with a roof and siding to protect against the elements (e.g., precipitation, direct sunlight) and secure fencing and lockable gate.

The following considerations will be followed in selecting the design and location of the storage:

- compatibility of the hazardous substance types and storage classes;
- secondary containment (concrete berm walls) capable for containing 110% of the volume of the largest tank in case of total storage quantity is more than 10,000 L;
- storage area provided with slab sloping towards a drain ditch equipped with grid in order to maintain easy access for loading/unloading operation; and
- safety valves shall be present and kept closed in the drainage system under normal operation to avoid environmental pollution through the drain.

Hazardous materials will be stored at the designated storage area according with the segregation compatibility of materials. Their segregation requirements and good practices are detailed below:

- HMs that are considered potentially reactive, corrosive, flammable and/or explosive shall be stored according with the materials compatibility (as per the relevant MSDS) in order to avoid uncontrolled reactions or conditions resulting in fire or explosion;
- incompatible materials (acids, bases, flammables, oxidizers, reactive chemicals) shall be stored in separate areas and with containment facilities separating material storage areas;
- segregate chemicals into similar hazard types (some chemicals have multiple hazards which requires further segregation);

- solid and liquid chemicals shall be stored separately to minimize the involvement of chemicals in the event of a spill or leakage;
- selection of materials of construction compatible with products stored for all parts of storage and delivery system, and avoiding reuse of tanks for different products without checking material compatibility; and
- The public will be protected from major hazards associated with hazardous materials incidents or process failure, as well as nuisance issues related to noise, odours, or other emissions.

For further information, refer to the ''Hazard and Risk Management Procedure'.

7.17 Spill Response

Spill response planning and preparation will be as follows:

- A spillage risk assessment will be undertaken as part of the development of the EPRP, to determine the optimal location and type of emergency response equipment and the required capacities for handling liquid spills;
- ERT will be trained about roles and responsibilities and regular drills will be conducted;
- Spill response kits will be available, including absorbent materials suitable for the materials to be handled onsite, will be held at secure, clearly signposted locations, instructions will be provided with the kits and personnel will be trained in their use; and
- All staff and subcontractors will be required to report any incidents, and these will be subject to investigation and remedial and preventive actions will be taken.

In case of any accidental spill occurring, the relevant person responsible will notify the incident to management. The operative procedure to be followed in case of spill and release of chemicals, in accordance with the EPRP, is indicated in the flow chart in Figure 7-4.

In case a contamination event occurred due to an accidental spill, sampling of the soil and subsoil must be conducted to check compliance with threshold reference limits. The detailed actions to be conducted are documented in the EPRP.

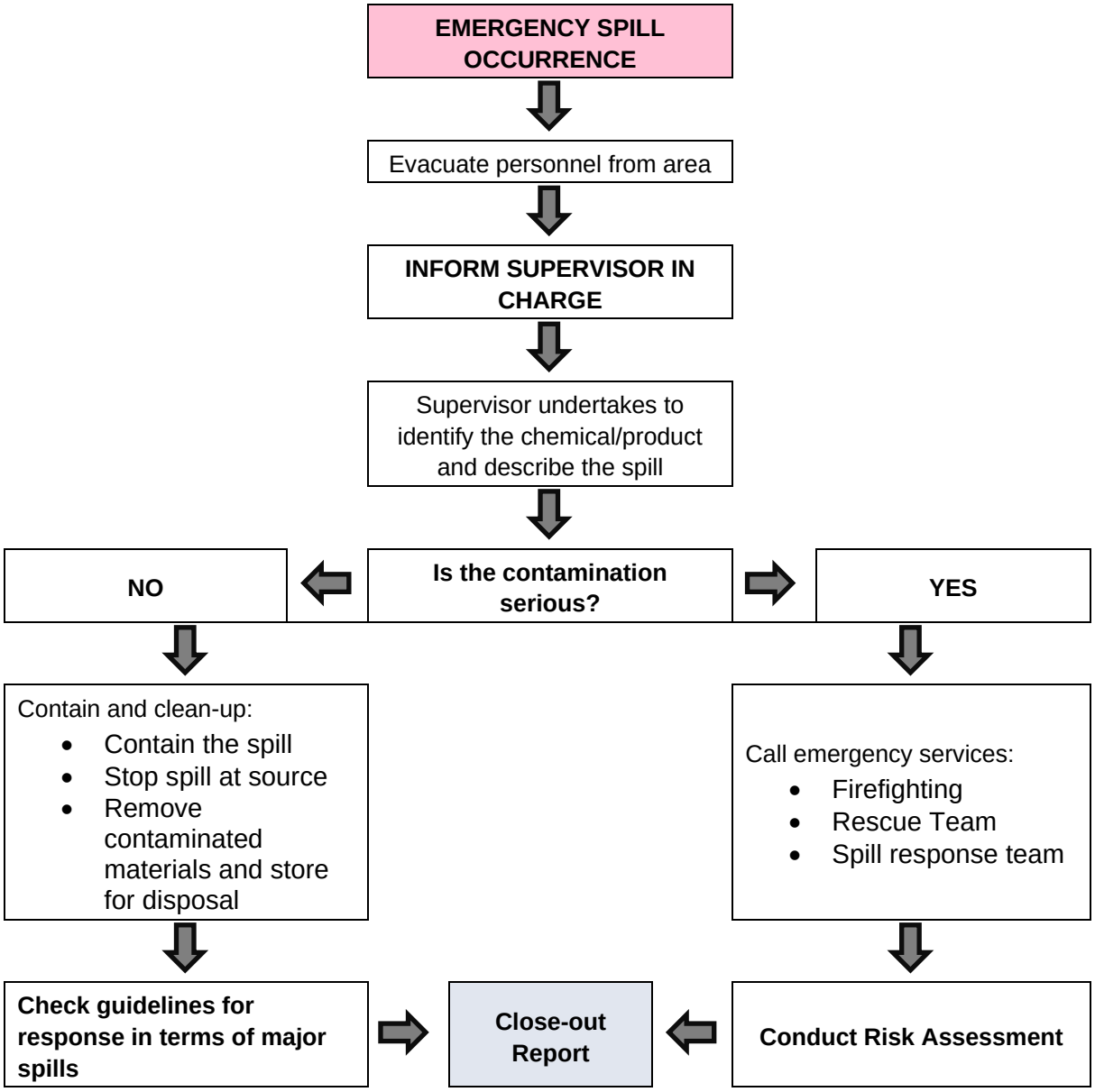

Figure 7-4 Emergency Spill Response Flow Chart

7.18 Waste Management

7.18.1 Sources and types of waste

The nature of the construction, operational and decommissioning activities of the Project will involve the generation of hazardous and non-hazardous waste streams, including municipal/general waste. Hazardous wastes that may be produced as a result include engine, hydraulic and transmission oils along with oil filters and absorbent materials.

Table 7-3 provides a summary of the sources of waste that are expected to be generated by the Project during construction.

Table 7-3 Waste Types and Sources

Waste Category	Type	Description
Non-Hazardous: Solid Waste	Glass	Bottles, jars, etc.
	Metal cans and tins	Drink and food cans
	Metal drums (cleaned)	Uncontaminated drums.
	Ferrous material	Scrap metal: steel, gratings, sheet steel, beams, wire, etc.
	Non-ferrous material	Aluminium, copper piping, etc.
	Paper/cardboard	Packaging, printer paper, old newspapers, magazines, etc.
	Plastic bottles	Drink bottles, cosmetic bottles, etc.
	Plastic packaging	Plastics, styrofoam, etc.
	Domestic waste	Mixed waste (organic food waste and inorganic)
	Textiles	Unwanted and uncontaminated clothes.
	Wood from packaging	Pallets, crates, beams, general packaging, etc.
	Concrete	N/A
	Clinical	Medicines.
Hazardous: Solid Waste	Containers	Container contaminated by original content (e.g. lube oil, hydraulic fluid, paints, solvents, etc.
	Oily rags	Textile materials such as clothes or rags used to clean excess oils.
	Used spill kits and contaminated soils	Absorbents, filter materials (including oil filters not otherwise specified), wiping clothes, protective clothing contaminated by dangerous substances and soil from remediation activities
	Clinical	Offensive waste (e.g., outer wound / surgical dressing, pads, swab), sharp needles, drugs, containers used to dispose urine, bodily secretion, etc.
	Batteries and E-waste	N/A
	Fluorescent tubes / bulbs	N/A
Hazardous: Liquid Waste	Spent / excess lube oil	N/A
	Spent /excess hydraulic fluid	N/A
	Spent / excess solvents	Halogenated/non-halogenated.
	Tanks / trap sludge and washings contaminated with hazardous	From diesel tanks, etc.
	Acids / alkalis solutions	From cleaning/maintenance.
	Paints	Waste paint and varnish pots containing organic solvents or other dangerous substances.
	Pesticides and herbicides	Used to control pests and weeds at campsites.
	Discarded chemicals	Discarded organic/ inorganic chemicals consisting of or containing dangerous substances.
	Wastewater	Wastewater from construction camps and construction operations (e.g., dust suppression activities, spraying concrete, adding water to backfill material, vehicle wash water contaminated with oil/grease/fuel, equipment cleaning and site clean-up).

7.18.2 Waste management approach

A waste management hierarchy will be implemented as presented in Figure 7-5. Its primary purpose is to minimize adverse environmental effects from waste and increase and optimize resource use efficiency in waste management as follows:

- Waste shall be prevented or reduced at source as far as possible;
- Plan and implement the segregation of liquid effluents principally along industrial, utility, sanitary, and storm water categories, in order to limit the volume of water requiring specialized treatment;
- Where waste cannot be prevented, waste should be reused or refurbished as far as possible;
- waste material should be then recycled or reprocessed into a form that allows them to be reclaimed as secondary raw materials;
- Where useful secondary materials cannot be reclaimed, the energy content of waste should be recovered and used as a substitute for non-renewable sources;
- Only if waste cannot be prevented, reclaimed or recovered, should it be taken offsite for responsible treatment and/or disposal in accordance with national legislative requirements by a reputable service provider (e.g. via incineration, appropriate treatment or disposal to a landfill facility); and
- The Project will only utilize fully licensed transport and waste disposal/treatment firms (due diligence will be undertaken to understand if the sites are materially compliant with Project requirements[4]).

[4] The treatment capacity of non-hazardous and hazardous waste management facilities has developed over the years in Turkey to treat the waste generation across the country. There is adequate capacity in the treatment facilities to treat the waste generated in the construction and operation phase of the Project. The licensed waste management facilities in İstanbul province have been reviewed from the MoEUCC website. A large number of licensed waste management facilities are available in İstanbul (625 facilities based on data obtained from MoEUCC website: https://eizin.cevre.gov.tr/Rapor/BelgeArama.aspx). There are numerous licensed waste management facilities in Başakşehir and Arnavutköy districts (167 in number) where the main Project route will be located. The waste facilities to be used during construction will be selected by the EPC contractor. Wastes during the construction and operation of the Project will be managed at the appropriate facility not only according to their class and type but also according to the status (validity) of the facility permit.

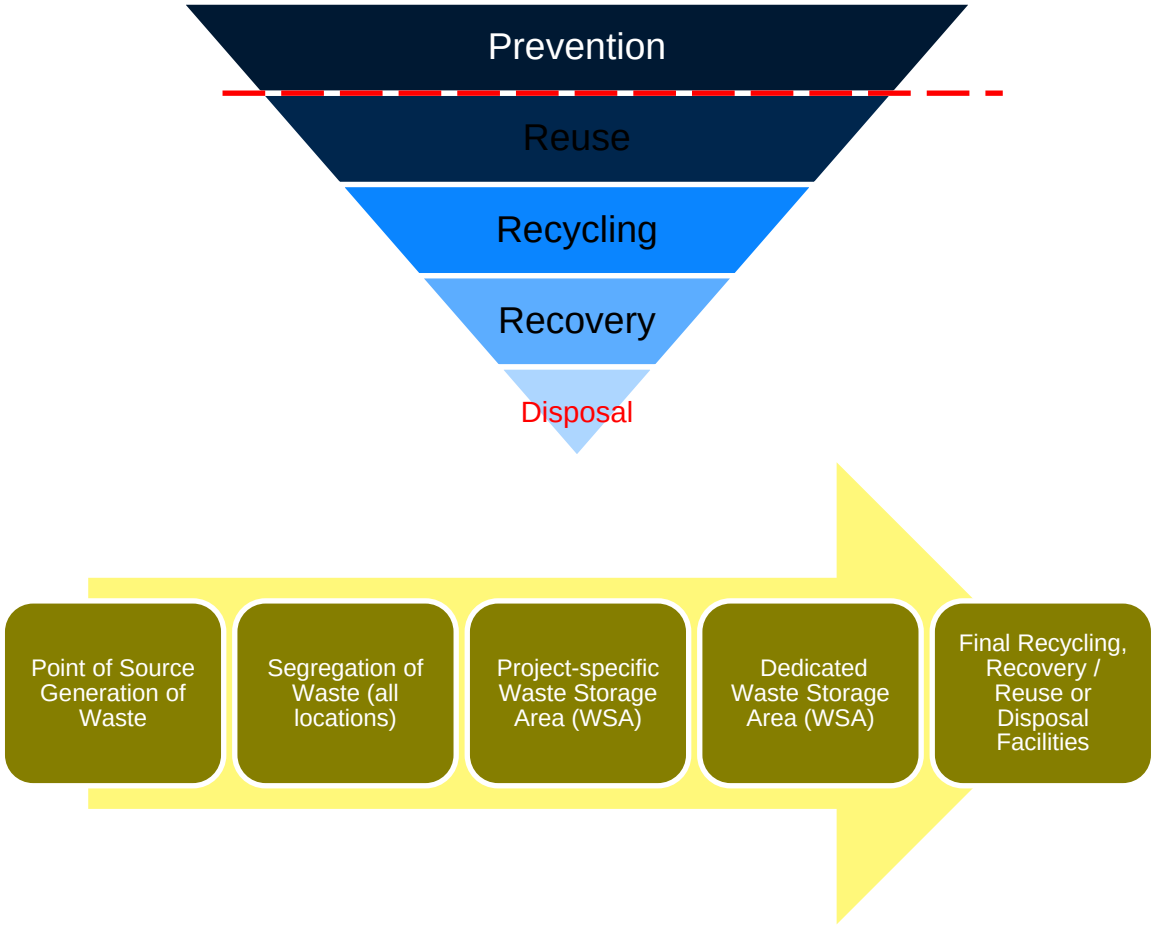

Figure 7-5 Waste Management Hierarchy and Approach

7.18.3 General waste

- Where possible, materials that would otherwise be waste will be reused or recycled as follows and in terms of Communiqué on Recycling of Certain Non-hazardous Wastes (OG Date/Number: 17.06.2011/27967):
  - recycling or reuse of rock / aggregate excavated from quarries/borrow areas during construction will be carried out to provide fill for road embankments and to produce road base aggregate where permissible;
  - packaging material may be returned to the supplier if this service is offered;
  - waste separation and separate storage of materials for disposal and those which can be reused onsite or collected and recycled at an offsite facility;
  - separate segregation bins shall be used for smaller items of plastic waste;
  - empty plastic drink bottles shall be placed into the appropriate bins and collected regularly for recycling purposes by the site personnel;
  - plastic, paper and cardboard packaging and wrapping of materials such as pallets of blocks or precast units will be collected, stored and recycled; and
  - glass, tins and scrap metal will also be recycled as far as possible;
- A waste inventory is to be maintained and regularly updated, recording waste type (EU Waste Code) and quantities of waste at all points of generation;

- Domestic solid wase will be managed in terms of Waste Management Regulation (OG Date/Number: 02.04.2015/29314) and Packaging Waste Control Regulation (OG Date/Number: 24.08.2011/28035);
- Waste streams will be segregated into the bins and the Project-specific waste storage area based on their classification in the waste inventory;
- If a waste item is not included in the inventory or if it is unrecognizable, samples will be taken and analysed to allow classification, however, if sampling is not appropriate or practical, the waste will be deemed to be 'hazardous waste';
- All waste streams from the Project-specific waste storage area will be transported to the dedicated Waste Storage Area (WSA) and the EPC Contractor will arrange to transport the waste from the Project-specific waste storage area for disposal;
- Waste storage at the WSA will be according to international practice (IFC EHS General Guidelines);
- Solid waste collection frequency is anticipated on a daily basis while hazardous waste collection will be determined on a case-by-case basis;
- The EPC Contractor will provide sufficient notification beforehand when transportation of waste is required from the site to the WSA and when containers are at approximately 80% capacity;
- Collection of waste from the WSA to its final location offset for treatment, recycling/recovery or disposal will be via several possible service providers subcontracted by the EPC Contractor as required (the EPC Contractor will ultimately be responsible for Project waste management and organise for collection and transportation of waste to authorized recycling/recovery and /or disposal facilities according to national regulations);
- The WSA will allow for the storage of all waste produced during construction activities and will be operated and managed by the EPC Contractor;
- The bins areas as well as the Project-specific waste storage area shall at all times be kept tidy, free of vermin, and continuously fumigated and sanitized with appropriate disinfectants;
- Appropriate signage will be posted within the bins areas and the waste storage area (i.e. Non-Hazardous/Recycling Waste Area or Reclamation Waste Area or Hazardous Waste Area) with a brief description of the types of materials that can be disposed through a sign, poster or similar;
- All waste bins and waste containers will be colour coded as discussed above and summarized below and will also be clearly labelled and numbered;
- All waste bins and waste containers will be completely contained to prevent loss or leakage and covered at all times to prevent waste from blowing away;
- If rain could cause contaminated run-off or prevent the waste from being reused it should be covered with a waterproof cover;
- Open burning or burial of waste is strictly prohibited at all times, as well as the general indiscriminate dumping of any waste;
- Waste shall be handled, transferred and dealt with by trained employees from the EPC Contractor with proper PPE as indicated within the Health and Safety Plan;
- A waste manifest will be used which details the type/ amount of waste that is generated by the EPC Contractor, transferred by the EPC Contractor from the site and disposed at final location, the waste manifest will be signed by the EPC Contractor;
- All waste transfer notes and hazardous waste consignment notes where the waste is being taken will be recorded; and
- As required by the Waste Management Plan, in any case of misconduct or unappropriated classification of the waste, the EPC Contractor will remain the producer of the waste and EPC

Contractor will be responsible to correctly classifying the waste stream whether onsite or at the dedicated WSA.

- Hazardous waste
- Hazardous waste will be separated from other types of waste generated on site and managed in terms of Waste Management Regulation (OG Date/Number: 02.04.2015/29314);
- Waste will be temporarily stored for a maximum of 6 months on site prior to appropriate disposal off-site;
- Mixing of hazardous and non-hazardous waste is prohibited;
- Liquid hazardous waste, which cannot be reused, shall be sealed in drums;
- Waste oils will be segregated and managed in terms of Waste Oil Management Regulation (OG Date/Number: 21.12.2019/30985) and Regulation on the Control of Waste Vegetable Oils (OG Date/Number: 06.06.2015/29378;
- In addition, other special and solid hazardous waste such as batteries that require special disposal shall be stored in sealed bins/containers in line with Regulation on Control of Waste Batteries and Accumulators (OG Date/Number: 31.08.2004/25569) and delivered to TAP (authorized waste battery collector) and waste accumulators to dealers;
- All liquid bins and containers will be leak-proof and sealed and in addition, secondary containment will be implemented to prevent any hazardous liquid escaping – e.g., to soil/ground. Secondary containment must be provided with a capacity of 110% of the largest storage bin/container or 25% of the total storage capacity;
- Hazardous waste containers will be colour coded in red and a label will be added with the type of hazardous waste (e.g., general, electrical, clinical, liquids, etc.);
- Waste shall be handled, transferred, and dealt with by trained employees from the EPC Contractor with proper PPE as indicated within the EPC Contractor Health and Safety Plan, which will include but not be limited to hard hat, safety glasses/goggles, face masks, gloves and safety boots, and respiratory protection (where applicable);
- The public will be protected from major hazards associated with hazardous waste, as well as nuisance issues related to noise, odours, or other emissions;
- At least one spill kit will be provided at the primary WSA; and
- In case of accidental spillage of hazardous material, procedures identified within the EPC Contractor EPRP must be implemented.

7.18.4 Medical waste

- Medical waste will be stored in special containers and areas in line with the Medical Waste Control Regulation (OG Date/Number: 25.01.2017/29959).

7.18.5 Wastewater management

During the construction phase of the Project, the following types of wastewaters are expected to be generated:

- Black water (sewage) from flushable toilets and portable/chemical toilets;
- Grey water from sinks, showers, canteens, and laundry facilities (at the worker camp);
- Another wastewater from equipment/vehicle washing, concrete washout, etc.; and
- ‘Dirty’ run-off water from impermeable surfaces (e.g., concrete paved areas).

The EPC Contractor will be responsible for the management, collection and treatment/disposal of wastewater produced in the Project site as follows:

- No direct discharge of wastewater or water containing waste to the environment is permitted;
- Wastewater from all construction compounds and the associated building will be either discharged into the local/municipal sewage network or treated before discharge to the suitable receiving environment or collected on site and transported by tanker for disposal at the local sewage treatment works;
- All wastewater discharges must comply with relevant Turkish legal requirements (Water Pollution Control Regulation 2004, No. 25687) and Project Standards before disposal, and relevant permits shall be in place;
- The EPC Contractor will provide a management service for the collection and transportation of wastewater generated to treatment/disposal facility;
- All wastewater produced during the construction activities will be temporarily stored on site and periodically collected by licensed companies appointed by the EPC Contractor and trucked to appropriate and licensed wastewater treatment/disposal facility authorized according to national regulations;
- Drainage from excavations will be collected and settled to remove suspended materials before discharge by required permits and if physically possible, local perimeter drains will be constructed around working areas to collect potentially suspended run-off and direct it to a system of settlement basins before discharge by required permits;
- Sewage and grey water will be collected in appropriate holding or conservancy tanks located at toilets/shower facilities, before their transportation for treatment offsite;
- Portable chemical toilets will be provided during construction as necessary and will be maintained and serviced by an external contracted service provider on a regular basis;
- The EPC Contractor will be responsible for arranging a vehicle washing area which will be provided with a wastewater containment and collection system including a containment berm and a drainage system leading wastewater to a collection basin/tank and/or oil water separator;
- Any paved area for storage of hazardous substances and waste will be provided with runoff collection system and dedicated tank;
- The EPC Contractor will install suitable concrete or bitumen lined evaporation ponds to collect concrete washout resulting from any onsite mobile concrete batching plants/activities and these ponds will allow for water evaporation while remaining debris will be collected and recycled/disposed of;
- The EPC Contractor will appoint local authorized transport companies to collect and transport to offsite facility all sewage and grey water as well as any other wastewater under its responsibility;
- The offsite facility identified by the EPC Contractor is the [Insert name of the wastewater treatment facility];
- The EPC Contractor will have responsibility for the full chain and will retain original invoices for wastewater collection and disposal; and
- Regarding reuse of wastewater:
    - grey water is generally deemed not reusable if not treated due to its characteristics (e.g., presence of detergents, vegetal oils, etc.);
    - the EPC Contractor will investigate any opportunities for separation of grey water at the Construction Camp for its reuse (e.g., for toilet flushing/washing, soil wetting, etc.);

- rainwater harvesting/recovery off of rooftops for example, for domestic use (e.g., for toilet flushing/washing, soil wetting, etc.) is permitted; and
- any national discharge or effluent standards/limits for storm water / rainfall runoff release to watercourses will need to be complied with, as well as relevant GIIP (for example the World Health Organisation/WHO Water Quality Guidelines and Standards, 2001[5]).

For further information, refer to the 'Waste Management Plan'.

7.19 Batching Plant Management

The following measures has been compiled for concrete batching plant management:

- Cement, sand and aggregate delivered to the batching plant must be stored away from storm water drains and watercourses, within an enclosed area without exposure to the elements;
- Operations must be performed to prevent dust and aggregates from being blown, swept, hosed or washed away;
- Since concrete is highly alkaline and corrosive, spillages have the potential to adversely affect water quality in particular;
- Temporary bunds placed downslope of the batch plant are recommended to prevent the migration of any spillages;
- Concrete batching should not be performed on bare ground but on artificial surfaces;
- It is recommended that all surface water runoff from the batch plant be directed to surface drains and a lined settlement pond equipped with a mobile pump such that water can be reused as far as possible (aligned with the Water Management Procedure);
- No washing out of any plant used in concrete transport or concreting operations will be allowed onsite unless this wash-water is directed to a dirty water collection and treatment system or stored for approved reuse on site;
- Where concrete is delivered to the batch plant, only the chute needs be cleaned, using the smallest volume of water possible;
- No discharge of cement contaminated waters to the construction phase drainage system or directly to any natural watercourse will be allowed;
- Any water containing a cement-based product that cannot be reused or recycled on site must be collected within a suitable wastewater collection system and then transported by tanker offsite for treatment and disposal at a reputable and licensed facility;
- Use weather forecasting to plan dry days for pouring concrete;
- Ensure that pour sites are free of standing water and plastic covers will be ready in case of sudden rainfall event;
- Any proposed water abstractions for concrete batching activities must be pre-approved, licensed/permitted and detailed in the construction site/layout plan; and
- Following completion of the concrete works, water contained within the washout sump will need to be pumped to a tanker and removed from site to a licenced waste facility and the washout area will then be cleared and fully reinstated.

[5] World Health Organization (WHO), 2001. Water Quality. *Guidelines, Standards and Health: Assessment of risk and risk management for water-related infectious disease.* Available online at: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjU44O_y-b3AhXJif0HHVAlC3cQFnoECDEQAQ&url=https%3A%2F%2Fapps.who.int%2Firis%2Frest%2Fbitstreams%2F50320%2Fretrieve&usg=AOvVaw30VWewbdhu8p2PYtBgok_Fpdf

7.20 Topsoil Management

- The area of soil exposure and disturbance will be limited to the construction site as much as possible;
- Stripped topsoil will be stored and preserved to the maximum extent possible to be re-used during re-vegetation of excavated areas, cut and embankment areas;
- Topsoil and subsoil will not be mixed during the earthworks;
- Measures to prevent erosion from excavated areas and soil stockpiles will be implemented;
- Sediments will be prevented from flowing into surface waters and drainage channels by localized control measures (e.g., sediment fences, check dams, fabric barriers, sediment basins), contouring to optimize slope angle and steepness will be appropriated;
- Wind erosion of stockpiled soils will be prevented via fencing and/or covering;
- Measures will be implemented to divert external 'clean' runoff around the construction area to prevent mixing of 'clean' and 'dirty' runoff and reduce the size of the required sediment basins;
- Disturbed fertile topsoil will be covered and protected with vegetation, mulch, or erosion-resistant material.

For further information, refer to the 'Soil Management Plan'.

7.21 Erosion and Sediment Control

The following measures will reduce erosion and sediment risks during construction:

- Implement the erosion and sediment controls before starting with vegetation stripping and site clearance works that could leave soils bare and exposed to the elements;
- Undertaking vegetation/soil stripping works during the dry season (where applicable) will result in significantly less erosion and siltation risk;
- The early establishment of temporary drainage facilities is recommended;
- Implement relevant construction standards (e.g. SEPA, 2009: Engineering in the Water Environment: Good Practice Guide: Temporary Construction Methods, DEFRA, 2009: Construction Code of Practice for the Sustainable Use of Soils on Construction Sites);
- Identified existing drainage and irrigation channels will be protected using appropriate measures such as sediment barriers, grassed areas, swale drains, and buffer strips, for erosion and sediment control;
- Construction activities taking place in or near watercourses shall be avoided during or after prolonged rainfall or an intense rainfall event;
- Work will cease entirely near watercourses when it is evident that sediment pollution is occurring;
- All drainage waters will be dispersed as overland flows through dense vegetation preferably to act as a filter for sediment;
- Concentration of flows is to be avoided as this will likely induce soil erosion;
- If it is expected that artificial drains will receive drainage water from works areas, check dams will be added to control flows and sediment loads;
- Large excavations, large movements of overburden or large-scale overburden or soil stripping will be suspended or scaled back if heavy rain is forecast, with the extent to which works will be scaled back or suspended relating directly to the amount of rainfall forecast;
- In the event that works are giving rise to siltation of watercourses, the Biodiversity Expert will instruct to stop all works in the immediate area around where the siltation is evident;
- The source of appreciable siltation of watercourses will be identified and additional drainage measures installed as deemed necessary in advance of works recommencing;
- Implement erosion control to prevent runoff flowing across exposed/bare ground;
- Intercept and divert clean water runoff away from construction site runoff to avoid cross contamination of clean water with soiled water;
- Implement sediment controls to slow down runoff allowing suspended sediments to settle in situ, particularly on roads and hardstanding areas;
- Minimise area of exposed ground by maintaining existing vegetation that would otherwise be subject to erosion in the vicinity of site infrastructure and keeping open/excavated areas to a minimum;
- Delay clearing before construction begins rather than stripping the entire site months in advance particularly during road construction;
- Install a series of silt fences or other appropriate silt retention measure where there is a risk of erosion runoff to watercourses from construction related activity particularly if working during prolonged wet weather period or during intense rainfall events;
- Implement sediment control measures that includes for the prevention of runoff from adjacent intact ground that is for the separation of ‘clean’ and ‘dirty’ water;

- Install appropriate silt control measures such as silt-traps, check dams and settlement ponds;
- Provide recommendations for road cleaning where needed particularly in the vicinity watercourses;
- Controls need to be regularly inspected and maintained otherwise a failure may result, such as a build-up of silt or tear in a fence, which could lead to water pollution;
- Controls must work effectively until the vegetation has re-established; inspection and maintenance is critical after prolonged or intense rainfall;
- Dewatering silt bags made of a high-quality geotextile fabric can be used for any dewatering activities, which allows the flow of water through them while trapping any silt or sediment suspended in the water.

7.22 Quarry Management

- Preference will be given to using existing (fully licensed) quarries over opening new quarries;
- Quarries providing stone/rock aggregate operated by third parties will need to be identified and contracts in place prior to construction commencing;
- Implement the SCMP to cover aspects such as compliance, monitoring of the workforce and mitigation of supply chain risks;
- The EHS considerations that will need to be taken into account in the selection of appropriate quarry sites and access routes will be based on IFC General EHS Guidelines (IFC, 2007) as well as guidelines for IFC EHS Guidelines for Construction Materials Extraction (IFC, 2007). These mitigation measures together with the existing permitting framework in Turkey will be used to minimize the worst-case scenario impacts and allow for residual impact assessment. Gaps identified based on E&S site selection will be requested to be mitigated by third party quarry operators. The use of the third-party quarries will be based on their suitability to be in line EBRD and IFC guidelines;
- Appropriate due diligence will be conducted for existing quarries to ensure permits are valid and operations are in compliance with national regulations and international guidelines. Relevant suggestions will be made to improve the current standards of the quarry;
- Materials need to be transported from the quarry to the construction site in an appropriate manner;
- Records of the volume of aggregate purchased, transported, and delivered to the construction site are to be maintained;
- When designing the quarry transport routes, the EPC Contractor will consider social issues to minimize the impacts from passing through populated areas.

For further information, refer to the 'Quarry Management Plan'.

7.23 Water Conservation and Management

7.23.1 Limiting water use

- Water abstraction from surface water resources such as rivers/streams/dams or groundwater from boreholes can only be carried out after receiving permits from the relevant authority;
- Install water saving fittings (taps, showerheads, urinals, low-flow toilets, etc.) at ablution facilities, kitchen areas, offices, and accommodation facilities;
- Ensure that construction activities are carried out in a manner so as to minimize water consumption as far as practically feasible;
- Use of potable water for construction purposes shall be avoided at all costs, unless due to technical and economic constraints which will require pre-approval;

- Use only non-potable water for dust suppression/any irrigation of road and construction surfaces;
- Ensure that washing/cleaning activities (e.g., vehicle and equipment washing, toilets flushing/cleaning, etc.) are carried out using appropriate methods requiring low water consumption or dry (water-less) cleaning techniques where possible;
- Shut off water to unused areas;
- Monitor and record supplied water and water consumption rates on a regular basis;
- Water to be used for bathing purposes shall be of potable quality; and
- Awareness about resource efficiency, in particular concerning water use, shall be provided to all workers (through signage, posters, trainings, etc.).

7.23.2 Minimizing water losses

- Implement measures to prevent evaporative water losses, including sealing of water supply tanks and undertaking dust suppression outside of the hottest time of day;
- Store supplied water in adequately sealed containers/tanks preventing any external contamination;
- Water containers/tanks and hoses/connections shall be regularly inspected to ensure they are waterproof and to promptly detect any water leakage;
- Personnel must report to the HSE Manager any leaks noted within potable and non-potable water storage tanks and water supply connections'; and
- In case a water leakage is detected, immediate reporting and repair action shall be undertaken to minimize water loss, including cutting off main water supply until the leak is repaired.

7.23.3 Water reuse/recycling

- Possible recycling and/or reuse of grey water, previous separate collection and any treatment shall be considered for dust suppression or any irrigation;
- When water quality criteria allow, manage storm water runoff as a resource, either for groundwater recharge or for meeting water needs at the construction site;
- Implement suitable rainwater harvesting measures as far as possible (for example using above ground storage tanks to collect and store runoff from roofs and hard surfaces, which can then be used for non-potable purposes); and
- Wastewater (e.g., contaminated storm water runoff, runoff from washing activities containing fuels/oils/chemicals, sewer water) shall not be recycled or reused on site but must be disposed of appropriately offsite.

For further information, refer to the 'Water Management Procedure''.

7.24 Invasive Alien Species management

- Invasive Alien Species (IAS) will be managed to prevent the introduction or spread of any invasive and/or alien plants within the footprint of the works and any adjacent disturbance or areas where IAS may have spread due to construction activities;
- An IAS survey will be carried out by a suitably experienced and qualified botanist or ecologist appointed following completion of construction activities to identify particularly problematic invasive and alien plant species and areas where these have colonised natural habitats as a result of any disturbance created through construction activities, and who will advise on final control measures and actions;

- The following steps are to be followed in general:
  - Step 1: Identify IAS and locations, size classes, densities and control/eradication requirements
  - Step 2: Decide on applicable method of removal/control with rationale provided
  - Step 3: Finalise and demarcate IAS control areas and agree on clearing/control plan
  - Step 4: Ensure relevant equipment and PPE is provided
  - Step 5: Selected applicable herbicide(s) where relevant
  - Step 6: Training of staff if required
  - Step 7: Implement IAS control with adequate supervision
  - Step 9: Monitor to inform follow-up control requirements
- The following PPE is recommended for IAS control teams:
  - Long overalls
  - Eye protection (safety googles/glasses)
  - Protective gloves
  - Safety boots
  - Sun protection hats/caps
  - Bush knives, machetes, saws, axes, chainsaws, etc.
  - Registered herbicides and diesel carrier
  - Paintbrushes, spray jets to apply herbicide
  - Drinking water
- There are various means of controlling IAS and generally an integrated control is recommended for implementation (manual and chemical control);

- The suitability of control methods[6] will need to be evaluated as this depends on a number of factors, including practical constraints, economic constraints and applicability of methods for particular species of IAS;
- Note that most methods of control (including herbicide use) are best applied in the growing season;
- Care must be taken with regards to the choice of herbicide to ensure that no additional impact and loss of indigenous plant or animal species occurs due to the herbicide used;
- Either water or diesel can be used as a "carrier" for certain herbicides, however, water is the generally preferred carrier, because diesel is expensive and can have very negative impacts on the natural environment (diesel should never be used for foliar applications due to its very negative impact on the environment);
- Mixing ratios for herbicide quoted by the manufacturer are tested for optimum results and it is important that these ratios be adhered to;
- Herbicide should always be applied immediately after the selected mechanical control method (e.g. after frilling, ring-barking, cut stumping or strip-barking);
- Always store herbicides in the original container together with the relevant MSDS and in secure storage areas out of reach of children and animals (*see also Section 7.24 'Hazardous Materials Management*);
- Footprint areas within natural habitat must be kept as small as possible when removing invasive/alien plant species;
- IAS removal must be undertaken in a stepwise manner according to the following general protocol:
  - Mark out what needs to be cleared in a day for the number of people in the team, depending on the density and method;
  - Ensure that all individuals of an IAS are removed at the same time to reduce re-infestation potential;
  - The dominant alien invasive species should be tackled first;

[6] The suitability of control methods depends on a number of factors, including practical constraints, economic constraints and applicability of methods for particular species of IAS. Selection of the appropriate methods of control should be based on the following criteria:

- **Species to be controlled**: herbicides are registered for specific species
- **Size/age of target plants**:
  - **For seedlings**: hand-pulling or hoeing and foliar applications of herbicides for dense stands
  - **For saplings**: hand-pulling or hoeing, foliar applications of herbicides for dense stands, basal stem treatments and cut stump treatments recommended.
  - **For mature trees**: ring barking, frilling, basal stem treatments and cut stump treatments recommended.
- **Density of stands:** Overall applications of herbicide can be made to dense stands of seedlings or saplings. Where dense stands of large trees are present, treatment of standing trees may be appropriate to obviate the problem of disposing felled trees.
- **Accessibility of terrain**: In inaccessible areas, methods that rely on the minimum amount of transportation of equipment and chemical should be given preference
- **Environmental considerations**: Riparian/wetland areas require a careful approach to treatment/control. Only herbicides approved for use in wetland/riparian areas are to be considered. Washing of equipment or disposal of any chemical substances is prohibited in or near areas where there is a potential risk of contamination of wetlands/riparian areas.
- **Disposal of dead vegetation**: Where possible, utilizable wood should be removed after tree felling. This is also the case for trees that could cause the blockage of water courses. Brushwood should be spread rather than stacked to limit soil damage in instances where burning is planned.
- **Cost of application**: the cost application and re-treatment should be taken into consideration when selecting methods/herbicides, etc.

- Attempt to tackle one vegetation structural type at a time in a systematic manner (e.g. start with open grassland areas and then move into shrubland);
- Start removing the target IAS in the least affected areas and work towards the heavier plant infestations that need to be targeted;
- Areas requiring follow-up treatment will take precedence over areas which still require initial clearing;
- Send slashers through the area first and remove all the small, thin plants by hand where necessary;
- Keep the team working in a line with the daily tasks pegged out;
- Cut target plants as low to ground as possible and apply herbicide to all cut surfaces and exposed roots;
- A dye must be applied to all cut stumps after herbicide application in order to mark which stumps have been treated and which have not;
- For dense alien plant infestations, exposed areas may need to be re-seeded with an indigenous grass mix to stabilise the soil and to assist in reducing alien regrowth;
- The cut brush material should be stacked in an open area away from dry vegetation (stacks will either be burnt, shredded and / or mulched onsite);

- Adequate follow-up control is usually required to target seedlings, root suckers and coppice growth, particularly for dense infestations of alien plants characterized by rapid growth/reproduction and follow-up work will need to be undertaken on a 3-to-6-month basis, depending on the rate of re-growth assessed through monitoring;
- It is critically important that regular monitoring of clearing operations and alien plant levels post-control be undertaken as this will inform further efforts required to control the spread and densities of alien plants on the property, as well as informing whether current methods of control require review and which areas need to be prioritised for alien control going forward:
  - A record of progress is to be maintained, including simple records of daily operations (e.g. site number, date cleared, status of site – initial, follow-up, amount of herbicide used, etc.);
  - Georeferenced digital photographs to be taken before and after work is undertaken and maintained in a central database
  - A visual survey is to be taken annually to document progress and inform changes required to the approach to clearing and to identify which areas still require further work (an assessor with knowledge of alien vegetation will need to visually assess the situation in the field).
- Based on the findings of the botanical/flora specialist assessments covering all seasons (February, May and September 2021) which informed the ESIA and a review of the '*Global Register of Introduced and Invasive Species* – Turkey (ISSG, 2019[7]), the IAS listed in Table 7-4 have been identified for the Project study area. *It will be useful for a local botanist to review the list of IAS and ascertain which species may have become naturalised in Turkey/Istanbul and to confirm control requirements as per available National legislation regarding IAS.*

[7] Invasive Species Specialist Group (ISSG), 2019. *Global Register of Introduced and Invasive Species – Turkey.* 24 December 2019. Available online at: https://www.gbif.org/dataset/acaa145f-7944-4bc8-a4cc-4e3410c41e99/project

- *Spartium junceum*[8] is also widely considered to have invasive tendencies and should be controlled where necessary based on the following protocol (adapted from CABI, 2022):
  - Where it can be identified that disturbance from construction has created conditions for S. junceum to dominate and displace other native species, control should be administered on a case-by-case basis under the supervision of an ecologist/botanist to ensure that the correct plants and areas are managed;
  - Small areas of S. junceum can be controlled by removing entire plants and all seedlings by hand;
  - For larger stands, a weed wrench or manual saw can be effective, however care must be taken to extract the entire root or else stump sprouting will occur;
  - Plants must be removed before they flower wherever possible to limit seed production;
  - Soil disturbance will need to be limited as far as possible during control activities, as this can stimulate the seedbank;
  - Herbicides such as triclopyr, picloram, 2,4-Dichlorophenoxyacetic acid and glyphosate have been recommended for the control of S. junceum;
  - Follow up treatments are required to control late germination and prevent regrowth;
- For further support on identifying and classifying IAS, refer to the '*Global Register of Introduced and Invasive Species* – Turkey' (ISSG, 2019).

[8] *Spartium junceum* (Spanish Broom) is a fast-growing shrub, widely introduced as an ornamental and also for erosion control. It has escaped from cultivation and become an aggressive invader in many tropical, subtropical and temperate regions of the world. *S. junceum* is a prolific seed producer, with abundant and persistent seed banks, high rates of germination and seedling establishment. It also has adaptations to grow in a wide range of habitats and soil types with tolerance to severe drought conditions. Seed germination is triggered by soil disturbance and fire. Once established, *S. junceum* typically forms dense, monospecific thickets that are impenetrable and unpalatable to most wildlife. These dense thickets outcompete and displace native species and increase fuel load for fires. The species is also nitrogen-fixing and capable of altering soil fertility, nutrient cycling and successional patterns. [Source of information: CABI (2022), *Spartium junceum.* In: Invasive Species Compendium, Available online at: https://www.cabi.org/isc/datasheet/51145#tosummaryOfInvasiveness]

Table 7-4 List of IAS (plants) for the Project and recommendations

IAS Botanical Name / Common Name / Turkish Name	Description	Associated Habitat(s) in the Project Area	Observed Abundance	Control Recommendations	Useful References
Agrostemma githago **/ *C*orn Cockle / -**	An erect, branched, silky stemmed annual herb, common to disturbed placed such as roadsides, agricultural fields and waste places.	■ Intensive Unmixed Crops	Rare	Manual removal by hand pulling or mowing	https://www.nrcs.usda.gov/wps/cmis_proxy/https/ecm.nrcs.usda.gov%3A443/fncmis/resources/WEBP/ContentStream/idd_F0C6556A-0000-C656-AA82-39513ADFBAEA/0/ILGM-SPECIES-NI_CornCockle.pdf
Ailanthus altissima / Tree-of-heaven / Kokar ağaç	A fast-growing deciduous tree native to China, common to disturbed places such as roadsides, urban waste sites, riparian areas, grassland, woodland and landscaped sites.	■ Low and Medium Altitude Hay Meadows ■ Mediterranean Riparian Woodland ■ Highly Artificial Coniferous Plantations	Rare	Hand pull seedling, cut stump and basal bark large trees, target the roots with systemic herbicides (e.g. Triclopyr) applied in mid- to late summer	https://wric.ucdavis.edu/information/natural%20areas/wr_A/Ailanthus.pdf
Aster subulatus / Wild aster / -	Erect, many branched, almost hairless, spindly, dark green, summer growing annual or biennial herb Native to the America's, occurring in a wide range of habitats and soil types but with a preference for damp/poorly drained sites.	■ Low and Medium Altitude Hay Meadows	Rare	Manual removal (completely remove plant) or foliar spray with a systemic herbicide	https://weeds.brisbane.qld.gov.au/weeds/wild-aster
Hedera helix / English Ivy / Duvar sarmaşığı	Fast-growing perennial evergreen vines that climb over vegetation and structures, native to Europe, occurring in riparian corridors, moist woodlands, forest margins and disturbed places.	■ Highly Artificial Coniferous Plantations	Moderate	If the root cannot be located and removed by hand, strip the bark and notch the exposed section of the vine. Paint on an undiluted herbicide, such as glyphosate.	https://wric.ucdavis.edu/information/natural%20areas/wr_H/Hedera_canariensis-helix-hibernica.pdf

IAS Botanical Name / Common Name / Turkish Name	Description	Associated Habitat(s) in the Project Area	Observed Abundance	Control Recommendations	Useful References
Pinus pinaster / Maritime Pine / Sahil çamı	A highly invasive, fast-growing large tree, with some controversy over its native origins, has become invasive in areas where it has been used extensively for forestry, and shows a high degree of genetic variation over its native range.	■ Mediterranean Riparian Woodland	Moderate	Cutting and burning provide effective control, and ringbarking or pulling can be effective depending on tree size	https://www.cabi.org/isc/datasheet/41688
Pteridium aquilinum / Bracken Fern / Eğrelti	A cosmopolitan weed (fern) that readily spreads into pasture and marginal areas and is favored by fire and soil acidity, reduces land productivity and adversely affects biodiversity.	■ Black Sea Garrigue ■ *Spartium junceum* Fields	Moderate	Difficult to control particularly because of its ability to sprout from an extensive network of underground rhizomes and has large reserves of carbohydrate. Control by herbicide is generally difficult. Some success attained through mechanical control, cutting the plants once or twice a year over several years. Timing of the cuts is very important, for example the optimal time is in the autumn, before the plant has transferred its nutrient reserves from the above-ground parts back down to the rhizomes for the dormant winter period.	https://www.cabi.org/isc/datasheet/45596

7.25 Habitat Reinstatement

7.25.1 Rehabilitation at temporary work areas

General principles for reinstatement of habitats affected by construction activities and where temporary works are removed from the site after construction has been completed are as follows:

- A phased development and restoration approach will be considered such that as each activity is completed in one section, areas shall be reinstated;
- Maintain the original soil layering and do not mix topsoil and subsoil layers;
- Reinstate soils in the reverse order (subsoil, then topsoil);
- Soil erosion features will be stabilised via backfilling as appropriate;
- Protect the reinstated bare soil surface with a physical barrier, such as a thin layer of mulch or geotextile/erosion control matting;
- Avoid compaction of soils, for example though excessive vehicle tracking, and rip soils where compacted to allow for vegetation growth;
- Identify indigenous species for planting and suitable sources for seed and plants as appropriate;
- Identify commercial sources of seed / plants from local nurseries for example;
- Encourage rapid re-vegetation through re-seeding using rapid growing, indigenous runner grasses (e.g. *Cynodon dactylon*); and
- Temporary fencing or other appropriate barriers to prevent entry to the area may be implemented in the short to medium term, to prevent grazing or allow vegetation re-growth in order to stabilise the soil surface.

7.25.2 Habitat restoration / recreation to compensate for the residual impact on biodiversity

Within the expropriation area, suitable natural habitat will also be restored and recreated to mitigate (compensate for) overall habitat loss and degradation associated with the Project and towards achieving 'no net loss' biodiversity objectives. In accordance with the application of the mitigation hierarchy, in order to obtain a non-residual impact (no net loss of biodiversity scenario), onsite restoration and/or recreation of at least a similar area of lost habitat supporting *Cirsium polycephalum* (i.e. Black Sea Garrigue, Maquis) is proposed - s*ee the Biodiversity Action Plan (BAP, ERM 2022) for further details.*

The following measures are to be implemented, with the detail will be documented within a separate and site specific 'Habitat Restoration and Recreation Plan' recommended for the Project:

- Visual plan/drawing to be developed showing areas that are to be restored / replanted;
- The identification of a service provider to support the Project team and the NGO with logistics in terms of the seed collection, transportation and propagation processes;
- Fill embankments and the road corridor/reserve[9] including the services area will be reinstated to a form of indigenous grassland and/or mixed low shrubland (resembling Garrigue / Maquis) type habitat rather than monotypic grass or conifers;

[9] Within the expropriation corridor, and not subject to direct intervention of the project, there are 89.72 ha of the modified habitat intense unmixed crops, that once expropriated could be used to reintroduce the affected natural habitats that support the critical habitat trigger species, *Cirsium polycephalum*. In addition, once the construction has finished, there will be a surface of 156.31 ha formed by newly created embankments, that could be used to host the required offset site. The combination of both areas guarantees the sufficient surface to address the identified requirements within the boundaries of the project, constituting in this way, a restoration to ensure no net loss.

- This will require reinstatement of topsoil and subsoil retained during the construction RoW stripping and clearing phase;
- Protection against erosion to be implemented, particularly for steeper embankments;
- These areas will also be the receiving sites for rescued plants and seed used to propagate and replace threatened/endemic species (i.e. *Cirsium polycephalum*);
- These areas will also be permanently fenced, being part of the road corridor/reserve, and in this way the site will be conserved and unauthorized access by the public and grazing livestock avoided;
- The interventions will require continuous monitoring, evaluation and maintenance for the operational life of the Project.
- The areas under plantation forestry and/or crop cultivation adjacent to the Sazlidere Dam (west side) can also be used for habitat recreation and will enhance the improved management of water quality at the dam and to provide a fringing habitat suitable for key species.

Refer to the Biodiversity Action Plan (BAP, ERM 2022) for further details on habitat reinstatement and restoration / rehabilitation actions required post-construction.

8. MANAGING EXISTING CONSTRUCTION IMPACTS

Based on the site visit conducted by ERM in May 2022, evidence of clearing of the RoW (vegetation and soil stripping and stockpiling), construction of temporary sites, culvert installation at watercourse crossings and bridge pillar construction was observed. The RoW clearing and construction identified had been undertaken prior to finalisation of the ESIA and CESMP and therefore an assessment of the level of implementation of the relevant construction-phase mitigation measures was undertaken to advise on what further measures can still be implemented at these sites where construction activities have commenced. This is reflected in Table 8-1 below with the map in Figure 8-1..

Where still feasible, the mitigation measures that can still be implemented have been identified for the already cleared areas and construction footprint where works have taken place, in an attempt to reduce the risk of further environmental damage or disturbance where possible. This is reflected in Table 8-1 and includes the following:

- No further clearing or stripping to take place until authorized to do so;
- Stockpiled topsoil is to be conserved and managed as per the CESMP for later use in site rehabilitation;
- Seed collection for key endemic/rare/protected plants to take place within remaining areas that have not been stripped and in adjacent habitats, commencing in June 2022;
- Temporary erosion and sediment controls are to be installed downstream of culverts immediately, as per the CESMP requirements for sediment and erosion control;
- Completed culverts to be backfilled as per CESMP at the appropriate time; and
- Dust suppression is to resume for open areas where dust may be an issue.

Table 8-1 Mitigation for existing Construction

Mitigation Measures	Observations by ERM	Further Requirements
Vegetation stripping confined to the planned RoW	Clearing of the RoW and stripping of vegetation appeared to be confined to the construction footprint as per the road design and expropriation area designated in plans.	■ No further clearing or stripping to take place until authorized to do so.
Stockpiling of vegetation stripped	Vegetation stripped/cleared has not been stockpiled for use in revegetation.	■ Vegetation stockpiling not possible in areas cleared. ■ This is not considered to be practically implementable in any case.
Stockpiling of soils	Topsoil appeared to have been stockpiled upslope of the construction RoW and stripped areas and had revegetated and stabilised. Some soils had been placed at the downslope edge or toe of the cleared RoW to act as a sediment control berm.	■ Stockpiled topsoil to be used conserved for use in site rehabilitation later.
Seed collection for rare/endemic/protected plant species	No evidence of seed collection having taken place prior to clearing and stripping of vegetation.	■ Seed collection not possible in areas cleared. ■ Seed collection to take place within remaining area prior to clearing and in adjacent habitats, commencing in June 2022.

Mitigation Measures	Observations by ERM	Further Requirements
Culvert installation at watercourse crossings	Box culverts had been installed at watercourse crossings, with flows being unhindered. These appeared also to be placed appropriately at the correct height of the channel and with no signs of erosion or excessive siltation downstream.	■ Temporary erosion and sediment controls to be installed downstream of culverts immediately, as per the CESMP requirements. ■ Completed culverts to be backfilled as per CESMP at the appropriate time.
Dust control	Water trucks were being actively used to suppress dust on access roads and along the RoW where construction vehicles are driving/operating, with the exception of the steep incline/decline at the Salzlidere Dam construction camp site where watering of the road is not possible due to traction limitations on the steep approach and decline.	■ Dust suppression to resume for open areas where dust may be an issue.
Pollution control	No signs of pollution or spills were observed during the site inspections. A wheel washing unit was established to wash the wheels of the trucks and the relevant personnel were assigned.	■ None
Waste Management	The current waste management at the existing Olimpiyat campsite is as follows: ■ Domestic solid waste is collected and delivered to Başakşehir Municipality for licensed disposal to landfill; ■ Domestic wastewater is connected to the city waterborne sewage system; ■ Recyclable wastes are delivered to the Başakşehir Municipality (participated in the Zero Waste campaign); ■ An agreement has been made with a licensed company (İSTAÇ) for the disposal of hazardous waste; and ■ An agreement has been made with a licensed company for the disposal of medical waste. (İstanbul Büyükşehir Belediyesi Çevre Koruma ve Kontrol Daire Başkanlığı-Atık Yönetimi Müdürlüğü).	■ None
Traffic Management	The Traffic Chief has been taking the following measures since December 2021 for the management of traffic impacts: ■ 1 traffic circulation project has been implemented which included a pedestrian path arranged with pedestrian safety in mind; ■ In addition, two disabled ramps for disabled citizens have been implemented; ■ Fixed traffic personnel are assigned at certain points in order to control the interaction with civil traffic due to excavation and loading activities at Atilla Altıkat Street (km 58+000), Adnan Menderes Boulevard (km 56+500), Kayaşehir Boulevard (km 55+000); ■ At blasting sites, the Traffic Team maintains both the pedestrian crossing safety and the	• None

Mitigation Measures	Observations by ERM	Further Requirements
	vehicle access restriction within certain periods by keeping the critical junction points; ■ In the Sazlıdere location of the Western Approach Viaduct, directions are made with many traffic signs in order to prevent civilian traffic from entering the construction site; ■ When joining the main road from our service road at Adnan Menderes Boulevard, fixed traffic personnel are assigned, considering the pedestrian safety at this point.	
Stakeholder Engagement and Community Liaison	■ Local administrations were contacted, meetings were organized with the local people and project information was provided. ■ In the Fedakar Çıkmazı area, regular water spraying is undertaken for dust suppression purposes as this can be a source of citizens' complain.	■ None

Figure 8-1 Map showing RoW clearing that had taken place as of May 2022

9. TRAINING

This chapter of the Plan provides the training requirements for staff involved with construction activities and provides the minimum requirements and guidance for Developers and Contractors to ensure that their training activities are carried out in compliance with this Plan.

The training program will focus on environmental, social and health and safety concerns that determine the best way to deal with a particular risk or hazard. When a risk or hazard is identified through the standard 'HIRA' (Hazard Identification and Risk Assessment) procedure, the intention will be to first remove the risk or hazard, and if not feasible, to train workers to protect themselves, others and the environment, against the remaining hazard. This typically involves developing induction and generic training for all employees and developing specific training goals and programs to meet specialized needs as appropriate.

Training needs have been identified for the Project in Table 9-1.

Table 9-1 Training Needs Assessment

Theme	Training Needs	Include in induction training?	Training Type	Relevance to Project
Social	Worker conduct	Yes	Generic training	High
	Community interactions		Generic training	Possible
	Gender based violence and Harassment		Generic training	Possible
	Communication	Yes	Generic training	High
	Worker rights	Yes	Generic training	High
	Workers' grievance mechanism	Yes	Generic training	High
	Human rights	Yes	Generic training	High
Health & Safety	Safe use of equipment		Generic training	High
	Heat stress		Generic training	High
	Traffic safety	Yes	Generic training	High
	PPE	Yes	Generic training	High
	First Aid		Generic training	High
	Safety signage	Yes	Generic training	High
	Emergency procedures	Yes	Generic training	High
	Security and access control	Yes	Generic training	High
	Illness and infectious disease		Generic training	High
	Hygiene and sanitation		Generic training	High
	Working at heights		Specialized training	High
	Safe use of equipment		Specialized training	High
	Basic driver training		Generic training	High
	Advanced driver training		Specialized training	Possible

Theme	Training Needs	Include in induction training?	Training Type	Relevance to Project
	Heavy or Specialized Machinery operator training		Specialized training	High
	Preventative measures	Yes	Generic training	High
	Rules and regulations	Yes	Generic training	High
	Nutrition awareness		Generic training	High
Environment	Waste management	Yes	Generic training	High
	Pollution controls		Generic training	High
	Environmental pollution		Generic training	High
	Environmentally sensitive areas		Generic training	Possible
	Wildlife interactions		Generic training	Possible
	Working in or near water		Generic training	High
	Environmental rules and regulations		Generic training	High

9.1 Induction Training

An HSE induction training (also termed 'orientation training') will be provided for all employees involved in the construction activities, aimed at providing workers with basic information about the Project-related HSE issues and policies/procedure in place and will also include measures for several topics regarding the management of environmental and social risks and health and safety hazards and risks.

All construction personnel will be inducted and made familiar with the relevant CESMP, other applicable plans and any construction method statements, risk assessments and traffic management plans, incident reporting and E&S requirements in general.

All employees, including contractors and subcontractors, will be required to attend the mandatory induction training before being permitted to enter the site and continue with activities on site. This applies whenever a new person is hired or arrives at the site. Visitors to the site will also be required to complete the mandatory induction training, which may be tailored to a basic visitor's induction training omitting certain themes and including only the basic ones.

Environmental Induction will be integrated into the general site induction on a case-by-case basis for each member of staff employed onsite depending on their assigned roles and responsibilities.

Induction training will address the following topics at a minimum:

- Project introduction and overview
- OHS policy, objectives and goals – no harm to people or the environment
- Safety Rules
- Code of Conduct
- Gender-Based Violence and Harassment
- Potential risk to health and safety
- General safety requirements
- PPE requirements, wearing and use
- Precautions to prevent exposure to key hazards
- Basic hygiene requirements

- Safe driving and transportation
- Prohibited substances and activities
- Pollution prevention
- Waste management
- Working in the vicinity of heavy machinery
- Coordination of activities
- Individuals' responsibilities
- Environmental DO's and DON'Ts
- Incident reporting
- Accident/incident management
- Communication
- Emergency response procedures (incidents and accidents)

9.2 Generic Training

Generic training for all short and long-term employees and subcontractors will be administered through formal training sessions and regular Toolbox Talks and refresher trainings. Generic training will be provided to employees under the following circumstances:

- For new employees who have completed the standard induction training and have been identified according to the training needs assessment and training matrix as requiring further training in particular aspects of their work role;
- Whenever an existing employee is given a new job assignment (extremely important that supervisors emphasize safety during initial task assignment);
- Whenever new work procedures are begun;
- Whenever new equipment is installed or to be used or new hazards are introduced;
- Whenever new materials or substances are used; and
- Whenever a new hazard is introduced is introduced to the employee.

Toolbox talks are to be held by the Biodiversity Expert/Construction Manager at the commencement of each day, or at the commencement of new activities on site:

- Identify the specific proposed work activities that are scheduled for that day;
- The necessary work method statements and sub plans would be identified and discussed prior to the commencement of the day's activities;
- Toolbox talks will need to include training and awareness on the following topics:
  - Communication protocols
  - Community relations
  - Ecological sensitivities on site
  - Electrical safety
  - Emergency preparedness and response
  - First Aid
  - Fuel and hazardous materials storage and transportation

- Gender Based Violence and Harassment
- General safety requirements
- Good practice controls
- Grievance Mechanism
- Hygiene
- Heat stress
- HSE Site Rules
- Housekeeping rules
- Incident reporting
- Knowledge of materials, equipment, and tools
- Lifting operations
- Noise management
- Project introduction and overview
- Pollution prevention and control
- Potential risks to health and safety
- PPE requirements
- Traffic routes and rules
- Vehicle and equipment operating rules
- Waste management
- Wildlife management
- Working in watercourses
- Working in the vicinity of heavy machinery
- Working at heights
- Worker conduct

- The CLO supported by the Project Management Team will ensure that all the workers on the Project are familiar with the Project objectives for the Community, including specific Project measures related to the community engagement. Specific Security measures related to community well-being will also be addressed.

9.3 Specialized Training

Specialized training will be provided for supervisors, managers, waste management teams, and specialized equipment operators.

9.3.1 Supervisors

Supervisors will be provided special training to help them in their leadership roles as follows:

- Identification of hidden hazards in the work under their supervision;
- Maintenance of the physical protection in their areas; and
- Reinforce employee hazard training through performance feedback and consistent enforcement when necessary.

9.3.2 Managers

Managers will receive special training in the following:

- Elements of the safety management system and the positive impact the various processes within the system can have on corporate objectives;
- Their responsibility to communicate the Health & Safety Program goals and objectives to their employees;
- Their role includes making clear assignments of Safety and Health Program responsibilities, providing authority and resources to carry out assigned tasks, and holding subordinate managers and supervisors accountable; and
- Actively requiring compliance with mandatory Health & Safety Program policies and rules and encouraging employee involvement in discretionary safety activities such as making suggestions and participation in the safety committee.

Training will emphasize the importance of managers' visibly showing their commitment to the safety and health program. They will be expected to set a good example by scrupulously following all the safety and health rules themselves.

9.3.3 Waste management teams

Specific training on waste management shall be provided to the workers that will be directly involved in handling and transporting of waste streams onsite. Training should include but not limited to:

- Awareness of hazards in working operations and how they are managed;
- Potential risks to health and safety;
- Precautions to prevent exposure;
- Correct use and application of PPE and clothing; and
- Appropriate response to emergency conditions, incidents, and accidents.

9.3.4 Other tasks

Specialized / job specific training by certified instructors (third-party training) will also be necessary for persons involved with the following tasks and activities:

- Working at height;
- Confined space works;
- Heavy machinery operation such as earth moving equipment;
- Specialised machinery or equipment training and instruction for operators;

- Working at heights;
- Welding and cutting;
- Crane operation;
- Driver training;
- Work permit system;
- Banksman/Flagman;
- Concrete batching;
- Asphalting;
- Herbicide / pesticide application;
- First Aid;
- Defensive driving;
- Accident-Incident root cause analysis;
- Scaffolding inspection; and
- Slinger-Signalman Training.

9.4 Refresher Training

Refresher training or recertification may be required depending on the employee's Project roles and responsibilities.

Retraining is required when an employee is given a new job assignment, new work procedures or when new hazards are introduced, new equipment is installed, new substances are used, or there has been an incident.

9.5 Training Matrix

The EPC Contractor shall prepare a training matrix (Table 9-2) which identifies the EPC Contractor staff and subcontractors' staff who have completed induction, the Project induction training, generic and specific training delivered and received and others as appropriate.

Table 9-2 Training Matrix

SECTION	PERSONS	TRAINING REQUIREMENTS		
		Induction	Generic Training	Specific Training
HSE Management	H&S and E&S Manager	X	X	
	HSE Chief	X	X	
	HSE Documentation Supervisor	X	X	
	HSE Supervisor	X	X	
	HSE Inspectors	X	X	
	HSE Trainer	X	X	X
	HSE Officer	X	X	
	Permit to Work officer	X	X	X
	Labor Compliance Officer	X	X	
	Community Liaison Officer (CLO)	X	X	X

SECTION	PERSONS	TRAINING REQUIREMENTS		
		Induction	Generic Training	Specific Training
Facilities Management	Facilities Director	X	X	
	Camp Services Manager	X	X	
	Soft Services Manager	X		
	Camp Services Technician	X		
	Transport Manager	X	X	X
	Equipment Management	X	X	X
	Lifting Supervisor	X	X	X
	Equipment Technician	X		
	Wastewater Manager	X	X	
	Solid Waste Manager	X	X	
	Solid Waste Management Worker	X	X	
	Workshop Supervisor	X	X	X
	Workshop Technician	X		
Security Management	Security Director	X		
	Deputy Project Manager	X		
	Emergency Response Head	X	X	X
	Emergency Responders	X	X	X
	Safety Coordinator	X	X	
	Traffic Coordinator	X	X	
	Administrator	X		
	Equipment Technician	X	X	
Administration Management	Administration Director	X	X	
	Coordination Officer	X	X	
	Accountant	X		
	Cost Control	X		
	Procurement	X		
	FMC Personnel	X		
	Customer Helpdesk	X		
	Medical Team	X		
Workers	Construction Foreman	X	X	
	Construction Workers	X		
	First Aid Team	X	X	X
	Fire Fighting Team	X	X	X
	Drivers	X	X	X
	Machinery Operators	X	X	X

10. MONITORING AND REVIEW

10.1 Monitoring

10.1.1 Pre-construction

- Baseline pre-construction surveys and monitoring to be completed before construction commences.
- Includes the following:
  - Land acquisition status10;
  - Permits status;
  - Quality of temporary and permanent access and haul roads;
  - Presence, status and extent of ecological resources and sensitive areas;
  - Access control;
  - Quarries, borrow pits and dump sites;
  - Accommodation and site camps; and
  - Existing damage to property.
- Refer to the ESIA where detailed information may be found.

10.1.2 During construction

General:

- Regularly (weekly) inspect drains, irrigation channels and culverts and maintain these free of debris and blockages;
- Inspection of construction zone (daily);
- Onsite haul routes will be inspected for integrity and instigate necessary repairs to the surface as soon as reasonably practicable, with all inspections of haul routes and any subsequent action to be recorded in a site logbook;
- Inspection of workshops, batch plants, vehicle wash down areas;
- Inspection of fuel storage areas;
- Inspection of construction site camps and worker's accommodation;
- Vibration on commencement of relevant construction activities will be monitored to ensure that the Turkish requirements are met - if the standards are exceeded additional measures will be taken to reduce vibration and if necessary, altering the methods of working to use equipment that creates lower levels of vibration.

Water quality:

- Frequent water quality monitoring for local streams, rivers and other water bodies that could be potentially impacted by construction;

[10] Land entry protocols shall be executed prior to land entry on each parcel.

- Water quality will be monitored at upstream and downstream of the river/stream at crossings before and after any instream construction activities are completed[11];
- Water analysis will be conducted weekly in line with World Health Organization (WHO) Standards if water (other than bottled water) will be provided for human consumption purposes;
- See the monitoring plan in Table 10-1.

Air quality / dust:

- Daily onsite and off-site inspection will be carried out where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the inspection log available to the local authority when requested;
- Regular site inspections will be carried out to monitor compliance with the 'Air Quality and Emission Control Plan and record inspection results;
- The frequency of site inspections by the person(s) accountable for air quality and dust issues on site will be increased when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions;
- Dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations will be agreed with the Local Authority;
- PM_{10} dust bucket monitoring (for suspended particulates) is to be implemented periodically (quarterly basis recommended) and to be informed by local/national emission standards and IFC General EHS Guideline particulate limit values;
- Dust and air quality complaints will be recorded using grievance mechanism and root causes will be identified, with appropriate measures taken to reduce emissions in a timely manner;
- See monitoring plan in Table 10-1.

Noise:

- Implement noise monitoring and reporting in conjunction with national regulations and environmental guidelines (e.g. IFC EHS Guidelines, 2007) regarding noise levels and exposure;
- Noise complaints will be recorded using grievance mechanism and root causes will be identified, with appropriate measures taken to reduce or mitigate noise impacts in a timely manner and as far as practically possible;
- See the monitoring plan in Table 10-1.

Social:

- A program of socio-economic compliance monitoring will be implemented to inform internal auditing and monitoring processes, focused on worker and community rights, avoidance of retaliation, discrimination and management, the workforce and community grievance mechanism;
- Regular monitoring of workforce health, working conditions, and hours of work;
- Appropriate food preparation and monitoring measures to ensure that all standards are being met by the relevant departments.

Monitoring results will be reviewed and compared against relevant standards, permit requirements/conditions, thresholds of concern, complaints and audit findings and recommendations. The ESHS Management team for the EPC Contractor will need to define appropriate action to follow in

[11] Samples will be analysed for a suite of determinands suitable to identify potential contaminants from project activities, e.g.: total petroleum hydrocarbons, dissolved metals, cations and anions (Ca, Mg, K, Fl, Cl, SO_4), pH, total dissolved solids (TDS) and total suspended solids (TSS), and other compounds of potential concern based on chemicals compounds used during the project (e.g.: lubricants, degreasers).

the instance that any exceedances in monitoring limits are confirmed or adverse impacts are identified, including:

- Communication protocol in the event that an exceedance is identified;
- Internal review process of recently performed maintenance and inspection;
- Review of previous monitoring data (e.g. ESIA baseline conditions) to identify any potential associated variations or trends in results;
- Recommendations for quarantine of equipment or change in work practices; and
- Review of monitoring frequency to ensure the issue does not re-occur.

10.1.3 Post construction

- Progress of decommissioning and closure of temporary works and temporary site infrastructure;
- Status of site rehabilitation;
- Monitoring of progression and success of habitat reinstatement/ replanting by comparing area and species diversity with nearby semi-natural areas (annual monitoring);
- Success of endemic/rare plant species translocation / replacement actions (annual monitoring); and
- Resettlement progress and success.

Table 10-1 Construction Monitoring Plan

Wastewater Discharges to Water Bodies – Direct Outfall (point-source)						
Parameter/ Aspect	**Responsibility**	**Locations**	**Frequency/Timing**	**Threshold level[12] (if applicable)**	**Trigger for Monitoring**	**Link to Adaptive Management**
Based on permitting requirements -Turkish Water Pollution Control Regulations (Official Gazette Date/Number: (31.12.2004/25687): Domestic wastewater treatment plants (if applicable) (IFC EHS General Guideline): ■ BOD ■ COD ■ TSS ■ pH ■ Total nitrogen ■ Total phosphorus Oil Water Separator in line with vehicle maintenance repairs: ■ Oil and grease NH4-N ■ CN^- ■ Total Chromium ■ Fish biotesting ■ pH Batch Plant and related washing activities: ■ pH ■ temperature	EPC Contractor	■ At the point of discharge as well as up-gradient and down-gradient of discharge point ■ Domestic wastewater Treatment Plants ■ Oil water separators at construction Camps and project site areas ■ Wastewater generated during concrete batch plant operations and washing of cement trucks	Based on permitting requirements	Domestic wastewater treatment plants (Table 21.1 of Turkish Water Pollution Control Regulations and IFC EHS General Guidelines) Oil Water Separator in line with vehicle maintenance repairs (Table 18).	Discharge from a project site to surface water (e.g. industrial effluent, wastewater from a sewage treatment plant, discharge from an oil interceptor, etc.	Monitoring results to feed back to plant design and operation, exceedances of permitted discharge standards to trigger investigation into root cause of exceedance and measures to be implemented to improve design or operation to meet standards. Wastewater treatment plant operator responsible.

[12] Unless not specified otherwise in permits/licenses, whichever of EU, IFC EHS Guidelines and national threshold levels is most stringent, applies.

Wastewater Discharges to Water Bodies – Surface Water Runoff (non point-source)						
Parameter/ Aspect	**Responsibility**	**Locations**	**Frequency/Timing**	**Threshold level[13] (if applicable)**	**Trigger for Monitoring**	**Link to Adaptive Management**
Turkish Regulations on Surface Water Quality (Official Gazette No/Date: 29327/15.04.2017) to include: ■ Dissolved oxygen ■ pH ■ TSS/Turbidity ■ Oil and grease (TPH and PAH) ■ Coliforms ■ COD ■ BOD River crossings testing for low flow and high flow conditions (seasonal) - tested routinely during construction.	EPC Contractor	Up-gradient and down-gradient locations of the following streams: ■ Km 51+000 and 52+000 Sazlıdere Stream and Sazlıdere Reservoir ■ Km 55+000 - 56+000 (Stream) ■ Km 56+000 - 57+000 (Stream) Up-gradient testing will inform of baseline conditions for surface water quality. Down-gradient testing locations are selected based on risk assessment, pending on receptors sensitivity (e.g. ecological and/or water resources).	The testing frequency will be selected based on the risk assessment of the down-gradient receptor sensitivity (e.g. ecological and/or water resources).	Category I = very good and Category II = good based on the latest changes in the Turkish Regulations on Surface Water Quality (Official Gazette No/Date: 29327/15.04.2017). Up-gradient Conditions (reference)	Discharge from a Project site to surface water (e.g. industrial effluent, wastewater from a sewage treatment plant, discharge from an oil interceptor, etc.	Comparison of up-gradient and down-gradient samples for streams to be undertaken to identify any potential pollution concerns and trigger requirement to investigate source of pollution and identify appropriate mitigation such as erosion control, temporarily halting activities, etc.

[13] Unless not specified otherwise in permits/licenses, whichever of EU, IFC ESHS Guidelines and national threshold levels is most stringent, applies.

Water Use at Project Facilities						
Parameter/ Aspect	**Responsibility**	**Locations**	**Frequency/Timing**	**Threshold level (if applicable)**	**Trigger for Monitoring**	**Link to Adaptive Management**
Quantity of water abstracted from groundwater/surface water sources or water supply from utility providers	EPC Contractor	At each Project facility with water supply from indicated sources	Ongoing, reported monthly	As specified in the site permit/license, if applicable	Abstraction of water from indicated sources or supplied by a utility service provider	Exceedance of permitted abstraction to trigger investigation into why there has been over abstraction and to identify suitable measures to reduce water consumption.
Water quality in case of supply from own source. Parameters as per applicable permits/licenses/regulations and type of use (e.g. potable/ sanitary/ industrial)	EPC Contractor	From each own source	Ongoing, reported monthly, unless otherwise specified in any permit/license	As specified in the site permit/license, if applicable	Abstraction from own source	Exceedance of water quality standard to trigger investigations and mitigation such as alternative sources of potable water supply.

Soil						
Parameter/ Aspect	**Responsibility**	**Locations**	**Frequency/Timing**	**Threshold level (if applicable)**	**Trigger for Monitoring**	**Link to Adaptive Management**
Regulation on Soil Pollution Control and Point-Source Contaminated Sites; Official Gazette Date/Number: 08.06.2010/27605 which include: ■ Total Petroleum Hydrocarbons (TPH) ■ benzene, toluene, ethyl benzene and xylene (BTEX) polycyclic aromatic hydrocarbons (PAH) heavy metals (As, Cd, Co, Cr, Cu, Hg, Ni, Pb, Sb, V, Zn)	EPC Contractor	At sites of suspected contaminated land including: ■ areas of known or suspected third-party contamination ■ areas where spills/contamination occurred during construction (excluding minor spills, where visual observation confirms complete removal of contaminated soil)	■ Before construction works initiation ■ After construction works finalization	Risk-based with consideration of the provisions of the Turkish Regulation on Soil Pollution Control and Point-Source Contaminated Sites; Official Gazette Date/Number: 08.06.2010/27605	Upon identification of suspected contaminated land on a project site During the demobilisation of project sites where spills/contamination occurred during construction	Contamination to trigger an investigation into suitable soil remediation and decontamination measures and to identify the source of contamination and address this through at-source control measures.

Air Emissions						
Parameter/ Aspect	**Responsibility**	**Locations**	**Frequency/Timing**	**Threshold level[14] (if applicable)**	**Trigger for Monitoring**	**Link to Adaptive Management**
Visual inspections of dust generation and dust suppression controls	EPC Contractor	Project sites and impacted third party sites, such as adjacent receptors or along site access routes	Daily or more frequently during high-risk, dry and windy conditions.	N/A	High-risk activities with the potential to cause dust nuisance including, but are not limited to construction traffic on unsealed access roads, construction sites adjacent to sensitive receptors. Visible wind-blown dust leaving site boundary or dust deposition observed on street furniture or at sensitive receptors. Any complaints received from third parties.	Triggers investigation into the source of dust and additional measures such as halting temporary activities during particularly windy periods, investigating dust suppression effectiveness and frequency of controls.
Emissions from stationary/non-stationary sources	EPC Contractor	Project site	Continuously	Unless not specified otherwise in permits/licenses, whichever of EU, IFC EHS Guidelines and national threshold levels is most stringent, applies	Visible black smoke from machinery or vehicle exhausts at any point during operation, not including initial start up	Investigate source of pollution, halting polluting activities/switching off equipment, and investigate equipment maintenance/repair requirements before resuming operation.

[14] Unless not specified otherwise in permits/licenses, whichever of EU, IFC EHS Guidelines and national threshold levels is most stringent, applies.

Real-time PM10 continuous monitoring locations will be agreed upon with the Local Authority.	EPC Contractor	Project site	Continuously	Unless not specified otherwise in permits/licenses, whichever of EU, IFC EHS Guidelines and national threshold levels is most stringent, applies	High-risk activities with potential to cause dust nuisance.	Triggers investigation into source of dust and additional measures such as halting temporarily activities during particularly windy periods, investigating dust suppression effectiveness and frequency of controls.
Noise and Vibration						
Parameter/ Aspect	**Responsibility**	**Locations**	**Frequency/Timing**	**Threshold level[15] (if applicable)**	**Trigger for Monitoring**	**Link to Adaptive Management**
Noise levels monitoring	EPC Contractor	At sensitive receptors (as identified in ESIA)	As necessary, risk-based pending on works performed During planned out of hours works	Unless not specified otherwise in permits/licenses, whichever of EU, IFC EHS Guidelines and national threshold levels is most stringent, applies	High-risk activities or out-of-hours activities with the potential to cause impact/nuisance to identified sensitive receptors.	Triggers investigation into the source of dust and additional measures such as halting temporarily activities during particularly windy periods, investigating dust suppression effectiveness and frequency of controls

[15] Unless not specified otherwise in permits/licenses, whichever of EU, IFC EHS Guidelines and national threshold levels is most stringent, applies.

Vibration monitoring	EPC Contractor	Inside representative occupied properties that are within 100 m of major vibration-generating activities (e.g. driven piling or vibro-compaction)	As necessary, risk-based pending on works performed	1 mm/s	High-risk activities or out-of-hours work with potential to cause impact/nuisance to identified sensitive receptors	Investigate the source of excessive vibrations, halting activities/switching off equipment, and investigate equipment maintenance/repair requirements before resuming operation.

Labor and Working Conditions

Parameter/ Aspect	Responsibility	Whom	Frequency/Timing	Legislation
Socio-economic compliance monitoring	Nakkaş Otoyol A.Ş. and EPC Contractor	All workers	Quarterly	Turkish law and ILO international standards.

10.2 Key Performance Indicators

A Key Performance Indicator (KPI) is a measurable value that can be used to demonstrate or evaluate how effectively a company or organization is achieving key business objectives. In this instance, KPIs have been developed to evaluate the performance of the EPC Contractor in terms of achieving the objectives of the CESMP. KPIs have been presented in Table 10-2, together with objectives/measurement and monitoring requirements.

Table 10-2 Key Performance Indicators (KPIs)

KPIs	Objective(s) / Measurement	Monitoring Requirement(s)
1 Pre-Construction		
1.1 Relevant permits have been obtained prior to construction commencing	All relevant permits have been obtained prior to construction works commencing.	■ Permit register ■ Audits
1.2 Pre-construction surveys have been completed prior to construction commencing	All necessary pre-construction environmental surveys have been completed prior to construction works commencing.	■ Audits
1.3 Temporary sites have been established appropriately	Temporary works are demarcated and established in appropriate areas as per the site plan.	■ Site inspections ■ Audits
1.4 Appropriate drainage systems are in place prior to construction commencing	Construction of the drainage system has preceded other construction activities.	■ Site inspections ■ Audits
1.5 Access roads have been appropriately constructed and maintained	The CESMP requirements for the design, construction and maintenance of new access roads and the upgrading of existing roads have been adhered to.	■ Site inspections ■ Audits
1.6 Traffic management measures are in place	The traffic management plan has been implemented, including the setup of traffic management measures prior to any construction works commencing.	■ Site inspections ■ Audits
1.7 Land entry protocols are in place and must be established	Before starting any construction activities, protocols should be filled in and signed by respective persons) as a prerequisite for starting construction activities on land parcels.	■ Entry protocols
2 During Construction		
2.1 Appropriate crossings of watercourses have been implemented	The CESMP requirements for the design, construction and maintenance of new or upgraded access roads across watercourses have been adhered to.	■ Site inspections ■ Audits
2.2 Hazardous substances, waste and wastewater to be managed in accordance with the appropriate plan	Implement the Waste Management Plan and Wastewater Management Plan and track performance against relevant KPIs.	■ Site inspections ■ Audits
2.3 Communicate construction timing and progress regularly with interested and affected parties	Communicate regularly with interested and affected parties shortly prior to (2 – 3 weeks) and frequently during the construction period.	■ Audits ■ Complaints register
2.4 Implement necessary noise and vibration controls during construction	Construction noise and vibration controls are to be implemented as per the CESMP requirements.	■ Site inspections ■ Audits ■ Complaints register

KPIs	Objective(s) / Measurement	Monitoring Requirement(s)
2.5 Dust and air quality risks are monitored and managed on site	Dust and air quality monitoring and site controls are to be implemented as per the CESMP requirements.	■ Site inspections ■ Audits
2.6 Erosion and sediment risks are managed during construction	Erosion and sediment controls to be implemented as per the CESMP requirements.	■ Site inspections ■ Audits
2.7 Pollution events are minimised	Controls and measures to reduce the risk of pollution events taking place are to be implemented.	■ Site inspections ■ Audits
2.8 Number of pollution incidents that have triggered the emergency response procedure	100% monitored and communicated, spill response implemented as per the Plan requirements.	■ Spill response reporting ■ Incident reporting
2.9 Compliance with emergency prevention measures	100% monitored and communicated.	■ Incident reporting ■ Site inspections ■ Audits
2.10 Batching plant and activities managed to prevent pollution	Batching plant procedure to be followed to minimise pollution potential.	■ Incident reporting ■ Site inspections ■ Audits
2.11 Cultural heritage resources management	Cultural heritage resources are managed as per the appropriate Plan.	■ Pre-construction surveys ■ Site inspections ■ Audits
2.12 Full compliance with Turkish Labour Law and ILO Standards	Socio-economic compliance monitoring will be in place.	■ Monitoring results ■ Site inspections ■ Labor audits
3 Post-Construction		
3.1 Temporary infrastructure has been removed post-construction	Temporary works have been decommissioned and removed and these areas closed once construction has been completed.	■ Site inspections ■ Audits
3.2 Habitat reinstatement and management plan to be compiled	A post-construction habitat reinstatement and management plan needs to be compiled.	■ Audits
3.3 Rehabilitation of disturbed areas has been successfully implemented	Post-construction, implement and monitor the success of habitat rehabilitation in accordance with the habitat reinstatement and management plan.	■ Site inspections ■ Audits
3.4 Success of plant translocation / replacement actions	30% success rate	■ Monitoring report
3.5 Exit protocols are in place	After any construction activities are completed, protocols should be filled in and signed by respective persons.	■ Exit protocols
4 Training		
4.1 Employee training requirements have been identified	Generic and specialised staff training requirements have been identified and the training matrix is kept current.	■ Training needs assessment and training matrix
4.2 All employees have received relevant training	All employees accessing the site have received the necessary induction and generic training (and any specialised training) as required.	■ Training register

10.3 Compliance and Review

10.3.1 Site Inspections

The EPC Contractor will be responsible for the implementation of an appropriate routine inspection and monitoring programme to the satisfaction of Nakkas Otoyol A.Ş. during the construction phase, enabling both parties to ensure works are being carried out in accordance with the CESMP and to identify and implement any corrective actions or possible improvements as necessary.

Routine inspections of will be carried out on a daily and weekly basis by the Site's Biodiversity Expert accompanied by the Construction Manager, to ensure all controls to prevent environmental impacts are in place, and relevant to the construction activities taking place at the time. This will ensure that the works are undertaken in compliance with the CESMP and any subsequent updates to this document.

A written record of inspections will be maintained or available onsite within this CESMP during the construction phase. The following periodic inspection regime will be implemented:

- Daily general visual inspections of construction activities, watercourse crossings and drainage infrastructure by the Biodiversity Expert or a suitably qualified and competent person as delegated by the Biodiversity Expert;
- Daily inspection checks will be completed on all plant and equipment;
- Event-based inspections by the Biodiversity Expert will be performed as follows:
  - Rainfall >10 mm/hr (i.e. high intensity localised rainfall event)
  - Rainfall >25 mm in 24 hours (heavy frontal rainfall lasting most of the day)
  - Rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week)
- Monthly site inspections by the Biodiversity and Environment Expert and Social Manager who should be supported by CLO during the construction phase; and
- Quarterly site inspections by the Biodiversity and Environment Expert and Social Manager who should be supported by CLO after construction for a period of one year following the completion of the construction phase.

10.3.2 Environmental Compliance

The following definitions shall apply in relation to the classification of Environmental Occurrences during the construction phase:

Environmental Near Miss: An occurrence which if not controlled or due to its nature could lead to an Environmental Incident.

Environmental Incident: Any occurrence which has the potential, due to its scale and nature, to migrate from the source and have an environmental impact beyond the site boundary.

Environmental Exceedance Event: An environmental exceedance event occurs when monitoring results indicate that limits for a particular environmental parameter have been exceeded. An exceedance will immediately trigger an investigation into the reason for the exceedance occurring and the application of suitable mitigation where necessary. Exceedance events can be closed out on achieving a monitoring result below the assigned limit for a particular environmental parameter.

Environmental Non-Compliance: Non-fulfilment of a requirement and includes any deviations from established procedures, programs and other arrangements related to the ESMMP.

10.3.3 Health & Safety Compliance

OHS related incidents (such as accidents, fuel/oil/chemical spills, fire, structural damages, personal injury, etc.) are to be reported to the site manager through a formal incident reporting protocol.

All H&S incidents are to be taken seriously and investigated and corrective actions documented and implemented to prevent the reoccurrence of H&S incidents in future.

10.3.4 Auditing

Both Nakkas Otoyol A.Ş. and EPC Contractor will be required to demonstrate how the requirements of the CESMP are being complied with during construction, as part of a construction phase auditing programme. Construction site inspections to inform formal E&S audits will be carried out during the construction phase of the Project by both parties under a formal internal and external auditing programme as follows:

- Internal monthly audits and bi-monthly external audits for the construction;
- Pre-prepared audit protocols will be used that reflect the specific requirements of the CESMP;
- Site inspections of all areas, themes and works covered by the CESMP;
- Audits shall include the in-field inspection findings and review of project documentation (such as incident reports, monitoring reports, records, etc.);
- Conduct interviews with project Stakeholders and any interested/affected parties, as appropriate;
- These will be performed to determine the underlying causes of non-compliance;
- Audits will be carried out by contractor staff or alternatively by external persons acting on their behalf;
- An independent, impartial and objective approach is to be adopted;
- Conducted at planned intervals (monthly frequency) to determine whether the CESMP is being properly implemented and maintained;
- The results of environmental audits will be communicated regularly to Project management personnel;
- A monthly audit report will be prepared and distributed; and
- A Corrective Action Plan will be prepared following the audits with corrective actions as per the Corrective Action Procedure (below).

External Quarterly Audits will be undertaken by the Lenders: Lenders' ESHS Advisor and Lenders' representatives will conduct quarterly audits during the construction phase to monitor the ESHS performance of the Project against the ESIA (including CESMP) and the Lenders' specific requirements.

A final close-out audit will be undertaken within one month of completion of all construction activities and works, including decommissioning and closure of temporary works and campsites, etc. Any remaining non-compliance issues will need to be documented and addressed within a period of one month (unless otherwise stated in the corrective action plan – see procedure below).

10.3.5 Corrective Action Procedure

A corrective action is implemented to rectify an environmental non-compliance problem identified through site inspection, incident reporting, complaints reporting and auditing procedures, and will be implemented by the Construction Manager, as advised by the Biodiversity Expert.

A Corrective Action Notice will be used to communicate the details of the action required to the main contractor who will then be tasked with developing and implementing a Corrective Action Plan.

A Corrective Action Plan (CAP) must be prepared which details the non-compliance issue, the location and corrective measures that will be taken to minimize the impact and prevent it from occurring again. Included in the CAP will be individual corrective actions, responsibilities, key resources and timeframes for implementing key actions to resolve issues of non-compliance, as well as any required maintenance, monitoring and follow-up. Once actions have been completed and closed, this will need to be reflected immediately in the revised CAP.

Examples of non-compliance may include but are not necessarily limited to the following:

- Breach of an environmental standard;
- Commencement of works without an approved risk assessment and method statement that covers environmental issues;
- No review of risk assessment and method statements following any significant changes in activities or site conditions;
- Works or activities taking place without relevant and valid permits or licenses;
- Failure to comply with waste storage/disposal requirements;
- Failure to comply with chemical storage and/or handling requirements;
- Un-containable or uncontrollable spills of fuels or chemicals;
- Works being carried out that are outside the scope defined within the risk assessment and method statement;
- Unpermitted discharge of untreated, contaminated wastewater to the environment; and
- Non-conformity on labour requirements in terms of the law.

In the case of severe non-compliance or repeated incidences of non-compliance, Nakkas Otoyol A.Ş. has the right to stop all works until necessary corrective actions are taken by the EPC Contractor.

The same goes for any activity perceived to be unsafe or behaviour that may result in an unwanted event, which may be stopped immediately depending on the potential severity of the consequence of such activity or behaviour. Activities may continue once the corrective and preventive actions are implemented and confirmed by ESHS Inspectors.

The CAP will be maintained onsite at all times and will be provided to external auditors upon request.

10.3.6 CESMP Review

This CESMP is to be considered a ‘living document’ that will be updated and reviewed prior to the commencement of construction, and also every six months thereafter during the construction phase of the Project or as soon as appreciable changes to the context or activities are identified. This is particularly important as changes in the Project may occur due to unanticipated situations. Nakkas Otoyol A.Ş. will implement a formal ‘management of change procedure’ to manage changes in the Project that will apply to all project activities.

Urgent updates in line with the principle of ‘adaptive management’ can be the responsibility of the Biodiversity and Environment Expert and CLO, with support from the HSE Manager, however any material changes to intervention design, the timing of monitoring activities, etc. should be made in consultation with a third-party consultant to ensure accountability.

11. REPORTING REQUIREMENTS

The following reporting requirements apply for the EPC Contractor:

- Maintenance of all materials, substances and waste registers and inventories as described in the 'Waste Management Plan';
- Monthly reporting as per the requirements of the Waste Management Plan;
- Incident reporting (as necessary, addressed in terms of the Accident and Incident Management Procedure);
- Monthly reporting of social KPIs including labour and supply chain, community health and safety, land entry/exit protocols, stakeholder engagement, status of grievances and or any potential court cases etc.
- Emergency response reporting;
- Records of annual emergency response training exercises;
- Biannual reports on E&S KPIs and performance trends;
- Monthly reports of relevant training activities completed and attendance registers to be maintained;
- Daily/Weekly/Monthly reports of site inspection activities;
- Audit reports;
- Inspection logs and status of non-compliance; and
- Wastewater quality analysis reports based on lab results (weekly/monthly basis).

In addition, the following external reporting will be done:

- All environmental and social incidents will be appropriately documented, notified and reported in accordance with established procedures.
- Incident notification and reporting to relevant Turkish regulatory bodies will be performed in line with applicable legislation in force and as stipulated in permits and licenses.
- The Lenders will be notified of incidents pursuant to the terms and conditions agreed upon in the Finance Agreements.

12. RECORD KEEPING AND DOCUMENT CONTROL

A record-keeping system shall be used to control all records and documents so that they are:

- Easy to retrieve and identify and are maintained in an orderly fashion;
- Current, accurate, legible, and dated, and that the dates should include revision dates when appropriate;
- Relevant/applicable and satisfy regulatory and/or legislative requirements; and
- Retained for a specified time period – Retention of records may be regulated by legislative or regulatory policies

Records are to be kept of all required activities and incidents, which must be readily available for inspection at any time and which are to include the following:

- All permits and licenses;
- Register of relevant environmental legislation;
- Register of relevant environmental consents;
- List of all stakeholders that are required to be consulted during construction;
- Risk register;
- All incidents reported;
- Grievance Register;
- Internal and external audit reports and corrective action plans;
- Site inspection reports;
- Equipment register and certifications, inspections and maintenance reports;
- Waste manifest and chain of custody for waste management/disposal certificates;
- Monitoring reports;
- Pollution prevention measures and pollution incidences;
- Records of successful and unsuccessful implementation of mitigation measures;
- Site inductions;
- Training records (including H&S);
- Toolbox meetings and other training records of attendance;
- Inventory of potential pollution sources associated with the construction process and details regarding the management of these sources; and
- SDS (Safety Data Sheets).

A copy of the CESMP documents / folders shall be kept at the Site offices for the duration of the works and will be available at all times for review.

The EPC Contractor will be responsible for the continual development of the CESMP as the proposed scheme progresses to take account of monitoring and audit results and changing environmental conditions and/or regulations.

Any and all changes made to the CESMP will be made in the master document and revision numbers and dates provided to track version numbers as part of the EPC Contractor's data and document management system. A summary document should also be produced that summarises the important changes made to the document for the different version numbers and who authorised these changes.

APPENDIX A TRAINING RECORD

TRAINING RECORD				
Employee Name			**Employee Number**	
Description	**Date**	**Duration (hrs)**	**Training Supplied by**	**Signature**

APPENDIX B WATER MANIFEST

<table>
<tr><td colspan="2">WATER MANIFEST</td><td>No:</td></tr>
<tr><td rowspan="6">Part A

To be completed by Transporter</td><td colspan="2">Water collected on (Date & Time):</td></tr>
<tr><td colspan="2">Type of Water (potable / non-potable):</td></tr>
<tr><td colspan="2">Volume (in m^3 or l):</td></tr>
<tr><td colspan="2">Name and Position:</td></tr>
<tr><td>Vehicle Reg. No:</td><td>Company:</td></tr>
<tr><td>Signed:</td><td>Date:</td></tr>
<tr><td rowspan="6">Part B

To be completed by EPC Contractor</td><td colspan="2">Water delivered on (Date & Time):</td></tr>
<tr><td colspan="2">Type of Water (potable / non-potable):</td></tr>
<tr><td colspan="2">Water Stored at (indicate ID/number of water storage tank):</td></tr>
<tr><td colspan="2">Volume (in m^3 or l):</td></tr>
<tr><td colspan="2">Name and Position:</td></tr>
<tr><td>Signed:</td><td>Date:</td></tr>
</table>

APPENDIX C MONTHLY WATER CONSUMPTION REPORT

Reporting Period: *DD/MM/YYYY*

A. Potable Water Requirements

Date of Water Tanker Delivery to Site	Number of Tankers	Total Volume Stored in Tanks (m^3 or l)	Compliance with Drinking Standards (Y/N)* (if not indicate corrective actions undertaken)
Total (in m^3 or l)			

*Attach water testing report

B. Non-Potable Water Requirements

Date of Water Tanker Delivery to Site	Number of Tankers	Total Volume Stored in Tanks (m^3 or l)
Total (in m^3 or L)		

C. Total Consumption to Date

Month	Total Consumption of Potable Water	Total Consumption of non-Potable Water	Total (m^3 or l)
Total (in m^3 or l)			

APPENDIX D WILDLIFE CROSSINGS DESIGN RECOMMENDATIONS

Nakkas-Basaksehir Motorway Project, Turkey

Wildlife Crossing Design and Implementation Recommendations

Relevance to Project

Given the potential for the motorway project in Istanbul to sever habitat linkages and serve as an obstructive barrier to wildlife species movement, wildlife crossings were considered as a suitable mitigation option, both from the perspective of allowing for continued species movement between habitats above and below the road and also from the perspective of reducing potential vehicle accidents that result in human fatalities, property damage and wildlife mortality.

Wildlife crossings describe a variety of structure types that can be designed or retrofitted to provide safe passage for wildlife above or below linear transportation infrastructure such as motorways. The fundamental aim of fauna underpasses is to allow native animals unrestricted access to a habitat that has been fragmented by the construction of impermeable or hazardous infrastructure. In practice, authors such as Huijser et al. (2009) suggest that the combination of fencing and an overpass or underpass provides the greatest reduction in potential wildlife collisions, exceeding an 80% reduction in most cases.

The majority of the road development corridor comprises little to no remaining natural habitat or typical wildlife corridors for terrestrial or ground-dwelling species (due to the extensive development of much of the road alignment, particularly in the eastern sections close to the residential centers of Istanbul and some of the industrial/commercial development in the west. There are also numerous existing multi-lane motorways and secondary roads that already fragment habitats and have associated barrier effects. There are however a number of key areas where semi-natural habitat remains and where more contiguous patches and belts of habitat will be fragmented by the road development. *These areas are considered potentially important for small mammal and reptile species movement based on the baseline biodiversity assessment findings in Section 5.3.5 of the ESIA.*

Key Species, Requirements and Habitats

Avifauna (birds and bats) have been specifically excluded from the wildlife crossing design recommendations, although it is recognized that some of these species may utilize larger underpasses/culverts, their volant (mobile, flying) nature precludes the need to include such species in wildlife crossing design. The focus has therefore been on terrestrial (land-based) fauna relevant to the project.

The following terrestrial fauna of conservation importance are considered to be of potential relevance based on species observations and/or potential presence and identification as PBFs (Priority Biodiversity Features) for which a biodiversity NNL (No Net Loss) objectives has pursued the project to align with EBRD PR6 requirements:

Small mammals:

- **European Souslik, Spermophilus citellus (EN: endangered).** Restricted to short-grass steppe and similar artificial habitats (pastures, airfields, lawns, sports fields, golf courses) on light, well-drained soils, where it can excavate its burrows. Roadsides and river banks are very important habitats in some regions (e.g. southern Romania), where they are virtually the last remaining grassland habitats in large stretches of land, and could also serve as important corridors for ground squirrels and other grassland species – IUCN.
- **Marbled Polecat, Vormela peregusna (VU: vulnerable)** Inhabit desert, semi-desert and steppe habitats, also cultivated landscapes – IUCN.

- **Eurasian Otter, Lutra lutra (NT: near threatened).** Utilize a wide variety of aquatic habitats, including highland and lowland lakes, rivers, streams, marshes, swamp forests and coastal areas well adapted to modified landscape. Most portion of their activity is concentrated on a narrow strip on either side of the interface between water and land – IUCN.
- **Lesser mole rat, Nannospalax leucodon (DD: data deficient).** Inhabits steppe grassland, meadows and pastures, in areas with a deep layer of loose, freely-draining soil in which it digs its extensive burrows. It is absent from ploughed land and arable monocultures, although it may be found in agricultural landscapes where there is a mixture of pastures, small crop-fields and orchards – IUCN.

Herpetofauna:

- **Mediterranean spur-thighed Tortoise, Testudo graeca (VU).** Inhabits a variety of dry, open scrubby habitats, meadows and pastures, sand dunes, forests, heathlands, and open habitats through its wide range. Areas of large rocks and steep slopes, tend to be avoided – IUCN.
- **European pond turtle, Emys orbicularis (NT).** Semi-aquatic - ponds, lakes, brooks, streams, rivers, drainage canals – IUCN.

Other ground-dwelling or arboreal species of lesser conservation threat status (LC: Least Concern, globally/Europe) identified for the study area (with PBF status indicated by an asterisk*) include:

Mammals:

- Caucasian squirrel, *Sciurus anomalus*
- Forest Dormouse, *Dryomys nitedula*
- Black Rat*, Rattus rattus**
- Wildcat, *Felis silvestris*

Reptiles:

- Aesculapian snake, Zamenis *longissimus*
- Balkan green lizard, *Lacerta trilineata*
- Balkan wall lizard, *Podarcis taurica*
- Blotched snake, *Elaphe sauromates*
- Caspian whip snake, *Dolichophis caspius*
- Common wall lizard, *Podarcis muralis*
- Dahl's whip snake, *Platyceps najadum*
- Dice snake, *Natrix tessellate*
- Eastern Montpellier snake, *Malpolon insignitus*
- European glass lizard, *Pseudopus apodus*
- European green lizard, *Lacerta viridis*
- European ratsnake, *Zamenis situla*
- Grass snake, *Natrix natrix**
- Italian wall lizard, *Podarcis sicula*
- Kotschy's gecko, Mediodactylus kotschyi
- Nose-horned viper, Vipera ammodytes
- Red whip snake, Platyceps collaris
- Ring-headed dwarf snake, Eirenis modestus
- Sand Boa, Eryx jaculus
- Slow worm, Anguis fragilis
- Smooth snake, Coronella austriaca
- Snake-eyed lizard, Ophisops elegans
- Snake-eyed skink, Ablepharus kitaibelii
- Soosan snake, Telescopus fallax
- Western Caspian turtle, Muaremys rivulata
- Worm snake, Typhlops vermicularis

Amphibians:

- European fire-bellied toad, Bombina bombina*
- Green Frog, Hyla orientalis
- Syrian spadefoot, Pelobates syriacus
- Agile Frog, Rana dalmatina
- Balkan-Anatolian Crested Newt, Triturus ivanbureschi

It should however be noted that based on good practice, wildlife crossing design has served, in the first instance, to meet the ecological requirements of the key conservation-important species mentioned above (threatened species based on threat status and PBFs). That being said, ERM has taken an approach to accommodate more general species ecological requirements for small mammals and reptiles (snakes, lizards, amphibians) as far as possible based on the broader set of species identified.

Based on the ecological requirements of the species mentioned above, the key habitats identified where species movement could be impeded or modified due to the planned motorway include:

- **Black Sea Garrigue** (open to closed shrubland / herbland)
- Moeso-Thracian Mesophile Hay Meadows (open grassland)

Identification of Key Locations for Wildlife Crossings

An analysis of the habitat mapping done for the RoW indicates three key areas of remaining natural habitat where species movement may be affected and which could benefit from the implementation of wildlife crossings are located as follows:

- on the slopes comprising a mosaic of Garrigue and Hay Meadow habitat to the immediate west of Sazlidere dam (labelled focal ‘Area A’ on the map in Figure A);
- within the valley associated with the southern arm of the motorway, comprising a mosaic of Garrigue and Hay Meadow habitat to the immediate west of Sazlidere dam (labelled ‘Area A’ on the map in Figure A);
- along the remaining narrow watercourses within the agricultural areas in the western section of the motorway, comprising mainly Garrigue habitat and wooded riparian habitat (labelled ‘Area C’ on the map in Figure A).

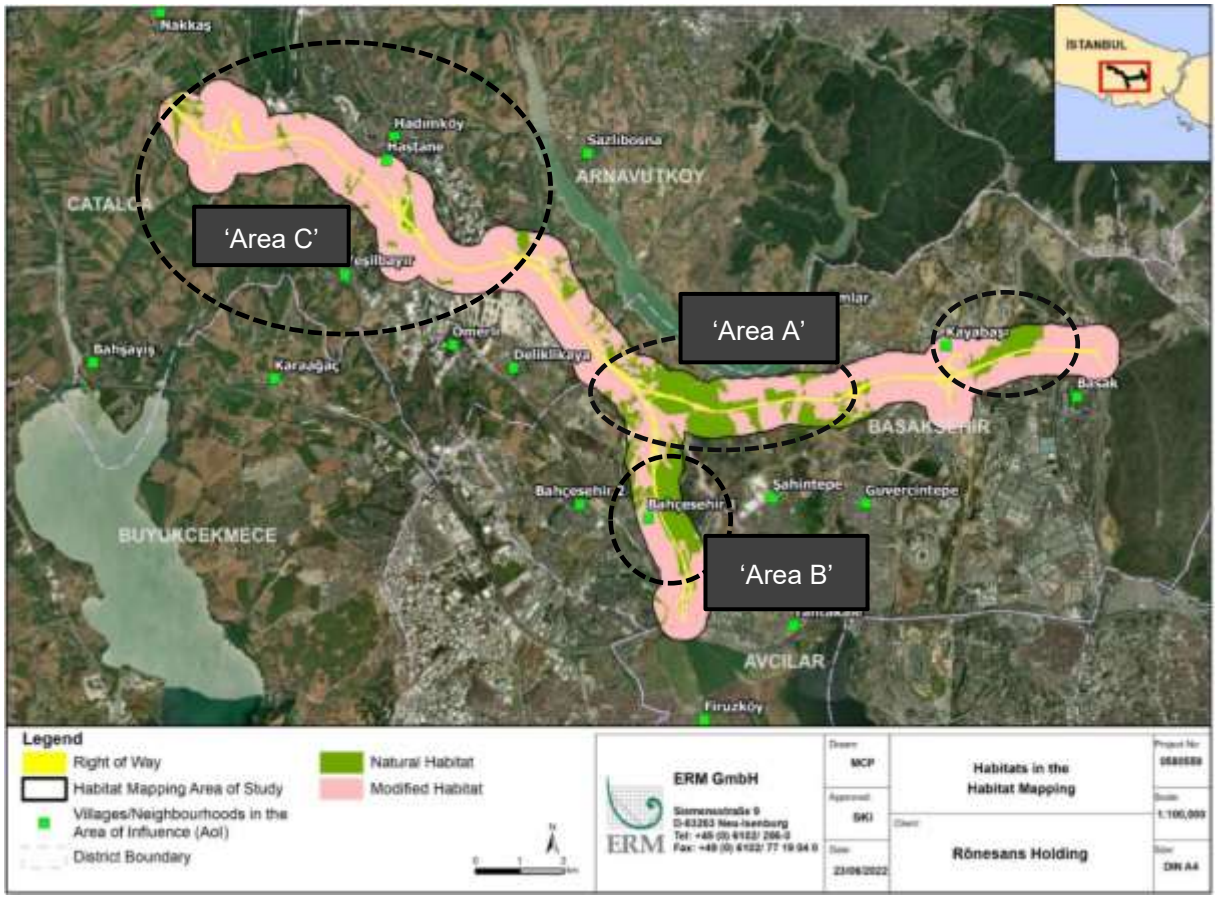

Figure A. Map showing natural vs modified habitat along the RoW

Within these broad areas, further desktop investigation was undertaken in GIS based on habitat mapping to identify possible positions for wildlife corridors. This was supported as far as possible by the onsite experience of ERM ecologists who undertook the site inspection in July 2022. Areas of high fauna activity have also been assumed to be mainly along the edges of watercourses and along the boundary between open and closed habitat types. The map in Figure B shows the location of potential wildlife movement corridors (shown as 'yellow' dashed lines on the map in Figure B and associated with areas of natural habitat linkages and existing corridors along watercourses / riparian habitats), with 14 of such corridors identified. *Note that a focus was on identifying continuous areas of habitat where existing roads and development have not already severed connections.*

Wildlife crossings are recommended for each of the 14 identified potential local corridors, with the following options suggested:

- Utilize the already **planned box culverts** for watercourse crossings as wildlife crossings (10 locations shown as 'turquoise' marker points 1, 2 and 7-14 in Figure B):
  - Given that much of the area in the west and east has been transformed by agriculture, very limited natural habitat remains and any functional wildlife corridors are likely to be restricted to the remaining wooded riparian habitats associated with the south-wards draining watercourses that have been maintained.
  - The most practical approach in this area would be to utilize planned box culverts within watercourses to function for the dual purpose of drainage management and aquatic and terrestrial fauna crossings.
  - Additional wildlife underpasses are considered unnecessary.

- **Rehabilitate habitat beneath the suspension bridge** to enhance/restore natural connectivity (the single 'blue' marker point 4 in Figure B at the planned bridge below Sazlidere dam/reservoir site):
  - The most practical approach in this area would be to facilitate the movement of terrestrial fauna below the suspension bridge and to use a combination of fencing, habitat restoration within the RoW and the creation of wildlife paths on slopes to direct fauna underneath the suspension bridge.
  - Will need to be replanted with local native vegetation if the area is disturbed during construction.
  - This will require a key focus on habitat recreation, rehabilitation and enhancement to meet species' ecological requirements. The recommended '**Habitat Restoration and Recreation Plan'** will be instrumental to achieving this objective, and habitat enhancement with a focus on facilitating wildlife movement below the bridge will need to be integrated into the Plan.
- Install new **wildlife underpasses** at three locations where terrestrial habitat connectivity will be severed by the road (three 'purple' marker points 3, 5 and 6 in Figure B):
  - Given that the road over much of the RoW is unlikely to severe any identified wildlife corridors, with the main area of intact and contiguous grassland/garrigue habitat being maintained, additional wildlife underpasses are considered largely unnecessary along much of the RoW.
  - Three locations have however been identified that will benefit from additional dry wildlife underpasses to connect terrestrial habitats that may be important for terrestrial species movement between areas.
  - Underpasses can essentially be constructed using pre-cast concrete culverts to create a 'dry' corridor beneath the road, however, there is no need for a floor to the culvert as this can be maintained as natural ground unless there is the potential for concentrated flow of runoff water through the underpass (unlikely given the location outside of known watercourses).

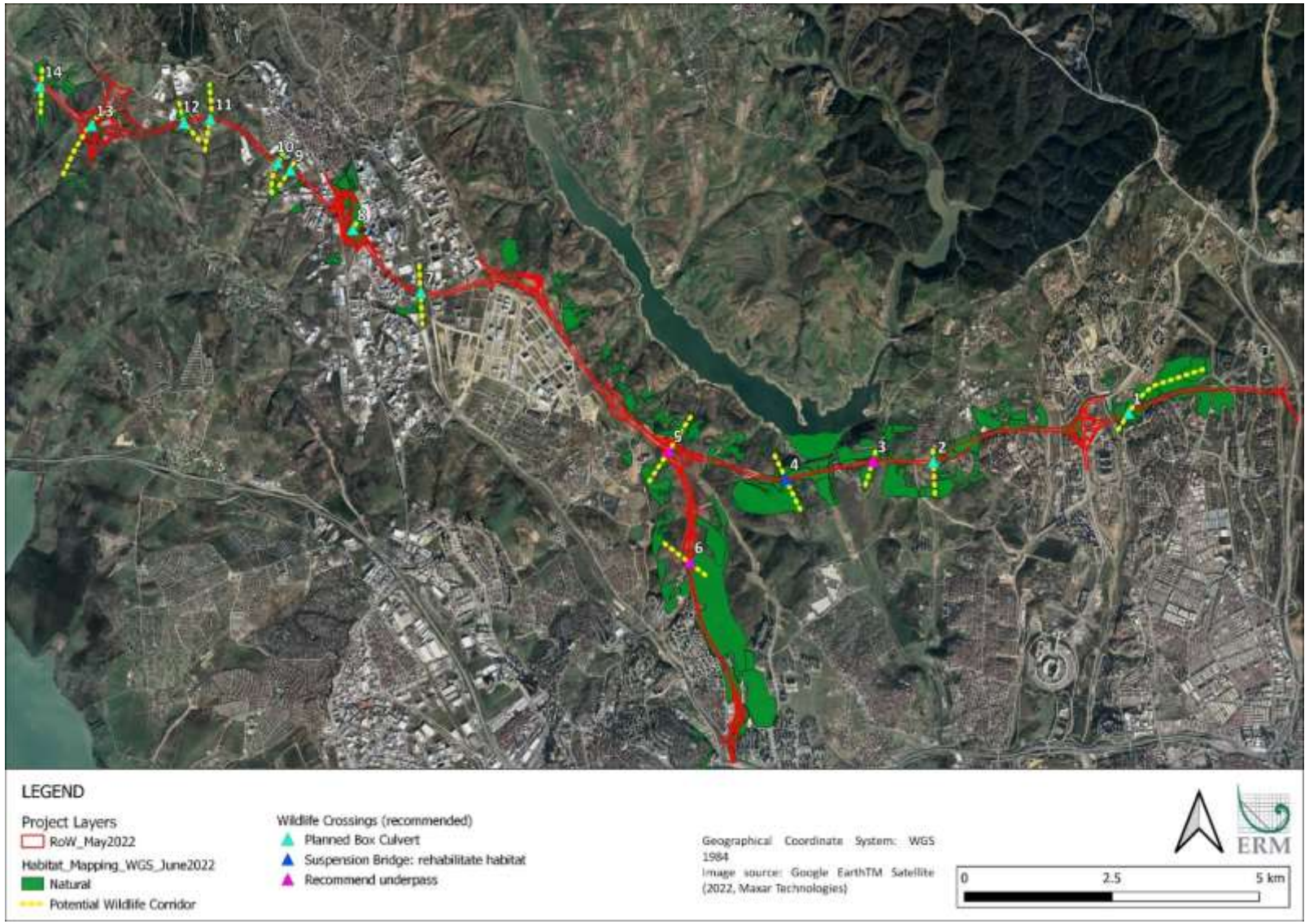

Figure B. Map showing locations for recommended wildlife crossings

Wildlife crossings design

A literature review undertaken by ERM of good practice guidance was used as a basis to inform wildlife crossing design. The following general guiding principles were selected for the project to inform crossing design, based on the review of available published and publicly available guidance on the subject:

General design guidelines:

- Crossings will be designed to serve target species at risk of habitat fragmentation and specific habitats or should otherwise accommodate the majority of species in the study area;
- Landscape bridges and wildlife overpasses have not been selected as these are significantly costlier and more suitable where there are significant movements of large migratory mammals for example, which is not the case here (smaller mammals in this case are less likely to use overpasses due to energy demands and predator risks);

Culverts at watercourse crossings:

- Culverts or underpasses are considered most suitable for fauna passage and allow the free movement of a wide range of native species and will therefore be most appropriate for the small mammals and reptiles identified;
- Culverts may be either singular or multiple, round or box sections and of various radii or rectangular box dimensions;
- Avoid rip-rap for culverts as this can impede animal movement;
- Incorporate elevated ledges in structures with no terrestrial passage zone to allow for terrestrial species movement (such as drainage culverts).

Dry underpasses:

- Dry underpasses outside of watercourses should comprise a traditional pre-cast concrete culvert or a concrete bottomless arch design;
- For dry underpasses, install natural substrate with some cover (e.g. branches, debris) to provide refuge from predators;
- Maximize microhabitat complexity and cover within the dry underpass using salvage materials (logs, root wads, rock piles, stones, branches, etc.);
- Encourage the use of the underpass by either baiting or cutting trails leading to the entrance to the structure, where appropriate;
- Avoid building underpasses at locations where secondary roads run parallel and adjacent to the entrance to the structure (as wildlife would potentially avoid these);
- If traffic volume is expected to be high on the road above the underpass it is recommended that sound attenuating walls be placed above the entrance to reduce noise and light disturbance.

Fencing requirements:

- Fencing will be combined with the crossing structure to assist with funnelling animals towards underpasses/culverts and preventing them from accessing the road;
- The fencing arrangement will be constructed on both sides of the roadway to maximize the entry of fauna on both sides of the culvert/underpass and to prevent animals being trapped on one side of the roadway;
- Small mammals and reptiles require appropriately small diameter mesh size for fences;
- Fencing below the planned suspension bridge will function to funnel animals, therefore fencing should tie into the support structures or be close as possible to side slopes, thus providing the widest area for wildlife passage;
- Cutback adjacent vegetation from fencing structures to prevent arboreal species from climbing over the fencing and into the RoW.

Table A. Conservation important species design recommendations

Faunal Groups	Species	Species Specific Requirements	Appropriate Crossing Type	Potential Crossing Locations (see map in Figure B)	Design Specifics
Small mammals	European Souslik	■ Short-grass steppe, similar artificial habitats ■ Adults grow to approximately 20cm in length and 300g in weight ■ Diurnal ■ Colonial	Underpass / box or portal culvert	Marker points 1, 3, 4, 5, 6	■ Box culvert design ■ Culvert height at least 30cm ■ Culvert opening should be at least 1m2 (1x1m, 0.5x2m for example)
	Marbled Polecat	■ Steppe habitats, cultivated landscapes ■ Adults grow to approximately 29 - 35cm in length and can weigh up to 700g ■ Diurnal, active mainly during morning and evening ■ Solitary	Underpass / box or portal culvert	Marker points 1, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14	■ Box culvert design ■ Culvert must be at least 80cm in height ■ Culvert opening should be at least $4m^2$ (2x2m, 1x4m for example)
	Eurasian Otter	■ Aquatic ■ Activity is concentrated on a narrow strip on either side of the interface between water and land ■ Typically, 60-90cm in length, weighing up to 7kg ■ Primary nocturnal ■ Typically solitary	Underpass / box or portal culvert	Marker points 1, 2, 4	■ Box culvert design ■ Culvert height of at least 50cm ■ Culvert opening should be at least 1m2 (1x1m, 0.5x2m for example)
	Lesser mole rat	■ Steppe grassland, meadows and pastures ■ 15 – 24cm in length, up to 500g in weight	Underpass / pipe or box culvert	Marker points 1, 3, 4, 5, 6	■ Box culvert design ■ Culvert height at least 30cm ■ Culvert opening should be at least 1m2 (1x1m, 0.5x2m for example)

Faunal Groups	Species	Species Specific Requirements	Appropriate Crossing Type	Potential Crossing Locations (see map in Figure B)	Design Specifics
Reptiles	Mediterranean spur-thighed tortoise	■ Dry, open habitats ■ Large rocks and steep slopes, tend to be avoided ■ Average size is 20cm in length, up to 6kg weight	Box or portal culvert	Marker points 3, 5, 6, 8	■ Culvert height at least 30cm ■ Culvert opening should be at least 1m2 (1x1m, 0.5x2m for example) ■ Avoid placing large rocks at crossing structures
	European pond turtle	■ Semi-aquatic ■ 12 - 38cm length	Box or portal culvert	Marker points 1, 2, 4, 7	■ Box culvert design ■ Culvert height at least 30cm ■ Culvert opening should be at least $1m^2$ (1x1m, 0.5x2m for example)

Table B. General design recommendations based on faunal groups

Faunal Groups	Species	General Requirement for Faunal Groups	Appropriate Crossing Type	Potential Crossing Locations (see map in Figure B)	Design Specifics
Small mammals: mice & squirrels	■ Caucasian squirrel ■ Forest Dormouse ■ Black Rat ■ Wildcat	■ Majority of small mammals prefer to cross in areas where brush and other vegetation can provide low cover ■ Prefer dense and proximate overhead cover because smaller structures seem safer ■ Mice travel easily on ground and arboreal substrates, so all cover types are acceptable ■ Squirrels are more likely to cross with vegetation cover ■ More likely to use crossing structures, especially culverts, with openings on the same side of the exclusion fence as their habitat	Underpass or Box Culvert	Potentially all 14 sites	■ Culvert height at least 30cm ■ Culvert opening should be at least $4m^2$ (2x2m for example) ■ Vegetation or other naturally occurring substrate, such as tree stumps, hollow logs, or rocks, will provide small animals with cover from predators, encouraging them to pass through a structure ■ Introduce low cover on the interior of the structure where possible, to function as protection from predators

Faunal Groups	Species	General Requirement for Faunal Groups	Appropriate Crossing Type	Potential Crossing Locations (see map in Figure B)	Design Specifics
Reptiles: small reptiles (lizards, snakes)	■ Balkan green lizard ■ Balkan wall lizard ■ Common wall lizard ■ European glass lizard ■ European green lizard ■ Italian wall lizard ■ Kotschy's gecko ■ Snake-eyed lizard ■ Snake-eyed skink ■ Western Caspian turtle ■ Aesculapian snake ■ Blotched snake ■ Caspian whip snake ■ Dahl's whip snake ■ Dice snake ■ Eastern Montpellier snake ■ European rat snake ■ Grass snake ■ Nose-horned viper ■ Red whip snake ■ Ring-headed dwarf snake ■ Sand Boa ■ Slow worm ■ Smooth snake ■ Worm snake	■ Riparian species require a moist substrate ■ Sandy substrate is generally for reptiles. ■ Riparian reptiles are prey species and rely on low-stature cover for protection from predators ■ Will readily use a culvert with a natural substrate, if it has adequate moisture and hiding cover that functions as protection ■ Must maintain moist travel conditions, without creating standing water or flooded conditions	Underpass or Pipe/Box Culvert	Potentially all 14 sites	■ Culvert height at least 30cm ■ Culvert opening should be at least $1m^2$ (1x1m or 0.5x2m for example) ■ Provide low-stature natural vegetation surrounding the approach and entrances of culverts ■ In larger culverts, maintaining or replicating streambed conditions will facilitate use by amphibians and riparian reptiles - slotted drain culverts are proven to be successful in maintaining proper moisture and drainage, while also providing ambient light ■ Include naturally occurring substrate, such as tree stumps, hollow logs, or rocks as cover for the passage where possible

Faunal Groups	Species	General Requirement for Faunal Groups	Appropriate Crossing Type	Potential Crossing Locations (see map in Figure B)	Design Specifics
Amphibians	■ European fire-bellied toad ■ Green Frog ■ Syrian spadefoot ■ Agile Frog	■ Amphibians are prey species and rely on low-stature cover for protection from predators ■ Will readily use a culvert with a natural substrate, if it has adequate moisture and hiding cover that functions as protection	Underpass or Pipe/Box Culvert	Marker points 1, 2, 4, 7, 8, 9, 10, 11, 12, 13, 14	■ Culvert height at least 30cm ■ Culvert opening should be at least $1m^2$ (1x1m or 0.5x2m for example) ■ Provide low-stature natural vegetation surrounding the approach and entrances of culverts ■ In larger culverts, maintaining or replicating streambed conditions will facilitate use by amphibians and riparian reptiles - slotted drain culverts are proven to be successful in maintaining proper moisture and drainage, while also providing ambient light ■ Include naturally occurring substrate, such as tree stumps, hollow logs, or rocks as cover for the passage where possible

Maintenance Requirements

Ongoing maintenance of the fence is important for the wildlife crossing / underpass to continue to function at an optimal level:

- Vegetation needs to be kept clear of the fence line to minimise the number of uncontrolled crossing points;
- Fence posts and strainers need to be checked regularly.
- Fencing in any areas with moist soil, such as near watercourses, need to be checked for significant signs of corrosion;
- Any defective fence sections should be replaced as soon as possible or practical; and
- Flood debris, refuse / litter and any other obstruction of culverts/underpasses will need to be regularly monitored and removed.

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