

AYDIN-DENİZLİ MOTORWAY PROJECT



NON-TECHNICAL SUMMARY

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT



ENCON ENVIRONMENTAL CONSULTANCY CO.

APRIL 2022

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Introduction

1. What is the Aydın-Denizli Motorway Project?

Aydın-Denizli Motorway Project ("Project"), which is a continuation of the previously completed İzmir-Aydın Motorway Project, was designed to connect Aydın and Denizli provinces of the Aegean Region of Turkey. The main carriageway of the motorway will be a dual carriageway of 3 lanes (2 x 3) in each direction. The total length of the Aydın-Denizli Motorway will be 163 km, of which 140 km is the main road (motorway) and 23 km is the access road. Aydın-Denizli Motorway will consist of the following two sections:

Section 1 (Aydın–Kuyucak) has a length of around 60 km. The section starts from Otoyol Ayrım Interchange which connects the Project to the existing Aydın Ring Road and ends at Km 60+865 which is close to the Karapınar neighborhood of Kuyucak district of Aydın province.

Section 2 (Kuyucak–Denizli) has a length of around 80 km. The section starts at Km 60+865 which is close to the Karapınar neighborhood of Kuyucak district of Aydın province and ends at Kocabaş Interchange which connects the Project to the Denizli-Afyon State Road.

2. Who is implementing the Project?

The Ministry of Transportation and Infrastructure (MoTI) General Directorate of Highways (KGM) has tendered for a contract in July, 2020 for the Aydın-Denizli Motorway Project ("Project") in accordance with the Law on Implementation of Some of the Investments and Services in the Framework of Build, Operate and Transfer Model (Law No: 3996). As a result of this tender, KGM has commissioned a Special Purpose Entity (SPV) for the implementation of the Aydın-Denizli Motorway Project under the related Build, Operate and Transfer (BOT) contract. In this regard, Fernas Group of Companies (Fernas Otoyol İşletmesi A.Ş. - FOIAS) has been awarded with a BOT Contract for the implementation of the Project and referred as Project Sponsor in the scope of the Environmental and Social Impact Assessment (ESIA) studies.

3. Where is the Project located?

Aydın-Denizli Motorway starts from the existing Aydın Ring Road Motorway Junction, reaches Yenipazar via Dalama, and reaches the south of Kuyucak District from the south of the Büyük Menderes River, from the north of the Hamidiye and Yazırlı campuses. Passing the D585 (Aydın-Denizli) Ayr.-Karacasu State Road, the Highway continues parallel to the D320 Aydın-Denizli State Highway from the north of Karapınar and south of the Azizabat and Yamalak campuses. Continuing from the south of Sarayköy, the Motorway passes to the north of the D320 State Highway in Kumkısık locality. From here, the Motorway surrounding Denizli Province continues in the direction of Çeltikçi-Korucuk-Kocadere and ends at Kocabaş.

In brief, the Motorway starts from Otoyol Ayrım Interchange which connects the Project to the existing Aydın Ring Road and ends at Kocabaş Interchange which connects the Project to the Denizli-Afyon State Road. Figure 1 shows the entire route and two sections of the Aydın-Denizli Motorway Project.



Figure 1 Route of the Aydın-Denizli Motorway Project

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4. How the land acquisition required for the Project will be realized?

The implementation of land acquisition and compensation for the Project take place in two interconnected work-streams:

- (i) Turkish procedures conducted by KGM, and
- (ii) The implementation of the additional procedures as per the LACRP by FOIAS to bridge the gaps between national entitlements and International Requirements.

KGM is the authority responsible from the implementation of expropriation works in accordance with national Expropriation Law. For the forestry lands, treasury lands and other state-owned lands, necessary permits, land use permits and/or easement rights are obtained by KGM from the related authorities in the scope of applicable legislation. Project expropriation and land use permitting works have already started and progressing at different paces and different locations.

Project Background

5. Why is the Project needed?

The primary aim of the Aydın-Denizli Motorway Project is to ensure provision of comfortable transportation services by means of balancing the intense traffic stress that prevail on the existing road transportation infrastructure of Aegean Region. Additionally, the Project aims to build capacity that would be necessary for meeting the anticipated traffic loads in the future. This is planned to be achieved by separating the local traffic caused by the urbanization and industrialization growing near the main transportation lines located in the east-west direction in the Aegean Region from the intercity and international traffic to the extent possible.

Implementation of the Project subject to the ESIA study will provide a transit corridor (i.e. for freight transportation) that bypasses the busy city centers and enable connection of the roads between Aydın province and Denizli province in the region.

Besides the benefits to be provided to the transportation networks and their users, Aydın-Denizli Motorway Project is anticipated to create social and economic benefits, which would include creation of employment opportunities, local and regional development, increased access to employment, markets and education, health and cultural/tourism facilities and contribution to national budget through collection of taxes and to national security.

On the other hand, to maximize those benefits and ensure environmental and social acceptance of the Project, effective management of the potential environmental and social impacts of the Project is a must.

As a result of these efforts, it is anticipated that the quality of transportation services would be increased and traffic-induced energy consumption, air emissions, time losses, etc. would be mitigated.

6. Which standards will be applied in the Project?

Aydın-Denizli Motorway Project will be in accordance with national environmental legislation, international agreements and protocols and international environmental and social standards, including the followings:

- Equator Principles (IV);
- IFC's Performance Standards on Environmental and Social Sustainability (2012);
- IFC General Environmental, Health and Safety Guidelines;
- IFC Environmental, Health and Safety Guideline for Toll Roads; and,
- IFC Environmental, Health and Safety Guideline for Construction Materials Extraction

When Turkish regulations differ from the levels and measures presented in the EHS Guidelines, the Project will aim to achieve whichever is more stringent.

The project must also comply with Turkish environmental and social legislation and, because Turkey is a candidate for accession to the European Union (EU), with EU Directives on protection of the environment and the community.

7. What has been done within the scope of the national EIA regulation?

The Aydın-Denizli Motorway Project was not planned before 1993 so that it has not an exemption from Turkish EIA legislation. In this regard, the EIA Report had been prepared in 2016, submitted to the Ministry of Environment, Urbanization and Climate Change (MoEUCC), reviewed by the evaluation committee and EIA Positive decision had issued in 2017.

8. What does the Environmental and Social Impact Assessment Process mean?

ESIA is a process for studying the effects of constructing and operating of a project on the physical, natural, cultural, social and socio-economic environment. The ESIA Report for the Aydın-Denizli Motorway Project describes the Project in detail and the impacts predicted to have on environmental and social conditions, and explain how the Project has been designed and how it will be implemented in order to minimize its adverse impacts and maximize its benefits.

9. Who is running the ESIA process?

The Environmental and Social Impact Assessment studies of the Project are carried out by ENCON Environmental Consultancy Co. ("the Independent Environmental and Social Consultant (IESC)" or "ENCON"). The works carried out within the scope of ESIA studies are as follows:

- Environmental and Social Impact Assessment (ESIA) Report
- Non-technical Summary (NTS)
- Stakeholder Engagement Plan (SEP)
- Environmental and Social Management Plan (ESMP)
- Environmental and Social Action Plan (ESAP)
- Land Acquisition Compensation and Resettlement Plan (LACRP)

The ESIA disclosure package includes the following three documents: NTS, SEP and ESAP. These disclosed documents will remain publicly available for the duration of the Project.

10. What are the important uncertainty and data limitations encountered in ESIA studies?

The ESIA Report prepared for the Aydın-Denizli Motorway Project is based on the information given in Project Description chapter. The design of the Project has progressed in parallel to the ESIA studies. Route selection has reached an advanced level within the ESIA process however design and/or optimization of certain Project components (e.g. storage sites, etc.) are still going on. The assessments done in the scope of the ESIA Report are based on the most current design. The expropriation plans have been mostly completed for the current route and land use permits have been obtained for certain parts of the Project area. On the other hand, since detailed engineering studies have not been finalized yet, Project optimization (e.g. change in the number, characteristic and locations of the engineering structures) may continue in the next phases of the construction. It should be noted that in case of any design change during and after the ESIA study has been completed, the Project would be managed in the scope of ESMS by means of Change Management Procedure, and FOIAS will inform the relevant Ministry and fulfill the legislative requirements, if any required by the Ministry.

11. What are the Project alternatives evaluated?

The project was put in the public investment program in 1994 by the former State Planning Organization with the number-91E040150. The preliminary projects and engineering services of the project were tendered in 1996, and final project reports were published in 2005 and 2007. Although the implementation of the project was tendered and the contracts were signed in 1998, the contracts were canceled due to the financing problems (credit supply for the project), and the project was excluded from the investment program in 2001. The implementation of the project (for which an EIA positive decision was taken in 2017) was tendered out in the framework of the BOT model in July 2020. Following the signing of the BOT Contract, FOIAS has continued route, and Project optimization and design work in cooperation with KGM and other related state authorities.

As explained above, throughout the project history, the alternative routes were evaluated from a technical and economic point of view. In the following paragraphs, the criteria that affected the route selection during the feasibility and tender stages and optimization of the route in the scope BOT Contract are explained.

A field walking was organized by the Project sponsor together with the related Museum Directorates in order to understand the archeological background of the Project. In this regard, 21 archeological findings along the motorway route were determined. Based on the location and status of the findings, necessary measures have been taken in terms of wall construction, construction technique revision, and re-location of the route.

Around the archeological sites, wall construction was applied to avoid potential damage to these sites. In this regard, at Km 50+900 around a registered fountain, at Km 85+500, at the border of the Kabaagaç Archeological Site, at Kumkısık intersection (Hacıeyüplü Tumulus), and at Km 135+700 Nomad Tomb, a wall was constructed between the Motorway and the structures. At Km 12+450 and at Km 12+700, the viaduct supports were located by taking into consideration of the Temple and Fountain. One of the route

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revisions was conducted at Km 33+150, where Orthasia Ancient City was located. The motorway route was revised to eliminate a possible physical impact of the project on the ancient site. Similarly, at Km 55+725-56+000 and Km 56+475-56+600, the motorway route was relocated due to the presence of Buyuk Nekropol Site and archeological structure ruins, respectively. In addition, at Km 34+900, the route was relocated to provide adequate space between the route and the fountain.

12. What are the necessary permits and licenses for the implementation of the Project?

Regarding to the Aydın-Denizli Motorway Project, main environmental permits and/or licenses that would be required for the Project are listed below:

Land Preparation and Construction Phase

- Land Use
 - Forestry permit
 - Permit for the use of pasturelands
 - Permit for the use of agricultural lands for non-agricultural purposes
 - Land use agreements with state authorities for state-owned lands
 - Expropriation of privately-owned lands
- Construction and Camp Sites
 - Crossing permits/approvals for railroads, rivers, roads, canals, power supply lines, natural gas pipelines, etc.
 - Workplace notification for Camp Sites
 - Utility permits for the temporary connection to existing utilities (telecom, electricity, etc.)
 - Fuel storage permit
 - Permits for service roads
 - Provisional operation certificate/environmental permit for the operation of ready mixed concrete plants
 - Provisional operation certificate/environmental permit for the operation of asphalt plants
 - Provisional operation certificate/environmental permit for the operation of crushing and screening plants
 - Provisional operation certificate/environmental permit for the operation of mechanical plants
- Water/Wastewater Management
 - Provisional operation certificate/environmental permit for the operation of package wastewater treatment plants
 - Wastewater treatment plant identity
 - Water Utilization Permit
- Waste Management
 - Permit for temporary waste storage areas
 - Storage permit for the access amount raised by the cut
 - Waste management plan approval
 - Agreements with licensed waste management/disposal companies
- Quarry Operation
 - Raw material production/quarry operation license
 - Permission to use long vehicles
- Blasting and Explosives Management
 - o Blasting permit

- Permit for storage of explosives
- Others
 - Private security permit
 - EIA Process

Operation Phase

- Water/Wastewater Management
 - Provisional operation certificate/environmental permit for the operation of package wastewater treatment plants at the service areas or connection quality control certificate and/or wastewater channel connection document
- Others
 - Certificate for starting up and operating of a workplace
 - Private security permit

Project Description

13. What are the main components of the Project?

The engineering structures constituting the main components of the Project are as follows:

- Viaducts
- Interchanges
- Bridges
- Underpasses
- Overpasses
- Culverts
- Toll collection areas
- Service areas
- Maintenance and operation centers

14. What are the temporary construction facilities?

During the construction works, temporary construction facilities/sites is needed. These facilities and sites include construction camp sites, quarries, plants (asphalt, concrete, mechanical, precast beam, etc.), temporary storage sites and service roads. Camp Sites includes facilities such as cafeteria, medical room, showers and toilets, wastewater treatment plants/septic tanks, water supply facilities (i.e. water wells, water tanks) etc. Following the completion of construction activities, temporary facilities will be decommissioned.

15. What are the main Project activities?

The main activities to be conducted before the commissioning of the Aydın-Denizli Motorway will include the land acquisition, land preparation and construction stages.

The works on a new route consist of three main steps. The first step, substructure works, start with earthworks that involve activities such as top soil stripping, poor soil excavations, and cut-fill operations. Following the earthworks, construction of engineering structures including bridges, underpasses, overpasses, retaining walls, culverts, concrete pipes, viaducts are performed. As the next step, pavement works, including the formation of

subbase, base, asphalt layer and concrete or parquet paving for special situations, are conducted (*http://www.kgm.gov.tr*). Following the completion of substructure and pavement works, finishing operations that involve the placement of horizontal and vertical traffic signs and installation of guardrails and fences are conducted. Once the park and service areas, maintenance/operation centers and toll collection systems are prepared, the Motorway become ready for the tests and commissioning. This standard procedure is being followed in the construction of the Aydın-Denizli Motorway.

When the Project has to cross existing infrastructure (e.g. sewage, electricity, water supply, telecommunication, natural gas, etc. lines), they will be relocated in the scope of the construction works so that no permanent interruption would occur on the services provided to local users. Similarly, some of the existing roads may need to be temporarily closed and the users of the affected roads will be directed to the service roads to ensure local transportation services are not interrupted.

During the operation phase, road maintenance and repair works will be conducted by the Project Sponsor until the end of Contract Duration. Maintenance works will involve routine maintenance, winter maintenance and periodic maintenance works. Periodic maintenance works that will involve large scale repair of the superstructures are anticipated to be required in every 10 years. Maintenance and repair works will be performed in accordance with the Operation, Maintenance and Repair Standards and technical specifications. The rights of the Project Sponsor to operate, maintain and repair the Motorway will expire at the end of the Contract Duration, when the motorway shall be transferred to the KGM free from any debt or commitment and in a well-maintained, operating, in-service condition, without any charge. Number of vehicles subject to passage fee will be identified by means of electronic passage systems to be installed in line with the specifications. Technical and legal supervision and control of the construction and operation works/periods will be executed by the personnel or independent consulting firms to be assigned by the KGM. Special structures will be inspected and released/signed off during site surveillance.

16. What is the construction workforce required for the implementation of the Project?

Large-scale employment of workforce will occur during the land preparation and construction phase of the Project. Workforce will include personnel to be employed by contractor (direct workers) and sub-contractors (contracted workers). These personnel will be categorized as site personnel and office/administrative personnel. Site personnel refers to the workers who are directly involved in the construction activities at field; while office/administrative personnel refers to the office managers, administrative staff, drivers, etc. who are not directly engaged with the construction works conducted at site. The maximum number of direct and contracted workers/personnel envisaged to be employed in each part of the project has been determined on the basis of the period of intense construction work.

Site personnel are mainly composed of engineers, technicians, foremen, topographers, operators, drivers, laboratory workers and unskilled workers. On the other hand, composition of office/administrative personnel generally includes Project Manager, Site Manager, office engineers, financial staff and other drivers.

In the operation phase, relevant personnel will work at the toll plazas, control, operation and maintenance centers. At each toll plaza, 4-5 personnel will provide services in shifts for the arrangement of cash payments. In addition, 4-5 personnel will work at each

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control center that will be established at the toll collection areas. Personnel to be employed at operation and maintenance centers will include white and blue-collar workers who will provide snow removal services and conduct maintenance, technical, repair and workshop operations.

In addition to the personnel to be employed at the toll collection areas and operation, control and maintenance works, Project will create employment opportunities for local people at the service areas that will include restaurants, tea and coffee houses, shops, gas stations, kiosks, etc.

17. How long is the contract period of the Project?

According to the BOT Contract, Contract Duration covers both the construction and operation phases. Contract Duration for the project has been specified as 20 years (3+17 years). Maximum construction period is 3 years after the effective (signing) date of the contract. If the construction period exceeds 3 years, the delay time (the time after 3 years) will be deducted from the operation period.

Stakeholder Engagement

18. Who are the Project stakeholders?

The following categories of stakeholders have been identified as being affected by or potentially interested in the Project:

- Project parties;
- National governmental and non-governmental organizations (NGOs);
- Local governmental organizations and NGOs;
- Local residents (potentially project affected persons including vulnerable groups); and
- Local businesses and universities

19. What are the stakeholder engagement activities carried out?

Within the scope of the EIA studies, two public consultation meetings were held alongside the route. The aim of the public participation meeting is to inform people who may be potentially affected about the Project and to understand their concerns, opinions and suggestions about the project. This process is the only formal requirement for stakeholder participation according to Turkish legislation.

The first of the two Public Consultation Meetings (PCMs) was held in Denizli on 14.10.2014. Approximately 65 people attended the meeting including officials of the relevant official institutions and the local people. The Second Public Participation Meeting was held in Aydın on 15.10.2014. Approximately 150 people attended this meeting. During the meetings, presentations were made to inform the public about the project. After the presentations, the questions asked by the local people about the project were answered by both the project owner KGM and KGM 2nd Regional Directorate and the EIA working group officials. These issues were generally the project route, the private properties on the route and the views of the owners of these properties. Value valuation of the lands and other issues related to expropriation were the main topics discussed at this meeting.

Moreover, a more comprehensive program of Public Consultation Meetings (PCMs) was held in February 2022 in the scope of the Aydın Denizli Motorway Project ESIA Studies. As part of this program, 5 PCMs were held along the entire Motorway route between Efeler district of Aydın province and Pamukkale district of Denizli province.

20. What are the stakeholder engagement activities planned to be carried out?

The timing and method of activities for stakeholder engagement activities are detailed in Table 1 below.

Activity	Method	Timing
Field Study	Key informant interviews, focus group discussions etc.	September 2021
Road Trip	Five Public Consultation Meetings alongside the motorway route, key informant interviews, focus group discussions etc.	February 2022
Public Announcements	Social Media announcements, Website of ADMP, Mass media arrangements etc.	Continuously as required
Disclosure of Environmental and Social Performance Reports	Website of ADMP	Annually
Activities with related parties	Formal/Informal Meetings with representatives of related parties	Continuously as required
Reporting to KGM	Official correspondences, meetings and reports	Semi-annually

Table 1 Stakeholder Engagement Activities during Project Implementation

21. What are the ways to be involved in the stakeholder engagement process?

As part of the Stakeholder Engagement Plan, a grievance mechanism has been established for the Project. The purpose of this mechanism is to establish a system for handling, evaluation and resolution of all kinds of internal and external grievances, concerns, queries and proposals of the affected communities and other stakeholders, such as construction workers, regarding the project activities.

All grievances related to the Project will be evaluated and responded. The grievance mechanism would serve for both internal (such as employees of FOIAS and sub-contractors) and external stakeholders. Any individual or organization may make enquiries and/or lodge complaints personally. The following communication channels could be used for lodging grievances:

- Telephone: <u>+90 (256) 221 1870</u>
- Project Web site: https://www.aydindenizliotoyolu.com.tr/index.html
- Project E-mail: <u>bilgi@aydindenizliotoyolu.com.tr</u>
- Grievance boxes at construction sites which already placed (mainly for workers)

• Grievance boxes at different settlements which already placed along the motorway route

• Direct contact with Unit Managers and Public Relations Specialist at construction sites

- Meetings
- All complainants can also submit their grievances anonymously if they wish.

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• In addition, FOIAS attaches great importance to the resolution of complaints related to sexual exploitation/abuse and/or sexual harassment. The confidentiality of the complainant's identity information and the priority of the complaint will be provided by FOIAS.

Potential Environmental and Social Impacts & Mitigation

22. What is the methodology used in impact assessment?

In the scope of ESIA report, study areas and possible areas of influence (AoI) for each environmental and social component are listed in Table 2. As mentioned previously, the AoI has been determined in consideration of the direct impact area of the Project activities. In this respect, the Motorway width (35.5 m) and the minimum width of the expropriation corridor (100 m) has been considered. It should be noted that the expropriation corridor will extend up to maximum 350 m at the locations of interchanges, large embankment and cut sites, service areas, etc. In addition, some of the Construction Camp Sites, quarries and disposal sites are located out of the expropriation corridor. Thus, in consideration of such components, study area had to be expanded exceptionally as needed. The overall study area covering all the sub study areas has been determined as 4,000 m corridor (2,000 m from each side of the Motorway axis) on the basis of the air quality and socio-economic environment components.

Environmental and Social Component	Study Area**	Possible Area of Influence (Aol)**
Land Use and Property	400 m	100 m
Topography, Soils and Geology	400 m	100 m
Ecology and Biodiversity	400 m	100 m
Air Quality	4,000 m	2,000 m
Noise and Vibration	2,000 m	1,000 m
Landscape and Visual Environment	400 m	400 m
Protected Areas	400 m	100 m
Cultural Heritage	400 m	100 m
Socio-economic Environment*	4,000 m	2,000 m
Health and Safety	2,000 m	1,000 m
Cumulative Impact Assessment***	10,000 m	10,000 m

Table 2 Proposed Study Areas and Possible Area of Influence for the Motorway

*It should be noted socio-economic environment, due to its nature, propound a distinction in the ESIA approach; thus the study area specified in the table for socio-economic environment should be considered as the minimum study area. Settlements, whose lands extend beyond the proposed study area, have also been included in the scoping assessments, whenever if they are likely to be affected.

**Represents the total width. For example; a 400 m study area is composed of 2 x 200 m corridors (200 m located in the left side and 200 m located in the right side of the Motorway's axis, making a total of 400 m in total).

***Within the scope of cumulative impact assessment studies, an area of 5 km north and 5 km south from the Project area was determined and cumulative impact assessment studies within this area were carried out in the Chapter 17 of the ESIA Report.

23. How will the Project affect land use and soils along the Motorway Route and how will this be managed?

The study area for the assessment of Project impacts on the land use is 8,500 ha for the 400 meters study corridor.

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A major part (more than 82%) of the entire route (for a corridor of 400 m which would cover the maximum width of the expropriation corridor that is given as 350 m) is formed of lands classified as agricultural areas according to CORINE Land Cover database.

The key findings of the land use capability analyses are summarized below:

- Agricultural lands suitable for soil cultivation (Classes I, II, III and IV) cover more than half of the entire study corridor (67.94%; 5,787.68 ha).
- Agricultural lands not suitable for soil cultivation (Class VI and VII) cover 30.28 % of the study corridor.
- Class VIII (non-arable lands) soil cover 0.09 % (7.41 ha) of the study corridor.

Lands classified as forest and semi natural areas cover 15% of the studied corridor, of which only 2% consists of forests classified as coniferous and mixed types. Within the study corridor, there is no forest specified as "coppice forest", and thus all of the actual forests are categorized as high forests having different canopy covers. The key findings of the analyses done based on the relevant Forest Management Plans of the study area are summarized below:

- According to the Forest Management Plans, 7% (601.3 ha) of the entire study corridor is covered by actual forests. Almost 52% of the actual forests are productive, where the canopy cover level changes between 10-100%, while the remainder 48% (289.05 ha) correspond to degraded forests where the canopy cover level is less than 10%.
- Regarding the forest functions, 17% (1102.66 ha) of the all actual forests serve for social and cultural function, while the remaining 53% (318.92 ha) serves for ecological and 18% (108.29 ha) serves for economic functions.
- In Section 1, actual forests (productive and degraded) cover an area of 206, 51 ha. Most of the actual forests (84.4%; 174.21 ha) in Section 1 serves for economic function. 15.6% of the actual forests in this section serve for ecological function.
- In Section 2, actual forests (productive and degraded) cover an area of 394.79 ha. Only 1.4%; of the actual forests (5.51 ha) in Section 2 serves for economic function. 72.6% of the actual forests in this section serve for ecological function, while 26% (102.66 ha) of the actual forest in this section serve for Social/cultural function.

Artificial surface consisting of urban and rural fabric, industrial or commercial units, roads, mineral extraction sites, etc. cover almost 2% of the studied corridor. The remaining negligible part (0.16%) of the corridor corresponds to water bodies.

The construction of motorway that have potential impacts on the forestland, agricultural lands, etc. are anticipated to be reduced to low levels in the long-run with effective implementation of mitigation measures, with the exceptions of (i) forests having ecological functions for which the residual impacts have been evaluated as medium due to their importance; (ii) agricultural lands that are suitable for soil cultivation for which the residual impacts have been evaluated as high or medium depending on the land use capability class of the soils to be affected; (iii) pasturelands with Class I-V land use capability class for which the residual impacts have been evaluated as medium. Regional land use character would also change significantly (may be beneficial or adverse depending on the planning measures to be taken by the authorities) in the long-run.

For Aydın and Denizli provinces, the largest rate of project parcel belongs to private property and this ratio is 82.50% for Aydın and 82.14% for Denizli.

24. What are the seismic and structural geological features of the Project area?

Turkey is located in one of the most actively deforming regions in the world. The tectonic in and around Turkey depends on relative motions between the African, the Aegean, the Arabian, the Anatolian, the Black Sea, and the Eurasian plates. Neotectonics in Turkey is mainly governed by the following three tectonic elements:

- A convergent plate boundary where the African Plate to the south is subducting beneath the Anatolian Plate to the north
- The dextral North Anatolian Fault Zone
- The sinistral East Anatolian Fault Zone

Western Turkey is located in one of the most seismically active regions in the world, owing to the fact that this region is located close to three large plate boundaries that are in constant movement. The kinematics of the regional deformation of the Aegean-Anatolian region is controlled by three critical factors. These are the westward motion of the Anatolian microplate relative to the Eurasian plate, the collision between northwest Greece-Albania and the Apulia-Adriatic platform, and the presence of the Hellenic subduction zone to the south of the Aegean province.

The collision of the Arabian plate with the Eurasian plate is still active. This is causing the accumulation of high topography in eastern Turkey and the Caucasus, driving the westward motion of the Anatolian and the Aegean plate. Continental materials are still being pushed over the oceanic crust of the eastern Mediterranean, forming the Hellenic subduction zone and the subducting slab beneath the Hellenic trench, thus maintain the present extension seen in the Aegean area. This extension is oriented NNE-SSW direction.

The project area (Aydın and Denizli provinces) is located in the Aegean region, which is dominated by horst and graben systems, divided by various normal faults. The Great Menderes Fault Zone (GMFZ), which causes destructive earthquakes at that part of Turkey, is about 200 km long and 10-100 m wide and has a right lateral character.

According to the earthquake hazard map of Turkey, which was prepared by Disaster and Emergency Management Presidency, the ground acceleration rates (PGA 475) of the Aydın and Denizli provinces vary between 0.4g and 0.6g, except for the Yenipazar region. The ground acceleration rate is about 0.6g at the northern part of the Yenipazar.

The Earthquake Hazard Map of Turkey, prepared by the Disaster & Emergency Management Authority Presidential of Earthquake Department, has been prepared with very detailed data, considering the most recent earthquake source parameters, earthquake catalogs, and new generation mathematical models. In the map, the highest ground acceleration values are shown instead of earthquake zones, and the concept of "earthquake zone" is eliminated. It assumes that a normal construction, which has 50 years of economic life, may not be exposed larger than these expected maximum acceleration values with %90 probability. For the important structures or buildings that have longer economic life, maximum acceleration values should be calculated. According to the earthquake hazard map of Turkey, the ground acceleration rates (PGA 475) of the Aydın and Denizli provinces vary between 0.4g and 0.6g, except for the Yenipazar region. The ground acceleration rate is about 0.6g at the northern part of the Yenipazar district.

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Consequently, seismic protection is one of the most critical design issues for the Motorway. Detailed investigations were conducted for assessing the stability conditions for the structural elements for both normal operation loads and under seismic loads. The Motorway is required to be designed and built to stringent Turkish and international engineering standards that will minimize the potential damage in the event of an earthquake. In the design of the engineering structures, the Standard Specifications for Highway Bridges published by the American Association of State Highway and Transportation Officials (AASHTO) has been used. In the seismic calculations, the Standard Specifications used for the seismic design of the highway bridges have been taken as a basis. Where required, Project-specific revisions have been/would be done with the approval of KGM to adapt these specifications to the Project adequately.

25. What are the noise and vibration impacts of the Project and how they will be managed?

Project land preparation and construction activities followed by the operation of the motorway are expected to result in increases in noise levels in the vicinity of the motorway route.

In order to predict the increase in noise levels in neighborhoods along the motorway route noise modeling was performed. For this purpose SoundPLAN V 8.2 (64 Bit) software was used. Modeling study aims the following:

- To predict noise levels due to construction activities of the project and preparation of noise maps.
- To predict noise levels during operation of the motorway and preparation of noise maps.
- To determine whether noise levels at a specified location exceed limit values defined in regulation and guidelines.
- Define mitigation measures to be used to decrease noise levels under acceptable values at specified locations.

Although land preparation and construction phase have the potential to result in noise impacts, it is considered that implementation of above mitigation measures would ensure that noise limits defined in RAMEN would not be exceeded at noise sensitive receptors. Regarding the operation of the motorway, after determination of receptors where noise levels exceed regulatory limits, further arrangements will be carried out for the application of action plans near suggested locations. For this purpose, for the implementation of noise barrier and other measures, background noise measurements should be made in sensitive receptors during the construction and operation phases and in cases where the results exceed the environmental noise limit values (specified in RAMEN), necessary measures should be carried out. In this respect, it is recommended that the process of taking measures will be determined after monitoring.

Vibration, on the other hand, is a low frequency disturbance producing physical movement in buildings and residents. Vibration can be measured in terms of Peak Particle Velocity, or PPV (i.e. the maximum speed of movement of a point in the ground during the passage of a source of vibration). Main sources of vibration during construction can be listed as piling, operation of vibratory equipment and blasting. As a result of the assessment, vibration arising from project construction activities is likely to result in short term disturbance at close settlements with different sensitivities which can be avoided by mitigation measures.

As a result of these measures, the residual impacts regarding vibration vary from medium to low for construction depending on the sensitivity of the receptor and type of activity.

26. What are the Project's impacts on air quality and how will these impacts be managed and how much the Project will contribute to greenhouse gas (GHG) emissions?

Main pollutants emitted from motorway projects are nitrogen oxides (NO_x (NO₂ and NO)), particulate matter (PM₁₀), carbon monoxide (CO), hydrocarbons (HC) and carbon dioxide (CO₂). PM₁₀ is expected to be emitted mainly during operation phase of the project as a result of material extraction and supply, motorway construction cut and fill operations and storage of excavated material. Particles can vary according to size and composition. PM₁₀ (particulate matter with aerodynamic diameter smaller than 10 μ m) standard is set to define the particles that people are likely to inhale and PM₁₀ has become the general measure of particulate matter. In this sense, generally limit values are defined for PM₁₀.

Air quality modeling was performed with AERMOD Gaussian Plume Air Dispersion Model which is a complete and powerful air dispersion modeling. AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain. The software generates daily, monthly as well as annual concentrations of pollutants in ambient air. The model handles a variety of pollutant sources in a wide variety of settings such as rural and urban as well as flat and complex terrain.

Air dispersion modeling, which includes Motorway Section 1 and 2, was carried out. The air quality modeling that was studied separately for the land preparation and construction phase and the operation phases was shared within the scope of the ESIA Report. As a result of the model, potential impacts were assessed, and mitigation measures and residual impacts were defined. And, it is foreseen that these effects will decrease with the mitigation measures to be implemented.

Consequently, when all scenarios are examined, it is seen that the construction of the Project does not make a significant difference for PM_{10} and settled dust emission in terms of annual air quality in the region. And, when all scenarios and measurement points are examined, it is seen that the operation phase of the Project does not make a difference for NO₂, CO, and TVOC emissions in terms of air quality in the region.

In addition to the impact on air quality, the contribution of project activities to climate change is also evaluated by estimation of the amount of greenhouse gas emissions. Greenhouse gas emissions will be generated during both construction and operation phases of the project. Total annual amount of greenhouse gas emissions resulting from the project correspond to 0.15 million tons CO_2eq . This amount corresponds to 0.03% of the total greenhouse gas emissions calculated for 2019 as reported by TurkStat (2021). Significance of the impact of the project on climate change is evaluated as low.

27. What will be Project's potential impact on water resources and how this will be managed?

The project area mainly passes through the Büyük Menderes Basin. The Büyük Menderes Basin is bounded by Küçük Menderes and Gediz basins in the north, Sakarya, Akarçay and Antalya basins in the east, Batı Akdeniz and Burdur basins in the south and

Aegean Sea in the west. The borders of Büyük Menderes Basin can be identified as; Samsun, Cevizli, Elma and Murat mountains in the north, Sandıklı mountains in the east, Madran, Babadağ and Bozdağlar mountains in the south. Total area of Büyük Menderes Basin is about 2,600,000 ha. The ratio of the projected area of the basin to the Turkey's area is 3.3%. On the other hand, population density in this basin is 86 person/km² while Turkey's average is 94 person/km² according to the Turkish Statistical Institute (TUIK) as given in the *Catchment Basin Protection Plans Büyük Menderes Basin*.

The environmental pressures in the basin include domestic wastewater discharge without treatment, irregular landfills, industrial wastes arising from textile and leather production, wastewater originating from olive oil production, agricultural and livestock activities, pollution from geothermal waters, and climate change. As a result of these pressures, Dokuzsel creek, Banaz stream, Çürüksu stream, Büyük Menderes Plain, Lake Bafa, highly polluted streams, dam lakes, and HEPPs are determined as hot spots.

A water quality assessment survey was undertaken in the scope of the ESIA studies to establish a description of the baseline conditions through Project route. In this regard, samples are taken, and relevant analyses were conducted by ENCON Laboratory Inc. in June and September 2021.

As the results of the samplings collectively imply, almost all determining parameters indicate some sort of agricultural activity (mainly irrigation returns) based on pollution in surface waters. This is due to the presence of primarily nitrogen and phosphorus compounds at the levels determining the water quality classes.

10 groundwater samples were collected and analyzed around the project route to get an idea about the groundwater quality in this area. For evaluation of the baseline conditions for groundwater quality again Annex-5, Table 2 of the Surface Water Quality Regulation was used. This approach also provided consistency for evaluating the groundwater and surface water quality together.

The analysis results for groundwater monitoring stations indicate that the water quality class is Class III for all stations based on the parameters taken into consideration. This is mainly due to the conductivity, oil and grease, nitrate nitrogen, total kjeldahl nitrogen, total nitrogen, total phosphorus, sulphur, and dissolved oxygen parameters, which shows similar results with the surface water stations.

28. How will hazardous and non-hazardous waste be managed?

As with other infrastructure projects, raw materials such as rock, sandstone, limestone, basalt, etc. will be used in significant quantities during the construction of the Aydın-Denizli Motorway Project. In the operation phase, use of materials will be limited with the maintenance activities to be conducted at the road, operation and maintenance centers and fuel stations. In addition to those mentioned raw materials, chemical materials will also be used for the Project. Chemicals that will be used will be identified by the Project Sponsor and their names, properties and Material Safety Data Sheets (MSDS) shall be provided.

Different types of wastes (hazardous, non-hazardous or inert) will be generated as a result of the materials use and personnel requirements during the land preparation and construction and operation activities. As use of construction materials and personnel involvement will be at significant levels during the construction phase, waste generation will be a more important issue when compared to operation phase. Types of wastes (i.e.

municipal, excavated materials) to be generated in each phase of the Project are identified wherever possible.

If not properly managed, waste generation may cause soil contamination, pollution of surface and groundwater resources, disturbance of flora and fauna components, visual nuisance and risks to public and personnel health and safety. Adverse impacts on ecosystem components including soil, surface and ground water resources as well as flora and fauna components and other social issues associated with waste generation can be avoided and/or minimized with effective implementation of good waste management practices in accordance with the requirements of national legislation and international standards. The incremental load to be put on the existing waste management infrastructure of the city will be another aspect related with the Project-sourced waste generation.

Wastes to be generated in the scope of Project activities will be managed in accordance with the waste management hierarchy. In this respect, waste generation will be avoided or minimized at the source to the extent possible. If this is not possible, on-site waste reuse options will be explored and implemented. If this is not possible, alternative external recycling/recovery options will be evaluated. As an ultimate alternative, wastes will be sent to final disposal only if other waste management methods are not possible. Legitimate contractors having proper licenses from the Ministry of Environment, Urbanization and Climate Change for the transportation, recycling/recovery or disposal of specific types of wastes will be used. Detailed procedures to be applied for each type of waste to be generated is provided in the Solid and Hazardous Waste Management Procedures prepared as a part of the Environmental and Social Management Plan (ESMP). Trainings will be provided to Project personnel regarding the proper implementation of waste management procedures in line with the requirements of national legislation and good site practices.

29. Are there any protected areas along the Motorway Route?

Pamukkale is the only Specially Protected Environment Area that is close to the Project area, and it intersects with the motorway between KM 121+900 and 122+650.

30. What are the potential impacts on ecology and biodiversity?

A study area is defined within a 400 m buffer along the length of the route for terrestrial studies. In the scope of the terrestrial field studies some sampling points which represent different habitat types and natural and/or sensitive areas choose by analyzing appropriate satellite imagery available from GoogleTM Earth in 400 m buffer and field surveys were carried out in those sampling points. Within the context of aquatic studies, rivers crossing on the motorway route and some streams which choose according to importance by hydrobiology experts were investigated. General information about methodologies described in following topics.

Within the scope of the field studies, a review of existing information were undertaken and ecological composition of the Motorway routes in terms of terrestrial and aquatic flora and fauna elements, potential sensitive areas and critical species were identified.

The information gathered included information on:

- Biological components on terrestrial environment,
 - Terrestrial flora and ecosystems,
 - Terrestrial habitats and ecosystems

- Flora species
- Terrestrial fauna components
 - o Amphibians and reptiles,
 - o Aves,
 - o Mammals,
- Biological components on aquatic environment,
- Key biodiversity areas,
- Important Bird Areas,
- Important Wetlands (Ramsar Sites)
- Potential sensitive areas.

As a result of the studies carried out on the Aydin-Denizli Motorway route between 31 May and 2 June 2021, 299 species and subspecies taxa belonging to a total of 66 families were identified from the area. Of these identified species, 15 are endemic, 2 of the endemic taxa are regional (*Verbascum salviifolium, Phlomis carica*), 13 (*Alyssum pateri subsp. pateri, Linum hirsutum subsp. anatolicum var. anatolicum, Cytisopsis dorycniifolia subsp. reseana, Astragalus heldreichii, Astragalus lydius, Jurinea pontica, Campanula lyrata subsp. lyrata, Verbascum splendidum, Verbascum pycnostachyum, Verbascum parviflorum, Stachys cretica subsp. smyrnaea, Phlomis nissolii, Asperula lilaciflora subsp. phyrgia*) are relatively widespread endemics.

A total of 31 Amphibian (for species belong to one ordo and three families) and Reptilian (27 species belong to two ordo and 13 families) species were observed in Motorway Project area as a result of habitat-based field studies in sampling locations. When the amphibian species observed in the project route are evaluated in terms of IUCN conservation criteria, it is seen that only *Pseudepidalea variabilisis* classified in the category of DD. The other three species are in LC (least concern) category. According to IUCN criteria, only *Testudo graeca* is included in VU category. *Emys orbicularis* is included in NT, according to IUCN criteria.

As a result of the studies carried out during the period of June 2021 on the Motorway route, a total of 76 bird species belonging to 13 ordo, 32 families were detected from the area. According to the IUCN Red List, *Streptopelia turtur* is evaluated as "VU", and *Anthus pratensis* is evaluated "NT" category. All other bird species that have been identified in the project area is in the category "LC: Least Concern".

As a result of the studies carried out during the period of June 2021 on the Project, a total of 37 mammal species belonging to six ordo, 19 families were detected from the area. According to the IUCN Red List, *Miniopterus schreibserii* is VU, and *Nannospalax leucodon* is in DD, and *Rhinolophus euryale* is in the NT category. Other mammal species that have been identified in the project area is in the category "LC: Least Concern", and no mammal species are classified as endangered and/or threatened.

Most of the fish species that is exist in rivers on motorway route belongs to family *Cyprinidae*. According to the European Red List (ERL) evaluation criteria, three species: Pseudophoxinus maeandri, Squalius carinus and *Petroleuciscus smyrnaeus* were identified in the Endangered (EN-Endangered) category. *Chondrostoma meandrense* and *Luciobarbus kottelati* species are classified as Vulnerable (VU-Sensitive), while *Aphanius anatoliae* is known as Near Threatened (NT-Near Threatened) in the same lists. *Carassius gibelio* is in the Not Evaluated (NE) category in the IUCN red lists. The rest of the species identified at the species level are in the Least Concern (LC-Low Risk) category.

Ecological bridges have been recommended for regions where terrestrial fauna species can cross. These recommendations can be updated with field and desk studies, and the most suitable ones from an engineering and ecological point of view will be determined approval of KGM.

31. How is the landscape character defined along the Motorway Route and what are the landscape and visual impacts of the Project?

Motorway itself and its large components such as viaducts, toll plazas, and service areas will be a source of change in the existing visual environment. Because of the experiential nature of visual resources, the human response to visual changes in the landscape cannot be quantified, even though the visual changes associated with a development can be described. The areas having unique or high landscape value, such as national parks, nature parks or natural forests, recreational areas, etc., are generally the ones that are most important with regard to potential visual effects of the Motorway and its components. The Project route selection has been done in due consideration of the protected areas, where a significant distance has been maintained with the Motorway components and the protected areas.

Temporary impacts of the construction phase can be mitigated to acceptable levels by means of proper rehabilitation of the construction sites. Therefore, residual visual and landscape impacts would be mostly low. Visual changes due to the motorway and permanent structures will cause a long-term impact on the landscape, either positive or negative, for different parts of the Motorway. However, since the Motorway Projects are linear projects, visual impacts will occur in a narrow (1,000 meters of each side of the Motorway Axis) but long corridor. Thus, residual impacts for the operation will be medium. Especially at the areas where rural landscape character is observed, the landscape character will change considerably at certain sections. Therefore, residual adverse impacts at these sections will be medium in construction phase. However, once landscape works are completed in operation phase (in 5-15 years), residual adverse impact at these areas will be low.

32. What are Project's potential impacts on cultural heritage and how these will be managed?

The study area for the archaeological and immovable cultural heritage assessments has been identified as the 400 m corridor (200 m from each side of the Motorway axis). The methodology followed in the scope of the studies has consisted of the following three phases as desktop studies, field surveys and reporting.

The "archaeological and immovable cultural assets" are regarded as one of the most critical high-risk groups which will be adversely affected by the Aydın-Denizli Motorway Project. The risk is not only attributed to the construction activities but other adverse effects such as vibration due to traffic during the operation phase.

A field walking was organized by the Project sponsor together with the related Museum Directorates in order to understand the archeological background of the Project. In this regard, 21 archeological findings along the motorway route were determined. Based on the location and status of the findings, necessary measures have been taken in terms of wall construction, construction technique revision, and re-location of the route.

A proposed chance find procedure has been prepared and presented in the ESIA report to be applied when any chance finds are encountered at different stages of the Project.

33. What impacts will there be on socio-economic environment?

The potential impacts of the motorway project on socio-economic environment of the region are assessed. Within this scope, the construction and operation phases of the motorway are taken into consideration and impacts are evaluated separately. For the assessment of impacts on socio-economic environment, desktop and field studies were performed. Objective of the socioeconomic field survey (conducted on 27-29, September 2021); is to determine Project affected area depending on land acquisition; to identify current socioeconomic characteristics of the settlements. In this context it is also aimed to provide database of measures and management implementations in order to assess possible social and economic impacts, and to prevent adverse impacts on socioeconomic living conditions in the settlements. Two main tools were used for quantitative and qualitative data collection during the socioeconomic survey namely the "Key Informant Questionnaires" and "Focus Group Meetings".

Within the scope of the Project in total, the key informant questionnaires were applied in five neighborhoods (Kocadere, Duacili, Yamalak, Yazırlı, and Yeniköy) that are likely to get affected by the Project. Main topics of the key informant questionnaires are population and demographic profile, socioeconomic conditions, agriculture and livestock, infrastructure services, health/education, issues related with settlements and the perceptions on the project. In parallel to the key informant questionnaires, the focus group meetings are detailed interviews conducted with selective groups in accordance with an objective. The main purpose of the focus group meeting is to identify priorities and necessities of PAPs and vulnerable groups and also to identify direct and indirect effects of the Project. Three separate focus group meetings were held with employees of Denizli Construction Camp Site, Kuyucak Construction Camp Site and Dalama Construction Camp Site between 27 - 29 of September 2021.

Within surveyed neighborhoods, there are 206 vulnerable people has been identified during the Social Field Survey. Yazırlı has the largest population with 78 individuals who are identified as vulnerable by neighborhood headmen. The female population in Yazırlı District is generally more than the males. The number of widow or women living alone was stated as around 30 by the mukhtar. Also, the number of women headed households is around 20 in Yazırlı. In this context, the number of widow and women headed households is higher than other settlements. In total, the largest vulnerable group in the five villages where the field study was conducted is the people in need of charity. According to the numbers stated by the mukhtars in five villages, the number of people in need of charity is 67. In the interviews with the mukhtars, some of the physically and mentally disabled people were also mentioned as people in need of nursing. Again in the interviews, it was stated that refugee households lived in some villages. These refugees are generally young, male, and it has been stated that they earn their living mostly by shepherding. According to the Key informant interviews in these five neighborhoods, the total population stated by mukhtars is 7,367. Thus, the total of 206 vulnerable people consists of nearly %3 of total population which is social study conducted.

Various social impacts are expected to occur within the scope of the proposed Project's land preparation and construction phase. These impacts can be categorized as: the impacts on livelihoods due to the expropriation and land acquisition activities, restriction of

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access to the agricultural and pasturelands due to the route design, impacts on local business, impacts of noise and dust emissions generated by construction activities on human health and livelihoods, effects on infrastructures and distribution of utility services, short and long term employment opportunities created by Project activities, changes in the demographic structure of the settlements, and a possible increase of tensions and conflicts in the local community.

The potential mitigation measures have been taken on the identified impacts and the significance of the identified impacts before and after the implementation of mitigation measures will be studied in the scope of ESIA report. In general, potential impacts on the livelihoods, infrastructures and utility services and demographic characteristics etc. are anticipated to be reduced to low levels in the long-run with effective implementation of mitigation measures, with the exception of impacts on livestock activities within the affected settlements. However, residual impacts related to the livestock owners which the residual impacts have been evaluated as medium due to their importance.

34. What are the labor management strategies and occupational health and safety risks?

Since a large number of direct and contracted personnel will be involved in and significant earthworks will be conducted in the land preparation and construction activities, labor and working conditions and occupational health and safety management will be an important aspect of the Project in this phase. On the other hand, maintenance activities to be conducted during the operation phase would also be subject to occupational health and safety risks for the construction and operation phase would mainly include physical and chemical hazards. Biological and radiological hazards are not anticipated to be applicable to the Aydın-Denizli Motorway Project. Accordingly, labor and working conditions, general occupational health and safety risks (e.g. hygiene, access, air supply, etc.) especially during the construction phase, physical hazards during the construction and operation phases, chemical hazards during the construction and operation phases, and an emergency preparedness and response have been assessed in the scope of ESIA report.

As with the Aydın Denizli Motorway, in projects that entail involvement of large numbers of personnel, management of working relationships and terms of employment, provision of adequate accommodation and working conditions, ensuring non-discrimination, equal opportunity and employee satisfaction and establishment of mechanisms for feedback are particularly important issues to establish a sound worker-management relationship. This relationship would ensure efficiency and productivity of the activities/operations and avoid any reputational risk that may jeopardize the Project. Accordingly, issues related with labor and working conditions, including safety and security of the workers, will have to be properly managed during the construction and operation phases of the Aydın Denizli Motorway Project.

Since the Project Sponsor will comply with the requirements of Turkish labor law, which covers the basic principles of international labor standards and the IFC PS 2 in the issues of equal treatment of employees, restrictions on the working age and employment of children, avoidance of forced labor and ensuring occupational health and safety at the workplaces, and implement Project-specific labor and employment and health and safety policies, no significant risk is anticipated in labor issues during the construction and operation phases of the Project.

On the other hand, occupational health and safety is an important aspect of the construction and operation of large infrastructure projects, especially during the construction phase when large number of direct and contracted personnel is involved to perform large-scale earthwork and construction activities.

Project Sponsor will ensure that the sub-contractors do have the technical capability to manage the occupational health and safety issues of their employees. Accordingly, all the sub-contractors who will be involved in the Project will be required to will be subject to the same contractual conditions with the Project Sponsor in the issue of occupational health and safety and will be required to implement Project's occupational health and safety policies. Regarding the labor conditions, sub-contractors will be subject to the same contractual conditions with the Project Sponsor. Duration of the contracts to be made with the sub-contractors will not exceed the duration of BOT Contract. In the management of occupational health and safety hazards, preventive and protective measures will be taken in the following order of priority in accordance with the following approach as recommended by IFC both during the construction and operation phases of the Project:

- The activity causing the hazard will be eliminated from the work process;
- Hazard will be controlled at its source through use of engineering controls.
- Hazard will be minimized through design of safe work systems and administrative or institutional control measures.
- Appropriate personal protective equipment (PPE) will be provided in conjunction with training, use, and maintenance of the PPE.

With effective implementation of occupational health and safety measures including compliance with the requirements of the relevant regulations, implementation of safe practices and procedures when conducting assignments, provision of occupational health and safety trainings, proper use of personal protective equipment (PPE) and monitoring of occupational health and safety impacts, number of accidents/incidents would be effectively reduced and associated risks with significant consequences are likely to be well managed throughout the construction and operation phases of the Project.

35. What are the Project-related community health and safety risks?

The Aydın-Denizli Motorway will involve typical community health and safety impacts and/or risks that are applicable in most of the large scale infrastructure projects. Especially, construction phase will include significant earth moving activities and involvement of a large number of workforces. However, due to temporary nature of the construction activities, associated impacts on the health and safety of the community will be short-term and temporary. During the operation phase, pedestrian safety, traffic safety and emergency preparedness and response would be among the most important community health and safety issues that are to be properly managed throughout the long-term operational activities. It should be noted that, with the improved road standards, accidents rates for the associated routes are anticipated to reduce providing an overall benefit to the community safety and public welfare. Main community health and safety issues to be covered are traffic safety during construction and operation, impacts of blasting operations during construction, impacts on water quality and availability during construction, airborne/communicable diseases due to construction workforce inflow, pedestrian safety during operation, emergency preparedness and response during the construction and operation, disturbance of public health and welfare due to air emissions, noise generation, water-borne, waterbased and water-related during the construction and operation, security personnel arrangements during construction, and structural safety during operation.

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Project-related risk would be minimized by taking relevant planning and design measures and implementation of an Emergency Preparedness and Response Plan, which meet the international requirements. On the other hand, some of the traffic and pedestrian safety risks will be mostly related with the users of the road on which the Project Sponsor will only have limited control.

36. What are the potential cumulative impacts?

Cumulative impacts are defined as the "impacts that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to in this document as "developments") when added to other existing, planned, and/or reasonably anticipated future ones. Several independent activities/projects/developments with insignificant effects on their own can together cause a cumulative impact that can be significant. Cumulative Impact Assessment (CIA), assessment of the possible impacts and risks of planned actions, projects or activities (development), together with other human activities and natural environmental and social external factors, on selected Valued Ecosystem Components (VECs) and reducing or mitigating the identified cumulative impacts and risks of the process that involves proposing concrete measures.as far as possible. IFC describes the CIA process in six steps in its Good Practice Handbook on Cumulative Impact

Step 1: Scoping Phase I – VECs, Spatial and Temporal Boundaries
Step 2: Scoping Phase II – Other Activities and Environmental Drivers
Step 3: Establish Information on Baseline Status of VECs
Step 4: Assess Cumulative Impacts on VECs
Step 5: Assess Significance of Predicted Cumulative Impacts
Step 6: Management of Cumulative Impacts – Design and Implementation

As a result of the preliminary evaluations made, considering the prevailing wind direction of the secondary projects around the project area, climatic characteristics, the distribution of the effects on air quality, the spread of the noise effect, the dimensions of the change to be observed on the flora and fauna, the project route should be 5 km in the north and south directions as a total of 10 km corridor cumulative impact assessment area has been selected. It is clear that this area is wide enough to allow appropriate assessment of the cumulative impacts that may be on VECs.

Within the scope of the cumulative impact assessment of the project, the "Alsancak-Egirdir Line between Aydın-Denizli II. Line Railway Project Total: 135+250 Km; Removing 130+623 Km Existing Railway Line to Double Line and Construction of 4+627 Km Double-Railed New Railways" project remains within the corridor of 10 km in total, 5 km in the north and south directions of the Aydın-Denizli Motorway project route, which was determined as the cumulative area of impact, and it is seen that the Aydın-Denizli Motorway project route of this project overlaps in certain parts. Therefore, this project was included in the cumulative impact assessment studies.

Among VECs assigned to high and moderate cumulative impacts; agricultural areas in Aydın province Efeler, Nazilli, Kuyucak, Buharkent districts and Denizli province Saraykoy, Merkezefendi districts are under the stress of more than one activity. Aydın-Denizli Motorway route; between Km 121+900 and Km 122+650, Pamukkale Specially Protected Environmental Area passes through the protection boundaries. There are no other projects whose route passes through the Special Environmental Protection Area. Therefore, the cumulative impacts on this legally protected area are identified as moderate. Similarly,

registered cultural heritage sites are not within the scope of more than one project. However, cooperation with relevant authorities is essential and route and project optimization may be required to avoid/minimize cumulative impacts. Cumulative impacts on most settlements will be of local importance, but a few settlements will be under the special influence of more than one project.

It is recommended that, the following specific actions that may be necessary to effectively manage cumulative impacts. Implementation of these measures will only be possible with the understanding, support and approval of the Ministry of Transport and Infrastructure as the owner of transport infrastructure projects and cooperation with other relevant planning and permitting authorities:

- Project design changes (location, timing, technology) to avoid cumulative impacts;
- Project mitigation to minimize cumulative impacts, including adaptive management approaches to project mitigation;
- Mitigation of project impacts by other projects (not under control of the proponent to further minimize impacts on VECs);
- Collaborative protection and development of regional areas to preserve biodiversity;
- Collaborative engagement in other regional cumulative impact management strategies;
- Participation in regional monitoring programs to assess the realized cumulative impacts and effectiveness of management efforts.

Environmental and Social Management System

37. What is the purpose and scope of the Project Environmental and Social Management System?

Environmental and Social Management System (ESMS) has been developed as a part of the Project's ESIA process in order to generate a systematic approach for daily implementations within the Aydın-Denizli Motorway Project.

ESMS consists of the following elements:

- (i) Project's policies on environmental, health, safety and labor aspects;
- (ii) Organizational structure of the Project;
- (iii) An integrated Environmental and Social Management Plan (ESMP) defining the main management approaches and mitigation measures for relevant environmental and social subjects;
- (iv) Framework for the monitoring and review of the ESMP

In addition, the Emergency Preparedness and Response Plan and the Stakeholder Engagement Plan prepared as a part of the ESIA Report, will be complementary parts of the Project's ESMS.

38. What are the management plans to be implemented in the Project?

Environmental and Social Management Plans (ESMP) are set forward to implement principles that are required to prevent, control and minimize potential impacts of the Project on the natural environment, wildlife and local communities. The idea is to apply environmentally sound management strategies in line with related national legislation, international agreements and protocols, and international standards to carry out project activities conserving the integrity of natural systems without negatively affecting the surrounding environment. As a part of the ESMS, an ESMP, consisting of sub-procedures on the management of environmental (e.g. water and wastewater, waste, hazardous materials, wildlife, etc.) and health and safety (occupational and community related) aspects of the Project has been prepared.

Under the ESMP, several subject specific procedures, laying out the main management approaches and mitigation measures together with a monitoring scheme in order to assess the effectiveness of mitigation measures to be implemented, have been developed. The Project ESMP and the procedures under the plans are listed below:

- Environmental Management Plan
 - Air Quality and Emissions Management Procedure
 - Water Quality, Wastewater and Storm Water Management Procedure
 - Solid Waste Management Procedure
 - Hazardous Waste Management Procedure
 - Noise Management Procedure
 - Habitat Alteration, Fragmentation and Wildlife Management Procedure
 - o Quarry Management Procedure
- Occupational Health and Safety Management Plan
 - Physical Hazards Management Procedure
 - Chemical Hazards Management Procedure
 - Noise Management Procedure
 - Personal Protective Equipment (PPE) Management Procedure
 - Communication and Training Management Procedure
 - Workers Accommodation Procedure
- Community Health and Safety Plan
 - Fire Management Procedure
 - Traffic Management Procedure
- Subcontractor Management Plan
- Change Management Procedure

In addition, the Emergency Preparedness and Response Plan and the Stakeholder Engagement Plan (including Grievance Mechanism) prepared as a part of the ESIA studies will be complementary parts of the Project's ESMS.

39. How will the Project Sponsor fulfill the commitments made in the ESIA and ESMS?

In accordance with the Technical Specifications of KGM, FOIAS will establish certified (ISO 9001, ISO 14001 and OHSAS 18001) Quality Management Systems. These systems will aim to ensure that all the construction activities and the services to be provided would cover quality assurance aspects. In addition to providing quality assurance, the Project will be implemented in accordance with the requirements of the national environmental legislation, international agreements and protocols and international environmental and

social standards including the Equator Principles (EPs) and International Finance Corporation's (IFC) Policy (2012) and related Performance Standards (PSs) on Environmental and Social Sustainability that would be applicable to the Aydın-Denizli Motorway Project. Environmental and Social Management System (ESMS) has been developed as a part of the Project's ESIA process.

The Project ESMS has been established to ensure that all the implementations within the Project will be carried out in an environmentally sound manner. The ESMS will also provide the main framework for implementation of health and safety measures for the employees and the affected communities.

As a part of the ESMS, the ESMP will consist of procedures indicating the good practices, mitigation measures and monitoring plan. However the system will not be limited with the provisions laid out in the document since continuous improvement will be carried out through an ongoing process of reviewing, correcting and improving. The ESMS will be implemented by the FOIAS and all the subcontractors involved. With effective implementation of the ESMS, compliance with the applicable national and international legislation and standards will be guaranteed.

40. What will the Project Sponsor do in case of an emergency?

A Project-specific Emergency Preparedness and Response Plan was prepared in order to minimize reaction time and adverse effects in cases of environmental, health and safety accidents/incidents, and will be implemented throughout the Project life cycle. FOIAS will establish communication channels with the Project personnel and local communities regarding to emergency response.

> Aydın-Denizli Motorway Project in 40 Questions