



Operational Programme of the European Union for Regional Development



**PREPARATION OF MAIN DESIGN AND TENDER
DOCUMENTATION FOR CONSTRUCTION OF NEW RAILWAY
TRACK**

**SECTION KRIVA PALANKA-BORDER WITH THE REPUBLIC
OF BULGARIA, PART OF CORRIDOR VIII**

Ref. no. EuropeAid/36050/IH/SER/MK

NON-TECHNICAL SUMMARY

**Environmental and Social Impact Assessment Study for the
construction of new railway track at the section**

**Kriva Palanka-border with the Republic of Bulgaria, part of
Corridor VIII**

November, 2017



This project is funded by the European Union

The project is implemented by



in

consortium with



and



1 INTRODUCTION

Corridor VIII is an integral part of one of five new Trans-National European axes: the South-East axle. Also in the context of the Euro-Asiatic transport links, Corridor VIII was identified to connect Europe with Asia, the Middle and far East to the Balkans and Turkey with both railway and road infrastructure.

The existing railway line along Corridor VIII is 155 km long. Within this corridor, it is planned to build new railway links that will connect the existing east-west line through:

- Stretch 89 km long, to the east, from Kumanovo to the border with Bulgaria, which will connect Macedonia with Varna (Bulgaria) and the Black Sea;
- Stretch 66 km long, in western Macedonia, from Kicevo to the border with Albania, which will connect Macedonia with Durres (Albania) and the Adriatic Sea.

The Eastern section of the Corridor VIII, between Kumanovo and the Bulgarian Border, includes 3 sub-sections:

- a) Kumanovo – Beljakovce (under construction);
- b) Beljakovce - Kriva Palanka (project documentation is prepared and reconstruction and construction is envisaged);
- c) ***Kriva Palanka - Bulgarian Border, new construction sub-section, which should be constructed and is a subject of this ESIA Study.***

The Macedonian authorities, i.e. Ministry of Transport and communication, intend to proceed with the development of the Section 3. For this purpose, EU IPA funding is intended for the project-Preparation of detailed design and tender documentation for construction of new railway section Kriva Palanka-border with Republic of Bulgaria, as part of corridor VIII. The holder of the Project is a consortium composed of IDOM, ADT OMEGA and JPD. Under this project (contract number EuropeAid / 136050 / IH / SER / MK), the consortium led by IDOM started with the realization of the work task for the Project, which includes the preparation of: Updated Feasibility Study, Study / Traffic Model, Cost-Benefit Analysis (CBA), Environmental Impact Assessment and Social Impact Assessment (ESIA), preliminary and main designs, for section 3 of the eastern part of the railway corridor VIII.

In 2011-2012 an ESIA Study was prepared for the eastern part of the Corridor VIII stretching from Kumanovo to the border with the Republic of Bulgaria (for all 3 sections), for which the Ministry of environment and physical planning issued a Consent for the ESIA Study on 05.11.2012 (number 11-1974/5). Because of the expired relevance of the issued Consent and the fact that during the technical documentation preparation process (preliminary and detailed designs) for the section 3 (Kriva Palanka-border with Bulgaria) there were some changes in the number of bridges and tunnels, as well as the fact that in the prepared ESIA from 2012 the border tunnel No. 22 was not taken into consideration (with a total length of 2.383 m, out of which 1,193.70 m belong to the territory of Bulgaria, at the chainage km 87+280,00 to km 89+560,00), on the last technical meeting (1-2.11.2016) with the main beneficiary (Ministry of Transport and Communication and Macedonian Railways-Infrastructure), designers and Jaspers was decided to be prepared completely new ESIA Study for the third section of the railway (it was also a requirement in the ToR).

The new version of the EIA Study will describe all activities related to the construction and operation of the third section of the railway line Kriva Palanka-Border with the Republic of Bulgaria, the impacts that will arise from these activities, as well as measures to mitigate the impacts (during construction and operation).

The consortium, engaged for the preparation of the project and tender documentation, comprised of IDOM, ADT OMEGA and RTC (Railway trade company), hired "DEKONS-EMA"-Environmental Management Associates from Skopje, as a subcontractor (Contract No.0307-57/1 from 11.05.2016), to prepare ESIA Study for the construction of a new railway line at the section Kriva Palanka-border with the Republic of Bulgaria, as part of Corridor VIII.

The following team was engaged in the preparation of the ESIA Study:

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2 GENERAL INFORMATION

2.1 Introduction

The Railway Corridor VIII, in the section that passes through the Republic of Macedonia, consists of two sections: the first, western section in the direction of Albania and the eastern section in the direction of Bulgaria. At the moment, the Republic of Macedonia has no railway connection with the two neighboring countries: Albania and Bulgaria. In the Spatial Plan of the Republic of Macedonia (2004-2020), Corridor VIII is included as a very important transport corridor for the country. Also, the National Transport Strategy of the Republic of Macedonia from 2007-2017 confirms the high state priority of the railway Corridor VIII for the country.

For the development of the railway connection between the Republic of Macedonia and the Republic of Bulgaria, through Corridor VIII, there is a bilateral agreement concluded between the two countries since 1993. The plans and activities for the construction of the eastern part of the railway line from Kumanovo to the Bulgarian border were started at the beginning of the XIX century and with interruptions (with a stronger intensity since 1994) were carried out continuously until 2004 when they were stopped due to a lack of financial resources. The Government of the Republic of Macedonia plans to continue completing the east section of the railway Corridor VIII (which includes section 3), with EU-IPA funding being applied for the preparation of project documentation, part of which is a new ESIA Study.

The subject of the ESIA Study will be the construction of the new railway line of section 3: Kriva Palanka-Border with the Republic of Bulgaria.

2.2 National legal framework requirements

The procedure for environmental impact assessment is defined in the Law on environment („Official Gazette of the Republic of Macedonia“ No. 53/05, 81/05, 24/07, 159/08, 83/09, 48/10, 124/10, 51/11, 123/12, 93/13, 42/14, 44/15, 129/15, 192/15 and 39/16) where the requirements of the EU Directive for EIA (85/337/EEK) are transposed.

In accordance with the Regulation on determining the projects and criteria by which the need for conducting an Environmental Impact Assessment is determined (“Official Gazette of the Republic of Macedonia” No. 74/05, 109/09, 164/12 and 202/16), the project for construction of a new railway line at the section Kriva Palanka-border with Bulgaria, as part of Corridor VIII, belongs to Appendix 1-Projects for which the need for conducting an Environmental Impact Assessment is mandatory, **section 7. Construction of: (a) railway lines at great distances and airports with a length of 2.100 m or more.**

In accordance with the established procedure, the Ministry of Transport and Communication, in the role of implementator of the Project, issued a Notice of intention for implementation of the project to the Ministry of environment and physical planning (MESP). In a procedure determined by the Law on environment and the Regulation on determining the projects and criteria by which the need for conducting an Environmental Impact Assessment is determined, MESP issued a Decision No. 11-5508/2 stating that an EIA procedure should be implemented, and defined the scope of the Study.

As a result of the envisaged activities for construction of the border tunnel that connects Macedonia and Bulgaria, a transboundary cooperation between the authorized ministries of both countries will be carried out, in accordance with the requirements of the Espoo Convention (Convention for assessment of impacts from individual projects in a transboundary context).

The activities for implementation of the ESIA procedure are shown in the following table.

Table 1 Overview of the ESIA procedure

Phase	Documentation	Issued/Prepared	Date of submission/issuing/publishing	Comments
Scoping	Notification of the intention for the implementation of the project and scoping of the ESIA	Submitted to MoEPP	February 2017	Submitted by the Ministry of Transport and Communications
		Published on the MoEPP website	5.04.2017	Available to the public
		Translated into English and Bulgarian language and submitted to the eventually affected party-Republic of Bulgaria, under article 3 of the Espoo Convention	11-2504/3 from 1.08.2017	The Notification is submitted to the Bulgarian Ministry of environment and waters, through the Macedonian MoEPP, as a technical Focal point of the Espoo Convention through the Ministry of foreign affairs, as a political Focal point of Espoo Convention in the Republic of Macedonia
	Decision on the need for implementing an ESIA procedure and Opinion for the scope of the ESIA Study	MoEPP-No. 11-5508/2	16.11.2017 November, 2017	Published on the web site of the MoEPP Published in one daily newspapers
Submission of the ESIA Study	ESIA Study (Article 83 from the Law on Environment)	Consultant	November, 2017	It will be submitted to the MoEPP by the Ministry of Transport and Communications
Publishing of information relevant to the ESIA Study-Public consultation	Complete ESIA Study (Article 83 and 90 from the Law on Environment)	MoEPP	November, 2017	The Study will be published on the MEPP website and the Municipality of Kriva Palanka

	Submission of information to the Republic of Bulgaria (according to Article 93 from the Law on Environment)	MEPP Ministry of transport and communication Republic of Bulgaria	November, 2017	MoEPP and the Ministry of Transport and Communication will submit information on the contents of the study to the Ministry of Environment and Physical Planning of the Republic of Bulgaria in order to implement the requirements of the Espoo Convention for transboundary assessment of the impacts, i.e. they will secure conditions for informing the public and for issuing Opinions and comments from the affected public, in accordance with the legal framework of the Republic of Macedonia.
	Information on the place and time for implementing the public hearing (Article 90 from the Law on Environment)	MEPP and the Ministry of Transport and Communication		Published on the websites of MEPP, Ministry of Transport and Communication, and the Municipality of Kriva Palanka
	Public hearing implementation (Article 91 from the Law on Environment)	Consultant, MEPP, Ministry of Transport and Communication		The public hearing will be held in the Municipality of Kriva Palanka
	Minutes from the public hearing (Article 91 from the Law on Environment)	MEPP		Preparation of minutes from the public hearing
Assessment of the compatibility of the ESIA Study	Preparation of Compatibility Report (Article 86 and 93 from the Law on Environment)	MEPP		The Minister of Environment establishes an expert committee for the assessment of the compatibility of the ESIA Study
	Publishing the Compatibility Report for the ESIA Study	MEPP		Published on the MEPP website and two daily newspapers
Consent for	Decision	MEPP		Signing and publishing

project implementation	Decision	MEPP	Published on the MEPP website
Submission of the Study to the Republic of Bulgaria	Submission of the ESIA Study and the Decision on the Study	MEPP	MEPP will submit the Study and the Decision on the Study to the Republic of Bulgaria

2.3 Project objectives and benefits from its implementation

The main objective of the Project for construction of the railway Kriva Palanka-Republic of Bulgaria-Section 3 from the railway Corridor VIII-Eastern part is promotion of the Balkan regional economic development, with an opportunity to use the significant potential for national and regional economic growth that the Corridor offers and creating new opportunities.

The construction of the remaining rail links from Corridor VIII will contribute to: attracting larger domestic passenger and freight traffic, which currently takes place mostly through the roads, or does not take place at all; increase of international passenger traffic; increasing the use of the railways for the import and export of materials; increasing the use of railways by international transit traffic; linking Macedonia with the neighboring countries and opening up opportunities for economic and sustainable development, improving the safety and security of the corridor, mitigating climate change as a result of reducing greenhouse gas emissions and so on.

3 PROJECT DESCRIPTION

Railway traffic in Section 3 is planned to start in 2025, that is, the construction works will commence in 2021.

3.1 Project area and project features

The project area is placed in the Municipality of Kriva Palanka, which belong to Northeast Region of the Republic of Macedonia.

Section 3 starts before the town of Kriva Palanka (at km 64 + 942.01) and goes to the border with the Republic of Bulgaria (at km 88 + 364.65). The Railway alignment of Section 3 on the territory of the Republic of Bulgaria starts from km 88 + 364.65 (reference station in the territory of the Republic of Bulgaria: km 138 + 325.40) and ends 100 m after the portal of the tunnel Deve Bair, km 89 + 658.47 (reference Chainage on the territory of the Republic of Bulgaria: km 137 + 031.58).

Project documentation for the railway line between km 89 + 658.47 and km 90 + 555.67 (railway station "Gyueshevo") is not subject to the analysis of this ESIA Study.

The projected alignment starts from km 64 + 942.01 on the northern side of the Kriva Reka valley. At km 71.0 it goes to Kriva Palanka, where a railway station will be built. Because the valley and the adjacent hills of Kriva Palanka are densely populated by buildings, the railway will pass through a 1068 m long tunnel in the town area in order to avoid major demolition of buildings. From the end of the tunnel to km 76.0, the railway passes between Kriva Reka and the planned motorway. At km 76.0 in the river valley of Kriva Reka, the route makes a 90 ° turn, changing its direction from the northeast to the southeast. After 3 km, the railway crosses to the south side of the valley. At km 82.3, a horseshoe curve is planned in order to get the length and the line to climb to the entrance of the existing border tunnel. The horseshoe-shaped curvature is near the tunnel.

The border tunnel "Deve Bair" has a projected length of 2 383 m, of which 1 193.70 m are on the territory of the Republic of Bulgaria (reference station in Bulgaria: km 137 + 131.7 to km 138 + 325.4). The construction of the tunnel from the Bulgarian side began in 1941. On the Bulgarian side, the 550 m section of the tunnel is completed, made with a bed of one layer consisting of concrete blocks on

the vault of the tunnel and concrete on the walls of the tunnel. To km 138 + 158 there follows a partially excavated and unfinished part of the tunnel - mainly galleries, etc.

On the Macedonian side, the tunnel is constructed in a length of 250 m, and the entrance is partially demolished. Along the alignment there are 22 tunnels with a total length of about 9 km and 52 bridges (one of which is replaced with a culvert) with a total length of about 5 km.

Section 3 has one station and one halt, namely: a station in Kriva Palanka at km 71.03 with 2 side tracks and 3 tracks for maintenance and stabilization and a halt in the village of Zhidilovo at km 80.8 with two side tracks. In both cases, it is planned to build a passenger building and a railway maintenance facility. For this purpose, several new facilities are proposed.

At the section from Kriva Palanka to the border with Bulgaria there is interference with several roads and alignments of linear facilities. The line will be electrified, that is, all the lines of the open track and all the side tracks and stabilization tracks that are located at the station and the station will be electrified.

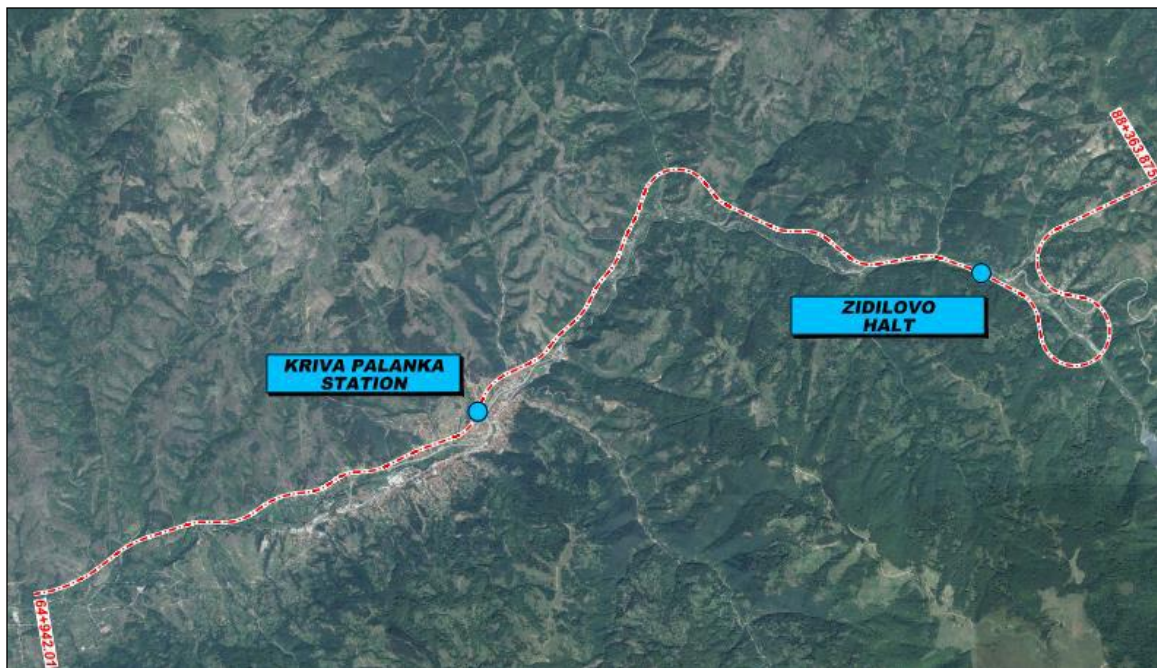


Figure 1 Project area

The permanent way consists of: rails (continuous welded rails, continuous rail track), fastening (elastic fastening system), sleepers: pre-stressed monoblock concrete sleepers and wooden sleepers (for turnouts), ballast and protective layer.

Major activities during construction

For the implementation of the Project, during the construction phase, the following activities should be undertaken: clearing the existing land from vegetation, buildings and other objects (demolishing activities), dismantling, demolition of housing facilities and resettlement of people; excavation; blasting; construction of accompanying facilities; closing or re-routing of existing roads or infrastructure, which will lead to changes in traffic movements; provision of new road traffic route, water supply, diversion of waters in the watercourses (during construction of bridges); transport of workers, materials, waste, use of natural resources, storage and handling of materials, energy and waste, etc. The above activities can cause negative impacts on human health and the environmental media and areas.

Raw materials, construction materials, heavy machinery, equipment and waste during construction

Different types of materials are needed for the construction of the envisaged facilities, which will comprise the railway line. The updated documentation lacks precisely defined information about the type and quantities of raw materials, supply sources (concrete batching plants and asphalt bases, gravel quarries, borrow pits); location of storage sites, locations of landfills, data on the use of vehicles, equipment and mechanization, routes and frequency of movement; data on the labor force and working conditions, etc. All listed data that are missing in the Feasibility Study will be provided at the level of the Detailed and Execution Design and by the Contractor, engaged in construction.

Operational activities on the railway

In the operational phase of the railway, water for water supply of the station and the halt will be used and wastewater, waste, etc. will be generated. The Feasibility Study does not have data on the required quantity of water, as well as on the quantities and manner of management of generated wastewater and waste.

4 ALTERNATIVES ANALYSIS

In line with the Regulation of the European Commission (EU) 2015/207, the revised project Feasibility Study from December 2016 analyzed the alternatives in order to evaluate and compare the various options that meet the existing and future requirements of the Project, in order to choose the best possible solution. The alternatives are considered in terms of different criteria, such as technical, institutional, economic, and environmental considerations.

The Feasibility Study analyzes the following alternatives: Alternative "No project"; Alternative A (reference alignment); Alternative B (Alternative alignment). The analysis takes into account the Decision no. 51-3556 / 1 of 19.07.2011, with which the Government of the Republic of Macedonia officially selected the reference alignment (Alternative A) for the alignment on which the new railway will be built, as a continuation of phase 1 (Kumanovo-Beljakovce) and phase 2 (Beljakovce-Kriva Palanka) from the section.

Although an analysis of the alternatives was previously done (Feasibility Study 2011 and EIA Study 2012), however, in the new Feasibility Study from December 2016 a review of the procedure was made and a reasonable justification for the choice of the preferred alternative was given. The information provided on the two alternative alignments, previously studied, has been checked, especially in terms of the consistency between cost information and the technical characteristics of both alternatives.

4.1 "No project" alternative

With the "No project" alternative, the existing situation will remain unchanged and this is not acceptable, because the railway line Kumanovo-Beljakovce is under construction. It is also expected that the construction of the railway line between Beljakovce-Kriva Palanka will soon begin. Therefore, the construction of the railway line between Kriva Palanka and the border with the Republic of Bulgaria is necessary, which will guarantee this operational continuity. The European Union's Transport Infrastructure Policy considers Corridor VIII as an extension of the TEN-T to the Western Balkans. Furthermore, SEETO, as a representative member for the development of the Western Balkans, prioritizes the Project to be eligible for funding under the Multi-Annual Development Plan of 2016.

4.2 Alternative A and Alternative B

Within the considered **strategic options**, the "**reference alignment**" is envisaged (**Alternative A**), and it is chosen as the best alignment, not only for Section 3, but also for sections 1 and 2.

Selecting the preferred alternative

In order to evaluate the two alternatives (Alternative A: Reference Alignment and Alternative B: Alternative Alignment), an analysis based on several criteria was made, including cost analysis, environmental impact analysis and social impacts.

Analysis of alternatives from a cost perspective shows that the reference alignment (Alternative A) is the most appropriate alternative for further implementation. The Alternative route for Section 3 is significantly shorter than the reference and it is recommended from the aspect of environmental protection, since significantly less areas with sensitive biotopes will be covered.

The preliminary analysis of the social impacts from the implementation of the reference and alternative alignment is based on the following aspects: people displacement / loss of land due to expropriation, time needed for travel, access to railway stations / halts and quality of life (for example, effects from noise and vibration).

Conclusion: Based on the criteria and alternatives considered, the consultant, who developed the Feasibility Study, created an assessment matrix based on several criteria in order to conduct multi-criteria analysis using the compensation method. From the matrix it can be concluded that **Alternative A (reference alignment) is selected as the best alternative, and not only for Section 3, but also for sections 1 and 2.**

✓ **Alternatives analysis for Reference alignment-Section 3**

Since the reference alignment is adopted (Decision number 51-3556 / 1 of 19.07.2011, in which the Government of the Republic of Macedonia officially selects the "reference alignment" (Alternative A), the scope of the Feasibility Study of 2016 includes only Section 3 and analyzes only the reference alignment.

After analyzing the strategic options, an assessment of various technical solutions for the reference alignment was carried out: **Alternative 1:** Track with ballast, bridges with ready-made concrete piers and a railway without crossings; **Alternative 2:** Track with slabs, continuous platform bridges and railway without crossings; **Alternative 3:** Track with ballast, bridges with ready-made concrete piers and railway crossings.

Considering that this solution coincides with the projects of the previous two sections, it saves time, offers lower construction costs, improves the safety of the railway and has less impacts on riverbeds and vegetation, then **Alternative 1 would be the best alternative for the railway line project Section 3: Kriva Palanka-border with the Republic of Bulgaria.**

5 ENVIRONMENTAL BASELINE

The municipality of Kriva Palanka is located in the eastern part of the Northeast planning region. It holds the second largest urban and economic center in this part of the region, with 34 settlements, only the city of Kriva Palanka is an urban settlement.

The project area, in the narrower sense of the word, includes four rural settlements (Talminci, Zhidilovo, Krklya and Uzem) and an urban settlement (the town of Kriva Palanka). The railway and associated facilities and infrastructure are positioned parallel to Kriva Reka, with geographical and visual orientation towards the east.

The most affected settlement is the town of Kriva Palanka, because the railway will pass through a section that is highly populated (although through a tunnel) and where certain activities will be carried out to acquire property located on the alignment itself. Most of the land is state-owned, although there is also private land.

The alignment of the railway passes mainly along the southern and quite disaggregated foothills of Bilino, that is, on the right valley side of Kriva Reka. The project area is mainly constructed of precambial metamorphic rocks, sedimentary volcanic series that are metamorphosed to green shales. The alignment passes through a severely dissected terrain. From geomorphological processes there is only surface decomposition, weathering and in some places weak erosion occur.

Within the project area, the following springs have been mapped: the spring zone of the chainage km 70 + 730, several small springs are registered at the chainage km 69 + 760 and km 71 + 120, in albite-epidote-chlorite shisties (Sep) two springs are located.

In several locations, along the alignment of the railway line, there are faults. The design area belongs to a seismological zone with a maximum intensity of 8 ° on an ICS scale.

In the initial part, the route passes on a complex of cemented forest soils and regosols. The alignment mostly passes through the territory where the processes of erosion are of medium intensity.

The following watercourses are located in the project area: Kriva Reka, Kiselichka Reka, Gradecka Reka, Gabarska Reka, Rangel, Domacki Dol, Zhidilovski Dol and other unnamed permanent or seasonal watercourses. In the basin of Kriva Reka, in the past 60 years, frequent occurrences of floods that were formed along the course of the Kriva Reka and its larger tributaries have been observed.

The alignment of the railway will pass dominantly through forests, pastures, partly construction land (settlements), through tunnels and very few agricultural land.

Most of the land in the project area is abandoned and is not used.

The settlements, along the railway corridor, are predominantly rural (7%), while the city of Kriva Palanka and its immediate surroundings (8%) can be characterized as a semi-urban area. The populated areas are interspersed mainly with anthropogenic broadleaf trees and belts. Ruderal vegetation, represented by annual plants and shrubs, is common on the periphery of rural areas, industrial locations and along the roads. The latter are characterized as artificial and all together occupy about 1% of the railway corridor.

In the municipality of Kriva Palanka there is no monitoring station for monitoring the air quality. The main factors influencing the air quality in the Municipality are: population, traffic and industry, but other polluters can not be neglected.

The noise baseline scenario in the municipality of Kriva Palanka has not been monitored and analyzed. Since there are no preliminary data on the level of noise in the environment, measurements of the noise level at sensitive locations were made along the alignment of the envisaged line, and they refer to the day period (07-19 h). The exceedance of the limit value is registered only in Kriva Palanka, at the chainage km 70 + 0.

From the assessments made to identify the baseline scenario and define the sensitive zones and receptors that would be potentially threatened by the increased impact of vibrations along the alignment, 13 sensitive zones are defined. The most sensitive zones are zones 3, 4 and 5, ie zone 3: Plateau 1 - railway station Kriva Palanka, Zone 4: Plateau 2 - railway station Kriva Palanka, Zone 5: Hill above a small tunnel.

The climate in the region is mostly moderate-continental to mountainous. Lower areas have moderately cold winter, moderately warm summer, fresh spring, and relatively warm autumn. On the other hand, the high parts of the Osogovo Mountains have a steppe climate. The average annual temperature in Kriva Palanka is 10.2 ° C. The average amount of precipitation in the municipality of Kriva Palanka is 622 mm. Winds blow at an average annual rate of 2.9 m / s, and the most common are winds from the northwest direction.

The envisaged alignment of the railway, almost completely, extends across an area characterized by a mountainous rural landscape, known as Osogovo Rural Landscape. Only a small part of the corridor (km 71 to km 73) is located in rolling hill rural landscape with borders. However, this part of the rolling hill rural landscape is not typical because it covers the town of Kriva Palanka, therefore it does not have any special value.

The area is slightly urbanized, that is, there is only one urban system in the project area - the city of Kriva Palanka and rare settlements. The strong and long-lasting human influence, especially on forests, has led to different types of changes in terms of degradation of the natural environment and production of new ecosystems, managed by man.

The habitats in the area of the railway corridor can be divided into two main categories according to their origin: natural and anthropogenic habitats. Natural habitats are represented by forests and bush areas, grasslands (which are semi-natural), rocky areas and water habitats. Near the analyzed railway corridor there are no areas that are included in the national system of protected areas. However, we can reference several habitats to Annex I of the Directive 92/43/EEC (Habitats Directive), which are described in details in Chapter 6.10.2 of the ESIA Study. The priority habitats are given in bold:

- ✓ 91W0 Moesian beech forests;
- ✓ **92A0 *Salix alba* and *Populus alba* galleries** (priority habitat);
- ✓ **40A0 Subcontinental peri-pannonic scrub** (priority habitat);
- ✓ **91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*** (priority habitat);
- ✓ 3230 Alpine rivers and their ligneous vegetation with *Myricaria germanica*;
- ✓ 6220 Pseudo-steppe with grasses and annuals of the *Thero-Brachypodietea*;
- ✓ 6510 Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*);
- ✓ 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation;
- ✓ 3290 Intermittently flowing Mediterranean rivers of the *Paspalo-Agrostidon*.

In the proposal for improvement of the system of protected areas (representative network of protected areas), two new areas have been identified and proposed: Osogovo Mountains and Kiselicka Reka (MES 2011). From the internationally recognized areas of protection, Emerald sites should be specifically analyzed in the project area, while the significant plant area "Osogovo Mountains" is less relevant. In the vicinity of the railway corridor there are no significant areas for birds or primary butterfly areas.

The alignment of the railway passes through the Emerald site of Pchinja-German¹ from km 75 + 213 to km 77 + 070 ie. in length of 1,857 km. Of these, 1,427 km pass through tunnels or bridges. The alignment passes through pine plantations, black locust plantations, degraded thermophilous oak forests and mesophilic oak forests.

The alignment of the railway passes through the Emerald site Osogovo Mountains from km 83 + 080 to km 83 + 630 ie. through area in which no significant populations of species of high conservation significance were identified. The planned corridor does not pass through the significant vegetation area "Osogovo Mountains".

The town of Kriva Palanka is supplied with spring water from the locality Kalin Kamen through the city water pipeline. The municipality of Kriva Palanka is not fully covered by the sewerage network, and there is also no waste water treatment system. Water for irrigation in the Municipality is used from the water system, from Kriva and Durachka Reka, which are polluted as a result of uncontrolled discharge of industrial and communal wastewater.

Permanent disposal of the generated waste from the municipality of Kriva Palanka is carried out at the controlled landfill "Konopnica". The dominant type of waste is communal solid waste, animal waste, garden waste and construction waste.

All settlements in the Municipality are electrified, with the exception of several individual objects in settlements of scattered type, where the low voltage network is with an inadequate degree of construction, especially from the aspect of delivered electricity.

¹ Reference to the Bern Convention, Art 4

In the project area, near the alignment of the railway, the 110 kV transmission line passes, as well as the local power distribution system for electricity.

The anticipated alignment in several places is intersected with the Kriva Palanka gas network, at the following stations: km 70 + 80.28, km 71 + 519.13, km 74 + 860.00, km 81 + 613.9.

In all settlements in the municipality of Kriva Palanka, a telephone network is provided, the area is also covered with an internet network. The presence of a telecommunication infrastructure is recorded in the project area.

The alignment of the railway line goes parallel to the alignment of the projected Rankovtsi-Kriva Palanka expressway, which is part of the projected motorway from Corridor VIII, and they do not interfere. The alignment of the railway, in several places, will interfere with the existing road that runs from Kriva Palanka-Deve Bair, as well as local unsurfaced roads. For crossing these roads, bridges and tunnels are provided in the project documentation.

6 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND MITIGATION MEASURES

The Environmental and Social Impact Assessment Study identifies the environmental and social impacts that may arise due to the project implementation during different stages: pre-construction, construction, operation and decommissioning.

The pre-construction phase includes activities for preparation of project documentation and plans, as well as providing the necessary permits/contracting that will enable a proper project implementation.

The construction phase involves the preparation/clearing of the project area and the performance of construction activities for the railway and other associated objects.

The operation of the railway includes the activities for railway operation, its regular maintenance, repair and reconstruction. The impacts that may arise due to these activities are subject of analysis in the operational phase.

The decommissioning phase causes environmental and social impacts similar to those in the construction phase due to the similar activities that are expected to be carried out during the decommissioning (dismantling, clearing, transport of materials and waste etc.). Due to the long life cycle of this type of projects, currently it is not possible to predict the mode of decommissioning of the railway; therefore these impacts are not subject of analysis.

The impacts are analyzed in terms of multiple criteria such as the nature of impacts, type, time of appearance, scope, probability, duration, intensity / magnitude, reversibility and significance.

The benefits of constructing the Kriva Palanka-Border Railway Republic of Bulgaria from the aspect of the environment are the reduction of greenhouse gas emissions at the national level, while the benefits from a socio-economic aspect are the improvement of transport services and the development of the economy at local, regional and national level, opening opportunities for employment and development of local businesses, improving the standard of the population, and reducing migration. In addition to the benefits, the construction of the railway line will also cause negative impacts on the environment and the social aspects, in the project area and in its surroundings.

The following tables show the impacts on environmental media and areas and social aspects and the appropriate mitigation measures.

6.1 Environmental impacts and mitigation measures

Environmental component-Geology and geomorphology		
Construction and operation		Mitigation measures
Impacts		
Geology and geomorphology During construction, due to the envisaged activities, contemporary geomorphological processes may occur (erosion, landslides). The increased erosion sedimentation can cause riverbed filling and elevation, meanderings, floods etc. Impact assessment: negative with moderate significance.		Application of good construction practice and implementation of the erosion mitigation measures and stabilization of the steep slopes. Special attention should be put on the construction activities in the area of the inundation valley of the river of Kiselichka, Gradechka, and Kriva Reka (especially Kriva Reka).
Geo-heritage The construction of the railway will cause certain negative impact on the geo-heritage, especially on the most impressionable part of the gorge of the river of Kiselichka (76+0 to 77+0), mostly during construction, as well as the attractive part of the gorge of Kriva Reka between the village of Zhidilovo and the village of Uzern. Impact assessment: negative with moderate significance.		<ul style="list-style-type: none"> Implementation of good construction practice, as well as continuous replantation of the area, in the most remarkable section of the Gorge of Kiselichka Reka (76+0 to 77+0), especially in the phase of construction, as well as in the attractive part of the gorge of Kriva Reka between the village of Zhidilovo and the village of Uzern.
Residual impacts and mitigation: Residual impacts on geology and geomorphology are possible. If the intensity of the residual impacts on geology and geomorphology is evident, additional analyses will be carried out and mitigation measures will be proposed.		
Environmental component-Soil		
Pre-construction		

<p>Impacts</p> <p>Soil baseline and quality: The railway construction may cause negative impacts on soils due to construction, transport, waste storage etc.</p>	<p>Mitigation measures</p> <ul style="list-style-type: none"> Preparation of Soil Management Plan as well as Erosion and Sedimentation Management Plan for the construction and operation of the railway Preparation of technical documentation for slope stabilization, reclamation, protection from erosion and torrential rains and implementation of the measures from the documentation Taking samples of soil near the v. Uzem.
<p>Construction</p>	
<p>Impacts</p> <p>Soil baseline and quality: The removal of vegetation, the tracing of new access roads, excavation, material and waste storage, movement of mechanization, accidental spills etc. can cause soil degradation of the topsoil, compaction, erosion, contamination etc.</p> <p>Impact assessment: negative, with negligible small to large significance.</p>	<p>Mitigation measures</p> <ul style="list-style-type: none"> Application of measures that will result from the Soil Management Plan and the Erosion and Sedimentation Management Plan; Implementation of good construction practices etc.
<p>Residual impacts and mitigation: Residual impacts on soils (compaction, erosion) are possible. If the intensity of the residual impacts on soils is evident (soil erosion and compaction), additional analyses will be carried out and mitigation measures will be proposed.</p>	
<p>Operation</p>	
<p>Impacts</p> <p>Soil baseline and quality: Inadequate maintenance of the culverts and vegetation along the alignment can lead to soil erosion.</p> <p>Deposition of air sediment, application of herbicides, leakage of oil and other liquids from the trains can lead to soil contamination.</p> <p>Impact assessment: negative, with negligible small to large significance.</p>	<p>Mitigation measures</p> <ul style="list-style-type: none"> Regular monitoring of possible erosion, regular maintenance of the vegetation and (if applicable) increase of the vegetation-covered areas, regular maintenance of the facilities etc. In case of a hazard, a detailed analysis and assessment of scope and intensity of contamination is recommended, and if the outcomes of the assessment require, a Plan for Remediation of Contaminated Soil should be prepared or the contaminated soil should be stored in special landfills and replaced with an uncontaminated one Preparation of Weed and Ruderal Vegetation Management Plan and its implementation etc.

Residual impacts: No residual impacts are expected.	
Environmental components-Hydrology and surface waters	
Pre-construction	
Impacts	Mitigation measures
<p>Impacts on bridge and viaduct stability, culverts and railway: The inadequate design of the bridges, viaducts and culverts in relation to the hydrological characteristics of the project area may jeopardize their stability as well as the stability of the railway, which will lead to negative impacts on the hydrology and the quality of surface waters and indirect impact on the other environmental media and relevant aspects</p> <p>Water regime and quality of surface waters: Construction site dewatering, watercourse diversion, execution of construction activities within riverbeds or in the vicinity of riverbeds, as well as use of water and management of wastewater can impact the regime and quality of surface water, ie, the ecological status of rivers.</p>	<ul style="list-style-type: none"> • Preparation of hydrological and meteorological layouts for the project area that include detailed information on the hydrological and meteorological parameters for each profile of Section 3, which will provide a starting point for dimensioning of the hydrotechnical structures, regulation of rivers and protection from natural disasters • Establishment of adequate correlation links between the run-off of the measuring profiles and the run-off measured at the existing hydrological stations (which are part of the country's network). • Preparation of Water and River Crossings Management Plan and preparation of Flood and Flash Flood Management Plan for the construction phase etc.
Construction	
Impacts	Mitigation measures
	<ul style="list-style-type: none"> • Obtaining permits for water use from rivers and/or discharge into rivers (dewatering activities at locations with high groundwater level or possible discharge of wastewater) from MEPP • Obtaining Water Management Consent for construction within or near watercourse.

<p>Surface water regime and quality: Watercourse diversion and regulation, construction site dewatering, clearing of riparian vegetation, execution of construction activities within riverbeds and their vicinity, establishment of borrow pits, landfills etc. may lead to change in the flow of rivers, higher sedimentation level, erosion, disturbance of the morphology of watercourses and deterioration of water quality in rivers. Inadequate management with: wastewater (fecal and industrial), waste, chemicals and auxiliary materials, fuels, maintenance and servicing of the equipment and vehicles etc. can lead to deterioration of the quality of surface water.</p> <p>Impact assessment: negative, with moderate significance.</p>	<ul style="list-style-type: none"> • Implementation of good construction practice and continuous maintenance of biological minimum • Bridges to be designed and constructed in a way that will provide minimal intervention and impact on the riverbed • The possible dewatering of locations to be done in a way in which the physical impacts on morphology of the recipient will be minimized. • Implementation of strict measures for protection of forest vegetation (which is scarce in the area of the right tributaries of Kriva Reka) and promoting afforestation with native plant species, which will contribute to the protection from floods and sedimentation (water erosion). • The borrow pits and landfills to be as far as possible from rivers in the project area etc.
<p>Residual impacts: Residual impacts are possible. The significance of the residual impacts on surface waters will depend on the level of implementation of the mitigation measures. Small erosion will remain even after the mitigation of impacts and will lead to temporary elevated turbidity of the rivers. If residual impacts are evident, additional analysis will be carried out and mitigation measures will be proposed.</p>	
<p>Operation</p>	
<p>Impacts</p> <p>Surface water regime and quality: Inadequate maintenance of the drainage systems, train leaks, use of herbicides for vegetation management, generation of municipal wastewater can lead to negative impacts on the regime and quality of surface waters.</p> <p>Impact assessment: negative, with</p>	<p>Mitigation measures</p> <ul style="list-style-type: none"> • Regular control and maintenance of the drainage systems in order to avoid clogging with waste and sediment • Adequate management of the wastewater generated within the train stations etc.

negligible to moderate significance.	
Residual impacts: No residual impacts are expected.	
Environmental components-Groundwater	
Pre-construction and construction	
Impacts	Impact mitigation measures
Water regime and quality: blasting, earth excavation, soil compaction, building retaining walls, storage of building materials and waste, dewatering etc may impact the groundwater regime. Accidental leakage, improper wastewater and waste management, use of technical water with inappropriate quality etc. can cause groundwater contamination. Impact assessment: negative, with moderate significance.	<ul style="list-style-type: none"> • Not to perform construction activities in conditions of high groundwater level • Implementation of good construction practice • Contracting with an authorized company for supply of technical water, and if ground- or surface water abstraction is performed, to secure a Permit for water abstraction from MEPP etc.
Residual impacts: There is a possibility of residual impacts occurrence. If an occurrence of residual impacts is evident, further analysis on the source of emissions and the measures implemented will be performed, and appropriate measures will be taken in accordance with the analysis.	
Operation	
Impacts	Impact mitigation measures
Impacts are not expected	Measures for mitigation are not foreseen
Environmental components-Ambient air	
Pre-construction	
Impacts	Impact mitigation measures
Air quality: The construction works and transportation activities can cause deterioration of ambient air quality.	<ul style="list-style-type: none"> • An optimal layout of the landfills for depositing of materials and stationary construction sites (bases) should be provided in the final design of the railway, in order the length of the access/haulage roads to be reduced on minimum. • A detailed analysis of the dispersion of pollutant substances (model) should be prepared and additional mitigation measures according to the results should be envisaged.

<ul style="list-style-type: none"> Preparation of: Plan for organization of the construction site; Dust Management Plan; Blast Management Plan; Traffic Management Plan. 	
Construction	
Impacts	Impact mitigation measures
<p>Air quality: The construction activities (which include blasting, asphaltting, welding etc.) and the traffic activities will generate dust emissions, exhaust gases, VOCs, aerosols etc. These emissions can cause direct impacts on the air quality and indirect impact on the human population, biodiversity, soil etc.</p> <p>Impact assessment: negative, with negligible small to moderate significance.</p>	<ul style="list-style-type: none"> Implementation of the measures from the Plans and implementation of good construction practice; Stationary dust emission sources (including concrete batching plants, crushers) will be located as far as possible from the sensitive receptors; Introduction of procedure for control of asbestos during the demolition works, prior commencing the demolition activities, asbestos exposure/asbestos materials risk assessment, adequate asbestos waste management in compliance with the legislation. If there are grievances from the local sensitive receptors-residents, the Contractor will need to implement additional measures..
<p>Residual impacts and mitigation: There is a possibility of residual impacts on the air quality, caused by dust emissions in the ambient air, generated by construction activities, especially in dry periods, as well as exhaust gases emissions. If an occurrence of residual impacts is evident, further analysis on the source of emissions and the measures implemented will be performed, and appropriate measures will be taken based on this analysis.</p>	
Operation	
Impacts	Impact mitigation measures
<p>Air quality: Emissions from railway traffic and railway maintenance can deteriorate the ambient air quality.</p> <p>Impact assessment: negative, with negligible small significance.</p>	<ul style="list-style-type: none"> Implementation of best practice for maintenance of railway, trains and locomotives, and implementation of European goods transportation standards; Implementation of the hazard and incident mitigation measures.
<p>Residual impacts and mitigation: Residual impacts are not expected</p>	
Thematic area- NOISE	
Pre-construction phase	
Impacts	Impact mitigation measures
<p>Increased noise level: The construction</p>	<ul style="list-style-type: none"> Preparation of a detailed Noise Management Plan for the construction phase, where appropriate measures for reduction of noise

<p>works and the transportation activities in the construction phase will generate increased noise level, which may cause negative impacts on the population and wildlife along the alignment.</p>	<p>in the construction phase will be foreseen and will allow to meet the criteria for the noise levels, defined in the legislation.</p>
Construction phase	
Impacts	
<p>Increased noise level: The construction works and the transportation activities in the construction phase will generate increased noise level, which may cause negative impacts on the population and wildlife along the alignment.</p> <p>Impact assessment: negative, with negligible small to moderate significance.</p>	<ul style="list-style-type: none"> • Implementation of the measures from the Noise Management Plan and implementation of good construction practices • Measures for noise reduction from railway traffic should be implemented earlier during the construction phase, which will enable noise reduction in the two phases simultaneously, ie placement of permanent sound barriers or noise insulation of facilities as much as earlier during the construction • Establishing an easily acceptable and well promoted call service, as well as well developed procedure for grievance and handling with complaints and proposals.
<p>Residual impacts and mitigation: There is a possibility for residual impact occurrence. The importance of residual impacts will be dependant on the nearby receptors and their sensitivity. If an occurrence of residual impacts is discovered, further analysis on the source of noise emissions and the proposed measures implemented will be performed, and according to this appropriate measures for decrease of residual impacts will be taken.</p>	
Operational phase	
Impacts	
<p>Increased noise level: Railway traffic along the rail, use of rail vehicles for maintenance of the rail, transportation of passengers to the station and halt, will generate increase noise level, which may cause negative impacts on the population and wildlife along the alignment.</p> <p>Impact assessment: negative, with moderate significance</p>	<p>Impact mitigation measures</p> <ul style="list-style-type: none"> • Implementation of the primary measures for reduction of noise level in the environment • Placement of permanent sound barriers or sound insulation at the affected facilities at the following chainages: <ul style="list-style-type: none"> ✓ Sound barriers: km 65+841 to km 65+980 (right side); km 71+038 to km 71+127.5 (right side); km 71+323.5 to km 71+419 (right side); km 71+323.5 to km 71+419 (left side); km 71+569 to km; 71+602 (right side); km 71+569 to km 71+602 (right side); km 72+804 to km 72+935 (right side); km 72+935 to km 73+300 (right side); km 75+340 to km 75+480 (right side); km 79+793 to km 80+003 (left side); km 82+105 to km 82+352 (left side). ✓ <i>Sound insulation of facilities:</i> km 69+790 (right side); km 69+800 (right side); km 70+030 (right side); km 70+200 (right side); km 70+220 (right side); km 81+100 (left side) • Due to landscape conservation, the barriers should be constructed from transparent material (polycarbonate) 20 mm thick. Because most of the barriers are located at bridges, a full concrete fence can be a part of the barrier, and the difference to the

<p>required height can be represented by polycarbonate elements.</p>	
<p>Residual impacts: There is a possibility for residual impact occurrence, especially on conflict locations where an improvement of the sound insulation of the habitats is recommended, in which due to the configuration of the field and from economic reasons (non-profitability) sound barriers can't be installed. If an occurrence of residual impacts is discovered, further analysis on the conditions, efficiency of applied measures will be performed, and according to this appropriate measures for decrease of residual impacts will be taken.</p>	
<p>Thematic area-Vibration</p>	
<p>Pre-construction phase</p>	
<p>Impacts</p>	<p>Mitigation measures</p>
<p>Increased vibration level: Anticipated operational and construction activities can cause negative effects on sensitive receptors in the project area as a result of the increased level of vibration.</p>	<ul style="list-style-type: none"> Recording the existing condition of all houses located along the alignment of the railway line, in a certain belt with a width of 100 m, in order to make a documented state of the objects, which will contribute to fair compensation of damages that would result from the vibrations occurring in the course of the construction and operational phase of the Project. Conducting a quantitative assessment of the expected vibrations from construction and operation of the railway and the implementation of the proposed measures.
<p>Construction and operational phase</p>	
<p>Mitigation measures</p>	
<p>Impacts</p>	<ul style="list-style-type: none"> Application of the measures arising from investigation in the pre-construction phase, and the application of good construction and operational practices.
<p>Increased levels of vibration: Increased vibration caused by the performance of the construction, blasting and operation of construction machines can affect sensitive receptors along the route of the railway. Increased level of vibration from rail traffic can cause adverse impacts on susceptible receptors.</p> <p>Impact assessment: negative, with negligible small to moderate significance in the construction phase and negative, with moderate significance in the operational phase.</p>	

Residual impacts and mitigation measures: During the investigations conducted in the pre-construction phase will determine the possibility of residual impacts and based on them would suggest cutting measures.

Thematic area-Climate Change	
Construction phase	
Impacts	Mitigation measures
<p>Impacts of climate change: Emissions of greenhouse gases generated by the building s activities, removal of forest plantations, decomposition of organic waste can cause negative impacts on climate change.</p> <p>Impact assessment: negative with negligible small significance.</p> <p>Residual impacts and mitigation measures: If the measures to reduce greenhouse gas emissions are implemented, no residual impacts are expected. Residual effects may occur as a result of the removed vegetation, but they are insignificant. If the occurrence of residual impacts is determined, an impact analysis will be additionally performed and additional measures will be proposed.</p>	<ul style="list-style-type: none"> • Implementation of the measures of plans: management and removal of vegetation, traffic management, waste management, and measures arising from the plan for protection of fires, explosions and hazardous substances etc.
Operational phase	
Impacts	Mitigation measures
<p>Impacts of climate change: Railway traffic will contribute to the reduction of greenhouse gases. The use of locomotives and rolling stock maintenance of railroad vehicles, removal of vegetation along the line will be a source of greenhouse gases and will have a small impact on climate change.</p> <p>Assessment of impacts: positive, with high significance and negative, with negligible small significance.</p> <p>Residual impacts and mitigation measures: residual impacts are not expected.</p>	<ul style="list-style-type: none"> • Application of good practice for the maintenance of the railway and the equipment involved; • Application of the measures from the prepared plans. • Training of employees who maintain the alignment.
Thematic area-Climate Change	
Pre-construction and construction phase	
Impacts	Mitigation measures
<p>Impacts of climate change on the railways: Climate change can cause deformations of the railway and bridges, blockade of the tunnels, disruption of the signaling and electronic system that can contribute to the disruption and endangering</p>	<ul style="list-style-type: none"> • Appropriate sizing of drainage infrastructure in design; • Setting large stone blocks at the base of the piers and strengthening the foundations of the pillars with concrete to reduce the risk of scouring the piers

the safety of rail traffic.	<p>of bridges;</p> <ul style="list-style-type: none"> • Stabilization with retaining walls of all the possible erosion areas and stabilization of slopes in cuts; • Reducing the angle of the alignment; • Raising the track and signaling equipment at locations with flood risk, etc.
Operational phase	
Impacts	Mitigation measures
<p>Impacts of climate change on the railways: Climate change (increased and / or decreased temperature, heavy rain and snow, the occurrence of frost, etc.) Can cause deformation of the track that can lead to endangering the safety of rail traffic.</p> <p>Impact assessment: negative medium to severe H achajnost.</p>	<ul style="list-style-type: none"> • Apply adaptation measures that will contribute to reducing future climate change impacts and would increase the elasticity / adaptability of the railroad as a whole to future climate change.
<p>Residual impacts and mitigation measures: By applying the adaptation of the railway to climate change is expected to avoid possible impacts. However, despite the implementation of measures can reliably confirm that there is no risk of residual effects. If it is determined the occurrence of residual impacts will additionally perform impact analysis and propose additional measures.</p>	
Components of the environment - Visual characteristics of the landscape	
Pre- construction phase	
Impacts	Mitigation
<p>Impacts on the landscape, construction and operation of the line will cause negative impacts on the visual characteristics of the landscape.</p>	<p>Drafting of a landscaping design of the area which will be implemented in the construction and operational phases.²</p>
Construction phase	
Impacts	Mitigation
<p>Impacts on the visual characteristics of the landscape: The predicted cuts will cause change in the visual landscape features along much of the alignment. In project scope, the landscape (which is part of the remarkable Osogovo rural landscape) has a</p>	<ul style="list-style-type: none"> • Application of good construction practice; • Revitalization / rehabilitation of disturbed locations (areas) should be performed immediately after the completion of the construction works at the specific locations and in accordance with the project documentation prepared

² The project will include localities, way of planting and types of plants for landscaping. Native species of plants are recommended in order to protect the biodiversity within the region. The project should envisage plant nursery for native plants which will be used for landscaping.

Environmental and Social Impact Assessment Study for the construction of new railway track at the section Kriva Palanka-border with the Republic of Bulgaria, part of Corridor VIII

<p>relatively small visual values and also design solutions (with a large number of tunnels) mitigate the negative impact. Impact assessment: negative with negligible small to moderate significance.</p>	<p>for this purpose, which will at least include mechanical work and stabilization of the land, grassing, afforestation with indigenous tree species etc.</p>
Operational phase	
<p>Impacts</p> <p>Impacts on the visual characteristics of the landscape: The existing line will cause impacts on the visual characteristics of the landscape. Impact assessment: negative with negligible small to moderate significance.</p>	<p>Mitigation</p> <ul style="list-style-type: none"> • Implementation of the measures of the project for landscaping of the area; • Maintenance of vegetation.
<p>Residual impacts (construction and operational phase) and mitigation: You can expect residual impacts on the visual characteristics of the landscape, especially in the bridges, but it is expected that the change in the landscape will gradually be accepted by the local population. Application of good construction practice, maintenance of newly constructed structures or revitalized parts and good practice of maintaining the railroad as a whole.</p>	
Components of environment - Functional characteristics of landscape- Biocorridors	
Pre- construction phase	
<p>Impacts</p> <p>Impacts on the functional characteristics of the landscape: There is some danger of reducing the permeability capacity of the landscape in relation to seasonal migrations of minor animals (fauna of amphibians and reptiles), especially near the permanent and non-permanent water bodies (especially ponds and streams) serving as habitat for frog propagation.</p>	<p>Mitigation</p> <ul style="list-style-type: none"> • There are several culverts envisaged in the project documentation for the construction of the railway line, so there would probably not be any need for additional interventions. However, for a definitive assessment of the need for additional culverts for animals it is recommended before starting the construction work to implement a bio monitoring in the spring season.
Construction and operational phase	
<p>Impacts</p> <p>Impacts on the functional characteristics of the area: Given the large number of tunnels and bridges along the alignment is considered that the functional characteristics of the area will not be significantly damaged with respect to migratory movements of large animals. Impact assessment: negative, with moderate significance.</p>	<p>Mitigation</p> <ul style="list-style-type: none"> • As a result of the insignificant impacts, measures are not provided in terms of additional green bridges or similar facilities that would facilitate the movement of animals.

Residual impacts and mitigation measures: Significant residual impacts are not expected.

Environmental Components - Biological Diversity: Habitats

Pre-construction phase

Impacts	Mitigation
<p>Impacts on biodiversity: The construction and operation of the line will cause negative impacts on habitats and overall biodiversity (plants and animals).</p>	<ul style="list-style-type: none"> • The future Contractor, together with the Ministry of Environment and Physical Planning, the Ministry of Economy, the Ministry of Transport and Communications and the municipality of Kriva Palanka, will identify locations (mostly on state land) on which preliminary investigations (hydrogeological and geodetic) will be made based on which will be prepared project documentation and documentation of the impact on the environment for future borrow pits and disposal sites; • It is not allowed to use raw materials for the construction of the railway from the following habitats: Alluvial deposits (coastal gravel banks and willows and poplar stands) - for excavation of sand and gravel, rivers and streams - for sand and gravel excavation, all types of forests (degraded forest stands could be an exception, but the impacts should be identified in advance); • To take into account all strategic and developmental documents relating to the preservation of nature and the utilization of natural resources; • Preparation of the Plan for biodiversity management (animal and plant species) in the construction phase and its implementation.
Construction phase	
Impacts	Mitigation
<p>Biodiversity and important habitats: The construction of the railway will cause negative impacts on habitats (plants and animals). Clearing the site and the permanent removal of vegetation will cause negative impacts on habitats in the project area and the wider environment. Also, at this stage, the possible occurrence of incidents can cause negative impacts on habitats in the project area and beyond.</p> <p>Impact assessment: negative with negligible small to large significance.</p>	<ul style="list-style-type: none"> • Application of good construction practice; • Conduction of constant monitoring by an independent expert (biologist / ecologist) in the construction of bridges in: <ul style="list-style-type: none"> - willow and poplar forests, stands and timber belts; - willow and poplar groves at: km 74 + 020 to km 74 + 300 and about km 75; km 81 + 200 to km 81 + 600; - Riparian willow and poplar belts: at km 74 + 200; from km74 + 800 to km 75 + 000; km 75 + 760; in 76 +500 km;

<p>Residual impacts and mitigation measures: Under normal operating conditions most of the impact can be significantly mitigated by the application of the proposed measures. Strict compliance with good construction practice and special measures for avoiding construction activities at certain habitats will contribute to a significant reduction in negative impacts or their complete elimination.</p>	<ul style="list-style-type: none"> - Gravel river banks at km 74 + 750 to km 75 + 000 and km 76 + 500; - Rivers and streams at km 74 + 250; km 74 + 870; km 75 + 770; km 76 + 500; km 79 + 850; km 81 + 060 to km 81 + 170; km 81 + 760 to km 82 + 170 and km 84 + 100. • Permanent or occasional expert supervision (biologist / ecologist) is recommended for the following habitats: in willow and poplar groves, stands and tree belts; in wet and mesophilic meadows; beech forests, hilly pastures; rivers and streams along the entire alignment. • Access roads must not pass through the following habitats: <ul style="list-style-type: none"> - Beech forests, in particular, no further disturbance of these habitats is allowed at km 81 + 500 to km 82 + 600, except for clearing the vegetation necessary for the alignment and the arrangement of the rails. - Wet and mesophilic meadows, especially at km 74 + 800 to km 75 + 000; km 75 + 700 and km 81 + 100. - Willow and poplar forests, stands and timber belts, wherever they are found during the construction. - Gravel banks of watercourses (rivers and streams), wherever they are found during the construction. - Through rivers and streams, everywhere they will meet during construction.
Operational phase	
<p>Impacts</p> <p>Impacts on habitats, clean-up and maintenance of vegetation around the railroad, and potential contamination from accidental conditions may cause negative impacts on habitats.</p> <p>Impact assessment: negative, with negligible small to moderate significance.</p>	<p>Mitigation</p> <ul style="list-style-type: none"> • Avoid using herbicides to control vegetation directly to the line (or alternatively avoid excessive use of herbicides); • To apply the measures for protection from incidental occurrences,
<p>Residual impacts and mitigation measures: Residual impacts are not expected.</p>	

Environmental Components - Plant Species (Flora)	
Before the construction and construction phase	
Impacts	Mitigation
<p>Impacts on plant species (flora): The construction of the railway will cause adverse impacts on plant species, as a result of execution of construction work, clearing of vegetation, excavation, construction, etc.</p> <p>Impact assessment: negative, with moderate significance.</p>	<ul style="list-style-type: none"> • Destruction of old trees and other trees with a distinctive appearance (specific form or ornamental characteristics) should be prevented or avoided to the extent possible; • Conducting detailed inspection of the alignment by the appointed independent expert (biologist / forester) to check whether there are old trees and other trees with a distinctive appearance, and possibly the presence of plant species with conservation importance.
<p>Residual impacts and mitigation measures: It is expected that most significant impacts to be mitigated by the application of the proposed measures. Strict compliance with good construction practice and special measures for avoiding construction activities of certain habitats will contribute to a significant reduction in negative impacts or their complete elimination. Additional measures will be identified if necessary.</p>	
Operational phase	
Impacts	Mitigation
<p>Plant species (flora): Rail traffic and maintenance of the railway, as well as accidental contamination can cause destruction of the plant species.</p> <p>Impact assessment: negative, with negligible small significance.</p>	<ul style="list-style-type: none"> • Plant species that grow along the tracks are usually cosmopolitan, so they are of very low conservation significance. Therefore, no specific measures for the protection of plant species along the railway line during its operation are envisaged.
<p>Residual effects: Residual impacts are not expected.</p>	
Environmental Components - Animal Species (Fauna)	
Pre-construction	
Impacts	Mitigation

<p>Animal species: construction of the railway line will cause negative impacts on animal species.</p>	<ul style="list-style-type: none"> • Due to the presence of the otter (<i>Lutra lutra</i>), appropriate design of bridges is recommended. Special attention should be given to the big Bridge no. 32 at km 76 + 402 76 + 611.5. It is necessary to design the base of the piers of the bridge out of the riverbed and at least 5-10 m from the river banks. • Application of new design solutions applied in some European countries³, in order to reduce the impact shock of the birds in the operational phase. • Conducting bio monitoring of the fauna of amphibians and reptiles in the spring season, in order to determine the need for placing additional culverts to protect the minor animals (fauna of amphibians and reptiles).
Construction phase	
Impacts	Mitigation
<p>Animal species (fauna): The construction of the railway line will cause negative impacts on animal species, disturbance of species, mortality caused by excavation and direct killing of amphibians and reptiles by workers because of unfounded fear, aversion to certain species or illegal hunting of birds and mammals, etc.</p> <p>Impact assessment: negative, with negligible small to moderate H achajnost.</p>	<ul style="list-style-type: none"> • Avoid unnecessary destruction of important habitats; • Not to kill and not to inflict serious damage to native fauna during the clearing of the site. This particularly applies to mammals, birds, reptiles, amphibians and fish; • Informing and educating workers that killing of animals is prohibited in the project area during the construction phase (amphibians, reptiles, birds, mammals). • The relevant hunting associations should be informed on the timeschedule of construction activities. The hunting should be prohibited in the project area (2 x 500 m) and so on.
Operational phase	
Impacts	Mitigation
<p>Impacts on animal species (fauna): Operation of the line can cause negative impacts on animal species due to railway traffic and maintenance of the tracks. These actions can cause destruction and degradation of habitats (delay of waste, pollution, harassment and disruption), death from electrical shock, disturbance from increased levels of noise and so on.</p>	<ul style="list-style-type: none"> • Disposal of dead animals for food and other waste from the nearby environment of the railway; • Do not plant fruit trees and trees that provide nuts within the buffer zone of the 2x100 m of railway;

³ Until recently, pillars have not gained the necessary attention, but from recently in Germany new designs of pillars are considered.

<p>Impact assessment: negative, with negligible small to large significance (in case of accidents).</p>	<ul style="list-style-type: none"> • Cleaning the snow under viaducts ; • Restriction of fishing in Kriva Reka and its tributaries in order to preserve fish populations and reduce the risk of accidents. Fishing should be banned in any body of water near the railway (100 m). • At the bridge no. 32 km 76 to 76 + 402 + 611.5, along the river in the range of 25 m, revegetation with willows on both sides of the bridge (50 m) needs to be performed.
<p>Residual impacts (construction and operational phase) and reduction measures: Possible residual impacts in the construction phase, but is expected to be negligible. Significant residual impacts are expected in the operational phase of the railway. For revealing and quantification of residual impacts must be conducted monitoring of the populations of animal organisms, fragmentation effect and mortality at the railway. The results of the monitoring can anticipate additional measures to reduce the residual effects such as afforestation, establishing daily biocorridors , Enhanced control of hunting and fishing, etc.</p>	
<p>Components of the environment – Diatoms and macroinvertebrates</p>	
<p>Construction phase</p>	
<p>Impacts</p> <p>Impacts on diatoms and macroinvertebrates : The performance of construction work in rivers and in their vicinity, and the occurrence of accidental contamination or intake of substances from the environment in rivers can cause negative impacts on river ecosystems (diatoms and macroinvertebrates).</p> <p>Impact assessment: negative, with moderate significance, while during accidental conditions they can be assessed with great significance .</p>	<p>Mitigation</p> <ul style="list-style-type: none"> - Apply good construction practices that would avoid pollution, eutrophication and modification of aquatic habitats; - Protecting the riparian vegetation, because it will be an important buffer zone and protection of rivers; - Prevention of interventions in the riverbed ; -Mandatory monitoring of the status of populations of dragonflies , especially Gaberska River.
<p>operational phase</p>	
<p>Impacts</p> <p>Impacts on diatoms and macroinvertebrates: Maintenance of bridges and potential contamination from accidental conditions may have an adverse impact on wildlife in river ecosystems.</p> <p>Impact assessment: negative, with moderate significance, while in an accident they can be assessed with great significance .</p>	<p>Mitigation</p> <ul style="list-style-type: none"> • Aquatic species (diatoms and macroinvertebrates) that inhabit aquatic ecosystems in the project area have little conservation importance. Therefore, during the operational phase no specific measures for their protection are envisaged.
<p>Residual effects (in the construction and operational phase) and mitigation: Residual impacts are not expected.</p>	
<p>Components of the environment: Proposed areas for protection and internationally recognized areas</p>	

Construction and operational phase	
Impacts	Mitigation
<p>Draft - protected areas and Emerald sites : impacts on proposed protected areas relate to the construction phase (degradation of forests and other habitats, diversion of rivers, etc.), and relevant threat during the operational phase is habitat fragmentation (which will occur in the construction phase, but there will be consequences in the operational phase), and will be manifested as a disorder in the function of bio-corridors.</p> <p>Impact assessment: negative, with negligibly small significance to moderate significance (the proposed area for protection - Natural Park "Gorge of Kiselicka River").</p>	<ul style="list-style-type: none"> For the proposed area "Protected Landscape Osogovo", Emerald site Pahnija-German and Emerald site Osogovo to apply measures relating to habitats and fauna, they are fully applicable and sufficient to mitigate the impacts on the internationally designated conservation areas ; For the proposed protected area nature park "Gorge of Kiselicka River", for which some impacts are identified, but they relate to riparian habitat and otter, and not specific to the whole area, therefore, it is necessary to pay more attention to the construction of the bridge no. 32 (km 76 + 402 to 76 + 611.5), or foundations of the bridge should be 5-10 m away from the bank of Kiselicka River and planting of willow belt along the river is necessary.
<p>Residual impacts and mitigation measures: Detected impacts on protected areas and the implementation of mitigation measures will result in residual effect with respect to all components of biological diversity. The destruction and degradation of nature is impossible to completely avoid. But the application of mitigation measures will contribute to minimize impacts to acceptable residual effects. Although at the moment there are no protected areas, in the future a certain assistance to managers of protected areas can be offered by institutions / enterprises that manage railway traffic that would constitute a significant compensatory measure.</p>	
<p>Thematic area-Forestry</p>	
<p>Pre-construction</p>	
<p>Impacts</p>	<p>Mitigation</p>
<p>Impacts on forestry: construction of the railway will cause negative impacts on forestry, as a result of the removal of forest vegetation / loss of forest area, loss of timber, loss of natural regeneration, loss of forest area in private ownership, conversion of forest into construction land and so on.</p>	<ul style="list-style-type: none"> Preparation of the Forest Management and Removal Plan in the construction and operational phases; Timely implementation of procedures for permanent conversion of forest land into construction site in accordance with the regulations and procedures for expropriation and fair compensation for lost property forests and forest land.
<p>Construction</p>	
<p>Impacts</p>	<p>Mitigation</p>
<p>Impacts on forestry: construction of the railway will cause negative impacts on forestry, as a result of the removal of forest vegetation, loss of forest area, loss of timber, loss of natural restoration, erosion, loss of forest area in private ownership, etc.</p>	<ul style="list-style-type: none"> Application of the measures of the Forest Management and Removal Plan; Avoiding construction works, construction of access roads, establishment of construction sites, borrow pits, storage of materials and waste in the vicinity of riparian forests of willow and poplar (km 74 + 020 and km 81 + 600), riparian

<p>Impact assessment: negative, with great significance.</p>	<p>belts of willow and poplar (km 74 + 200 to km 81 + 300) and submontane beech forests (km 81 + 500 to km 82 + 600);</p> <ul style="list-style-type: none"> Minimizing the area affected by construction activities and minimize the cutting of timber in order to reduce damage to forests through appropriate solutions in the final design; Partial landscaping of the land and the surroundings, and reforest certain areas where construction is complete, and so on.
<p>Residual impacts and mitigation measures: Likelihood of residual impacts as a result of the removed forest vegetation is possible. If the occurrence of residual impacts is evident, additional impact analysis will be performed and additional measures will be proposed.</p>	
Operation	
Impacts	Mitigation
<p>Impacts on forestry: Maintenance of the track and removal of vegetation along the railway, as well as occasional emergence of fires can cause negative impacts on forestry.</p> <p>Impact assessment: negative with negligible small importance (if not taken into account the effects of a possible outbreak of fire).</p>	<ul style="list-style-type: none"> Implementation of activities for natural or artificial recovery of the forest with native species, which are also adapted to climate change. If there is no possibility to establish new forest areas, to find land which will be afforested (compensation, which will be implemented by the investor of the project); Application of measures to prevent accidents, incidents and hazards.
<p>Residual impacts and mitigation measures: Residual impacts are not expected.</p>	
Components of the environment-Waste	
Pre-construction and construction	
Impacts	Mitigation
<p>Generating waste: inappropriate waste management can cause negative impacts on the environmental media and other relevant aspects and can impact the health of the community.</p> <p>Impact assessment: negative, with negligible low to moderate significance.</p>	<ul style="list-style-type: none"> Preparation of Waste Management Program for the construction and implementation of measures Signing contracts with authorized companies for collection, transport and treatment of waste and transfer of waste, and engaging and expert-waste manager Kriva Palanka, should appoint / allocate sites for disposal of inert waste / construction debris and residue of excavated soil, which can not be used for construction of the railway.
<p>Residual impacts and mitigation measures: Residual impacts are not expected if the waste is managed properly.</p>	
Operation	

Impacts	Mitigation
<p>Generating waste: Inadequate waste management by (created by the maintenance of the track and facilities, passengers etc.). Can cause negative impacts on air, water, soil etc.</p> <p>Impact assessment: negative, with negligible small significance.</p>	<ul style="list-style-type: none"> The establishment and implementation of procedures for waste management; Set collection containers, especially at the station, the halt and in facilities where labor will be included, and collection and disposal of waste by authorized handlers; If the operator of the railway from its operation during one calendar year produces more than 200 kilograms of hazardous waste and / or more than 150 tons of non-hazardous waste is required to draw up programs for waste management in accordance with Article 21 of the Law on waste management.
<p>Residual impacts and mitigation measures: Residual impacts are not expected.</p>	

6.2 Impacts on society and measures to reduce impacts

SOCIAL IMPACT	PRE-CONSTRUCTION	MITIGATION MEASURES
<p>Social aspects management system</p> <p>Improper management of the implementation of the social aspects management system</p> <p>Impact assessment: negative, with little significance.</p>	<p>Do not expect residual impacts, if all the measures are implemented.</p> <ul style="list-style-type: none"> Appointment of an employee in PERI who will be responsible for managing and monitoring the implementation of measures for mitigation and monitoring programs, and it regularly informs the highest reaches of the company and external stakeholders. 	
<p>Delays in project implementation due to maladjustment of the company to the requirements of the IFIs</p> <p>Impact assessment: negative, with moderate significance.</p>	<p>residual impacts</p> <ul style="list-style-type: none"> Procurements must be carefully planned and executed to avoid delay in implementation of the investment, The investor has to start early consultations with all potentially interested companies that can engage in construction works, The developer must either allocate staff or hire an external expert who will prepare all necessary documents and procedures before the announcement of the tender. 	<ul style="list-style-type: none"> Delays can always happen, even though all procedures and recommendations are implemented. Anyway, this project is complex and requires engagement of various professionals and companies that do not always fit to accept the given assignments, or ready for teamwork.
<p>residual impacts</p>		

<p>Delays in the project due to poorly executed expropriation and dissatisfaction of the persons concerned</p> <p>Impact assessment: negative, with moderate significance.</p>	<ul style="list-style-type: none"> • Development of Resettlement Policy Framework and Resettlement Action Plan; • Appropriate information, communication and consultation with those whose property will be expropriated, at an early stage, until their final resettlement and disappearance of the negative consequences of the resettlement and more.
<p>residual impacts</p> <p>Increased anxiety among the population because of the lack of communication with local settlements and property owners near the project area</p> <p>Impact assessment: negative, with moderate significance.</p>	<p>Because of inertia and self-confidence of individuals, the need for implementation of the measure may be underestimated by the developer, and then the condition can appear before the appearance of this negative impact. Or, some of those affected have high aspirations and in every possible way to insist on the creation of this impact, in order to extract greater financial and material benefits from the developer.</p> <ul style="list-style-type: none"> • Consultation activities with stakeholders, especially those who own land near or along the alignment of the railroad; • Creating a mechanism for grievance, and be publicly available in each affected settlement, at the headquarters of PE and the field premises and in the municipality of Kriva Palanka. • Making Stakeholder Engagement Plan (SEP) which will be made according to good international practice which promote MFIs. • Organization of the facility / office that will serve as the Information office of the project. It will be a public location where all information and documents related to the project will be available to the public.
<p>residual impacts</p> <p>Problems concerning the organization of labor</p> <p>Impact assessment: negative, with little significance.</p>	<p>Residual impacts will remain, but with far less intensity because it is very difficult to impact the minds of the people and their interests and desires.</p> <ul style="list-style-type: none"> • Making Employment Plan for the Project (EPP), in cooperation with the local office of the Employment Agency, with special emphasis on hiring local labor and reduce the pressure of losing qualified staff to other economic entities in the municipality.
<p>residual impacts</p> <p>Underperformance in compliance with the standards of IFIs in terms of workers and working conditions</p> <p>Impact assessment: negative, with little significance.</p>	<p>Despite the implementation of all measures, residual effects are possible.</p> <ul style="list-style-type: none"> • The developer must implement a system for occupational health and safety (SUBZRM / OHSAS). • Development of Occupational Health and Safety Plan (OHP) for temporary or mobile construction sites which will include implemented grievance mechanism for workers and Security statement with risk assessment for jobs on a construction site.
<p>residual impacts</p> <p>Housing , communications and utilities</p>	<p>Residual impacts are not expected, if all the measures are implemented.</p>
<p>Expropriation of houses / homes</p> <p>Impact assessment: negative, with great significance.</p>	<ul style="list-style-type: none"> • Development of a Resettlement Policy Framework (RPF) and Resettlement Action Plan (RAP). • Appropriate information, communication and consultation with those whose property will be expropriated, at an early stage, until their final resettlement and disappearance of the negative

	consequences of resettlement.
<i>residual impacts</i>	Almost impossible to mitigate negative impacts in its entirety, because not all parties will be satisfied.
Economy and livelihood	
Increasing expectations of the affected population in terms of employment	<ul style="list-style-type: none"> Development of a Employment Plan for the Project (EPP), in cooperation with the local office of the Employment Agency, with special emphasis on hiring local labor and reduce the pressure of losing qualified staff to other economic entities in the municipality.
Impact assessment: negative, with little significance.	Possible residual effects. The expectations of the local population can't be controlled from the outside.
<i>residual impacts</i>	<ul style="list-style-type: none"> Making Employment Plan for the Project (EPP), in cooperation with the local office of the Employment State Agency.
Loss of qualified staff in local companies (increase in operating costs)	Despite the implementation of all measures, residual impacts are expected. The expectations of the local population can't be controlled from the outside.
Impact assessment: negative, with little significance.	CONSTRUCTION
Social aspects management system	
Reduced activities to involve stakeholders in the construction phase	<ul style="list-style-type: none"> Maintain communication with stakeholders and interested parties from the project area in the construction phase, because not all stakeholders are able or willing to fill out a complaint or grievance.
Impact assessment: negative, with little significance.	Do not expect residual impacts if all the measures are implemented.
<i>residual impacts</i>	
Safety and health of the community	
Increased threat for the population and livestock due to the presence of construction	<ul style="list-style-type: none"> Preparation and implementation of procedures to protect the health and safety of local communities and populations and their livestock; Construction Site Organization Plan in order to respond to accidents and emergencies in a manner appropriate to the construction risks ; Safe pedestrian and traffic corridors through the site marked with visible signs, and communicated with the local communities and schools; Preparation, design and implementation of safety campaigns for the population during construction of infrastructure projects.
Impact assessment: negative, with moderate significance.	

<p>residual impacts</p>	<p>Although all the measures are implemented, there are still "interested" parties that will try to find a way to satisfy their own curiosity and be present at the site at any given moment.</p>
<p>Occurrence of accidents from transporting materials and railway Impact assessment: negative, with moderate significance.</p>	<ul style="list-style-type: none"> Developing plans for evacuation and rescue in case of emergency (fire, explosion, release of hazardous substances), which will cover all possible incidents involving railway under construction, and operation of the same, and possible measures for rapid response and mitigation of harmful impacts.
<p>residual impacts</p>	<p>Despite the implementation of all measures, residual impacts are expected, but so far it is too early to talk about something that has not happened</p>
<p>Problems related to the behavior of workers to the local environment Impact assessment: negative, with little significance.</p>	<ul style="list-style-type: none"> All employees, even those of subcontractors, must sign a code of conduct, which should be accessible and visible, and each employee must understand the value of the document and the consequences it brings if they break it.
<p>residual impacts</p>	<p>Despite the implementation of all measures, residual impacts are possible.</p>
<p>Fear for personal health and safety due to the increased volume of traffic through settlements Impact assessment: negative, with little significance.</p>	<ul style="list-style-type: none"> Making full implementation of the Plan for traffic management in the settlements, actively communicated with stakeholders from the affected areas and the local public.
<p>residual impacts</p>	<p>Despite the implementation of all measures, residual impacts are possible</p>
<p>Anxiety from noise due to construction activities Impact assessment: negative, with moderate significance.</p>	<ul style="list-style-type: none"> Organizing meetings with locals where all the negative consequences of the project are explained, and will be particularly focused on the noise frequency of vehicles and workers, and safety of the public during the upcoming period of construction activities in the vicinity of their homes.
<p>residual impacts</p>	<p>Despite the implementation of all measures, residual impacts are possible.</p>
<p>Adults in remote areas Impact assessment: negative, with little significance.</p>	<ul style="list-style-type: none"> Creating an Action Plan for Social support during construction (APSSC) and signing an agreement with the Municipal Center for Social Work Kriva Palanka to cope with the needs of adults in remote areas and delivery of contractual obligations.
<p>residual impacts</p>	<p>Do not expect residual impacts, if all the measures are implemented</p>
<p>Housing, communications and utilities</p>	
<p>Disruption of everyday life caused by limited access to populated settlements, land and property Impact assessment: negative, with moderate significance.</p>	<ul style="list-style-type: none"> Availability of the timeframes of construction activities for the public, particularly for each settlement, to reduce the impact that comes from inability of access to desired destinations; Engaging an adequate % of manpower for this project from the whole project area, with special preference given to applicants from rural populated areas of the project area.

<p>residual impacts</p> <p>Degradation of local roads due to construction related transportation</p> <p>Impact assessment: negative, with little significance.</p>	<p>Do not expect residual impacts, if all the measures are implemented</p> <ul style="list-style-type: none"> • After completion of civil works contractor must repair the damaged local roads which are used to transport goods and people.
<p>material assets</p> <p>Interruption of access to communal and road infrastructure</p> <p>Impact assessment: negative, with little significance.</p>	<p>Do not expect residual impacts, if all the measures are implemented.</p> <ul style="list-style-type: none"> • To provide all the opinions and approvals from competent authorities for material assets, facilities, networks and infrastructures present in the project area or planned construction in their planning and strategic documents of the Republic of Macedonia, region or municipality. In the design phase, as well as during the performance of the construction work, to comply with the recommendations and opinions from the competent institutions.
<p>residual impacts</p> <p>Impact on dwelling facilities from vibration</p> <p>Impact assessment: negative, with little significance.</p>	<p>With the implementation of all the measures, residual impacts are not expected.</p> <ul style="list-style-type: none"> • Recording the current state of all the houses that are located along the alignment in width of 100 m and to document the condition, which will serve to properly compensate for any damages caused by vibrations generated in the construction and operational phases.
<p>residual impacts</p> <p>Degradation of local roads due to construction related transportation project</p> <p>Impact assessment: negative, with little significance.</p>	<p>Despite the implementation of all measures, residual impacts are possible. Sometimes vibrations damage the object gradually, and it is not always visible.</p> <ul style="list-style-type: none"> • After completion of civil works contractor must repair the damaged local roads which are used to transport goods and people.
<p>Economy and livelihood</p> <p>Anxiety of cattle because of the noise during construction activities, explosions and / or displacing cattle away from the alignment of the railroad</p> <p>Impact assessment: negative, with moderate significance.</p>	<p>Do not expect residual impacts, if all the measures are implemented.</p> <ul style="list-style-type: none"> • Consultation / meeting with the owners of cattle on pastures on local hills and the river, which will promptly be informed of the timeframe of the construction activities on site.
<p>residual effects</p> <p>Increasing employment</p>	<p>Despite the application of any measures to mitigate the impact, residual impacts can be expected.</p> <p>NO</p>

Assessment of impacts: positive with moderate significance.	
<i>residual impacts</i>	NO
Loss of agricultural land and property for the railroad Impact assessment: negative, with moderate significance.	<ul style="list-style-type: none"> • Consultation / meeting with the owners of livestock and agricultural land will be confiscated. If it is estimated that households will lose part of their existence, because of the seizure of agricultural property, then they must be compensated through RAP.
<i>residual impacts</i>	Do not expect residual effects , if implemented all measures.
Economic loss of local businesses Impact assessment: negative, with little significance.	<ul style="list-style-type: none"> • The contractor must meet with the owners of the fish pond, to which will present the building solutions and would talk to minimize the negative impacts on farm and restaurant. This case and other similar cases that include economic losses due to the project, not seen at this stage of the project, must be included in the policy framework for resettlement and RAP. In case of work cessation of the fish pond or restaurant or other economic losses, the owners of the fish pond should be reimbursed at market prices.
<i>residual impacts</i>	Despite the implementation of all measures, residual impacts are expected
Increase of professional engagement of local companies Assessment of impacts: positive, with moderate significance.	NO
<i>residual impacts</i>	NO
Economic benefits of the project Assessment of impacts: positive, with great significance.	NO
<i>residual impacts</i>	NO
Education Anxiety from disturbed process of education and learning Impact assessment: negative, with little significance.	<ul style="list-style-type: none"> • Between the contractor and the local authorities and affected communities, at the very beginning of the construction phase, a channel of communication and information should be established. It should be maintained until the end of construction activities. The locals in the city and populated areas where explosions are taking place must be informed of the sequence of planned explosions on a weekly basis.
<i>residual impacts</i>	Despite the implementation of all measures, residual impacts are expected.
Labor and working conditions	

Stress , caused by a noisy work environment Impact assessment: negative, with negligible significance.		<ul style="list-style-type: none"> Preparation of Occupational Health and Safety Plan on temporary and mobile construction sites that includes implemented grievance mechanism for workers and Security statement with risk assessment for jobs on a construction site.
An influx of workers Impact assessment: negative, with little significance.	residual impacts	Do not expect residual effects if all measures are implemented.
Incidents caused by easily flammable, corrosive and explosive materials Impact assessment: negative, with little significance.	residual impacts	<ul style="list-style-type: none"> Preparing a Worker Accommodation Plan (WAP), which will be in line with the best international practice through experience and standards of the IFIs. Do not expect residual impacts if all measures are implemented. Providing special training for workers handling flammable materials protection and fire prevention; Storage of flammable materials away from their initiating sources and oxidizing materials.
Stress caused by exhaust fumes in the workplace Impact assessment: negative, with little significance.	residual impacts	Do not expect residual effects if implemented all measures.
Endangered health of workers due to work at height Impact assessment: negative, with little significance.	residual impacts	<ul style="list-style-type: none"> Preparation of Occupational Health and Safety Plan on temporary and mobile construction sites that includes implemented grievance mechanism for workers and Security statement with risk assessment for jobs on a construction site. Do not expect residual impacts if all measures are implemented.
Endangered health of workers from rotating and moving equipment Impact assessment: negative, with negligible significance.	residual impacts	<ul style="list-style-type: none"> Proper training of employees on use, maintenance and integrity of PPE (personal protective equipment). Implementation of protection measures against a fall. Do not expect residual impacts if all measures are implemented.
Endangered health workers to drive industrial vehicles and traffic construction Impact assessment: negative, with negligible significance.	residual impacts	<ul style="list-style-type: none"> The use of specially designed machines that eliminate the danger of trapping, and ensuring that the limbs are away from danger of injury, during normal operating conditions. Do not expect residual impacts if all measures are implemented. Training and licensing of operators of industrial vehicles for the safe handling of specialized vehicles, as well as regular check of their health, according to the law.
Cultural heritage, religion, values and habits		
	residual impacts	Do not expect residual impacts if all measures are implemented.

Potentially destruction and loss of undiscovered archaeological sites Impact assessment: negative, with negligible significance.		<ul style="list-style-type: none"> In the event of an accidental discovery of archaeological objects, Contractor shall immediately inform the investor and the Ministry of Culture and follow their instructions. Workers need to pass basic training procedure for accidental archaeological site.
residual impacts		Do not expect residual impacts if all measures are implemented.
Anxiety from blasting during religious ceremonies Impact assessment: negative, with moderate significance.		<ul style="list-style-type: none"> Making weekly timetable of activities for resources that will generate strong noise and vibration, which will be placed on public sites in populated areas.
residual impacts		Do not expect residual impact if all the measures are implemented
OPERATION		
Demographics		
Reduce migration		NO
Assessment of impacts: positive, with moderate significance.		
residual impacts		NO
Safety and health of the community		
Possible incidents of road crossings over railway Impact assessment: negative, with little significance		<ul style="list-style-type: none"> The investor must implement regular practice of raising local awareness of the negative aspects of disrespecting signaling at road crossings. Local people must be reminded, especially the youth, about the possible consequences of the breach of security infrastructure and signaling along the tracks.
residual impacts		<ul style="list-style-type: none"> Despite implementation of mitigation measures, residual effects will occur. Attempts of illegal crossings by car through the railway will not disappear. Some people rely on their own feelings when it comes to personal safety and often do not respect the rules set by the railway.
Possible incidental crossing over the railway at illegal crossings Impact assessment: negative, with little significance.		<ul style="list-style-type: none"> The investor must implement regular practice of raising local awareness of the negative aspects of the railroad crossing at illegal pedestrian crossings.
residual impacts		Despite implementation of mitigation measures, residual impacts will occur. Attempts of pedestrian illegal crossing of the line won't disappear. Some people rely on their own feelings when it comes to personal safety and often do not respect the rules set by the railway. <ul style="list-style-type: none"> Specifically for this project, mitigation measures are proposed in the chapter on "Noise".
Anxiety due to noise from rail traffic Impact assessment: negative, with moderate significance		

<p>residual impacts</p>	<ul style="list-style-type: none"> Residual impacts are possible even after the implementation of mitigation measures. Sometimes the proximity of the railway can initiate resettlement of sensitive persons / households into the calmer parts of the city or other settlement, ie a kind of process of internal migration. Such induced migration in reality not only depend on the proximity of the railway but also by economic and other factors.
<p>Economy and livelihood</p> <p>Deterioration of the economic situation of residents in the municipality and the possible migration Impact assessment: negative, with moderate significance.</p> <p>residual impacts</p> <p>Residual impacts are possible.</p>	
<p>Labor and working conditions</p> <p>Diseases caused by electromagnetic radiation in the workplace Impact assessment: negative, with little significance</p> <ul style="list-style-type: none"> Regular health checks for staff exposed to this kind of radiation. 	
<p>residual effects</p>	<p>Do not expect residual effects if implemented all measures.</p>

6.3 Transboundary impacts

As a result of the proximity of the Republic of Bulgaria, possible impacts with a cross-border context (cross-border impacts) were analyzed. Considering that construction activities in the immediate vicinity of the border include the construction of a cross-border tunnel only (the activities will be carried out exclusively on the territory of the Republic of Macedonia), it can be concluded that transboundary impacts are not expected on the environmental media and areas or if they occur, as for example, the impacts on ambient air quality or impacts caused by noise, they will be negligible. The transboundary environmental and social impacts and their assessment are shown in the table below.

Table 2 Overview of transboundary impacts

Environmental media and factors	Assessment of transboundary impacts	Mitigation measures
Geology and geomorphology	No significant impacts are expected, due to the terrain characteristics.	Adhering to the proposed tunneling methodology
Soils	No significant impacts are expected, due to the fact that construction activities, landfilling, storage of materials will be performed at Macedonian territory.	No measures are proposed
Surface water	No significant impacts are expected, due to the fact that there are no shared watershed areas at the border line between the two countries	No measures are proposed
Groundwater	No significant impacts are expected, due to the identified low permeability of the soil and rocks, and the depth of the groundwater table (more than 100 m).	Adhering to the proposed tunneling methodology, monitoring of the groundwater table and quality using the installed piezometers on the Bulgarian and Macedonian side.
Air quality	No significant impacts are expected.	No measures are proposed
Noise	No significant impacts are expected, due to the distance of settlements and protected areas.	No measures are proposed
Vibrations	No significant impacts are expected, due to the distance of settlements and protected areas.	No measures are proposed
Climate change	No significant impacts are expected.	No measures are proposed
Visual fetures of landscape	No significant impacts are expected, due to the fact that most of the tunnel is already constructed and there are no nearby receptors.	No measures are proposed
Functional characteristics of landscape	No significant impacts are expected, due to the fact that most of the tunnel is already constructed and the tunnels are preferred option regarding the functional aspects of the landscape.	No measures are proposed
Habitats	No significant impacts are expected, due to the fact that most of the tunnel is already constructed and the tunnels are preferred option regarding the protection of the existing habitats in the area.	No measures are proposed
Plant species	No significant impacts are expected.	No measures are proposed
Animal species	No significant impacts are expected.	No measures are proposed
Diatoms and macroinvertebrates	No significant impacts are expected.	No measures are proposed
Protected areas	No significant impacts are expected, due to the fact that the tunnel alignment does not interfere	No measures are proposed

	<p>with protected areas, and the distance between the border tunnel and NATURA 2000 sites on the neighbouring country (Republic of Bulgaria):</p> <ul style="list-style-type: none"> ✓ approx. 1, 90 km from the “Osogovska Planina” site (site code: BG0002079); and ✓ approx. 1,50 km from “Karshalevo” (site code: BG0000294) 	
Forestry	No significant impacts are expected, due to the fact that no deforestation is envisaged during the construction of the border tunnel and operation of the railway	No measures are proposed
Waste	No significant impacts are expected, due to the fact that the waste generated by the construction activities will be deposited on identified locations ⁴ , far away from the border	No measures are proposed
Social aspects	Assessment of transboundary impacts	Mitigation measures
Transport of goods and passengers	Positive impacts, improved trade, economy, communication and new opportunities (business, tourism etc.)	No measures are proposed
Economy and livelihoods	Positive impacts, improved trade, economy, communication and new opportunities (business, tourism etc.)	No measures are proposed

⁴ Some of the locations are already identified, but will be approved by the future Contractor for construction of the railway.

7 ENVIRONMENTAL AND SOCIAL CUMULATIVE IMPACTS AND MITIGATION MEASURES

Changes in the environment and society, caused by the envisaged activities for the implementation of the railway construction project, combined with other activities from the past, present or future activities, similar to the activities envisaged in the project area, are assessed as cumulative impacts.

From the submitted documentation for the Corridor VIII section (Kriva Palanka-Border with the Republic of Bulgaria) and the collected data and information it can be concluded that in the immediate vicinity of the project area, where the route of the envisaged railway line is located, activities for implementation of the Infrastructure projects, and there are also facilities that have already been built and their presence or prolonged effects from the time of their construction contribute to the emergence of cumulative impacts. In the immediate vicinity of the project area is planned: A) construction of the express road Rankovce-Kriva Palanka; B) reconstruction of the existing main road Kriva Palanka-Deve Bair; C) a new motorway to the Republic of Bulgaria (if built in the future).⁵ From the major infrastructure facilities that are nearby or interfere with the Project Corridor, the 110 kV transmission line connection with the Republic of Bulgaria and the gas pipeline network has been built.

The activities of rehabilitation and reconstruction of the existing road to the border crossing, as well as the construction of the expressway are assumed to start before the implementation of the construction works for the construction of the railway line. However, since it is about the implementation of projects related to construction activities that will last every 24 months at least (there is a risk of overlapping of activities), the sum of the impacts on the environment and the social environment will have greater significance than the similar impacts considered Individually.

If all projects are active at the same time, the intensity of the cumulative impacts will be significantly higher, and difficulties can arise in the implementation of the measures for their reduction or avoidance. This is unlikely, as the pace of realization of the projected projects does not always follow the envisaged course, so there is a high probability of deferring the duration of each of them, which will greatly reduce the anticipated cumulative impacts.

Environmental cumulative impacts

Considered from the aspect of environmental impacts, the implementation of the Project will cause positive cumulative impacts in terms of reducing greenhouse gas emissions, since much of the road transport for human and cargo transportation, which is one of the more significant sources of greenhouse gases Contributing to climate change, will be replaced by rail transport. Based on the calculations and analyzes, the construction of the railway line is expected to contribute to the reduction of CO2 emissions at the national level by 27 (kt) by 2030 or the cumulative CO2 emissions will be reduced by 229 kt.

In addition to the positive cumulative impacts, the construction and operation of the railway line will cause negative cumulative impacts on the media and environmental areas.


Below is an overview of possible negative cumulative impacts on the media and areas on the environment, as well as measures to reduce or avoid them.

Cumulative impacts	Measure/Mitigation
Geology and soils	Use of the same access roads, landfills, camps, dumping grounds and other construction facilities, which would reduce the impact on soils and geology.
Hydrology, surface- and groundwater	During construction work, coordination of projects (roads and railways) is recommended in order to avoid concurrent construction works at close distances to the rivers and streams in the project area. If the construction work is carried out simultaneously, take into account the

⁵ The motorway is a planned investment, but there is no confirmation that will be implemented for sure.

	<p>maintenance of the biological minimum in the rivers and strict control of the measures for avoiding possible water pollution.</p>
Ambient air and climate change	<p>In the construction work, coordination of the projects (roads and railways) is recommended in order to avoid simultaneous construction work;</p> <p>Use of the same access roads, landfills, camps, landfills and other construction facilities, in order to avoid unnecessary removal of vegetation;</p> <p>If construction works are carried out simultaneously, apply all available measures to reduce air emissions and strict control of all sources of emissions.</p>
Noise	<p>During the elaboration of Detailed Designs, the sections should be taken into account, where there is a possibility of cumulative impacts, in the construction and operational phase.</p> <p>During construction work, coordination of projects (roads and railways) is recommended in order to avoid concurrent construction works at close distances at locations where sensitive receptors are present,</p> <p>When preparing Detailed Designs for roads, account should be taken of the calculated levels of noise from the railways and, if necessary, to design sound barriers between the road and the receptors.</p>
Vibrations	<p>In the detailed assessment of the vibrations in the pre-construction phase, take into account the envisaged construction of the express road, the highway, the reconstruction of the existing road and, if there is a possibility for cumulative impacts, to anticipate appropriate measures that will be applied in the construction and operational phase.</p>
Landscape (visual characteristics of the landscape)	<p>The measures for landscaping of the excavations and embankments along the railway line should be fully implemented and replicated in the context of the other linear infrastructure projects envisaged in this corridor. In this way, the change in the visual characteristics of the landscape can be mitigated by introducing a new object in the landscape, but can not be eliminated.</p>
Landscape (functional characteristics of the landscape)	<p>Taking additional measures to ensure the "flow" of the biocorridors, ie providing additional culverts along the highway, which will be based on detailed assessments and analyzes.</p>
Biodiversity - habitats	<p>No additional measures are planned to eliminate the cumulative effects on the habitats (in the case of river and riparian habitats only), except for the consistent application of the measures envisaged in the railway construction. The same measures should apply in the event of the construction of the motorway.</p>
Biodiversity - flora	<p>No additional measures are foreseen to eliminate the additional effects on the flora, except for the consistent application of the foreseen measures for the construction of the railway line. The same measures should apply in the event of the construction of the motorway.</p>
Biodiversity - fauna	<p><i>Construction of the railway and the planned highway</i></p> <p>Careful planning and undertaking of serious measures for mitigating the impacts from the construction of the future highway, especially the area of the identified biocorridors from MAKNEN (Macedonian national ecological network).</p>
Biodiversity - fauna	<p><i>Construction of the railway and the expressway</i></p> <p>The envisaged measures for the construction and operation of the railway at this moment are sufficient to minimize the expected impacts, but in the planning of this section of the expressway, particular attention will need to be paid to enable the movement of animals even during the functioning of the expressway .</p>
Biodiversity – fauna	<p><i>Construction of the railway and reconstruction of the existing national road</i></p> <p>It is necessary to anticipate effective mitigation measures, as well as strengthened monitoring.</p>

Protected areas	The proposed measures are sufficient to mitigate most of the impacts. However, care should be taken in planning the borrow pits and landfills, ie such areas should be outside the boundaries of the aforementioned areas (Osogovo Mountains, German-Kozjak and Kiselicka River Gorge).
Forestry	Use of the same access roads, landfills, campsites, landfills and other construction facilities, Change of designing documents for forestry management, in accordance with the newly created changes.

 Cumulative impacts on the social aspects

The construction of the railway, together with the construction and reconstruction of the envisaged roads will contribute to positive cumulative impacts in the region, as a result of the increased opportunities for temporary employment of the local population, development of local businesses, migration, etc. Also, the operation of the railroads and roads will contribute to improving the transport services and their quality (fast and efficient transport of people and goods), which will significantly contribute to the revival of the region, the development of the economy, reduction of the intensity of the village-town and city-capital city migration, etc.

In addition to the benefits, the implementation of projects can also cause negative cumulative impacts. The following table provides an overview of social domains where social cumulative impacts are expected.

Cumulative impact	Measure/Mitigation
Economy Business -	Companies should be timely informed about possible impacts and opportunities for economic activity in the surrounding areas and for the expected periods of impacts, enabling them to plan and prepare. Specific programs need to be set up to enable local businesses to benefit from procurement opportunities and more.
Economy workforce -	Information on the workforce, the proposed schedule and the conditions for placement in the project area are unknown. Indicatively stated starting dates in public information may differ from the exact dates of the project. Labor projections can be postponed substantially by changing the peak moment of need of the workforce. Of great importance for all projects is to enable collaboration and communication at a higher level and to establish coordination of their activities in order to avoid any obstacles in their mutual work.
Economy employment -	Local residents should be given preference for employment, especially in the Project, and avoid losing funds in the local community. The Contractor will offer adequate education and professional upgrading of the low qualified personnel. Cooperation with ESA in the pre-construction phase in order to ensure in a timely manner qualified personnel. Contact the local ESA office in order to provide additional training for the workforce.
Social services	In order to reduce the potential impact on the local health service during the construction phase, the contractor should hire his own medical staff who will be available for the time of work. It is also expected that the contractor will communicate with the local health organizations, especially with the medical institutions, and cooperate and coordinate.

8 RISK OF ACCIDENTS

The risk of accidents or incidental situations may arise as a result of:

- technical defect of the equipment for work (construction equipment and railway equipment);
- improper handling of raw materials and auxiliary materials, waste, etc.;
- human error and
- natural phenomena (earthquakes, floods, etc.).

Incidental occurrences of a fire or explosion at locations near the border with the Republic of Bulgaria, if they are not timely controlled and prevented from spreading, can cause negative transboundary impacts on the affected receptors.

To reduce the risks of accidents, appropriate measures have been prescribed to mitigate or avoid impacts in the construction and operational phases.

9 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN AND MONITORING PROGRAM

Within the framework of the study, the Environmental and Social Management Plan (ESMP) has been prepared, which reflects the measures for protection against possible identified impacts and gives clear obligations and responsibilities for implementation of these with a certain time dynamics. The plan provides a description of the proposed measures to be implemented in order to achieve a sustainable and acceptable level of environmental and social impacts and at the same time represents a simple tool that can help meet the requirements and comply with national regulations and the regulation of the European Union.

In the *construction phase*, the EMSP will be implemented by the Contractor in cooperation with PERI and MTC. For this purpose, it will implement an environmental and social management system, and prepare Environmental Management Plan composed of the following planning / programming documents: Construction Site Organization Plan, Dust Management Plan, Blasting Management Plan, Traffic Management Plan, Noise Management Plan, Waste Management Program, Soil Management Plan and Erosion and Sedimentation Protection Plan, Biological Diversity Management Plan (Plant and Animal Species), Plan for management and removal of forest vegetation, Plan for water management and river crossing, Plan for flood management, especially for protection against "flash floods", Hazardous Substances Management Plan and Leakage Control, Plan for protection and rescue from natural disasters and other accidents, Plan for emergency evacuation and rescue (fire, explosion, discharge of hazardous substances), Occupational safety and health plan for temporary and mobile construction sites with implemented grievance mechanism for workers, as well as a statement of safety with risk assessment for site workplaces, Political Resettlement Framework (PRF) and Resettlement Action Plan, Stakeholder Engagement Plan, Employment plan for the needs of the project, Action plan for social support during construction, Plan for worker accommodation.

In the *operational phase*, EMSP will be implemented by PERI, with all its structural units, in cooperation with MTC and the Government of the Republic of Macedonia. For these needs, PERI will implement a system for environmental management and social aspects, and prepare an Environmental Management Plan composed of the following planning / program documents: Soil management plan and protection against erosion and sedimentation, Plan for remediation of contaminated soils or replacement of contaminated soil material with new and its storage in special landfills (if required), Plan for management and removal of forest vegetation, Plan for protection from weeds and ruderal vegetation, Waste Management Program if the requirements of Article 21 of the Law on Waste Management are fulfilled, Hazardous substances Management Plan and Leakage Control, Assessment of the threat of natural disasters and other accidents with the Plan for protection and rescue from natural disasters and other accidents, Plan for evacuation and rescue in the event of an emergency, Plan for restoring livelihoods, etc.

The monitoring program aims **to assess the degree of project implementation and the effects of implementing the mitigation measures**. You can find more details on this within the ESIA Report.

10 DIFFICULTIES IN THE DEVELOPMENT OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY

During the preparation of the Environmental Impact Assessment Study for the construction of the new railway line Kriva Palanka-Border with the Republic of Bulgaria, as part of Corridor VIII, its developers faced the lack of data in order to provide a more detailed description of the Project activities, as well as environmental conditions. Below is an overview of the reasons for the lack of data and the consequences and the difficulties of the lack of them:

- The study was prepared on the basis of the Feasibility Study, and then information and layouts were provided, as well as part of the project documentation that will be part of the Preliminary Project, because there are no precise data on the type and quantities of materials to be used in the construction phase, the manner of their supply, the exact locations on the borrow pits, quarries, concrete batching plants, locations for the storage of materials and waste, locations for permanent waste disposal, number and type of vehicles and construction mechanization, manner of their maintenance, routes for the transport of materials and waste, water supply, electricity, wastewater, etc., which resulted in a more general definition of possible impacts and measures to be applied;
- The available project documentation lacks labor force data, ie the number of engaged workers, work camp sites, work days / shifts, hours, water supply for hygiene maintenance, waste water management, generated waste management, etc. which resulted in a more general definition of possible impacts and measures to be applied;
- Lack of continuous data for environmental quality (air, noise, soil, water) that resulted in limitation of the period for which the data were evaluated⁶;
- When collecting data on the current social situation and their processing, there were restrictions as a result of the institutional organization and authorizations, organization of labor, or financial reasons.

11 UPDATE ON THE ESIA

The study on environmental impact assessment for the construction of the new railway line Kriva Palanka-Border with the Republic of Bulgaria, as part of Corridor VIII, should be updated if: significant changes have occurred in the alignment of the railway; significant changes have occurred in the design of the railway (facilities and infrastructure); the conducted investigations show new conditions that may affect the environment and the community; changes in the legislation have occurred, etc.

⁶ Mainly data was used from the current databases (Macedonian Information center, Hydrometeorological department, State Statistics Department, etc.), as well as the data from site visits during the development of the ESIA.