NON-TECHNICAL SUMMARY

OF

ENVIRONMENTAL IMPACT ASSESMENT REPORT FOR INVESTMENT PROPOSAL

“REHABILITATION OF PLOVDIV – BURGAS RAILWAY LINE, PHASE 2“:

Component 1 - „Design and Construction of Signalling and Telecommunication Systems along Plovdiv – Burgas Railway Line; Component 2 - „Construction of Overpasses/Underpasses for Plovdiv – Burgas Railway Section to Replace Existing Level Crossings”; Component 3 - „Planting of Protective Forest Belt along Chernograd – Aytos Open Line”; Component 4 - „Rehabilitation of Skutare – Orizovo Railway Section”; Component 5 - „Modernization of Orizovo – Mihaylovo Railway Section“; Component 6 - „Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station”; Component 7 - „Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the Catenary at Zimnitsa and Straldzha Stations” and Component 8 - „Rehabilitation of Straldzha – Tserkovski Railway Section”

Sofia
April, 2018

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Introduction

This document is a non-technical summary of the Environmental Impact Assessment (EIA) Report of the investment proposal for "Rehabilitation of the Plovdiv-Burgas Railway Line, Phase 2" Project. The purpose of the non-technical summary is to present and summarize in a publicly accessible form the basic information and conclusions contained in the EIA Report so that all stakeholders can understand the nature of the investment proposal in terms of expected impacts on the environment and people's health and the relevant mitigation measures where they are needed and to create an informed opinion on the positive and negative consequences from the project implementation.

The Environmental Impact Assessment (EIA) Report of investment proposal for "Rehabilitation of the Plovdiv-Burgas Railway Line, Phase 2" Project with Employer SE "NATIONAL RAILWAY INFRASTRUCTURE COMPANY", Sofia is being elaborated on the grounds of MoEW Letters, out. № OBOC-74 and № OBOC-51/15.11.2017 and OBOC No-83/ 10.01.2018 (Annex 1).

The EIA report has been prepared in accordance with Art. 96 (1) of the Environmental Protection Act (EPA, State Gazette 91/2002, amended and supplemented, State Gazette № 12/2017) and Art. 12, (1) of the Ordinance for the Conditions and the Order for Carrying out EIA (OCOCEIA) (*Ordinance on EIA*, State Gazette, issue 25/2003, amended and supplemented, SG № 3/2018).

According to the requirements of Art. 95 (2) and (3) of the EPA and Art. 9 of the Ordinance on EIA, EIA scope and content have been prepared and detailed information about the investment proposal and consultations have been conducted with specialized agencies, representatives of the affected public, incl. and NGOs in accordance with Art. 9, (1) of the Ordinance on EIA and consultations with the specialized departments – Ministry of Environment and Water (MoEW) and Ministry of Health (MH) pursuant to Art. 10 of the Ordinance for the conditions and order for carrying out EIA.

With letter out. № EIA-83/12.02.2018 the competent authority MoEW has agreed upon the scope and content of the EIA report (Annex 2). The MH has also coordinated the scope and content of EIA report with letter out. № 92-6/16.02.2018 (Annex 3).

The EIA report and the final version of the scope and content of the EIA report reflect and take into account the comments and recommendations made during the consultations held, incl. those made on the scope and content of the EIA by the competent authorities.

The conditions and measures relevant to the investment proposal from EC Statement 1-1/2010, which coordinates General Transport Master Plan and EC Opinion No 10-6/2014, which co-ordinates Operational Program on Transport and Transport Infrastructure 2014-2020, have been taken into account during the EIA Report preparation.

With letters out. №OBOC-74 and №OBOC-51/15.11.2017, № OBOC-83/10.01.2018, MoEW has decreed a Report on the Degree of Impact Assessment (RDIA) of the investment proposal on the subject and objectives of the affected protected areas within the scope of the route by the separate components to be prepared:

- BG0000578 „Maritza River" for preservation of natural habitats and wild flora and fauna;
- BG0000444 „Pyasachnik River" for preservation of natural habitats and of wild flora and fauna;
- BG0000429 „Stryama River" for preservation of natural habitats and of wild flora and fauna;
- • BG0000443 "Omurovska River" for preservation of natural habitats and of wild flora and fauna;

- BG0000442 „Martinka River" for preservation of natural habitats and of wild flora and fauna;
- BG0000425 „Sazliyka River" for preservation of natural habitats and of wild flora and fauna;
- BG0000418 „Kermenski Vazvisheniya" for preservation of natural habitats and of wild flora and fauna;
- BG0000192 „Tundzha 1 River" for preservation of natural habitats and of wild flora and fauna;
- BG0000205 „Straldzha" for preservation of natural habitats and of wild flora and fauna;
- BG0000196 „Mochuritsa River" for preservation of natural habitats and of wild flora and fauna;
- BG0002028 „Straldzha Complex" for preservation of wild birds.

The Report on the Degree of Impact Assessment of the investment proposal on the subject and the objectives of the protected areas concerned, in accordance with Art. 12, (2), item 5 of *EIA Ordinance* is attached as a separate appendix to the EIA report.

The Report on the Degree of Impact Assessment has been assigned to experts meeting the conditions of Art. 9, (1) of the Ordinance on Compatability Assessment (CA).

The EIA report was developed by DANGO PROJECT CONSULT Ltd., Sofia. The authors of the report are independent EIA experts, meeting the requirements of Art. 83, (1) and (2) of the EPA (last amended and supplemented SG 101/2015), with the relevant declarations attached.

General information

1. Information about the Employer

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2. Necessity and purpose of the investment proposal

The investment proposal "Rehabilitation of Plovdiv-Burgas Railway Line, Phase 2" is classified as repair, restoration and modernization of the existing railway infrastructure. Plovdiv-Burgas Railway Line is a part of the Pan-European Transport Corridor VIII linking the Italian ports Bari and Brindisi and Albanian Durres to the Adriatic Sea with the Black Sea ports of Burgas and Varna and through them the countries of TRACEKA Corridor (the international transport corridor Europe-Caucasus-Asia). The link TRACEKA-Corridor VIII is extremely perspective for Bulgaria, because it is the most direct link between Central Asia and Western Europe. Plovdiv – Burgas Railway Line is a part of TINA network (according to the Ordinance on categorization of the railway lines in the Republic of Bulgaria, included in the railway infrastructure and closing of separate lines or sections of lines) (prom., SG, issue 112 from 2001) has a status of railway highway and it is a link between Pan-European Corridors IV and IX.

The high traffic intensity and traffic are typical for this railway line. Actually, all the passenger and freight traffic from Sofia to Burgas port is carried out along it.

"Rehabilitation of the Plovdiv-Burgas Railway Line, Phase 2" Project brings together preparatory activities for the construction of sections along Plovdiv-Burgas railway line, which have to be implemented during the second programming period of Operational Program on Transport and Transport Infrastructure 2014-2020, thus the construction of the railway systems in this direction will be completed.

The implementation of this investment proposal is aimed at:

- Stimulating the economic growth in the Republic of Bulgaria by providing assistance for the improvement and development of the main railway infrastructure;
- Implementation of the commitments for development of the railway infrastructure in compliance with the European standards and transport policy;
- Ensuring optimization of the existing infrastructure related to the railway network safety;
- Improving the operational railway process in accordance with European standards and transport policy;
- Increasing the competitiveness of rail transport.

3. Location of the investment proposal

"Rehabilitation of Plovdiv-Burgas Railway Line, Phase 2" Project falls within the transitional continental climate and the Black Sea climatic area. The Trans-Continental Climate Area, by its climatic characteristics, occupies an intermediate position between the moderate continental and the continental-Mediterranean climatic region. The climate in the transition area is influenced by both the geo-geographic position of the transition between two climatic belts and the continental air masses of moderate latitudes and the air masses coming from the Mediterranean Sea and the Aegean Sea. For the transitional climatic area two almost equal precipitations are typical – May - June and November - December and two minimums - February and August. In southern Bulgaria, the snow cover lasts about two times less than in Northern Bulgaria. It usually melts before the next snowing. In the transitional area the western and north-west winds prevail and in the more easterly parts - the north - east winds.

The Black Sea climatic region is heavily influenced by the climate-inducing influence of the Black Sea and the peculiarities of atmospheric circulation in this region of the country. This climate area covers a strip along the sea with a width of 30 to 50 km. The specific Black Sea climate is determined by the geographical situation, the peculiarities of the atmospheric circulation in the eastern part of the Balkan Peninsula, the influence of the Black Sea basin. The most significant feature of the climate, that distinguishes it from the climate in other areas, is that it is with relatively mild and damp winter and hot, sunny and dry summer. Spring is cool and autumn is warm.

Plovdiv - Stara Zagora - Burgas Railway Section from the railway network of the Republic of Bulgaria is its essential element. It has the status of a highway and is numbered 8. It is also a part of the Pan-European Corridor №8.

The railway line passes through the southeastern part of Bulgaria and it is entirely located in the South Central and Southeastern Economic Areas. The terrain along which it is built is predominantly plain-hilly, with only a few small areas being low mountainous.

The scope of the investment proposal for "Rehabilitation of Plovdiv-Burgas Railway Line, Phase 2" includes the following components:

- **Component 1:** „Design and Construction of Signalling and Telecommunication Systems along Plovdiv – Burgas Railway Line" including:
  - Optic fiber cable construction along Plovdiv – Burgas Railway Line;
  - Signalling systems construction along Plovdiv – Burgas Railway Line (ETCS level 1, version 2.3.0d);
  - Implementation of computer based interlocking systems in the railway stations along Plovdiv-Burgas Railway Section.
- **Component 2:** „Construction of Overpasses/Underpasses for Plovdiv – Burgas Railway Section to Replace Existing Level Crossings**";**
- **Component 3:** „Planting of Protective Forest Belt along Chernograd – Aytos Open Line"
- **Component 4:** „Rehabilitation of Skutare – Orizovo Railway Section"
- **Component 5:** „Modernization of Orizovo – Mihaylovo Railway Section"
- **Component 6:** „Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station";
- **Component 7:** „Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the Catenary at Zimnitsa and Straldzha Stations"; Rehabilitation of the Catenary along Zimnitsa - Tserkovski Open Line, incl. Straldzha Station";
- **Component 8:** „Rehabilitation of Straldzha – Tserkovski Railway Sectio**n"**

Component 1: „Deisgn and Construction of Signalling and Telecommunication Systems along Plovdiv – Burgas Railway Line" is situated on the territory of Plovdiv, Stara Zagora, Sliven, Yambol and Burgas Regions.

Plovdiv Region - Plovdiv Municipality on the territory of the town of Plovdiv; Maritsa Municipality on the territory of Rogosh, Skutare, Manole and Manolsko Konare villages; Rakovski Municipality on the territory of Belozem Village and Rodopi Municipality on the territory of Brestnik Village;

Stara Zagora Region - Bratya Daskalovi Municipality on the territory of Opalchenets, Mirovo, Orizovo, Cherna gora and Partizanin villages; Chirpan Municipality on the territory of Malko Tranovo, Rupkite, Svoboda and Gita villages and Stara Zagora Municipality on the territory of Vodenicharovo, Samuilovo, Mihaylovo, Borovo, Arnautino, Kaloyanovets, Hristianovo, Elenino, Hrishteni, Kalitinovo, Dalboki, Gorno Botevo, Khan Asparuh and Podslon villages;

Sliven Region - Nova Zagora Municipality on the territory of the town of Nova Zagora and on the territory of Sabrano, Zagortsi, Stoil Voyvoda, Sadievo, Kamenovo and Konyovo villages; Sliven Municipality on the territory of Mladovo, Bozadzhii, Skobelevo, Zhelyo Voyvoda villages and the town of Kermen;

Yambol Region - Yambol Municipality on the territory of the town of Yambol; Tundzha Municipality on the territory of Bezmer, Kabile, Zavoy villages and Straldzha Municipality on the territory of the town of Straldzha and on the territory of Zimnitsa and Atolovo villages;

Burgas Region - Karnobat Municipality on the territory of the town of Karnobat and Devetintsi, Venets, Tserkovski, Iskra, Glumche and Klikach villages; Aytos Municipality on the territory of the town of Aytos and on the territory of Chernograd, Topolitsa, Karageorgievo and Polyanovo villages; Burgas Municipality on the territory of the towns of Burgas and Balgarovo and Kameno Municipality on the territory of the town of Kameno.

The installation of an optical cable will be along the entire 8th railway line from Plovdiv to Burgas. According to the design, the route for the optical cables is within the railway line and no land acquisition is required for its installation.

The installation of signaling systems along Plovdiv - Burgas Railway Line is also within the railway line and no land acquisition is required for its installation.

The planned activities for implementation of station interlockings at the railway stations along Plovdiv-Burgas Railway Section affect only distinctive elements of structural sub-system "Control-command and signaling along the railway line".

Distances from residential areas of the nearest settlements.

- the town of Plovdiv – 20 - 30 m;
- the town of Skutare village – 10 m;
- the town of Belozem – 20 m;
- the village of Orizovo – 10 - 20 m;
- the village of Cherna Gora – 30 - 35 m;
- the town of Chirpan – 23 - 30 m;
- the village of Mihaylovo – 20 - 30 m;
- the village of Hristiyanovo – 30 – 45 m;
- the village of Manole – 20 m;
- the town of Stara Zagora – 20 m;
- the village of Kalitinovo – 25 - 35 m;
- the village of Han Asparuhovo – 20 m;
- the town of Nova Zagora – over 45 m;
- the town of Kermen – 20 m;
- the village of Zimnitsa – 25 - 50 m;
- the town of Straldzha – 15 - 20 m;
- the town of Klikach – 10 - 15 m;
- the town of Aytos – 45-50 m.

Component 1 does not affect protected areas. Within close proximity (up to 500 m) Natural Landmark (NL) "Mladezhki Halm"; Protected Area (PA) "Chirpan Koriya" and Protected Area (PA) "Hissarya".

Component 1 passes through the following protected areas:

- BG0000578 „Maritza River"; BG0000444 „Pyasachnik River"; BG0000429 „Stryama River"; BG0000443 "Omurovska River"; BG0000442 „Martinka River"; BG0000425 „Sazliyka River"; BG0000418 „Kermenski Vazvisheniya"; BG0000192 „Tundzha 1 River"; BG0000205 „Straldzha"; BG0000196 „Mochuritsa River"; BG0002028 „Straldzha Complex" for preservation of wild birds.

Component 1 - historical, architectural and archaeological monuments of culture

There are totally 128 archaeological sites registered in the places where the works will be carried out.

At a distance of 260 m south of the railway line at km 246 + 050 there is a settlement mound of the chalcolith (Vth millennium BC). The railway alignment passes through the territory of an archaeological site - a settlement of the Iron Age (1st millennium BC).

The railway line crosses the alignment of the Via Dialogis Roman road.

Component 2: „Construction of Overpasses/Underpasses for Plovdiv – Burgas Railway Section to replace existing level crossings" is situated on the territory of Plovdiv, Stara Zagora, Sliven, Yambol and Burgas Regions.

Plovdiv Region – Maritsa Municipality on the territory of settlements Rogosh Village and Manole Village, Manolsko Konare Village and Rakovski Municipality on the territory of Belozem Village;

Stara Zagora Region - Stara Zagora Municipality, on the territory of Mihaylovo Village, Kaloyanovets Village, Hristiyanovo Village, Elenino Village, Kalitinovo Village, Hrishteni village, Gorno Botevo Village, Dalboki Village and Han Asparuhovo Village and Bratya Daskalovi Municipality on the territory of Opalchenets Village and Mirovo Village;

Sliven Region - Nova Zagora Municipality on the territory of Sabrano Village, Stoil Voyvoda Village, Sadievo Village and Konyovo Village and Sliven Municipality on the territory of the town of Kermen;

Yambol Region - Tundzha Municipality on the territory of Bezmer Village, Kabile Village and Zavoy Village;

Burgas Region - Karnobat Municipality on the territory of Tserkovski Village, Venets Village, the town of Karnobat, the town of Klikach and Aytos Municipality on the territory of Topolitsa Village, Karageorgievo Village, Chernograd Village and the town of Aytos.

The table shows the structures to be built - 28 overpasses, 1 underpasses and 1 transition bridge and their distances from the residential areas of the nearest settlements.

Type of structure	**km**	**Settlement, Type of area**	**Distance from the construction site, m**
Overpass	18+607	The village of Rogosh, West	890
Overpass	21+890	The village of Manole	40
Overpass	23+800	The village of Manole, North	145
Overpass	26+306	The village of Manole, West	1715
Overpass	32+000	The town of Belozem	borders with the residential area
Overpass	39+092	The village of Opalchenets, North	340
Overpass	85+083	The village of Mihaylovo, West	145
Overpass	92+958	The village of Kaloyanovets	5
		The village of Kaloyanovets, industrial area	20 - 30
Overpass	97+617	The village of Hristiyanovo	borders with the residential area
Overpass	100+113	The village of Elenino	borders with the residential area
Overpass	114+729 (115+115)	The village of Kalitinovo, East	15
Overpass	119+450	The village of Gorno Botevo, South-east	1130

Type of structure	km	Settlement, Type of area	Distance from the construction site, m
Overpass	124+657	The village of Han Asparuhovo	borders with the residential area
Overpass	127+805	The village of Podslon, North-west	1660
Overpass	134+350	The village of Stoil Voyvoda, North-west	1340
Overpass	145+787	The village of Sadievo, North-west	1630
Overpass	151+770	The village of Konyovo	20
Overpass	158+777	The town of Kermen	20
Transition bridge	160+300	The town of Kermen	25
Overpass	171+620	The village of Bezmer	1400
Overpass	187+590	The village of Kabile, West	1050
Overpass	192+625	The village of Zavoy	450
Overpass	219+390	Industrial area, Vinprom Karnobat	borders with the residential area
Overpass	222+220	The village of Tserkovski, South	1240
Overpass	230+320	The town of Karnobat, Southeast	1980
		The town of Karnobat, industrial area	80
Overpass	241+285	The town of Klikach, South	borders with the residential area
Overpass	244+619	The village of Chernograd, South	900
Overpass	248+202	The village of Topolnitsa, South-eats	330
Overpass	248+202	The village of Topolitsa, stop, single houses	10
Overpass	253+520	The village of Polyanovo, West	600
Overpass	260+921	The town of Aytos, North	1150

Component 2 - historical, architectural and archaeological monuments of culture.

There are totally 128 archaeological sites registered in the places where the works will be carried out. During field searches in the areas of future overpasses, it will be determined whether some of them will be endangered.

Component 2 does not affect protected areas. Nearby (up to 500 m) such ones are also missing.

Component 2 concerns the following protected areas: BG0000418 "Kermenski Vazvisheniya" and BG0000196 "Mochuritsa River" for the Preservation of Natural Habitats and Wild Fauna and Flora.

Component 3: „Planting of Protective Forest Belt along Chernograd – Aytos Open Line".

The site is located on the territory of Burgas Region, Aytos Municipality, the territory of Topolitsa Village and Chernograd Village.

Section I of the forest belt - from km 244 + 060.00 to km 244 + 760.00, is situated 1000 m to the north of Chernograd Village.

Section II of the forest best - from km 245 + 365.00 to km 246 + 390.00, is situated 1200 m to the north of Chernograd Village and 620 m to the south of Topolitsa Village.

Component 3 - historical, architectural and archaeological monuments of culture.

At a distance of 260 m south of the railway line at km 246 + 050 there is a settlement mound of the chalcolith (V^{th} millennium BC).

Component 3 does not affect protected areas. Nearby (up to 500 m) such ones are also missing.

Component 4: „Rehabilitation of Skutare – Orizovo Railway Section" is for a linear site, situated on the territory of Plovdiv and Stara Zagora municipalities. The railway stations Skutare, Manole, Belozem and Opalchenets are located along the alignment, falling within the territories of Plovdiv, Maritsa, Rakovski and Bratya Daskalovi municipalities.

Component 4 is divided into five sections, as follows:

- Skutare - Manole Section - from km 16 + 905 to km 21 + 730
- Manole Station - from km 21 + 730 to km 22 + 663;
- Manole-Belozem Section - from km 21 + 730 to km 31 + 875;
- Belozem Station - from km 31 + 875 to km 32 + 879;
- Belozem – Orizovo Section - from km 32 + 879 to km 43 + 030.

The component under consideration (by sections) is at the following closest distances from the settlements and the relevant residential areas located near the railway line:

Settlement	**Distances, m**		
	km	distance, m	Type of area
Rogosh Village	17+000 до 17+220	50 - 80 m east	residential area
Manole Village	21+550	65 m	industrial area of Manole Village
Manole Village	21+700	15 m	industrial buildings of Manole Village
Manole Village	21+730	5 m	industrial building to the north
Manole Station	21+870	85 m	industrial building
Manole Station	21+870	140 m	residential area, to the north
Manole Station	22+000 до 22+200	50 – 140 m	residential area, to the north
Manole Station	22+250 до 23+200	15 - 25 m	residential area on both sides of the railway line
Belozem Station	32+000 до 32+900	20 – 30 m	residential area on both sides of the railway line
Opaltchenets Halt	39+100	300 m south	residential area
Orizovo Village	42+400 до 43+030	15 – 20 m	residential area on both sides of the railway line

Component 4 - historical, architectural and archaeological monuments of culture.

At a distance of 260 m south of the railway line at km 246 + 050 there is a settlement mound of the chalcolith (V^{th} millennium BC).

No archaeological real cultural valuables are registered. In this section, the railway line crosses the alignment of the Via Dialogis Roman road.

Component 4 does not affect protected areas. Nearby (up to 500 m) such ones are also missing.

Component 4 affects Protected Zone BG0000429 "Stryama River" for the preservation of natural habitats and wild flora and fauna;

Component 5: "Modernization of Orizovo – Mihaylovo Railway Section"

The activities of the modernization of Orizovo-Mihaylovo Railway Section will take place on the territory of Stara Zagora Region, Stara Zagora, Chirpan and Bratya Daskalovi municipalities, the territory of Orizovo, Cherna gora, Svoboda, Mihaylovo, Rupkite, Malko Tranovo, Vodenicharovo, Samuilovo, Partizanin, Gytha villages and the town of Chirpan.

The component under consideration is at the following closest distances from the settlements and the relevant residential areas located near the railway line:

Settlement	**Distances, m**		
	km	distance, m	Type of area
The village of Orizovo	43+029 to 43+700	15 – 50 m	residential area on both sides of the railway line
The village of Cherna Gora	47+000 to 48+800	25 – 50 m	residential area on both sides of the railway line
The village of Cherna Gora	49+000	60 m	industrial area
The town of Chirpan, bypass connection	58+500	23 m	dwelling house
The town of Chirpan, bypass connection	58+400 to 59+000	40 m, west	residential area
The town of Chirpan, bypass connection	58+200 to 60+250	south, east and north-east 15 – 20 m	industrial area
The town of Chirpan, bypass connection	--	130 south	school
The village of Svoboda	65+300	330 m south	residential area
The village of Svoboda	65+600	120 m south	industrial area
The village of Svoboda	67+000	320 m	dwelling house
Svoboda Halt	67+200 to 67+700	160 m north	industrial area
The village of Mihaylovo	--	west	the railway line borders with industrial buildings
The village of Mihaylovo	77+000 до 80+000	25 - 45 m	residential area on both sides of the railway line

Component 5 - historical, architectural and archaeological monuments of culture.

11 archeological sites have been registered along the route, which will be threatened to a different extent by future construction activities.

Component 5 does not affect protected areas. Nearby (up to 500 m) Protected Area (PA) "Chirpan Koriya" is available.

Component 5 affects protected areas BG0000443 „Omurovsa River" and BG0000442 „Martinka River" for preservation of natural habitats and wild flora and fauna;

Component 6: "Modernization of Yambol - Zimnitsa Railway Section, at Zavoy Station" is a site located on the territory of Yambol Region, Yambol Municipality and Tundzha Municipality, on the territory of the town of Yambol and Zavoy Village.

Its implementation is related to the expropriation of about 60 decares of land for the alignment of the new double railway line.

The closest distance of Component 6 to a residential area is at the village of Zavoy, km 91 + 950 to 420 m to the north-west.

Component 6 - historical, architectural and archaeological monuments of culture.

The route passes through the territory of one archaeological site - a settlement of the Iron Age (1st millennium BC).

Component 6 does not affect protected areas. Nearby (up to 500 m) such ones are also missing.

Component 6 affects Protected Area BG0000192 "Tundzha I River" for preservation of natural habitats and wild flora and fauna;

Component 7: „Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the Catenary at Zimnitsa and Straldzha Stations"- the site is located at Zimnitsa Station and Straldzha Station, located on the territory of Yambol Region, Straldzha Municipality, the territory of Zimnitsa Village and the town Straldzha.

Component 7 is at the following closest distances from the populated areas and relevant residential areas located near the railway line, as follows:

- Zimnitsa Village – 20 - 50 m residential and industrial area on both sides of the railway line;

- Straldzha Village – 20 - 25 m residential and industrial area on both sides of the railway line;

Component 7 - historical, architectural and archaeological monuments of culture.

No endangered archaeological sites have been identified in the area.

Component 7 does not affect protected areas. Nearby (up to 500 m) such ones are also missing.

Component 8: "Rehabilitation of Straldzha - Tserkovski Railway Section" is a site located on the territory of Burgas Region, Karnobat Municipality, the territory of the Devetintsi Village.

Component 8 – 10 - 35 m industrial area, Vinprom.

Component 8 - historical, architectural and archaeological monuments of culture.

No archaeological sites have been registered in the area.

Component 8 does not affect protected areas. Nearby (up to 500 m) such ones are also missing.

Component 8 affects Protected Area BG0000205 "Straldzha" for preservation of natural habitats and wild flora and fauna and BG0002028 „Straldzha Complex" for preservation of wild birds.

We apply a Google Map with location and exact distance from the railway alignment of the individual components to the nearest residential areas and other areas and sites subject to health protection within the meaning of §1, paragraph 3 of the Supplementary Provisions of OCOCEIA, Annex 4.

4. Structure, situation development and main technological characteristics

The scope of the investment proposal for "Rehabilitation of the Plovdiv-Burgas Railway Line, Phase 2" includes the following components:

- Component 1: „Deisgn and Construction of Signalling and Telecommunication Systems along Plovdiv – Burgas Railway Line" including:

- Optic fiber cable construction along Plovdiv – Burgas Railway Line;
- Signaling systems construction along Plovdiv – Burgas Railway Line (ETCS level 1, version 2.3.0d);
- Implementation of computer based interlocking systems in the railway stations along Plovdiv-Burgas Railway Section.

- Component 2: „Construction of Overpasses/Underpasses for Plovdiv – Burgas Railway Section to Replace Existing Level Crossings";

- Component 3: „Planting of Protective Forest Belt along Chernograd – Aytos Open Line"

- Component 4: „Rehabilitation of Skutare – Orizovo Railway Section"

- Component 5: „Modernization of Orizovo – Mihaylovo Railway Section"

- Component 6: „Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station";

- Component 7: „Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the Catenary at Zimnitsa and Straldzha Stations";

- Component 8: „Rehabilitation of Straldzha – Tserkovski Railway Section"

- **Component 1: „Deisgn and Construction of Signalling and Telecommunication Systems along Plovdiv – Burgas Railway Line"**
  - **Optic fiber cable construction along Plovdiv – Burgas Line, conceptual design 2016**

Beginning Filipovo Station – station building axis (border of coverage Plovdiv - Svilengrad) km 5 + 652 - Burgas Station km 293 + 500.

The length of Plovdiv - Burgas Railway Line is 293.5 km. There are 31 stations and duty points along the route. The line is fully electrified.

The purpose of the project is the newly built telecommunications system to meet the requirements of the railway infrastructure and the Bulgarian railway operators over a long period of time, ensuring the management and servicing of trains, the administrative and operational management of the stations and NRIC's units and the railway operators along the section of 8th main railway line Plovdiv - Stara Zagora - Burgas. *Its implementation will also cover the interoperability criteria for this section of the rail system, an integral part of the Trans-European conventional and high-speed rail systems.*

Current status of the telecommunication systems in the section
Main cable

A copper main cable is installed along the entire route. The cable is paper-insulated and consists of 8 high frequency (HF) pairs up to 150 kHz and 30 low frequency (LF) pairs for tonal systems - 0.3 to 3.4 kHz. The majority of the LF pairs are loaded.

There is a second cable of the same type in the sections where the alignment of the 8ht railway line overlap with other railway lines; with 4th railway line - along Mihaylovo - Stara Zagora Section; with 3rd railway line - along Zimnitsa – Karnobat Section and for 82nd railway line - along Plovdiv - Filipovo Open Line.

The cable was laid down between 1970 and 1980. It is in a satisfactory technical condition along Plovdiv - Stara Zagora Section. Serious damages have been caused in Stara Zagora - Zavoy Section during the repair works on the rehabilitation of the permanent track and the cable is in a poor condition due to the presence of temporary connections.

The signaling systems operation for control of the open line is disturbed. The train operation in this section is provided under the telephone mode requirements. Operational technological and telecommunication connections is violated. Generally, the cable is at the end of its lifetime (about 45 years) and it is completely morally and technically outdated, with no potentials and capacity to provide modern telecommunication services.

General requirements for the optical cable system

An optical cable will be installed along the entire 8th railway line from Plovdiv to Burgas.

- One optical cable will be installed along Plovdiv - Filipovo - Skutare and Plovdiv - Plovdiv Marshalling Yard - Trakiya - Skutare sections.

-Two cables will be installed underground, together with the corresponding HDPE pipes in a duct network along Skutare - Orizovo Section.

- An air optical cable will be installed on the catenary pillars along Orizovo - Chirpan – Mihaylovo Section. **The second optical cable will be installed along the future track №2 between Orizovo and Mihaylovo.**

- Two optical cables will be installed under the ground, as along the open lines they will be laid down in excavations on both sides of the track, and in the stations - in the duct network.

Two HDPE pipes will be laid down in the excavation made for underground installation of the fiber optic cable, as the second one remains free for future development. The optical cable will be available at all stations and operational points in the section and on the endpoints of ODF optic distributors. According to the design 50 m optic cable reserve is foreseen in the open lines at the level crossings (to be removed) for the future application of modern video surveillance systems and their remote control.

In the area of Plovdiv Railway Node, a real optical ring will be installed, as the optical cable will be laid down along the route Plovdiv - Philipovo - Skutare - Trakia Halt - Plovdiv. It aims covering the route of fast and passenger trains, operating along the eastern railway tangent Plovdiv - Plovdiv Marshalling Yard - Skutare. In some parts of the route (the platforms of Plovdiv and Filipovo stations) there is duct network that will be used. Reconstruction of the station developments at the stations is envisaged in the area of Plovdiv, Filipovo, Skutare and Plovdiv Marshalling Yard.

Two optical cables will be installed from Skutare Station to Burgas Station and a real optical ring will be fulfilled in this area.

Under Component 4 "Rehabilitation of Skutare - Orizovo Railway Section", a route with three HDPE pipes Ø 40 will be constructed. Two optic cables will be pulled out in both tubes, the third one will remain in reserve. In Manole, Belozem stations and Orizovo Station Belozem side, duct network will be installed to the premises for signalling, telecommunication, including also Basic Sectional Post (BSP) Belozem.

In compliance with the the current design one optical fiber cable will be installed on the catenary pillars from Orizovo Station to Mihaylovo Station.

Two independent routes for the two optical cables with 2 HDPE pipes Ø40 will be traced along the open lines.

Cable with 12 pcs. Single mode fibers are installed up to Chirpan Substation and Chirpan Catenary Railway Sub-Region.

At Stara Zagora Station, cables are installed up to the building of the main telecommunication junction Stara Zagora - servicing the south-east network of NRIC. The building is situated to the east, next to Stara Zagora Central Station. In the area of the platform the cables will be drawn into the existing duct network. In this section from km 106 + 130 to km km 107 + 255 will be built a pipe network with 4 pcs. pipes Ø 110 protected with concrete casing and 17 pcs. shafts. The duct network will be pulled out to the administrative building of Stara Zagora Railway Section.

Construction of a duct network in the area of the stations, where pipes are provided for drawing the optical cables to the telecommunication premises is envisaged in Kaliyanovets, Kalitinovo, Han Asparuh, Nova Zagora, Konyovo, Bezmer, Yambol, Zavoy, Straldzha and Tserkovski stations. In the area of Kermen Station cables will be laid down along both independent routes. In the area of Nova Zagora and Yambol stations the existing duct network between the station buildings will be used.

From km 232 + 146 in the region of Karnobat Station to the autimatic exchange (AE) building, both routes becomes merged. Construction of a pipe channel with 4 pcs. pipes Ø 110 protected with concrete casing and 6 pcs. shafts is envisaged in this section.

At all the stations from Stara Zagora - Burgas Railway Section 6 (six) optical fibers from both cables for connection with the dispatching interlocking at Plovdiv Station will be introduced to the premises of the new route computer based interlockings (RCI).

At Zimnitsa Station and at the stations from Chernograd to Burgas, the alignment is planned to pass through the new duct network of the signaling system.

Deviation from the main fiber optic cable by an optic cable with 12 pcs. single mode fibers to the traction substations Stara Zagora, Nova Zagora, Yambol, Karnobat, Burgas (located between Lozovo Duty Point and Vladimir Pavlov Station) and Catenary Railway Sub-Regions at the same stations. Deviation from the main fiber optic cable is also provided at the GSM-R base stations for located along the open line at km 150 + 423, km 228 + 707 and km 252 + 290.

At Karnobat Station, the cable will go into the telecommunication building, located at about 100 m from the station.

At Burgas station the cable will be fully developed in the telecommunication premisis located on the second floor of the station building.

Construction

According to the design the fiber optic cable route is within NRIC easement and no land acquision is required for its construction.

The total distance of the route along the mileage of the track is 308 km. The total length of both optic cables defined by the conceptual design, taking into account all reserves, crossings, entries, deviations and others, is 680 km optical cable.

All the passings under the railway line and crossings of republic roads are carried out only under the ground with drilling, at distance and depths according to Annex 6 of Art. 34,(13) and Art. 131 of Ordinance № 58 of the Ministry of Transport. Drilling shafts are located at appropriate locations in the area of expropriation of the track. A siege metal pipe is installed in accordance with Art. 87 of Ordinance №. 58 and HDPE pipe is laid down along it.

All the catenary railway sub-regions, substations, BSPs and GSM-R base transmission stations of interconnection provide for deviation from the main optical cable or a separate internal optical fiber cable. Deviation from the fiber optic cable is also made at the halts along the double track sections with train operation in both directions along two current tracks.

The track of the optical cable must be marked and marked in accordance with the requirements of Ordinance № 35 from 30.11.2012 on "Rules and Norms for Design, Construction and Commissioning of the Exploitation Cable Electronic Communication Networks and the Adjacent Infrastructure" (prom., issue 99 from 14.12.2012).

- **Signaling systems construction along Plovdiv – Burgas Railway Line (ETCS level 1, version 2.3.0d), conceptual design 2016**

Component 1 envisages also development of ETCS Level 1, version 2.3.0d. including the following activities:

- complete dismantling of the track equipment of the system for automatic locomotive signaling JZG-703 type in the section Skutare Station - Stara Zagora Station;
- dismantling of all the balises of ALTRACS BDZ system at Plovdiv Railway Node and Stara Zagora - Balgarovo Section;
- delivery and installation of new balises (markers placed between the rails) in return for the existing balises of ALTRACS BDZ system;
- revision of all track encoders (LEUs) of ALTRACS BDZ system;
- dismantling of faulty LEUs at Plovdiv Node and mounting of the regular ones in their place along Stara Zagora - Balgarovo Section;
- use of laid LEU cables and boxes at Plovdiv Railway Station and Stara Zagora - Balgarovo Section and installation of new electronics for ETCS level 1 system version 2.3.0d;
- creation of new ETCS level 1 database, version 2.3.0d for the track equipment of the existing ALTRACS BDZ version 1.2.0 system. The existing system can not migrate to ETCS Level 1, version 2.3.0d;
- technical and detailed design;
- supply and installation of track equipment and cables for the ETCS level 1 system, version 2.3.0d in the section Skutare Station - Stara Zagora Station and Zavoy, Zimnitsa, Chernograd, Aytos, Balgarovo stations;
- delivery of LEU charging tool and balises;
- loading of LEU and balises;
- static tests of telegrams.

Introduction of ETCS system dramatically reduces the probability of trains passing at a red train signal or exceeding the permissible train speed. The equipment provides interoperability enabling safely and efficiently operating in the section of trains equipped with ETCS and GSM-R systems supplied by different manufacturers. The technical reliability of the facilities is also increased due to the expected low number of failures, which are a main factor for breaking train operation timetable. The modernization contributes also to qualitative servicing of passengers at the stations by providing real-time information on trains timetable, directions and connections, as well as messages related to safety and security of passengers.

- **Implementation of computer based interlocking systems in the railway stations along Plovdiv – Burgas Railway Section, conceptual design 2015 и 2016**

The implementation of Component 1 envisages installation of route computerized onterlockings (RCI) at: Kaloyanovets; Kalitinovo; Han Asparuh; Nova Zagora; Konyovo; Bezmer; Yambol; Zavoy; Straldzha; Tserkovski, Burgas, Vl. Pavlov, Lozovo Duty Point; Dolno Ezerovo stations, Druzhba Station and Chernograd, Aytos and Balgarovo stations. Its implementation improves safety and train operation management. The activities included in the scope of Component 1 are delivery, installation and deployment, testing and commissioning of the route computer based interlocking at the stations.

The planned activities concern only specific elements of the structural subsystem "Control-command and signaling along the railway line".

The following activities are planned for implementation:

- **Signalling eqiupment**
  - dismantling of the external and internal equipment of the existing route - relay interlockings;
  - completion of a ducting network with the necessary number of pipes and shafts for signaling cables drawing;
  - supply and laying of cables for new equipment and temporary units;
  - installation of new lights, switch machines, axle counters and cable fittings;
  - installation of internal equipment of the route computer based interlocking in the technical premises and in the premises of the train operation manager on duty; installation of internal relay and internal power supply;
  - delivery of machines and equipment for route relay interlockings (RRI), including 5% spare equipment;
  - staff training;
  - supply of facilities and equipment for system maintenance, including special equipped vehicles.
- **Railway switches heating**
  - reconstruction of the kiosk switchgears according to the new capacities;
  - construction of cable lines, installation of the equipment (distribution panel for switches heating (DPPH), switches heating box (PHB), railway switches heaters);
  - supply of cables, machines and equipment.
- **Renovation of technical premises and buildings**
  - construction of new signaling and telecommunication premises at Chernograd Station;
  - renovation of the premises at Aytos and Balgarovo stations;
  - air conditioning of the premises;
  - reconstruction of the electrical installations in the premises;
  - installation of fire alarm systems;
  - renovation of technical building Aytos;
  - renovation of sanitary and household premises.

The following measures are envisaged for the premises to be made fit for use.

- dismantling of the existing equipment;
- laying of a reinforced cement coating;
- laying of a new floor of granite tiles;
- partial crushing of plaster on the wall;
- plastering of walls;
- restoration of walls and ceiling;
- replacement of the entrance door with a new metal door;
- priming and painting of walls with oil paint;
- laying of granite tiles;
- installation of a hanging ceiling;
- installation of an air conditioning system.

➢ **Component 2: „Construction of Overpasses/Underpasses for Plovdiv – Burgas Railway Section to Replace Existing Level Crossings", conceptual design 2016**

- **Section 1 - from km 18+607 (Skutare) to km 102+020 (Stara Zagora)**
- **Section 2 – from km 115+115 (Kalitinovo) to km 260+921 (Aytos)**

Removal (closure) of 31 existing level crossings is foreseen. The following types of structures (or in the vicinity of the existing level crossings) – 30 pcs., are envisaged to be constructed instead:

Sub-component	Type of structure	km	Type of road	№ of road

Sub-component	Type of structure	km	Type of road	№ of road
101	Overpass	18+607	national road	път III-565
102	Overpass	21+890	street	
103	Overpass	23+800	agricultural road	
104	Overpass	26+306	agricultural road	
105	Overpass	32+000	street	
106	Overpass	39+092	municipal road	Road SZR2006
115	Overpass	85+083	municipal road	Road SZR1190
116	Overpass	92+958	municipal road	Road SZR1183
117	Overpass	97+617	municipal road	Road SZR2175
118	Overpass	100+113	street	
213	Underpass	114+729 (115+115)	municipal road	SZR1185
214	Overpass	119+450	municipal road	SZR1181
215	Overpass	124+657	national road	III-5701
216	Overpass	127+805	agricultural road	
217	Overpass	134+350	agricultural road	
218	Overpass	145+787	agricultural road	
219	Overpass	151+770	municipal road	
220	Overpass	158+777	agricultural road	
221	Transition bridge	160+300		
222	Overpass	171+620	municipal road	JAM3093
223	Overpass	187+590	agricultural road	
224	Overpass	192+625	national road	III-5305
225	Overpass	219+390	municipal road	BGS2063
226	Overpass	222+220	agricultural road	
227	Overpass	230+320	agricultural road	
228	Overpass	241+285	agricultural road	
229	Overpass	244+619	municipal road	BGS1002
230	Overpass	248+202	agricultural road	
231	Overpass	253+520	municipal road	BGS1003
232	Overpass	260+921	municipal road	BGS2007

Total number of strucures:
Road overpasses – 28;
Road underpasses – 1;
Pedestrian overpasses –1.

- Section I from km 18+607 (Skutare) to km 102+020 (Stara Zagoda) – totally 22 one-grade crossings are considered – level crossings.

- Overpass at km 18+607 (between Skutare and Manole)

The sub-site is located east of Skutare Village, where the railway line crosses national road III-565 Skutare-Manole at km 5 + 450. The situational position of the existing crossing (outside the settlement) allows development of a road variant with an overpass.

- Overpass at km 21+890 – Manole Village

The sub-component is located in the western part of Manole Village. *It is designed as an alternative to the both existing overpasses in the village, located at km 21 + 720 and km 22 + 739 respectively*. In the section the railway line is developed as a situational straight alignment, entering Manole Village between the road III-565 Skutare-Manole and a street located in the southern part of the village. The developed road variant seperates from the existing street, heading north, crossing the railway line at an angle of 100gr. and enters road III-565 with a crossing at km 8 + 650.

In the area of over 3.0 m high embankments, at the end of the pavement, installation of a safety parapet h = 1.10 m is envisaged that as a continuation of the planned one at the overpass.

- Overpass at km 23+800 – Manole – Belozem Open Line

The sub-component is located east of Manole Village where the railway line crosses an agricultural road at km 23 + 800. In the area of crossing, the railway line is developed in a straight alignment. The road variant is separated from the existing agricultural road, heading north and crossing the railway at an angle of 100 gr. The length of the variant is 467 m.

- Overpass at km 26+306 – Manole – Belozem Open Line

The sub-component is located east of Manole Village where the railway line crosses an agricultural road at km 26 + 306. In the area of crossing, the railway line is developed in a straight alignment. The road variant is separated from the existing agricultural road, crossing the railroad line at an angle of 100 gr and going north to Manolsko Konare Village. The length of the variant is 520 m. The planimetry decision is taken according to the adopted design speed V = 40 km / h.

- Overpass at km 32+000 – Belozem Village

The sub-component is located in the western part of Belozem Village. It is designed as an alternative of the existing crossing at km 32 + 905. In the area of crossing, the railway line is developed into a situational straight alignment as it enters Belozem Village parallel to road III-565. The developed road variant is separated from a street located in the southern part of the village as a continuation, heading north, crossing the railway line at an angle of 100gr, then enters road III-565 with a crossing km 21 + 800. The length of the variant is 531 m.

At about km 0 + 180, the road variant is crossed obliquely by a drainage channel.

- Overpass at km 39+092 (Opaltchenets –Belozem side)

The sub-component is located south of Opalchenets Village, where at km39 + 092 the railway line crosses the municipal road SZR 2006 „Mirovo – Opalchenets". In the area of crossing, the railway line is developed into situational straight alignmnet. The developed road variant initially follows the route of the municipal road, then goes north-east, crosses the railway line at an angle of 100 gr and re-enters the route of the municipal road before entering the underpass under Trakia Highway (at km159 + 270). The length of the variant is 575 m.

- Overpass at km 85+083 (Mihaylovo – Kaloyanovets side)

The sub-site is located to the east of Mihaylovo Village, where at km 85 + 083 the railway crosses the municipal road SZR 1190 „Kaloyanovets - Lovetz – Mihaylovo". Situationally, in the area of crossing the railway line is developed in a horizontal curve with a very large radius. The developed road variant initially follows the route of the municipal road, then goes east, crosses the railway line in a straight alignment at an angle of 100gr, and re-enters the route of the municipal road. The length of the variant is 599 m.

- Overpass at km 92+598 – Kaloyanovets Village

The sub-component is located in the western part of Kaloyanovets Village, where the railway crosses the municipal road SZR 1193 (road II-66 - road SZR 1177), overlapping with a street in the village at km 92 + 598. In the area of crossing, the railway line is developed into a

situational straight alignment, enters Kaloyanovets Village from the west and crosses the municipal road. The developed road variant is separated from a street (the municipal road SZR 1193) located in the western part of the village as its extension, goes north-west, crosses the railway line in a straight alignment at an angle of 100gr, passes round the military division from the north and enters the municipal road with a crossroads . The length of the variant is 692 m.

- Overpass at km 97+617 (Hristiyanovo Village)

The sub-component is located in the eastern part of Hristianovo Village, where at km 97 + 617 the railway line crosses the municipal road SZR 2175 „Pamukchii – Kristiyanovo". In the area of srossing the railway line is developed into a situational straight alignment. The developed road variant initially follows the route of a street in the northern part of Hristianovo Village (overlaps with the municipal road SZR 2175), then goes east, crosses the river and the railway line in a horizontal curve with a radius R = 270 m, with obliquity of 119 gr., and re-enters the route of the municipal road. The length of the variant is 482 m.

- Overpass at km 100+113 (Elenino Village – street leading to national road SZR1190)

The sub-component is located at the eastern end of Elenino Village, where at km 10 + 175 the railway line crosses a street that overlaps with the municipal road SZR 1190 „Stara Zagora-Hristiyanovo". In the area of crossing, the railway line is developed into a situational straight alignment. The developed road variant is separated from a street located at the eastern end of the village, goes westwards, crosses the railway line in a straight alignment at an angle of 100gr and re-enters the street, just before the existing crossing with the municipal road SZR 1190. The length of the variant is 590 m .

Section 2 – from km 115+115/ Kalitinovo/ to km 260+921/Aytos/ totally 22 one-grade crossings are considered.

- Underpass at km 114+729/(115+115) (Kalitinovo)

The sub-component under consideration is located in the northern side of Kalitinovo, where the railway line crosses the municipal road SZR1185. The design speed is V = 50 km/h up to km 0 + 500, then V = 30 km/h. The length of the newly-designed section is 719.36 m, passing also under the road to the south. The gauge is G8 - 2 road lanes x 3.00 m and 2 banquettes x 1.00 m. The total length of the section is 587.40 m. The maximum longitudinal slope used is 6.5%.

- Overpass at km 119+450 (Gorno Botevo)

The sub-component under consideration is located north-west of Gorno Botevo between Kalitinovo and Ploska Mogila, where the railway line crosses the municipal road SZR1181. The road gauge is G8 - 2 road lanes x 3.00 m and 2 banquettes x 1.00 m /grass/. The adopted design speed is V= 50 km/h.

- Overpass at km (Han Asparuhovo)

The sub-component under consideration is located northeast of Han Asparuhovo. The crossing is with a national road - third class № 5701. The road is with G9 gauge - 2 road lanes x 3.25m and 2 banquettes x 1.25 m. The adopted design speed is Vpr = 50 km/ h for the area within the regional planning, and V = 60 km/h for the area out of the regional planning.

- Overpass at km 127+805 (Sabrano)

The sub-component under consideration is located between the Han Asparuhovo and Nova Zagora stations. The crossing is with an agricultural road, which on the north side is agrarian, and from the south it is with a broken stone pavement. The width of the road is 4.00 m in average and the overpass is 5.50 m. The level crossing is IVth category, the level crossing is local type, it is located in a straight section, crossing 1 track at an angle of 100g (90^o). The adopted design speed is V= 30 km/h.

- Overpass at km 134+350 (Stoil Voyvoda)

The sub-component under consideration is located between Han Asparuhovo and Nova Zagora stations and It represents a crossing with a dirt road /agricultural road/. The width of the road is 4.50 m in average and the level crossing covering is 5.00 m. The railway level crossing is

IVth category, the level crossing is local type, it is located in a straight section, crossing 1 track at an angle of 100gr (90^o). The adopted design speed is V= 40 km/h.

- Overpass at km 145+787 (Sadievo)

The sub-componet under consideration is located to the south of Sadievo, between Nova Zagora and Konyovo. The crossing is with an agricultural road /dirt road/. The road gauge is 4.50 m and the level crossing covering is 7 m wide. The railway level crossing is IVth category, the level crossing is local type, crossing 1 track at an angle of 100g (90^o). The road at the level crossing goes in a straight section, but before and after the level crossing goes into curves. The adopted design speed is V= 40 km/h.

- Overpass at km 151+770 (Konyovo)

The sub-component under consideration is located southwest of Konyvo (Konyvo – Kermen Open Line). The crossing is with a municipal road - IVth class № 55505 with gauge G8 - 2 road lanes x 3.00 m and 2 banquettes x 1.00 m. The flooring at some palces is crushed stone /ballast/, there are traces of asphalt laid at some palces, which is currently rutty. The level crossing is IVth category, the level crossing is local type, crossing 1 track at an angle of 100g (90^o). The road from the settlement goes from straight to curve. The level crossing covering is 5 m wide concrete. The newly designed track meets the design speed V= 40 km/h.

- Overpass at km 158+777 (Kermen)

The sub-component is located west of Kermen (between Konyvo and Kermen). The crossing is with an agricultural road with a gauge of average 5.50 m, as currently the level crossing is closed, without passing through the railway line. The covering of the road around the railway line is stone-cut /ballast/, the road is black in some places. The railway level crossing is IVth category, the level crossing is local type, crossing 1 track at an angle of 100g (90^o).

Currently the railway line in this area is under repair.

- Pedestrian overpass at km 160+300 (Kermen)

The sub-component is located in the southeastern part of Kermen (between Konyovo and Kermen). The crossing is with a 2-lane street with a width of 3.00 m.

It is envisaged the crossing on one level to be eliminated and a pedestrian transitional bridge to be built at place of the railway level crossing and *the road traffic to be redirected east from the railway level crossing over the existing nearby overpass.* The dimensions of the transitional bridge will be decided according to the current requirements of "Persons with Reduced Mobility" TSI.

The fact that there is an overpass nearby over the railway line to the east of this railway level crossing at the crossing with the third-class road №6601, as well as that the heavy conditions in the urban environment of this kilometer, make it unjustifiable to design an overpass at the place of this level crossing. An overpass is planned according to the design in the western end of the city - Sub-component 20: crossing at km 158 + 777 (Kermen).

The place of the transition bridge (next to Nikola Vaptsarov Str.) is unchanged, next to the existing level crossing which will be closed. The location of the pedestrian overpass is closer to the station and a possibility of future doubling is provided. The transitional bridge is developed in two versions - an open and covered structure.

- Overpass at km 171+620 (Bezmer)

The sub-component is located southwest of Bezmer, between Kermen-Bezmer stations. The crossing is with a public road JAM3093. The gauge is G8 - 2 lanes x 3.00 m and 2 banquettes x 1.00 m in the area of the level crossing and in the rest part is transformed in G9 - 2 lanes x 3.25 m and 2 banquettes x 1.25 m. There are crossings with Water Supply and Sewerage facilities / duct network / and crossings of optic cables owned by the military base nearby. There are 2 existing culverts. There is also a swamp spot.

- Overpass at km 187+590 (Kabile)

The sub-component is located east of Kabile, between Yambol and Zavoy railway stations /a local road between Kabile Village, the town of Yambol and the Ormana area/. The road passing through the level crossing, the road is dirt with a gauge of 5.0 m on average with crushed stone

pavement. The pavement at 20 m from the final rail is an asphalt road that is currently severely destroyed and the covering at the level crossing is concrete.

Situationally, the design axis of the road is not displaced, the direction towards Yambol remains unchanged. The total length of the newly designed section is 479.38 m.

- Overpass at km 192+625 (Zavoy)

The sub-component is located southeast of Zavoy, between Zavoy and Veselinovo. The crossing is with a national road - third class III №5305 with gauge G9 - 2 lanes x 3.25 m and 2 banquettes x 1.25 m. The asphalt concrete covering in general is in a good condition. The existing overpass is wooden.

Situationally the road is designed on the basis of maps of the property which ownership has been restored and is maintained into a straight alignment, aiming at maximum overlapping of the new design axis with the existing one. The total length of the newly designed section of road III-5305 is 598.29 m. The existing gauge G9 - 2 lanes x 3.25 m and 2 banquettes x 1.25 m is unchanged.

The agricultural road after the level crossing that currently crosses the third-class road at one level should be displaced situationally and incorporated in III 5305 as a triple crossing (km 0 + 503.26).

The designed triple crossing provides access to the properties within the triangle between Trakia Highway, the railway line and road III-5305, as well as the other side of road III-530. If a larger area around the crossing is considered, the necessity of such a discharging becomes evident, aiming at avoidance of access interruption from Zavoy Village and the properties from this side (north-west) of the railway line to those on the other side (the southeast). It should be noted that such a discharging is existing at the moment (as a four-way section) as it was ascertained during on-site inspection and by the maps of the property which ownership has been restored.

There is a separate opening in the facility for an agricultural road parallel to the railway track (on the southeast side) as well as the maps of the property which ownership has *been restored.*

At km 0 + 022.41 on the left of the rising mileage, discharging of currently existing agricultural road is envisaged.

- Overpass at km 219+390 (in the region of Tserkovski Station)

The sub-component is located to the north-west of Tserkovski /next to Tsanko Tserkovski Dam/. The crossing is with municipal road BGS2063 with G8 gauge - 2 road lanes x 3.00 m and 2 banquettes x 1.00 m. The road crosses three tracks - Track 1 and Track 2 from the Plovdiv - Burgas Railway Line and industrial branch for Karnobat Winery.

To ensure access to the entrance of Karnobat Winery, at km 0 + 350, two one-way local lines parallel to the main direction are provided, the first one being longer and continuing to the properties located to the north side of the line.

- Overpass at km 222+220 (Tserkovski)

The sub-component is located to the north-west of Karnobat, between Tserkovski and Karnobat West. The crossing is with a local (dirt) road on the territory of Tserkovski Village with an average width of 5.00 m. The railway level crossing is the IV category, crossing 1 track at an angle of 100g (90º).

The length of the design section is 491.56 m, due to the serious discrepancy between the shot position of the agricultural road and the maps of the property which ownership has been restored, it is necessary to "extend" the axis before km 0 + 000.00 with 209 m and after km 0 + 491.56 with 104 m.

- Overpass at km 230+320 (Karnobat)

The sub-component is located to the north-west of Karnobat, between Tserkovski and Karnobat West. The crossing is with a local (dirt) road with a width of 5.00 m. The railway level crossing is the IV category, crossing 2 tracks at an angle of 100g (90º).

- Overpass at km 241+285 (Klikach)

The sub-component is located north of Klikach Village, between Karnobat and Chernograd stations. The crossing is with a local (dirt) road with crushed stone with an average width of 4.50 m and banquettes x 1.00 m. The railway level crossing is the 4th category, located in a straight section, as 2 tracks are crossed at an angle of 100g (90º).

- Overpass at km 244+619 (Chernograd)

The sub-component is located north-west of Chernograd, between Chernograd and Aytos stations. The crossing is with BGS1002 municipal road between the settlements Topolitsa and Chernograd, G8 gauge - 2 lanes x 3.00 m and 2 banquettes x 1.00 m.

- Overpass at km 248+202 (Topolitsa)

The sub-component is located southeast of Topolitsa /Topolitsa Halt/ between Chernograd and Aytos stations. The crossing is with a local (dirt) road with crushed stone pavement with a width of 5.00 m, which changes into an asphalt road in the direction of the village.

- Overpass at km 253+520 (Polyanovo)

The sub-component is located northeast of Polyanovo. The crossing is with municipal road BGS 1003 with G8 gauge - 2 lanes x 3.00 m and 2 banquettes x 1.00 m.

The developed version of the newly designed route is with gauge G8 - 2 lanes x 3.00 m and 2 banquettes x 1.00 m.

- Overpass at km 260+921 (Aytos)

The sub-component is located between the town of Aytos and Malka Polyana Village on the VIIIth railway line. It is fourth category and the crossing is with municipal road BGS2007 with non-standard gauge - 1 lane x 4.50 m and 2 banquettes x 1.50 m.

The length of the section is 620 m. The developed version of the newly designed route is with gauge G8 - 2 road lanes x 3.00 m and 2 banquettes x 1.00 m.

The displaced secondary agricultural road in the opening of the overpass, parallel to the railway line, is with length of 56.91 m and gauge - 1 road lane x 3.00 m and 2 banquettes x 1.00 m.

The flooring is crushed stone with a thickness of 20 cm and a surface protective layer of fine grain fractions of 2 cm. The displacement is with a view to providing access according to the maps of the property which ownership has been restored.

After the planned overpasses/underpass construction, the level crossings will be removed: dismantling of electrical barriers facilities. There will be dismantled: barrier mechanisms; road traffic lights; earthings; equipment in the outdoor rack for level for crossing operation and the outdoor rack. All dismantled equipment will be handed over to the warehouses of Signalling and Telecommunication District (STD) - Plovdiv.

- **Component 3: „Planting of Protective Forest Belt along Chernograd – Aytos Open Line", detailed design 2015**

Section I – from km 244+060.00 to km 244+760.00, with length L=700 m

Section II - from km 245+365.00 to km 246+390.00, with length L=1025 m

A 20-meter snow protection belt is adopted in the sections under consideration, which also complies with the recommendations that protective facilities should be at a distance of 10-12 times more than their height. The width of the belt is adopted to be 8 m, according to the recommended 4 m at a distance of 15 m and 9 m at a distance of 30 m. It should be planted parallel to the railway line at a distance of 20 m from its axis along the entire length of the track. The structure of the belt is with a rising height from the wind direction and a sharp descending of the height from the side of the track.

This will be achieved by planting shrubs from the side of the wind and trees from the side of the track. The belt will be set up by planting two rows of trees with shrubs between them and three rows of shrubs with a descending height. The rows of trees will be planted at a distance of 3 m from each other and the shrubes - at 1.5 m. The distance between the rows is 2 m, which will ensure better plant development and more convenient access for their maintenance. Plowing and harvesting will take place along the entire length of the belt and within a width of 9 m before planting the trees

and shrubs. The trees will be planted using 3-6 year old saplings in holes 50/50/50, and the shrubes - 3 years old ones in holes 40/40/40. The plantspecies composition is selected according to the local conditions, the height and the density of the crown. Ten times watering with 10 l/pc and two times sowing of the saplings are planned for growing the plants.

Belt gaps are envisaged in three places in Section I (for passgaeways) to ensure passage of people, machines and animals. Four passageways are envisaged for Section II. In these places from the side of the track, the shrub belt changes its direction at a distance of 4-5 m.

To improve the drainage and reduce water flow to Precast Concrete Ditch Element 200/50 type ditch, an additional protective channel is envisaged between the ditch and the snow protective belt. It is built along the entire length of the section with its axis parallel to the axis of the railway line and at a distance of 17 m. The depth of the channel is 0.95 m.

- **Component 4: „Rehabilitation of Skutare – Orizovo Railway Section", detailed design 2017**

The rehabilitation of the Skutare - Orizovo Railway Section covers a section from km 16 + 905 to km 43 + 030.

The section is divided into the following sub-sections:

- Skutare – Manole Section - from km 16+905 to km 21+730;
- Manole Station - from km 21+730 to km 22+663;
- Manole – Belozem Section - from km 21+730 to km 31+875;
- Belozem Station - from km 31+875 to km 32+879;
- Belozem - Orizovo Section - from km 32+879 to km 43+030.

The design solution in the section is for a single electrified railway line, achieving the following design parameters:

Sub-section	**PLAN**						**PROFILE**		
	Length	Design speed	Min radius	Max. outstanding lateral acceleration	Speed of wheel lifting	Max. cant	Max. inclination	Min. length of a vertical element	Min. radius of a vertical curve
	L [m]	V_d [km/h]	$R_{min.}$ [m]	A_{cf} [m/s^2]	F_v [mm/s]	H [mm/s]	I_{max} [‰]	$L_{v.min}$ [m]	R_v [m]
Skutare - Manole	4 840	90	400	0.65	35.5	140	-3.2	308	15 000
Manole Station	862	120	-	-	-	-	-4.2	350	
Manole-Belozem	9 279	120	775	0.58	29.6	130	-4.2	485	15 000
Belozem Station	1 003	120	-	-	-	-	-2.3	500	
Belozem-Orizovo	11 004	130	1500	0.41	31.6	70	-5.5	290	10 000

Rehabilitation of the technical buildings and premises, implementation of the stations and the temporary signalling equipment are envisaged.

Rehabilitation and modernization of the station buildings, the technical buildings for route relay interlockings (RRI), the sanitary units and the switch cabins in the stations are envisaged.

The renewal of the permanent way envisages displacements of the design axis in some points towards the existing one by up to 150 cm, without breaking the integrity of the easement. It includes the following types of main activities: Dismantling the rails and sleepers grid with rails

S49 type and sleepers Ст 4 type or wooden sleepers, transportation to a base for dismantling and arranging the materials; Collecting, loading and transportation of crushed gravel from the existing ballast prism to a depot; Installation of new ditches along the railway track; Laying of reinforcing mesh and separating geotextile; Laying and consolidating of a protective layer with 0.30 m thickness; Delivery and laying of a new rails and sleepers grid with E60 kg/m rails, concrete sleepers and elastic fastening - prepared for continuously welded rail track; Delivery of new ballast, track laying, lifting and tempting up to the design axis and level. Compacting of the track and planning of the ballast prism; Laying of backfill along the track to provide shunting paths.

The renewal of the permanent way in the stations under consideration envisages the following types of main activities: Dismantling the rails and sleepers grid with rails S49 type and sleepers Ст 4 type or wooden sleepers, transportation to a base for dismantling and arranging the materials; Collecting, loading and transportation of crushed gravel from the existing ballast prism to a depot; Excavations and embankments up to the design elevations and inclinations; Laying of reinforcing mesh and separating geotextile; Laying and consolidating of a protective layer with 0.30 m thickness; Delivery and laying of a new rails and sleepers grid with E60 kg/m rails, concrete sleepers and elastic fastening - prepared for continuously welded rail track; Delivery of new ballast, track laying, lifting and tempting up to the design axis and level. Compacting of the track and planning of the ballast prism;

- **Skutare – Manole Section.**

The section covers an open line with length L = 4,840 m from the beginning of switch 1 (16 + 894.22) at Skutare Station to the beginning of switch 2 (km 21 + 734,65) at Manole Station compared to the overall mileage ascertained for the project.

The parameters of the horizontal elements provide a design speed of 120 km. The radii of Curves № 3,4 and 5 impose design speed limit up to 90 km/h.

Level crossings

There are 3 level crossings in the section - at Opalchenets Halt at km 16 + 971.77 and at km 18 + 607.55 and at km 21 + 685.06. The project includes installation of a new elastic covering for the three level crossings. Discharging of the ground bed in the area of the level crossings with drainage systems is planned.

Level crossing at km 16+971.77

Existing situation

The crossing of the railway line with a local road is in close proximity to the entrance throat of Skutare Station. The railway line is in a straight section. The level crossing covering is elastic for rails S49 type.

Design situation

The design development for permanent way part involves change of the existing level crossing covering and its replacement with an elastic level crossing covering for rails 60 type. Draining system for discharging of the level crossing is envisaged.

Under the design for Component 2 - **this level crossing is scheduled to be closed and after Skutare Station a road overpass to be built.**

Level crossing at km 18+607.55

Existing situation

The railway line and road III-565 cross each other on one level at km 18 + 607.55. The railway line is in a straight alignment. The level crossing covering is elastic for 49 type.

Design situation

The design development for permanent way part involves change of the existing level crossing covering and its replacement with an elastic level crossing covering for rails 60 type. Draining system for discharging of the level crossing is envisaged.

Under the design for Component 2 - this level crossing is scheduled to be closed and a road overpass to be built instead (described above in Component 2).

Level crossing at km 21+685.06

Existing situation

The railway line crossing with a local road is in close proximity to the entrance throat of Manole Station. The railway line is in a transition curve. The level crossing covering is elastic for 49 type.

Design situation

The design development for permanent way part involves change of the existing level crossing covering and its replacement with an elastic level crossing covering for rails 60 type. Draining system for discharging of the level crossing is envisaged.

Under the design for Component 2 - this level crossing is scheduled to be closed and a road overpass to be built at km 21+890 (described above in Component 2).

Big structures

- Bridge at 21+204;
- Reinforced concrete retaining wall from 21+232.04 to km 21+478.07

Small structures: Culvert at km 17+015.72; Culvert at km 17+738.07; Culvert at km 18+343.07; Culvert at km 19+998.01; Culvert at km 20+594.08

❖ **Manole Station - from km 21+730 to km 22+663**

The section covers the track development at Manole Station, as the length of the current track is L=928 m from the beginning of switch 2 (km 21+734.65) to the beginning of switch 1 km 22+662.72 compared to the overall mileage ascertained for the project.

Track development

The solution provides the required design speed on main Track 1 V_d = 120 km/h and V_d = 40 km/h on secondary Track 2.

Existing track development

The existing track development is with 3 tracks:

- Track 1 – dead-end – rails 41 type, sleepers CT3;
- Main Track 2 – current track - rails S49 type, sleepers CT4;
- Secondary Track 3 - rails S49 type, sleepers CT4.

The existing switches are S49 type - 1:9-300 on wooden sleepers.

New track development

The detailed design envisages dismantling of the existing tracks and construction of new track development that includes the following tracks:

- Main Track 1 – L_e = 825 m - V_d=120 km/h (superstructure 60 E1 type);
- Secondary Track 2 – L_e =750 m - V_d=40 km/h (superstructure тип S49 type);
- Refuge Track 1 – L=50 m (superstructure S49 type);
- Refuge Track 2 – L=50 m (superstructure S49 type).

Restoration of the existing Track 1 is not envisaged in the new track development, so the numbering of the tracks is changed.

The distance between the axis of Track 1 and Track 2 is 6.20 m.

There are two switches 60E1 type on the main Track 1 - 1: 9-300.

Two refuge tracks in both station throats with a length of 50 m from the beginning of the switches are envisaged to be constructed. This requires two more switches S49-1: -300 type.

Platforms

The existing platforms 2 and 3 are planned to be demolished. A new Platform №1 with length L = 100 m will be built vice the dismantled Track 1 and a new Platform № 2 with length L = 100 m will be built to the right of Track 2.

The platforms have the following basic parameters:

- length L = 100 m from km 21 + 986 to km 22 + 086
- width 3.0 m
- height of top edge of platform element above rail head 550 mm
- horizontal distance from the track axis to the nearest part of the platform 1750 mm:

Crossings

The necessary legal gauging distances are provided with the new geometric solution. The design position for the new road overpass at km 21 + 890 is presented.

Discharging

Drainage between Track 1 and Track 2 with a total length of L = 985 m with PVC pipes ø 200 (L = 317 m) and PVC ø 300 (L = 668 m) is foreseen for dewatering of the ground bed. The drainage is envisaged to pass through the foundations of the catenary pillars, as the developed foundations allow passage of the pipes.

❖ **Manole – Belozem Section - from km 21+730 to km 31+875**

The railway line in Manole Belozem Open Line is single electrified with a length of 9,278.43 m from the beginning of switch 1 at Manole Station - km 22 + 596.89 to the beginning of switch 2 at Belozem Station at km 31 + 875.32.

Plan solution

The direction of the straight along the current track from Manole Station is saved. The design axis according to the Detailed design shifts to the right up to 23.9 cm. The rising is 6 cm at the beginning and 8 cm at the end of the structure. The straight aignment between curve №1 and curve №2 is saved.

The second horizontal curve has changed radius and lengths of the transverse curves. The length of the transverse curves is reduced to a length equal to standard, the radius is increased by 15 m in order to optimize the position of the track on the existing embankment.

The bridge at km 31 + 149.36 (TROG system) is out of gauge in the existing position, as the railway line is positioned diagonally towards its axis. The gauge in the initial left and right end points is violated. According to the Detailed design, the axis of rotation is left, remaining diagonally positioned but symmetrical, and the 1 CM-2 gauge is kept unchanged, as the minimum distance to the structure is 1,725 m - the same at the first left and the last right point of the top structure.

The curve before Belozem Station (from km 31 + 552.80 to km 31 + 856.10), where the Technical design envisages a displacement of more than 130 cm from the existing railway line, is improved in the Detailed design, as the values of the radius and the lengths of the transverse curves are kept unchanged. The displacement towards the center of the curve is reduced to less than 100 cm, on account of about 30 cm displacement to the left before the curve.

These following improvements are achievd with these changes:

The maximum horizontal displacement is reduced from 130 cm to 98 cm, which is in favour of keeping the existing ground bed and existing culverts;

The horizontal distance from the beginning of the last transition curve in the open line to the beginning ofswitch 2 increases from 15.40 m to 19.25 m.

Crossings

Level crossing at km 22+700.98

The crossing is existing and it is located on the territory of Manole Village at km 22 + 700.98 along the mileage of railway line, in Peta Street, which is with asphalt pavement. The level crossing covering is made of reinforced concrete slabs. The design envisages dismantling of the covering and its replacement with a new elastic one for UIC 60 type rails. The existing road traffic light will be replaced with a new one. All the rest existing level crossing equipment such as: elastic fences, gauge frames, concrete guide posts, etc. will be retained.

To ensure the possibility of road vehicles passing through the level crossing during the repair activities, the construction and assembly works are planned to be carried out in 2 stages. First stage - closing the western lane of the street (closing half of the railway level crossing) and traffic directing along the eastern lane with two-way waiting movement. Second stage - transferring the traffic along the repaired western lane (with two-way waiting movement) and closing of the eastern lane for repair.

The design envisages also repair works along 37th and 44th streets. 37th street is located on the north side of the railway level crossing and the road lane width ranges from 4.30 to 5.00 m. 44th street is located on the southern side of the railway level crossing and the road lane width varies from 6.00 to 7.00 meters. Construction of sidewalks and banquettesis planned along both streets, as their exact location is presented in the graphic part of the design.

After the construction of a road overpass at km 21 + 890, provided by Component 2, the level crossing will be closed.

Level crossing at km 23+800.90

The level crossing is situated on a field road without pavement. The level crossing covering is made of reinforced concrete slabs. Dismantling of the covering and its replacement with a new elastic one for UIC 60 type rails is intended.

Under Component 2 - this level crossing is scheduled to be closed and a road overpass to be built in its place (described above in Component 2).

Level crossing at km 26+305.98

The level crossing at km 26+305.98 is situated on a field road without pavement. The level crossing covering is made of reinforced concrete slabs. Dismantling of the covering and its replacement with a new elastic one for UIC 60 type rails is intended.

Under Component 2 - this level crossing is scheduled to be closed and a road overpass to be built in its place (described above in Component 2).

Discharging

Culverts

There are 14 culverts and four reinforced concrete bridges in the open line. The condition of the structure is not good. Some of the culverts do not fulfil the function for running water away from the track. During the construction of irrigation and drainage systems along the track, the surrounding terrain has been changed. The function of one of the existing culverts has been neglected. The heifht of the inlet and the outflow are lower than the adjacent terrain, retain water and create conditions for railway line weakening. In solving the track discharging, the designer has eliminated these culverts without interfering water supply through the ditches and ensuring discharging of the ground bed of the track.

Culverts subject to removal

- Culvert VOD1 pipe ø 80 at km 24+040.10 silted at the inlet and outflow.
- Culvert VOD2 pipe ø 80 at km 24+372.66.
- Culvert VOD7: existing – slab with a bright opening 0.80 m at km 27+855.15.

- Culvert VOD9: на км 30+027.89 - existing - pipe ø 60 with a length of 5.60 m, extended with a slab 1.80 m more.

- Culvert VOD12 на км 31+011.53 - existing - slab with a bright opening 0.80 m. The structure is with a height of inflow and outflow 1.5 m lower than the surrounding terrain. Thus, conditions for water retention and worsening the state of the railway track are created.

Culverts № 7, 9 and 12 will be destroyed. Culverts № 1 and 2 will be rehabilitated according to the solution on the technical design.

Ditches

30 cm thick protective layer is provided beneath the ballast prism. This requires lowering the bottom of the ditches below the lower edge of the protective layer. Discharging of the track is difficult to achieve, due to the flat nature of the terrain.

The ditches are discharged into the existing culverts and bridges. Only in single cases they are poured out when the surrounding terrain becomes lower. The foreseen ditches are waterproof faced. Depending on the height of the earth ground bed and the terrain, the following types of faced ditches are accepted:

- monolithic Type 1 – trapezium type section with a depth of 35 cm;
- ditches Precast Concrete Ditch Element 200/50 type;
- monolith Type 2 with variable depth h = 35-90 cm.

A hydraulic dimensioning is made to prove the flow capacity of the profiles adopted under the "Railway Infrastructure Technical Requirements".

Ditches are foreseen along one or two sides of the track, depending on the direction of terrain lowering and the possibility for water outflow.

Other infrastructures crossings

The track crosses three sag pipes in the open line. During the works, a representative of the respective company operating the water supply systems and power supply lines, tracing of the exact location and depth and working in compliance with the safety rules should be provided in the areas of crossings.

Big structures: Bridge at km 23+290; Bridge at km 25+760; Bridge at km 26+073.

Small structures: Culvert at km 24+040; Culvert at km 24+732; Culvert at km 24+833; Culvert at km 24+961; Culvert at km 25+728.94; Culvert at km 27+320; Culvert at km 27+376; sug pipe at km 27+574; Culvert at km 27+855; Дюкер при км 28+593; Culvert at km 28+604; Culvert at km 30+191; Passage at km 30+378; Culvert at km 31+012; Passage at km 31+373; Culvert at km 31+390; Passage at km 31+73.

- **Belozem Station - from km 31+875 to km 32+879**

Existing situation

Subject of the present sub-section is Belozem Railway Station. It is with 5 arrival-departure tracks. There are two loading and unloading tracks at the station.

There are 3 passenger platforms for passenger servicing. The platform is covered with basalt plates.

Next to the first track on the eastern side of the station building there is one-sided ramp with a length of 50 m and a width of 10 m, and a weightbridge with lifting capacity of 120 tones.

A railway branch derives from the even throat, servicing "Jet" Ltd., "Insa Oil" Ltd. and "Gazexpress" companies. 4th, 5th and 6th arrival-departure tracks at Belozem Station are used for shunting activity. The current track is track 2, which is higher compared to the other tracks.

The existing distances between tracks 2nd and 3rd and between 3rd and 4th are smaller than the legal requirements. In the odd throat of the station there is a road level crossing, as the distance between the edge of the pavement and the switches is less than 6 m.

The condition of the track by axis and level is not good. Generally, the load-bearing capacity of the ground bed is not sufficient. The section discharging is not good – there are no drainages built.

Design solution

The solution made is optimizing and completing the technical design with new planimetries on the station tracks so that the solution is feasible within the platforms, the station building and the pedestrian path between the tracks.

The first, fourth and fifth tracks are with partially changed planimetries in the transition areas after the throats to allow the pedestrian path meeting the requirements of Ordinance №4/2009 on accessible environment for disadvantaged people and the longitudinal inclination of the first track within the weightbridge to be in the horizontal alignment.

Plan solution

According to the Technical specification, the existing third track and third platform are destroyed and a new platform is planned instead. The solution on the track development is also consistent with the updated easement line.

Protective tracks in both throats and eliminating of the existing third track are envisaged in the design. All the planned tracks are 54.70 meters long, measured from the beginning of the protective switch including the length of the ballast pyramid serving for diverting against route overlap.

Entrance throat

The current track, now track 2, is entirely in a straight alignment. The location of the entrance switch №2 is displaced at 88 cm towards the open line. Thus, the distance from the end of switch№ 2 to the beginning of switch №4 is 8.42 m, sufficient for positioning of long sleepers. The distance from the beginning of switch № 2 to the beginning of the protective track of the horizontal curve in the open line is 19.28 m.

North side

The proposed solution provides the existing track servicing INSA OIL to be used as a protective one. It is a continuation of the station track with a new №3 and with rising longitudial gradient vice versa to the augmentative mileage.

The horizontal curve following switch № 14 on the fifth track, which is an arrival-departure track for the passenger movement, is determined with a radius R = 370 m. Thus, by the end of the adjacent switch № 14 distance of 6.20 m is remaining.

South side

The design envisages construction of a protective track, which is a continuation of First station track, connecting the current track via "S" type connection of switches №№ 4 and 6. The detailed design envisages keeping the position of track 1 unchanged.

Exit throat

Designing of protective tracks within the easement and taking into account the location of the level crossing requires a change in the situational position of the First and Fifth station tracks. Therefore, the following solution is developed:

North side

The new protective track follows roughly the direction of the dismantled third track, as the existing switch №7 is turned and set in a direction coinciding with the direction of switch №9 and with along the deviation - with the axis of the new protective track.

Station track with a new number five is intended for passenger traffic and therefore the radius of the horizontal curve is increased to R = 300 m for the curve from km 0 + 617.40 to km 0 + 650.70 per fifth track mileage. The solution for 5th track - its existing location due to switch № 9 and the protectice track is kept unchanged.

South side

At the existing track development situation, the level crossing at km 32 + 833.32 crosses two tracks – the first and the current ones. Protective track is envisaged along the direction of first station track, with exit switch №1 forming "S" type connection with switch № 3, which are put 64 m forward in the open line. The beginning of curved switch № 3 to the protective track is 6.00 m from the level crossing pavement. Thus the level crossing crosses first and second station tracks outside the switches area. All railway tracks retain their approximate situation. The displavements envisaged in plan place the main and third tracks in a right alignment. The displacements are minimal - from 1.0 cm to 3.0 cm on the second main track and 2.0 cm to 4.8 cm on the third one. There are maximum displacements in the area of the new platform 3.0 cm to 5.8 cm at a distance of 50 meters on the second track.

Platforms

The detailed design envisages construction of a new third platform instead of the dismantled third track and a new second platform after the existing platform is destroyed. The two platforms are in a straight alignment and with a length of150 m.

The new third platform is half-height (55 cm above the rail head) with a width of 5.56 m and a horizontal distance of 1.75 m from the design axes of the main track and the third track. The platform pavement will be made of concrete slabs on 7 cm flat sand bed.

The new second platform has a constant width of 2.48 m, at a varying horizontal distance to the first track in the range of 1.73 m to 1.80 m. In case of a future repair of the first track it must be placed parallel to the main track and will be at a distance of 1.75 m from second platform.

Downstream drainage is provided to discharge the water into a collector pipe ø 160. The street outflow pipes are positioned at each 22 m and 3 ‰ slope from the beginning of the platform up to the passenger shed and with a variable gradient from the shed to the end of the platform. The collector pipe will collect the water from the second roof gutter of the passenger shed and run into the drainage shafts after the end of the platform.

Tactical plates 40/30/5 are provided on both platforms to limit dangerous areas. There is a pedestrian walkway at the end of the platforms. The walk way has a width of 2.50 m and a rubber coating and will serve the passengers and officials. At the beginning of the new platforms, terminative ramps are planned.

Discharging

Drains

Two longitudinal drains are designed, taking into account the existence of two culverts: drain 1: From km 31 + 914.28 to km 32 + 741 on the left and from km 31 + 743 to km 32 + 908.68 to the right of second station track and drain 2: from km 32 + 077.38 to km 32 + 742.00 to the left of third Track.

Drain №1 is 994 m long. Drain №2 is 665 m long. Drainage pipes holes are dimensioned for both drains. A minimum diameter of 160 mm is adopted due to a small coating of the pipe, and after the conductivity is exhausted, a pipe with Ø 200 is envisaged. When passing under the station tracks, the drainage pipe is unperforated and passes into a metal pipe accordingly Ø 200 for drainage pipes Ø 160 and Ø 250 for drainage pipe Ø 200.

Inspection shafts are planned in each 50 m and only in some places up to 60 m. Drainage 1 provides for 19 inspection shafts. Drainage 2 provides 13 inspection shafts.

The existing culvert at km 32 + 742.61, where both drains outflow, is destined to be destroyed and a new one with a width of 2.00 m to be built using slabs. Cleaning of the inlet and outflow is envisaged.

Ditches

At the entrance and exit throats from the northern side of the station construction of lined monolithic ditches Type 1 on a sand flatten layer is envisaged. The ditch at the entrance throat starts at km 31 + 892.50 and outflows at km 31 + 771.40 in an existing decrease of the terrain with an inclination to the culvert at km 32 + 731.43. In the exit throat on the left, from the culvert at km 32 + 742.61 to km 32 + 805 a monolithic ditch Type 1 with an inclination against the growing mileage, which is outflowed into the culvert is provided. On the right side from km 32 + 912 there is a lined ditch Precast Concrete Ditch Element 200/50 type with an inclination towards the open line.

The construction works will be carried out in accordance with the following sequence and requirements:

- After uncovering the earth ground to the level of the earth ground bed its leveling and compaction are performed;
- Field tests for determination of the load bearing capacity of the earth ground and fixing a respective design solution for the construction of the earth bed in the section are performed.

When carrying out the earthworks after excavation of the existing ballast prism, reaching the design horizont and compacting the earth bed, samples should be made to determine the load bearing capacity of the ground. Expected deformation modules below the main track are within 18 Mpa and larger, with the geotextile and geogrid being laid. If the load capacity is 30 MPa at the level of the earth bed, it is not necessary to apply geogrid.

Level crossing at km 32+833.32

The level crossing is existing and it is located on the territory of Belozem Village at km 32 + 833.32 along the mileage of the railway line, connecting Podem Street and Samuil Street, which are with asphalt pavement. According to the Technical Specification for the level crossing, replacement of the existing level crossing rubber covering for rails 60E1 type on the main track is required.

Under Component 2 - this level crossing is scheduled to be closed and a road overpass at km 32 + 000 to be built in its place (described above in Component 2).

Other infrastructures crossings

There are two crossings of the railway track with an existing water supply pipeline: at km 32 + 033 and at km 32 + 891 and an underground crossing with EVN power supply line at km 32 + 485. For the pipeline crossings, replacement of the existing asbestos cement pipes pipes with polyethylene pipes with a diameter corresponding to the existing and transition elements is envisaged.

Small structures

- Culvert at km 31+914.78
- Culvert at km 32+741.96.

❖ **Belozem –Orizovo Section – from km 32+879 to km 43+030**

The section covers an open line with a length L = 10 106 m from the beginning of switch 1 (km 32 + 923.07) at Belozem Station to the beginning of switch 2 (km 43 + 028.92) at Orizovo Station. The design solution provides a design speed Vd = 130 km/ .

Plan solution

Geometric elements parameters close to those of the existing track are achieved after route optimization in plan and profile is performed. With the presented geometric solution, the existing metal bridge at km 42 + 035 is replaced with a new reinforced concrete structure.

The analysis of the existing geometry of the railway track and the design geometrical solution of the Technical design in the section from Road overpass at Trakia Motorway to the entrance of Orizovo Station concludes with the following findings: the right section from km 39 + 635.79 to km 41 + 598.60 with length L = 1962.81 m and the tangent determined by the actual measured direction of entrance switch № 2 at Orizovo Station are almost parallel to each other. At this location, the distance between both directions in the section from the bridge construction at km 42 + 036 to the beginning of point 2 (km 43 + 028.92) at Orizovo Station varies from 1.40 m to 1.05 m along the rising mileage.

Solution in profile

With the new planimetry solution, the following main goals are achieved:

- realization of elements with a minimum regulatory length of 500 m. The new plaimetry solution foresees reduction of the shoulders with a shorter length of 500 m to 1 with a length of 425 m;
- providing a minimum thickness of the ballast prism in the sub-section of 33 cm for the slab culverts and large reinforced concrete structures;
- providing gauging distances for the air electrical crossings according to the data submitted by the co-ordination procedures;
- providing height of the rail head in the crossings with road infrastructure;
- providing earth bed in a geological layer with greater load bearing capacity;
- providing earth bed with a regulatory width in the embankments without tneed of further extension;
- lifting earth bed in the excavation areas with view to improve discharging;
- achieving regulatory values for the inclinations of the ditches.

Activities and materials

The following activities are foreseen for the reinforcement of the earth bed by sections:

- From km 32 + 923 to km 35 + 300 - laying of geogrid and geotextile according to the requirements of the technical specification;
- From km 35 + 300 to km 35 + 600 - excavation of low load bearing capacity layer to height - 20 cm under the earth bed, application of 20 cm thick reinforced layer from stone fraction 0-63 mm, laying of geogrid and geotextile according to the requirements of the technical specification ;
- From km 35 + 600 to km 43 + 029 - laying of geogrid and geotextile according to the requirements of the technical specification.

The detailed design envisages laying of 30 cm thick protective layer.

Discharging

Section 1 – L=2 673 m

Embankment from the beginning of switch 1 at km 32 + 923.07 to the reinforced concrete bridge (L = 10 m) at km 35 + 596.31

The earth bed is on an existing low embankment with a height of up to 1.3 m. In parallel to the railway embankment along the whole length of the section on the left there is a drainage channel and on the right there is a dirt road.

There are 3 existing small structures in the section: slab drainage at km 33 + 143.55, km 34 + 475.33 and km 34 + 619.53.

The discharging in the section is realized by ditches Precast Concrete Ditch Element 200/50 type and Precast Concrete Ditch Element 30/200 type, which are discharged in the small structures and the river under the reinforced concrete bridge at km 35 + 596.

Sub-section from km 35+000 to km 35+596

The discharging is gravitational to the drainage channel, with the exception of 100 m area at km 35 + 050 where lined trenches are envisaged.

For the whole length of the section from km 35 + 000 to km 35 + 596 (reinforced concrete bridge) the earth bed is drained by a ditch Precast Concrete Ditch Element 30/200 type which is discharged at km 34 + 990 before the lowered area of the terrain and in Rahmanliyska River under the reinforced concrete bridge at km 35 + 596.

From km 35 + 000 to km 35 + 150 (lowered area) - the ditch is located in the heel of the protective layer. Next to the ditch there is a banquette 1.10 m wide, after which a slope with 1: 6 cant is shaped, discharging water gravitationally in south direction. For the formation of the slope, an additional earth embankment will be applied along the width of the entire lowered area.

Section 2 – L=2 874 m

From km 35+596.31 to km 38+470 (HF).

From the reinforced concrete bridgeat km 35 + 597 to the pipe culvert ø 800 at km 36 + 792.68 drainage with ditches type 20, Precast Concrete Ditch Element 30/200 type and Precast Concrete Ditch Element 50/200 type. In the section between the two pipe culverts from km 36 + 792 to km 37 + 285 discharging by ditches Precast Concrete Ditch Element 30/200 type in the heel of the embankment is foreseen. In the areas of the two structures re-excavation and widening of the embankment is planned, where water is taken away from the embankment of the railway line.

Section 3 – L=620 m

From km 38 + 470 to the level crossing at Opalchenets Halt at km 39 + 090.96.

The detailed design envisages lowering of water flow towards the structure, allowing gravitational outflow on the banks and removal of the existing trenches in the heels. Lined ditches are only foreseen in the excavated section from km 38 + 450 to km 38 + 700.

Section 4 – L=584 m

The detailed design includes a slope of 1 ‰ of the ditches, being discharged into water wells at km 39 + 515.12 and km 39 + 424.97. The water wells discharge water at 3.6÷4.3m depth to a draining layer 4 - sand, with on equal grains, unevenly clayed.

An additional hydrological and hydraulic study is carried out, which shows that the envisaged under the technical design section of a slab culvert (km 39+675) with dimensions 150/100 cm can not run off water quantities with 1% collateralisation. Therefore, a larger section of two ø 1000 pipes is planned, omitting the expected maximum water quantities at a collateral rate of 1%. The earth bed in the area of the crossing is drained by a drainage with ϕ200 and a length of 17 m, which is discharged into the lined ditch at km 39 + 103.90 in the ditch Precast Concrete Ditch Element 30/200 type after the overpass.

Section 5 – L=760 m

From a tabular culvert (2x ø 1000) km 39 + 674.83 to a slab culvert (L = 0.8 m) km 40 + 434.82. The section is drained with lined ditches type 20 and Precast Concrete Ditch Element 30/200 type which are discharged into the culverts on both sides of the section.

Section 6 – L=806 m

From a tabular culvert (ø 1000) km 40 + 434.82 to a vaulted culvert (L = 3.9 m) km 41 + 240.96. The earth bed falls into an excavation from km 40 +755 to km 41 + 165. The areas before both structures limiting the section are in an embankment. Drainage is provided with ditches Precast Concrete Ditch Element 30/200 type discharged into the structures. In the excavation area a significant elevation of the planimetry (15 ÷ 35 cm) is achieved, which avoids ditches deepening and inclinations favorable for the drainage are achieved.

Section 7 - L=795 m – from a vaulted culvert 41+240.96 (L=3.9 m) to a bridge at km 42+035.07 (L=9.00 m)

The earth bed in the section is in an embankment. Drainage with ditches Precast Concrete Ditch Element 30/200 type is provided in the embankment heels. The slope of the ditches follows the slope of the natural terrain to the river at a metal bridge at km 42 + 035. No ditches are envisaged - right side from km 41 + 586 to the metal bridgeat km 42 + 035 –L = 450 m.

The slope of the terrain is greater than 1: 6 and water is gravitationally discharged into the existing earth ditches at a distance of 10 ÷ 13 m from the axis of the railway line.

Section 8 - L=47 m – from a slab culvert (L=1.0 m) at km 42+975.12 to a level crossing at Orizovo Station at km 43+022

The earth bed in the area, including that under the overpass, is drained by a drainage ø 200 on the left hand side along the mileage, which is discharged into a ditch Precast Concrete Ditch Element 30/200 type at km 42 + 975.12.

Section 9 - L=987 m – from a bridge at 42+035.07 (L=9.00 m) to tabular culvert at km 42+201 (Φ=0.8 m)

Drainage with ditches Precast Concrete Ditch Element 30/200 type is planned at the heels of the embankment.

Section10 - L=774 m – from a tabulat culvert at km 42+201 (ø=0.8 m) to a slab culvert (L=1.0 m) at km42+975.12

The earth bed in the section is in an embankment. Drainage with ditches Precast Concrete Ditch Element 30/200 type and Precast Concrete Ditch Element 50/200 type is provided. The slope of the ditches descends to the river at km 42 + 035 contrary to mileage.

The slope of the ditches descends back to the kilometer to the river at km 42 + 035. The ditches are discharged at the culvert at km 42 + 201 and in the area from 42 + 035 to km 42 + 201 the water are taken into existing earth ditches to the river.

Platforms

There is one platform at Opalchenets Halt within the section.

A new design position is foreseen on the platform from km 38 + 972.13 to km 39 + 060.13 to the left of the mileage before the level crossing ot Opalchenets Halt.

The new platform is displaced against the existing one, as a new road overpass is planned above the old platform under the design for Component 2.

The new platform position ensures constant access and normal operation of the new platform during the construction of the future overpass. In this way no parts of the platform will be affected and its reconstruction will not be needed.

The necessary tactile strips, ramps, parapets and sheds are provided to meet the requirements of Ordinance № 6 of 26 November 2003 on the development of an accessible environment in urbanized territories and the requirements to provide an accessible environment for PRMs according to the TSIs.

Crossings

With the new geometric solution the necessary regulatory gauge distances are provided according to the data submitted by the coordination procedures.

The design location for the new road overpass at km 39 + 092 is reflected.

Level crossings

There are two level crossings in the section - at Opalchenets Halt at km 39 + 090.96 and at km 43 + 029.09 before switch № 2 at Orizovo Station.

For both level crossings the design envisages laying of a new elastic level crossing covering. The new geometric solution provides non-conflict crossing in the places of the level crossings. Earth bed discharging is planned in the area of the level crossings with drainage ø 200.

Level crossing at km 39+090.96

Existing situation

The crossing of the railway line with road III-565 is in close proximity to the existing halt. The level crossing covering is elastic for rails 49 type.

Design situation

The track in plan is in a curve with R = 1970 m and H = 60 mm. The design development for permanent way part involves change of the existing level crossing covering and its replacement with an elastic level crossing covering for rails 60 type. Draining system for discharging of the level crossing is envisaged. No replacement of the gauge frames on both sides of the level crossing is envisaged. The barrier from the north side will be moved to the south side.

Under the design for Component 2 - this level crossing is scheduled to be closed and a road overpass at km 39+092 to be built.

Level crossing at 43+022.51

Existing situation

The crossing of the railway line with road III-666 is in close proximity to the existing halt. The railway line is in a straight alignment. The level crossing covering is elastic for rails 49 type.

Design situation

The track in plan is in a straight alignment and the crossind is with road III-666 m and at an angle 100 g. The design development for permanent way part involves change of the existing level crossing covering and its replacement with an elastic level crossing covering for rails 60 type.

Draining system for discharging of the level crossing is envisaged. No replacement of the gauge frames on both sides of the level crossing is envisaged. The existing barrier are not envisaged to be replaced.

This level crossing is scheduled to be closed and a road overpass to be built after Orizovo Station. The overpass will be constructed within the scope of Component 5 – "Modernization of Orizovo – Mihaylovo Railway Section".

Big structures: Bridge at km 35+596.30; Bridge at km 42+035.07

Small structures: Culvert at km 31+143.55; Culvert at km 34+475.33; Culvert at km 34+619.53; Culvert at km 35+049.64; Culvert at km 36+792.68; Culvert at km 37+285.02; Culvert at km 38+839.52; Culvert at km 39+674.83; Culvert at km 40+434.82; Culvert (passage) at km 41+240.96; Culvert at km 42+200.98; Culvert at km 42+975.12.

Rehabilitation of big and small structures for Skutare – Manole – Belozem – Orizovo Section

For steel bridges current maintenance of the structure is foreseen - sandblasting, painting, replacement of weak rivets, lead in bearings, masonry, rehabilitation.

The rehabilitation of culverts and syphons includes basic cleaning at inlet and outflow, upgrading of hatches and restoration of areas with damaged concrete reinforcement coating (where necessary).

- **Component 5 „Modernization of Orizovo – Mihaylovo Railway Section" from km 43+029 to km 80+722, conceptual design 2015**

The component is designed for a route of 160 km h for single and double line. Due to the large difference between the parameters of the geometric elements of the existing and the new route, for the section from 56 + 611 to km 61 + 033 the new route leaves the existing easement and land acquisitions will be required. In addition, the design envisages doubling of the existing single railway line along the entire section from Orizovo to Mihaylovo. In total, the areas expected to be

subject to expropriation procedures are amounting approximately to 600 acres. A key point for the alignment is the crossing with the Trakiya motorway with at the existing overpass at km 56 + 514. For the new route the crossing is set to be implemented using the existing structure. This fixed point and the legal limitations for a design speed of 160 km/h do not allow inclusion in the existing route after the crossing and require construction of a tunnel (L = 835 m) and detouring the city of Chirpan by an entirely new route.

The section provisionally is divided into three sub-sections. The cross sections mileage is along Track 2 for sections 1, 2-01, 3, and along Track 1 for sections 2-02, 2-03, 2-04

The main geometrical parameters of the route by sub-sections are presented in Table № 1A-1

Table № 1A-1

Section	Length of the section [m]	Design speed [km/h]	Minimum radius [m]	Maximum inclination [%]	Minimum length of a vertical element [m]
Orizovo Station – Cherna Gora Station	3409	160	2000	10	479
Cherna Gora Station – Chrpan Station	5130	160	2000	9	600
Chrpan Station – Svoboda Station	12557	160	1300	12	500
Svoboda Station – Mihaylovo Station	8875	160	1000	13	619

Under the design the lengts of the stations are as follows:

- Orizovo - L=1227 m;
- Cherna Gora - L=1240 m;
- Chirpan (new one) - L=1305 m;
  Chirpan (existing one - L= 900 m;
- Svoboda - L=1225 m.

1. Section Orizovo Station – Cherna Gora Halt, from km 43+029 to km 56+968.670

The new alignment is optimized for speeds of 160 km/h and follows the existing one with minimum deviations. Cherna Gora Station turns into a halt using the platform of the existing station. At Cherna Gora Halt - Bypass End (km 56 + 919 - Track 2)

The alignment diverges from the existing one in a completely new direction in the section from km 52 + 300 to km 56 + 563 - L = 4 263 m. This results in a shorter route and a greater total length in straight sections. A key point is the existing overpass of Trakia Motorway (km 56 + 557).

According to the design for Orizovo - Chirpan Open Line, duct network is planned to be constructed up to the entrance signal at Chirpan Station - 16 350 m.

2. Section Chirpan Bypass

The two tracks in the section are separated as single railway lines at Bypass beginning - km 56 + 919 (Track 2). The route of Track 1 (Vd = 80 km / h) passes through the town of Chirpan and has a total length of L = 5 842 m (from km 56 + 916.11 to km 62 + 757.86).

The bypass aims to provide a connection with the existing Chirpan Station for the trains stopping there, while the remaining traffic passes transit along the main route.

The separation (km 56 + 625) and entering into (km 61 + 033) the main route is realized by duty points with turnouts CO-CT6-60E1-1: 9-300 type, allowing a speed of 100 km/h along the diversion track. The bypass route follows the existing one and it is designed for a design speed of 80 km / h. Mileage continues the mileage of the main track. Within the bypass, the track is the same as the existing one except the connecting geometric elements.

The design envisages rehabilitation of the bypass (Track 1) via Chirpan Station for Vd = 80 km/h. During the rehabilitation of the bypass via Chirpan Station also re-equipment with new equipment with axle counters, barrier mechanism and road traffic lights with third white light crossing automatic level crossing barrier per km 58 + 820 in Cherna Gora – Chirpan Open Line should be carried out.

Track 2 is a transit one (Vd = 160 km / h) with a single tunnel with length L=835 m (from km 57 + 750 to km 58 + 585) through Chirpan Heights. The total length of the alignmet along Track 2 in the section is L = 4 052 m (from Bypass beginning km 56 + 919.27 to km 60 + 970.80). In the place where both single railway lines are merged in a double one, the mileage of Track 1 is equal to that of Track 2 - (Track 1) km 62 + 757.86 = km 60 + 970.80 (Track 2).

Section 2-1 – Track from km 56+919.21 to km 60+970.80

Section 2-2 – Track 1 from km 57+100.00 to km 59+064.28

Section 2-4 – Track 1 from km 60+192.74 to km 62+400.00

3.Section Bypass End (km 60+970 - Track 2), from km 61+100.00 to km 76+500.00

Sub-section 1 – Svoboda Halt

A key area in the section is the disturbed territory and the existing quarry for construction materials owned by KAOLIN AD before Svoboda Station. The new route surrounds the quarry to the south, and Svoboda Station is being reconstructed into a halt and shifted to a new location south of the existing station. With the design so developed, the route is shorter and the crossing with road infrastructure before Svoboda Station is shifted to a more favorable location at the expense of larger excavation works in the section from km 65 + 700 to km 66 + 400.

Sub-section 2 Mihaylovo Station

The track alignment in the section after Svoboda Halt to its entering into the existing railway line is so developed as to reduce the length and optimal balance of earth masses to be achieved. Due to the requirement for a design speed of 160 km/h when entering Mihaylovo Station, a significant correction of the long curve before the station and reconstruction of the track development is needed.

Stations and halts

Orizovo Station

The design track development consists of 3 tracks with effective lengths L_{e1} = 1020 m, L_{e2} = 933 m, L_{e3}= 755 m, removal of Tracks №1, 1г and 2г from the existing track development. Both throats will be reconstructed. For achievement of the necessary effective length of the tracks and platforms, the even throat shifts in the direction of Plovdiv. For Tracks №1 and 3, one-sided platforms with length of 300 m, width of 3.0 m and height of 55 cm are envisaged. Track № 2 provides transit operation through the station.

Changes in the planning for provision of an accessible environment - instead of the envisaged pedestrian underpss, a transition bridge with lifts and approaches to the platforms

connecting the northern and southern terminals of the station to accommodate passengers and residents in the village on both sides of the railway is planned to build.

The platforms will be covered with a light metal structure and roof thermo panels. Under the covers, an area protected by atmospheric conditions will be established - benches with seats, space for wheelchair and standing passengers.

Rehabilitation of the existing station building is envisaged.

The station building and the platforms will be provided with an accessible environment for people with reduced mobility, including disabled people and the requirements of the TSI.

There is a drainage system Φ 200 for earth bed discharging.

Cherna Gora Station

Cherna Gora Station will be turned into a halt. The new halt is located on the platform of the existing station. No stopping of international trains is foreseen at the halt and two new one-sided platforms with length L = 150 m and width of 5.70 m and height of 55 cm are designed.

Repair of the waiting room in the existing station building and a new pedestrian underpass are planned. In order to provide an accessible environment, sunderpasses nd elevators will be ensured between the first and second platforms. The platforms will be covered with a light metal structure and roof thermo panels. Under the covers, an area protected by atmospheric conditions will be established - benches with seats, space for wheelchair and standing passengers.

An accessible environment for people with reduced mobility, including disabled people and the requirements of the TSI will be provided for the waiting room and platforms.

The existing station remains in service during the construction works to ensure carrying capacity.

Chirpan Station

The design track development consists of 4 tracks with effective lengths L_{e1} = 800 m, L_{e2} = 850 m, L_{e3}= 635 m. Tracks №3 and 4 and platforms №2 and 3 removal from the existing track development. Both throats will be reconstructed, retainning the connection with the remaining existing tracks. Reconstruction of platform 1 and construction of a new two-sided platform with a length of 400 m and a width of 12.24 m between tracks № 2 and 3 are foreseen. The height of the platforms is 55 cm. Repair of the existing station building and the pedestrian underpass is planned.

Chirpan station building will be rehabilitated and completely refurbished. The rehabilitation will also be carried out according to the technological requirements for deployment of the new signaling and telecommunication equipment.

All elements of the transport infrastructure - buildings, passageways and surrounding areas, will provide an accessible environment for people with reduced mobility, including those with a TSI disability.

Drainage system Φ 200 for earth bed discharging is envisaged.

According to the design for Chirpan - Svoboda Open Line, duct network will be constructed from an internal entry signal at Chirpan Station - 10 900 m.

Svoboda Halt

New halt is planned to be built in Svoboda Village on entirely new platform. Shifting of Svoboda Halt to the west with about 500 m aiming at provision of a connection with the existing track. The new option is designed for achieving a shorter route and shifting the road infrastructure crossing before the existing Svoboda Station to a more favorable location for construction of a road underpass (km 66 + 961.80). No stopping of international trains is foreseen at the halt and two new one-sided platforms with length L = 150 m and width of 5.70 m and height of 55 cm are designed.

New sheds and a new pedestrian underpass for crossing through the tracks with two lifts are envisaged. Roof covers will be erected on both platforms - sheds, with light metal structure and polycarbonate cover or heat-insulating panels. An area protected by atmospheric conditions will be established on each platform – small waiting room with seat and space for wheelchair and standing passengers.

An accessible environment for people with reduced mobility, including disabled people and the requirements of the TSI will be provided for the all the areas.

The existing station remains in service during the construction works to ensure carrying capacity.

According to the design for Svoboda – Mihaylovo Open Line, duct network will be constructed 8 600 m.

Samuilovo Halt

Instead of closing the halt, new Samuilovo Halt near its existing position when entering the new alignment is envisaged to be constructe with access provided to the new halt. The halt is provided with all necessary facilities for its normal operation.

Spasovo Halt

Instead of closing the halt, new Spasovo Halt near the planned new road overpass at km 55+841, including provision of an access to the new halt. The halt is planned to be provided with all necessary facilities for its normal operation.

Mihaylovo Station

The new route envisages reconstruction of the track development at Mihaylovo Station, allowing entering and operation along the current track at the station with a speed of 160 km/h.

The new track development is with 4 acceptance and delivery tracks with effective lengths L_{e1} = 875 m, L_{e2} = 895 m, L_{e3}= 860 m, L_{e4}= 955 m. Tracks №2 and 5 removal from the existing track development and platforms № 2,3,4 and 5.

There is a pedestrian underpass and platforms covers above the stairs of the underpass - on the first platform and over the areas protected by atmospheric influences - on the second and third platform. These areas will be equipped with seats and space for wheelchair and standing passengers.

An accessible environment for people with reduced mobility, including disabled people and the requirements of the TSI will be provided for all the elements of the transport infrastructure.

Rails 60E1 type, reinforced concrete sleepers CT-6 type and tension clamp fastening SKL14 type are designed for the superstructure. The new turnouts are CO-60E1-1: 9-300 type and CO-60E1-1: 18.5-1200 type on concrete sleepers.

Reconstruction of Platform 1 and the construction of new platforms between tracks № 1 and № 2 and tracks № 3 and № 4 are envisaged. The new two-sided platforms are with a length of 400 m, a width of 8.30 m and a height of 55 cm.

Construction of a new pedestrian underpass linking the three platforms is planned. Both throats are provided with 2 protective track with a length of 50 m. The station building is rehabilitated under another project and construction and assembly works are not envisaged.

Mihaylovo – Dimitrovgrad Railway Line.

The design does not envisage correction of Mihaylovo - Dimitrovgrad Railway Line. Keppeing unchanged the existing position of Mihaylovo - Dimitrovgrad Railway Line and the cancellation of the reconstruction of this railway line and of third class road in this section.

Rehabilitation of existing station buildings and servicing buildings

The station building and the existing store house will be rehabilitated *at Orizovo Station*. Depending on the results of the survey various design solutions are possible to ensure the load-bearing capacity and durability of the structures: impregnation and sanitation of the existing wooden structure; partial replacement of defective beams and impregnation and sanitation of the wooden structure and restoration of their joints with the vertical bearing structure; Complete replacement of the wooden structure or replacement of wooden beams with reinforced concrete slabs.

The station building is a double-story building with a basement. In case of prolonged rainfall, the basement is flooded. Design and insulation of the basement walls, ring drainage and sufficiently wide pavement flooring around the building with suitable slopes for surface water discharging are required.

At Cherna Gora Halt reconstruction of the existing waiting room from the station building is planned for use as a halt. For the station n building, the same activities are planned as for Orizovo Station.

At Chirpan Station, the station building and the adjacent sheds are made of monolithic reinforced concrete structures. There are no significant defects on their top constructions. The station building is with two overground floors and a basement. From the south side of the building to the basement there are „English yards" and a ramp from the ground to the floor of the ground floor. Reconstruction of English yards and pavements is forthcoming.

Structures

The mileage of structures in plan is along Track 2 for sections 1, 2-01, 3 and along Track 1 for sections 2-02, 2-03, 2-04.

Bridge structures

Bridge at km 44+170.00

The bridge is existing and it will be removed, with a new double track reinforced concrete bridge built in its place. A technical design will be elaborated after signing a design and construction contract.

Bridge at km 47+ 125.68

The structure is located at km 47 + 125.68 where the railway line crosses the bed of an existing irrigation channel. The opening of the bridge is determined on the basis of the existing structure along the old alignmet of the railway line. Pavement blocks with a width of 1.45 m are planned to be laid down at both ends of the beam, with a steel parapet 1.10 m high installed on them.

Bridge at km 50+ 110.23

The structure is located at km 50 + 110 where the railway line crosses the bed of Omurovska River. The opening of the bridge is determined on the basis of the hydraulic sizing and the existing structure along the old alignmet of the railway line. The bridge has two holes with a length L = 24 m. The superstructure represents 105 cm thick reinforced concrete slab, installed both on the pillars and on the bearings. The overall dimension of the structure is 11.10 m, with pavement blocks 1.45 m wide on both sides of the slab, with a parapet 1.10 m high installed on them.

Bridge at km 64 + 778.92

The structure is located at km 64 + 778.92 where the railway line crosses the bed of Starata River. The opening of the bridge is determined on the basis of the hydraulic sizing and the existing structure along the old alignment of the railway line. The structure consists of 3 single-opening frames with a clear opening of 9.65 m. At both ends of the beam, boards 0.8 m wide and 0.85 m high are planned to be constructed.

Bridge at km 74 + 182.26

The structure is located at km 47 + 182.26 where the railway line crosses the bed of Starata River. The opening of the bridge is determined on the basis of the existing structure along the old alignmet of the railway line. The structure represents a single-opening frame with a clear opening of

9.65 m. Pavement blocks with a width of 1.45 m are planned to be laid down at both ends of the beam, with a steel parapet 1.10 m high installed on them.

Agricultural underpass (passageway) at km 61 + 383.63

The structure is located at km 61+383.63 where the railway line crosses the existing agricultural road. The structure represents a single-opening frame with a clear opening of 8.00 m. Pavement blocks with a width of 1.45 m are planned to be laid down at both ends of the beam, with a steel parapet 1.10 m high installed on them.

Bridge at km 69 + 917.01

The structure is located at km 69+917.01 where the railway line crosses the existing agricultural road. The structure represents a single-opening frame with a clear opening of 8.00 m. Pavement blocks with a width of 1.45 m are planned to be laid down at both ends of the beam, with a steel parapet 1.10 m high installed on them.

- **Crossings with road infrastructure**

The crossing is planned to be at different levels by new structures. There are two crossings with road infrastructure at different levels where existing structure are retained:

- ***Existing overpass at Trakiya Highway – km 56+563***

The following distances are ensured with this structure:

- the minimum clear height of the side gauge above the rail head is 6.70 m;
- minimul horizontal axle distance from the axle of the railway line to the supporting columns of the overpass superstructure - 5.67 m, at minimum required - 2.50.

- ***Existing overpass at Road II-66 – km 60+648.67***

In the place of this structure the new railway line coincides with the existing one, thus the existing gauge distances are retained.

❖ **Overpass at km 44+212.33**

The sub-component under consideration is located east of Orizovo Village, where construction of road variant of national road III-65 „Skutare – Cherna Gora" is envisaged, which will cross the railway line through a road overpass and its route is planned to be replaced by a new alignment. Currently the existing railway line crosses two republic roads with level crossings at the following level: at railway km 43 + 150 road III-666 „Road II-66 - Orizovo – Brezovo" - km 4 + 710 and at railway km 45 + III-565 Skutare –Cherna Gora - km 37 + 134. In the area of both existing overpasses it is impossible to build road overpasses. The railway line crossing with road III-666 is in a urbanized area that is densely built-up and the crossing with road III-565 is so obliquely. During the process of designing, construction of a new road variant of road III-565 that crosses the railway line at railway km 44 + 212.33 with overpass was found out to be most appropriate, as well as connection with road III-565 to be constructed, thus all the directions are provided.

There is a possibility provided for tracing of a road through one of the end openings servicing the railway line.

Overpass at km 48 + 777.60

The structure is located to the north-east of Cherna Gora Village where the railway line crosses national road III-565 „Skutare – Cherna Gora", which is planned to be shifted along a new alignment

During the process of designing, it was found out that there is a technical possibility to build a road variant and a road overpass for non-conflict crossing of the railway line, but it is appropriate to move the new road variant backwards from the existing alignment. The overpass has three holes 3x20.0 m with a total length L = 60.0 m from joint to joint. The selection of holes is in line with the future development of the railway line from single track to double track

The structure gauge is 11.0 m and consists of a road lane with a width of 7.0 m and two pavement blocks of 2.0 m. The pavement blocks are provided with a H2W5 type safety fence and a steel parapet with a height of 1.10 m.

There are 4 rows of supporting walls with lengths of respectively 12.6 m; 175 m; 27 m; 70 m.

Overpass at km 52 + 114.46

The sub-component is located north-west of the town of Chirpan, where the railway line crosses national road III-64 "Chirpan - Bratya Daskalovi" through a level crossing crossing at km 4 + 225. During the development process, it was found out that there is a technical possibility a road variant with an overpass to be built along the alignmet of the existing road.

Overpass at km 55 + 840.82

The sub-component under consideration is locatednorth of the town of Chirpan, where the railway crosses ational road III-608 „Spasovo – Chirpan" at km 60 + 800 through a level crossing. During the development process, it was found out that there is a technical possibility a road variant with an overpass to be built along the alignmet of the existing road. The overpass has three holes 3x16.0 m with a total length L = 48.0. The selection of holes is in line with the future development of the railway line from single track to double track

Overpass at km 59 + 317.22

The sub-component under consideration is located west of the town of Chirpan, where the new railway line will cross national road II-66 „Stara Zagora – Chirpan". During the development process, it was found out that there is a technical possibility for construction of a road variant with an overpass along the alignment of the existing road. The overpass has three holes 3x16.0 m with a total length L = 48.0. The selection of holes is in line with the future development of the railway line from single track to double track

Underpass at km 62 + 816.91

The sub-component under consideration is situated to the north-west of Volanovo Village, where the railway line crosses municipal road SZR 1223 „Road II-66 - Volovarovo – Gita" at the level of the railway level crossing. During the process of development, it was found out that there is a technical possibility for construction of an overpass, crossing the municipal road, thus avoiding the need for a situational change of the track alignment. The road crossing the structure has a gauge of 9.50 m, 8 m of them is a road lane and ditches 75 cm wide at both ends. The structure represents a single-opening frame with a clear opening of 10.00 m. Pavement blocks with a width of 1.45 m are planned to be laid down at both ends of the beam, with a steel parapet 1.10 m high installed on them.

Underpass at km 65 + 164.26

The sub-component under consideration is located north-west of Svoboda Village, where the newly designed railway line will cross the municipal road SZR 1222. During the development process it was found out that there is a technical possibility for building an underpass crossing the municipal road, thus avoiding the need for a situational change of the track alignment**.**

Underpass at km 66 + 961.80

The sub-component under consideration is located north of Svoboda Village, where the newly designed railway line will cross the municipal road SZR 1222. During the development process it was found out that there is a technical possibility for building an underpass crossing the municipal road, thus avoiding the need for a situational change of the track alignment**.**

Tunnel structure

Construction of a tunnel structure (single-way tunnel) along Track 2 with length L = 835 m from km 57 + 750 to km 58 + 585 in Orizovo - Mihaylovo Tunnel Open Line, the tunnel crosses a height obstructio north of the town of Chirpan.

The tunnel will be excavated in a non-explosive way divided into calotte, bench and invert and the complete closure of the contour with the primary lining should not exceed 7-10 m. The

secondary lining will be implemented after the tunnel is finally excavated and reinforced with a primary lining.

Excavation of the tunnel primarily in the direction from the entrance to the exit (increasing mileage) is advisible to provide gravity drainage during the construction.

The exemplary sequence of construction works is as follows:

- Excavation of the tunnel trenches and reinforcement of the front slopes;
- Excavation of the tunnel in an underground method in the direction of increasing mileage. At the same time, it is possible to work at the exit - cutting of the tunnel (underground) at a length of 5-10 m and construction of the section in an open method;
- Construction of the secondary lining along the entire tunnel;
- Construction of the section in an open method at the entrance of the tunnel;
- Construction of portals and operating systems and installations.

Culverts

- 28 units tabular culvert
- 23 units slab culvert
- 17 units cassette culvert

REGISTER OF THE CROSSINGS WITH OTHER INFRASTRUCTURES

№	Type of infrastructure	KM Track 1
1	Overhead line	43+692.54
2	Overhead line	47+010.22
3	Overhead line	49+071.66
4	Overhead line	52+256.32
5	Overhead line	56+333.44
6	Sewerage system	56+971.74
7	Overhead line	57+856.43
8	Pipeline	57+987.58
9	Sewerage system Φ600	58+109.28
10	Overhead line	58+120.35
11	Sewerage system Φ400	58+254.74
12	Gas pipeline Φ250	58+660.55
13	Pipeline	58+660.55
14	Pipeline Φ150	58+686.37
15	Pipeline Φ300	58+686.37
16	Sewerage system Φ400	58+984.09
17	Pipeline 2xΦ1000	58+989.64
18	Pipeline Φ300	58+989.64
19	Sewerage system	60+451.89
20	Overhead line	60+843.38
21	Overhead line	62+799.72
22	Overhead line	65+411.15
23	Overhead line	65+726.16
24	Overhead line	66+299.78
25	Sewerage system	67+803.73
26	Sewerage system	70+627.48
27	Overhead line	73+890.00

28	Overhead line	74+177.87
29	Overhead line	74+643.68
30	Overhead line	76+468.00
31	Cables electrical section	76+462.55

№	Type of infrastructure	KM Track 2
1	Overhead line	43+691.88
2	Overhead line	47+011.76
3	Overhead line	49+071.23
4	Overhead line	52+250.63
5	Overhead line	56+346.38
6	Sewerage system	56+974.93
7	Overhead line	59+251.65
8	Overhead line	62+797.14
9	Overhead line	65+414.69
10	Overhead line	65+728.87
11	Overhead line	66+297.48
12	Sewerage system	67+805.15
13	Sewerage system	70+631.10
14	Overhead line	73+895.60
15	Overhead line	74+178.30
16	Overhead line	74+651.50
17	Overhead line	76+450.35
18	Cables electrical section	76+466.37

- **Component 6 „Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station"**

The technical design is developed for a new alignment of the railway line, including:

- double railway line with regard to*: geometric solution, bridge structures, culverts, ditches, drainages and implementation of expropriation procedures and environmental procedures;*
- single railway line with regard to: *earth bed, catenary, signaling and telecommunications.*

The length of the new railway route is 2 116 m. This section will be completed with a new reinforced concrete bridge with a length of 119 m over Tundzha River and a smaller reinforced concrete bridge with a length of 10 m.

Surface water disposal with ditches lined with concrete elements ECT 50-200, laid on 5 cm thick sand is envisaged along the entire length. Construction of two new drainage structures at km 190 + 745 and km 191 + 260, extension of a slab culvert with 1m per km 190 + 599 is planned.

Three pipeline passages under the railway line with a diameter of 0.30 m are envisaged to be built. They are planned to be constructed at km 190 + 950, 191 + 350 and 191 + 575.

The total track length is divided into 2 specific sections:

■ **Section I (Open line)** – from km 190+200 to the beginning of switch № 2 (beginning of switch 2 – km191+693.11) from Zavoy Station, **preliminary design 2015**;

■ **Section II (Zavoy Station)** – from the beginning of switch № 2 (beginning of switch 2 – km 191+693.11) to km 193+080, **technical design 2013.**

The design parameters of the new route meet the requirements of the Technical Specifications and "Instruction on the Arrangement and Maintenance of the Permanent Way Superstructure and Railway Switches" and Ordinance 55:

• Category of the railway line - highway;
• Type of the railway line- single / double, electrified;
• Design speed - 160 km / h;

Description of the sections

The new route is consistent with the geometric elements and mileage of "Technical Assistance for Rehabilitation of the Railway Infrastructure along Sections of Plovdiv-Burgas Railway Line in the Republic of Bulgaria" Project.

■ **Section I (Open line)** – from km 190+200 to the beginning of switch № 2 (beginning of switch t 2 – km 191+693.11) from Zavoy Station.

The railway line is a new one along an open route section. The newly designed bridge ove Tundzha River is lovated in this section. The longitudinal profile in this part depends on the existing railway track embankment, the road overpass built over Trakiya Highway and the track development of Zavoy Station. The diversity of factors in the planimetry solution do not give much flexibility in the height positioning of the future bridge.

In compliance with the terms of reference for designing: The technical design refers to a section from km 190 + 590 to km 192 + 706 along the 8th Plovdiv-Burgas Railway Line in Yambol - Zavoy Open Line. During the designing process, it was found out that the implementation of the new railway line affects the distance from km 190 + 355 to km 192 + 764 along the existing mileage. The elaborated Technical Design starts from km 190 + 200 with a straight section (176.19 m) on the embankment of the existing Yambol-Zavoy Line.

■ **Section II (Zavoy Station)** – from the beginning of switch № 2 (beginning of switch 2 – km 191+693.11) to km 193+080.

Zavoy Station is situated in the section. The newly designed route, in its main part, coincides with the existing railway line and it is planned for capital repair.

The track development of the Zavoy Station consists of two arrival-departure tracks in "S" type connection (Tracks №1 and №2) and one refuge track and dead-end track for each throat (Tracks №3 and №4). Track №1 and Track №2 represent respectively a continuation of Track 1 and Track 2 at the station. The refuge tracks will only exist initially when the open track is single. They aim to prevent getting a vehicle out of the current track (Track 1) when there is a permission for train operation along it. Upon the future doubling of the line in the open route section, Track 2 will be a continuation of Track 2 at the station and there will not be need of refuge tracks.

Platforms

The existing platforms are low (with a height above the head rail 25-30 cm) and a length of 100 m. Platform № 2 is located between the departure-arrival tracks. For these so listed parameters, the platforms do not meet the interoperability requirements specified in the TSI. The design envisages demolition of the existing and construction of two new platforms for Track 1 and Track 2 with the following parameters:

- horizontal distance from platform element edge to track axis 1.65 m;
- height of upper platform element edge above rail head 0.55 m;
- length 150 m;
- width 3 m.

The necessary tactile strips, ramps and parapets are provided to meet the requirements of "Ordinance No 6 of 26 November 2003 on Construction of Accessible Environment in Urban Areas".

Modernization of the catenary network is envisaged for Zavoy Station, including:

- keeping a part of the pillars and the catenary network - cleaning, painting, corrosion protection and replacement of defective details and nodes on the pillars and dismantling and rehabilitation of all the cantilevers;

- erection of new pillars with new contact wire installation, carrying ropes, strings and string clamps in the sections of the new construction.

Dismantling of all the pillars and wires which are not going to be used is also envisaged.

Reconstruction of the external lighting of Zavoy Station is also planned.

The design provides changes:

- Building of a double grade pedestrian structure to ensure safe movement between the platforms is planned. The pedestrian crossing will be located on the territory of the Zavoy Station, around km 192 + 000 and it will be situated in accordance with the new track development of the station. The new structure is envisaged to be steel, with one-sided opening with a minimum headroom height of 6800 mm (+300 mm reserve for construction and operating tolerances) - 7100 mm. To ensure access for disabled people using wheelchairs, installation of lifts is planned;

- Closure of the existing level crossing in the area of Zavoy Station and construction of a road overpass.

With regard to earth bed and draining system, the following specific sections can be distinguished:

Section1 – Embankment from km 190+200 to km 190+745 (L=545 m)

The earth bed is on the embankment of the existing railway line. Embankment heels discharging is carried out by ditches Precast Concrete Ditch Element 50-200 type, which are drained in the envisaged for reconstruction culverts at km 190 + 267, km 190 + 599 and km 190 + 745. The right ditch discharges also the earth bed of the service track and the left one is in line with the future widening of the embankment during the construction of Track 2.

Section 2 – Embankment from km 190+745 to km 191+401.02 (L=647 m)

The earth bed is entirely on the newly built embankment. Embankment heels discharging is carried out by ditches Precast Concrete Ditch Element 50-200 type, which are drained in new drainage structures at km 191+125 and km 191+260.

Section 3 – Reinforced concrete bridge over Tundzha River from km 191+401.02 to km 191+520.02 (L=119 м)

Section 4 – Embankment from km 190+520.02 to km 191+668 (L=146 м)

The earth bed is entirely on the newly built embankment. Embankment heels discharging is carried out by ditches Precast Concrete Ditch Element 50-200 type, which are drained in Tundzha River.

Section 5 – Station ground from km 191+668 to km 192+557 (L=889 м)

The earth bed for track development of Zavoy Station is:

- in an excavation from km 191+668 to km 192+125;

This sub-section is dewatered by a draining system with PVC Ø 200 mm pipes and Ø1000 mm shafts which is discharged into ditches Precast Concrete Ditch Element 50-200 type.

This includes the areas of Trakiya Motorway overpass and the station platforms.

- in the embankment from km 192 + 125 to km 192 + 557. The earth bed is on the existing embankment, which is drained with ditches Precast Concrete Ditch Element 50-200 type discharged into the culvert at km 192 + 205.

The design includes construction and assembly works for dismantling, dismassembling and reinstallation of signaling equipment, automatic locomotive signaling (ALS), together with the

underground cable network. Replacement of track circuits with a centralized system for axle counters is foreseen. This will improve the safety equipment performance and avoid the installation of insulated joints along the current tracks and switches arrangement. Reconstruction and replacement of all signals are also included. For the electric barrier at km 192 + 427.47, replacement of the relay equipment with a cabin, new barrier mechanisms and level crossing road signals are envisaged. Construction of a duct network with concrete channels 20x20 at Zavoy Station from entrance signal A to entrance signal Г, replacement with new signal cables and installation of two new cable cabinets are foreseen

Laying a new main copper cable MCAKAEPP 4x4x1.2 + 15x4x1.2 type is planned in a ground excavation with a minimum depth of 900 mm.

New catenary system is envisaged for the new railway route including: excavation for foundations, construction and installation of foundations, installation of new pillars, mounting of cantilevers and catenary suspension.

Service road

Construction of a service track in accordance with the requirements of Annex 2 of NRIC "Instruction on the Arrangement and Maintenance of the Earth Bed for Railway Lines" is planned for the maintenance of the permanent way, catenary and the cable network.

New bridge over Tundza River

The aim of the project is a solution for a new bridge over Tundzha River at a design speed of up to 160 km / h. The design complies with the Expert Technical Econimc Council (ETEC) decisions and is designed for a double track railway line for 160 k /h. The type of foundation is consistent with the hydro-geological survey, as a pilot foundation is selected.

The investment proposal includes construction of a new reinforced concrete bridge with five openings over Tundzha River. The length of the bridge is 119 m from km 191 + 401.02 to km 191 + 520.02.

Construction of a smaller reinforced concrete bridge at km 191 + 125 with a length of 10 m is also envisaged to overcome a swampy area, thus avoiding druing the territory up.

Two culverts with a hole of 4 m each, one passage for small animals are developed in the design for double track railway line for 160 km/h

Road overpass (km 192+427.47)

The design does not envisage a change in the categorization of the level crossing, but only reconstruction of level crossing covering and signaling system in connection with the implementation of the construction and assembly works on the permanent way.

The level crossing reconstruction will include the following construction and assembly works:

- dismantling of the existing level crossing covering of wooded sleepers;
- clearing of the existing asphalt concrete flooring;
- construction of draining facilities for the surface water from the level crossing covering and ensuring dewatering from the ditches (Precast Concrete Ditch Element 50-200 type), draining the earth bed of the railway track;
- installation of a new elastic system for railway crossing;
- laying of new asphalt concrete flooring;

Under the design for Component 2 - this level crossing is scheduled to be closed and after Zavoy Station a road overpass to be built at km 192+625.

Closedown and recultivation

Upon completion of the construction and launching of train operation along the new track, activities on dismantling of the existing permanent way and recultivation of the old track are foreseen. The envisaged activities include:

- dismantling of the permanent way and transportation of materials;
- excavation of old ballast and transport to a depot;
- disassembly of contact wire and suspension devices;
- dismantling of reinforced concrete and metal pillars;
- dismantling cables and devices from signaling and telecommunication systems;
- humus laying and landscaping of the old earth bed.

Big structures: Bridge at km 191+125 and bridge over Tundzha River from km 191+401.02 to km 191+520.02.

Small structures: Slab culvert at km 190+715; Slab culvert at km 190+745; Slab culvert at km 191+260; Tabular passage Ø300 at km 191+350.

- **Component 7: „Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the Catenary at Zimnitsa and Straldzha Stations", conceptual design 2015**

❖ **Reconstruction of Switches Development at Zimnitsa Station**

Zimnitsa Station is a part of "Orient/East Mediterranean" corridor of the core network under Regulation (EU) № 1316/2013 of the European Parliament and of the Council of 11 December 2013 for establishing Connecting Europe Facility, amending Regulation (EU) № 913/2010 and repealing Regulations (EC) № 680/2007 and (EC) № 67/2010.

Zimnitsa Station is a railway station in Zimnitsa Village, Straldzha Municipality, Yambol District. It is located from km 198 + 144 to km 199 + 360 along the 8th Plovdiv – Burgas Railway Line.

The superstructure along the main tracks is provided with rails 60E1 type, reinforced concrete sleepers ST-6, continuously welded track. The superstructure along the arrival and departure tracks is provided with rails 49E1 type, CT-4 reinforced concrete sleepers, continuously welded track

Rehabilitation of the drainage systems; reconstruction of platform №1, L = 90 m and construction of two new platforms; building of a new pedestrian underpass; capital repair of the existing pedestrian underpass in the odd throat and building of noise protection barriers are envisaged.

Complete rehabilitation of the catenary system is envisaged, in accordance with the reconstruction of the permanent way and the modernization of Zimnitsa Sectional Post.

The rehabilitation of the catenary system includes, but does not limit to: dismantling of the existing catenary system and installation of a new one with complete replacement of units, elements, contact wires, insulators, etc., according to the requirements of Energy TSI. Dismantling of the pillars line, keeping a part of the steel-grid pillars that need only rehabilitation and restoration of the foundations. The construction of a new pillars line will be accomplished by erecting metal-grid, solid metal or metal profile pillars, depending on the purpose and loadings, with foundations with anchor bolts and hot dip galvanization. Passive protection against nesting and landing of birds is provided.

The modernization of Zimnitsa Sectional Post includes complete dismantling of the facilities and demolition of the building (the existing SP is closed and the building is with degraded parameters). Construction of a new open sectional post with a foundation and complete replacement of the facilities are foreseen.

The activities on signaling and telecommunication systems include the supply, construction and installation of a new computer based interlocking system (CIS) with a new routing for Zimnitsa Station; new duct network and new cable laying for management and control of the field objects; new switches turning machines with external locking; new LED lights with LED modules and a centralized system of axle counters to control sections of the railway track at the station and

adjacent open lines. Surface water discharging with ditches lined with concrete elements Precast Concrete Ditch Element 200/50 type and Precast Concrete Ditch Element 200/30 type, laid on sand with a thickness of 5 cm is provided.

Refurbishment of the level crossing equipment from the side of Zhelyu Voyvoda will be implemented.

Description of the development

According to the project, 6 tracks will be preserved. The neat throat is developed for the purpose of the future doubling of the Zavoy – Zimnitsa section between stations.

General

The specific requirements for Zimnitsa Station from the technical specifications are fulfilled. The implementationof complete reconstruction of the switches development of Zimnitsa Station does not envisage displacement of the design axis from the existing one and does not disturb the boundaries of ownership. The optimization of the track development of Zimnitsa Station includes the following types of basic activities:

- Removal of existing double track connections (cross overs) in both throats and their replacement with single track connection composed of ordinary switches with a 1:9 deviation and a radius of 300 m;
- Renewal of the superstructure at the station with rails 60E1 type and reinforced concrete sleepers with tension clamp fastening;
- Renewal of the superstructure of all the switches on the current track at the station with rails 60E1 heavy type and new reinforced concrete sleepers with tension clamp fastening;
- Application of an anti-frosting layer;
- Rehabilitation of the drainage facilities;
- Construction of drainages along the current track at the station;
- Rehabilitation of the catenary;
- Repair of platforms;
- Capital repair of the underpass at km 199 + 195.00.

Structures

- Culverts - rehabilitation of the drainage facilities is foreseen.
- Platforms - there is a reconstruction of the platform № 1, L = 90 m, the construction of two new platforms according to the TSI with a height of 550 mm above the rail head and a distance to the track axis of 1.75 m and construction of a new passenger overpass at km 198 + 726.11. A tactile stripe for attention under Art. 19. of the "Rules for Technical Operation of NRIC Railway Infrastructure" is provided, as well as leading stripes along the platform.
- Underpass - a capital repair of the existing underpass is planned.

➢ **STRALDZHA STATION**

- **Catenary**

- The rehabilitation of the catenary system includes, but does not limit to: dismantling of the existing catenary system and installation of a new one with complete replacement of units, elements, contact wires, insulators, etc., according to the requirements of Energy TSI. Dismantling of the pillars line, keeping a part of the steel-grid pillars that need only rehabilitation and restoration of the foundations. The construction of a new pillars line will be accomplished by erecting metal-grid, solid metal or metal profile pillars, depending on the purpose and loadings, with foundations with anchor bolts and hot dip galvanization.

The contact wire of tracks II and III is retained, as it is of good performance and it was changed in 2013.

- **Pillars**

Passive protection against nesting and landing of birds is provided.

- **Component 8: „Rehabilitation of Straldzha – Tserkovski Railway Section", detailed design 2017**

The section envisaged for rehabilitation by lot is a railway section in Staldzha - Tserkovski Open Line from km 217 + 210 to km 218 + 919 (Track 1) and from km 218 + 586 to km 218 + 973 (Track 2).

The purpose is rehabilitation of Staldzha - Tserkovski Railway Section for a design speed of 130 km/h.

The railway track optimization includes the following types of basic activities: Dismantling of the rails and sleepers grate with rails S 49 type and sleepers St 4 type or wooden sleepers, transportation to a depot for dismantling and arrangement of the materials; Collecting, loading and transporting of the crushed gravel to a depot from the existing ballast prism; Excavation and embankment while achieving design heights and inclinations; Laying of geo-materials (geotextile and geo-grid); Laying and consolidating of a protective layer with a thickness of 0.40 m; Delivery of a new ballast, laying, lifting and tempting of the railway track, while acieving design axis and level. Firming of the railway track and planning of the ballast prism.

Line category

Straldzha – Tserkovski Section is a part of the eighth Plovdiv - Karnobat - Burgas Railway Line of the Republic of Bulgaria, with a category of railway highway.

According to Regulation 55, the parameters of the line should be as follows:

- prevailing design speed: 160-200 km/h for passenger traffic and 120 km/h for freight traffic;
- axle load: 22.5 tonnes;
- train length: 750 m;
- gauge - 1-CM2;
- distance between tracks - 4.10 m (for speeds below 160 km/h).

According to Order №477/18.03.2015 of NRIC Director General for railway lines categorization under the TSI Infrastructure Subsystem, the operating parameters for eighth railway line are as follows:

- design speed: 120-160 k h;
- axle load: 22.5 tonnes;
- train length: 600 m;
- gauge - GC;
- usable platform length: 200 - 400 m.

Design solution

Design solutions along track 1

The start of the repair is shifted to km 217 + 185.24 (instead of 217 + 210) on one hand due to the construction of continuously welded track and on other hand due to the smooth attachment to the existing section. The design envisages tempting and ballast adding on the railway track in the section from km 216 + 085 to km 217 + 185.

In the section from km 216 + 085 to the beginning of the area of repair (area of curve №9), an axis and level correction will be made to achieve design parameters. Deviations from the existing track are up to 15 cm in the curve to the right, in the direction of rising mileage. A check of the gauge is made with respect to the existing track 2 along the design axis of track 1. Curve 9 has a radius of 996 m and transition curves of 182 m.

The next curve № 10 has a radius of 966 m and transition curves of 182 m. Within the previous stages of the project, the curve is optimized by increasing the transition curves to normal ones. This causes significant deviations from the existing situation, which reach 73 cm in the area of

the second transition curve. The displacements favorably affect the position of the railway track on the crown of the embankment. The gauge is checked along the existing track 2, according to the design axis 1.

Curve № 11 is designed between the direction of Track 1 from the throat of Straldzha Station and the tangent of curve 10. The curve can not be avoided by changing the tangent because the extension of the straight line from the station is 3.85 m from Track 2 in the area of the beginning of the transition curve 102. The rounding of the break between the two directions is designed with a radius of 50,000 m for obtaining a larger circular curve length that is possible to be performed.

The connection with the existing track from the side of Tserkovski Station along track 1 is fulfiled at km 218 + 918.6 (HC 2), and a new railway track is built in the section from km 218 + 909.81 to 218 + 918.6 during the construction of Tserkovski Station. At the point of attachment, the track is constructed with deviations in plan of up to 3 cm (the displacements are local in the area of the switch), with deviations from the design position being less than 1 cm towards the station. Thus, the design position according to the technical design is not changed and the deviations of switch 2 have to be removed or a smooth transition to be made.

Design solutions along track 2

The start of the repair is shifted to km 218 + 577,757 (instead of km 218 + 586) due to the connection with the constructed continuously welded track.

The beginning of the repair is in the straight section from the beginning of the transition curve 62 to the beginning of curve 7 with a length of 649.86 m. At the point of connection, the displacements of the existing road to the design are minimal - less than 1 cm. At the point of attachment, the displacements of the existing track compared to the design one are minimal - less than 1 cm. Due to the fact that they increase gradually in the direction opposite to the direction of mileage increase, the track is envisaged to be tempted 120 m backward or from km 218 + 457.76 to km 218 + 577.76.

Curve 7 and Curve 8 are designed to increase the track gauge at Tserkovski Station. The parameters of the curves and the length of the intermediate straight section meet the requirements for speed standards of 130 km/h.

The connection with the trains at Tserkovski station takes place at the end of switch 4 (km 218 + 973.37). At the point of attachment, the track is filled with deviations in the plan of up to 3 cm (the displacements are local in the area of the arrow), with deviations from the design position being less than 1 cm to the station. Therefore, the design position of the deviations at switch 4, to remove or to perform a smooth transition.

At the point of attachment, the track is constructed with deviations in plan of up to 3 cm (the displacements are local in the area of the switch), with deviations from the design position being less than 1 cm towards the station. Thus, the deviations of switch 4 have to be removed or a smooth transition to be made.

From the km 218 + 909.06 to km 218 + 973.379 (end of switch 4) a new railway track is built during the construction of the Tserkovski Station project. The present project provides repair of the track by axle and level in this section, keeping the implemented superstructure and substructure.

Justification of the design solution by level

Design solutions along track 1

On the basis of the geodetic measurements, it was found out that the existing planimetries in the section from km 216 + 085 to the beginning of the repair (area of curve 9) along route 1 is about 3-4 cm higher than the design level. In order to make a smooth transition to the incoming railway track through the adjustment in plan and level, the design solution envisages lifting of the planimetries in this section with 35-40 mm. The elevation of the planimetry for correction by axis and level in the section results in a change of the planimetry arm from km 217 + 240 to km 218 +

150 by changing from inclination 0.00 ‰ to 0.04 ‰ descent. After the end of the planimetry arm at km 218 + 150 the technical solution of the technical design is kept unchanged.

The connection with the existing track from Tserkovski Station along track 1 is realized at km 218 + 918.6 (beginning of transition curve 2), the existing level at the connection is lower than the design one with ~ 1 cm. At the station, the existing track position differs from the design one with minimal differences.

Design solutions along track 2

The design planimetry along track 2 is not modified. At the beginning of the repair at km 218 + 577.76, the existing railway track is 5 cm lower than the design level. Since the track will be corrected by axis and level in the section from km 218 + 457.76 to km 218 + 577.76, then the track will be lifted to a design position given that at km 218 + 457.76 the difference (existing/project) is 0.

Strengthening of the earth bed

When updating the design developmentt, additional engineering and geological studies are carried out confirming the necessity to strengthen the earth ground and the use of geothermal materials. It is decided to apply a protective layer of 40 cm across the entire length of the section under renewal. This will facilitate the technology and control of earthworks implementation and will increase the load-bearing capacity of the earth bed.

Draining system

For earth bed drainage, Precast Concrete Ditch Element 200/50 type, laid on sand with a thickness of 5 cm are envisaged to be used.

Track 1

The area from km 217 + 185 to the culvert at km 217 + 418 is in an embankment and there is no need of ditches. The existing embankment will be supplemented with binder soil with 1: 6 inclination of the slope to prevent and remove surface water from the embankment.

There is a section following, where the existing conditions create problems with water discharging. Irrigation channels cross the culverts at km 217 + 418 and at km 218 + 298. The area bordering with the railway track, the irrigation channel and both culverts can not be drained. The reasons for this situation is the flatness of the section and the level of the irrigation channel, which is higher than the terrain. The possible design of a ditch is pointless provided that it will be at lower design heights than those of the nearby channel and there will not be a way for the ditch to be discharged. That is why it is accepted only a possibility for water removal from the heel of the embankment (protective layer) to be provided on the transverse slope of the earth bed. *Redesigning the slope is envisaged.*

The next drainage facility is designed from km 218 + 445 to km 218 + 915.26, where it is connected with a ditch under the project for construction of Tserkovski Station. The designed ditch takes water away from the drainage of the station from the level crossing back to the open line. During the implementation of the project for the station, a trench is excavated parallel to track 1, which will serve as a ditch for draining water from the station. The ditch is situated parallel to the track at a distance of 6.02 m and after km 218 + 587 it approaches the railway track at a distance of 492 m. After km 218 + 894 the ditch changes its direction to connect with the ditch built at km 218 + 915.

Track 2

A ditch from km 218 + 584 to km 218 + 996 is designed to take the water away from the throat of Straldza Station and it is discharged at the point around the beginning of the repair along track 2.

Replacement of CBT3x1.5mm2 supply cable for the balise group at the warning signals from entrance signal „А" to „ПсА" is envisaged. The new cable will be placed along the signaling cables route from the side of track №2

Small structures

- Culvert at km 217+418;
- Culvert at km 218+298;

Repair works are planned only for one of the culverts (km 218 + 298), where a reinforced concrete casing should be built on its front side (from the side of the inlet). The inlet and the condition of the other culvert is good and no repairs are planned.

Reconstruction of the infrastructure owned by other institutions

Crossings - power lines

The existing Overhead line 20 kV "Venets" crosses the new railway line at km 218 + 649.

The reconfiguration of Overhead line 20 kV "Venets" is needed for achieving the standard gauge and angle of crossing with the newly designed railway line. The reconstruction of Overhead line 20 kV "Venets" at the place of crossing with the new railway line will be implemented as a cable crossing at km 218 + 639. For this purpose, on the existing steel-grid pillars №103 and №104, sectional disconnectors with motor operation and three metal oxide valves will be installed. Three single-core cables will be withdrawn from the disconnectors, in protective pipes, through the new shafts ШІ1 and ШІ3, in a pipe network with 2 pcs. PEHD pipes Ø140 and through a new shaft ШІ2 from pillar №103 to pillar №104. The supply cables are tagged to the disconnectors via 3x1 sets of 3 pcs. single phase cable heads for open installation. From ШІ2 to ШІ3, the route passes under the tracks and it will be fulfilled at a depth of 2.6 m from the rail height elevation. To protect the cables, the duct network is envisaged to be constructed in a concrete casing and with a plastic strip marking. The cable shafts are permanently marked with horizontal markers and passive markers are placed in the critical locations (points) along the cable route. The overhead line wires in the section limiting the railway line crossing from pillar № 103 to pillar № 104 are to be dismantled.

We attach situations with the location/situation of the design routes for the different components of the investment proposal for "Rehabilitation of the Plovdiv - Burgas Railway Line, Phase 2" (Appendix №5).

5. Stages for implementation of the investment proposal

Periods for implementation of the constructuin activities under the different components of "Rehabilitation of Plovdiv-Burgas Railway Line, Phase 2" Project:

Component 1 - „Design and Construction of Signalling and Telecommunication Systems along Plovdiv-Burgas Railway Line"

Implementation period - 30.01.2018 – 31.12.2021

Component 2 - „Construction of Overpasses/Underpasses along Plovdiv-Burgas Railway Section to Replace Existing Level Crossings"

Implementation period – 29.11.2019 – 01.02.2021

Component 3 – "Planting of Protective Forest Belt along Chernograd – Aytos Open Line"

Implementation period - 30.10.2018 – 1.11.2019

Component 4 - „ Rehabilitation of Skutare – Orizovo Railway Section"

Implementation period - 07.11.2016 – 07.11.2018

Component 5 - „Modernisation of Orizovo – Mihaylovo Railway Section"

Implementation period - 30.03.2018 – 30.12.2021

Component 6 – "Modernisation of Yambol – Zimnitsa Railway Section, at Zavoy station"

Implementation period - 30.10.2018 – 01.04.2021

Component 7 - „Reconstruction of the Switches Development at Zimnitsa Station and Catenary Rehabilitation at Zimnitsa and Straldzha Stations. Rehabilitation of the Catenary along Zimnitsa – Tserkovski Open Line, incl. Straldzha Station".

Implementation period - 30.04.2018 - 30.11.2020

Component 8 - „Rehabilitation of Straldzha – Tserkovski Railway Section from km 217+210 to km 219+059"

Implementation period - 26.01.2017 – 01.02.2018

6. Alternatives for implementation of the investment proposal

6.1. Project development

The implementation of the concept of rehabilitation of the railway line starts with "Technical Assistance for Rehabilitation of the Railway Infrastructure along sections of Plovdiv-Burgas and Mezdra-Gorna Oryahovitsa Railway Lines'. This project is a continuation of PHARE LSIF BG9811-01 "Renewal of the railway lines in Bulgaria" Project for the railway sections Zimnitsa - Straldzha and Straldzha - Tserkovski.

"Rehabilitation of the Railway Infrastructure along Sections of Plovdiv-Burgas Railway Line" Project co-financed under "Operational Program on Transport" 2007 - 2013 was approved by EC decision of 01.07.2011. Rehabilitation of the permanent way and catenary, rehabilitation of small and big railway structures along the existing route of 177,430 km were implemented, including the following sections: Mihaylovo - Kaloyanovets (10.7 km); Stara Zagora - Zimnitsa (91.2 km, excluding the section from km 190 to km 192) and Tserkovski - Burgas (75.5 km). Rehabilitation activities of Infrastructure and Energy Subsystems along Mihaylovo - Kaloyanovets, Stara Zagora - Zimnitsa and Tserkovski - Burgas sections were carried out under the project.

Project for "Preparation of "Rehabilitation of Plovdiv – Burgas Railway Section, Phase 2" Project" was launched in 2015 under "Operational Program on Transport" 2007 - 2013 under Priority Axis 5, including preparation of activities for rehabilitation and modernization of Infrastructure, Energy and CCS subsystems by sites in railway sections that have not been upgraded.

The train speed in these sections of the railway line varies between 50-120 km/h. The entire railway line is equipped with an Automatic Train Safety System with an exhausted maintenance resource that is not interoperable. The existing situation of sections and sub-systems of the railway infrastructure that have not been rehabilitated and upgraded is featured by an unsatisfactory state of the railway infrastructure not responding to the interoperability requirements of the rail system under the Infrastructure, Energy and Control - Comand and Signalling Subsystems.

Eight components included in "Preparation of "Rehabilitation of Plovdiv - Burgas, Railway Section, Phase 2" Project" are subject of EIA. All the eight components have gone through the pre-investment phase of the study to determine a possible technical implementation solution. Options under the procedures of Chapter Six of the Environmental Protection Act (EPA) and Chapter Two of the CA Ordinance and the procedures for assessing the necessity of EIA. For each investment proposal under the individual components a decision is made by the relevant competent environmental authority stating that:

- the project is not a subject to the procedures under Chapter Six of the EPA and Chapter Two of the CA Ordinance;

- an environmental assessment shall not be carried out;

- EIA and assessessment of the compatibility with the subject and the purposes for conservation in the protected areas shall not be carried out.

The following components are included in the scope of the investment proposal for "Rehabilitation of Plovdiv – Burgas Railway Line, Phase 2":

- **Component 1 „Design and Construction of Signalling and Telecommunication Systems along Plovdiv-Burgas Railway Line"**
- **"Optical fiber cable construction along Plovdiv-Burgas Railway Line"**

An open procedure for awarding a public procurement contract for "Preparation of "Rehabilitation of Plovdiv – Burgas Railway Section, Phase 2" Project" was carried out in 2014, within the scope of which is included Component 1: „Design and Construction of Signalling and Telecommunication Systems along Plovdiv-Burgas Railway Line".

The task of the selected consultant is to review, prepare additional developments and/or update the existing design prepared by the Consortium Sudop - TEE in 2010, if necessary.

The main objective of the investment proposal is the newly built telecommunication system to satisfy the requirements of the railway infrastructure and the Bulgarian railway operators for a long period of time, providing management and servicing of trains, administrative and operational management of the stations and the units of National Railway Infrastructure Company, BDZ EAD and the private railway operators along the section from 8th Plovdiv - Stara Zagora – Burgas main railway line. Its implementation will also cover the interoperability criteria for this section of the rail system, an integral part of the Trans-European conventional and high-speed rail system. The total distance of the route along the mileage of the railway track is 308 km.

For implementation of telecommunication systems and facilities modernization along 8th main railway line in Plovdiv - Stara Zagora - Burgas Section, installation and commissioning of an optical cable with a capacity of 36 single - fiber optical fibers) is envisaged, installed entirely underground in the area of expropriation (alienation area) of the railway track, in accordance with Art. 96 of Ordinance №55 of 29 January 2004 of MTITC (SG 18/2004).

For the implementation of the project in the part for laying of HDPE pipes, a machine excavation with a depth of 1 100 mm with a total length of 200 000 m in the soil I to III category is envisaged and machine excavation with a total length of 135 000 m in soil IV to VI category. No blast will be used. The fiber optic cable trenches are within the easement of NRIC railway track, outside the drainage ditches at a distance of at least 1 m from them and no more than 0.5 m from the end of the easement area.

In the excavated trench for underground laying of the optical cable, two HDPE pipes are laid, the second one remaining free for future development. The second pipe also goes into the shafts, but it is plugged/protected against dust and other materials. The necessary shafts are constructed at about every 2 km. The shafts are so constructed, that they can be covered with a minimum of 30 - 40 cm earth embankments up to the ground level. The shafts (possibly plastic with sealing and waterproofing) are of a size suitable for mounting a second optical cable along the second HDPE pipe **in the future.** A yellow signal bar with a label "Caution optical cable" above the laid HDPE pipes is placed at a depth equal to half the distance between the surface of the terrain and the cable. The optic route passing under railway lines, bridges, overpasses, culverts and other artificial structures, as well as the installation of inspection shafts at a distances of up to 2 km requires drilling, laying of steel pipes, welds making, digging plastic shafts for the optical cable. According to Regulation № 58, the drillings for passing under the railway alignment must be fulfilled at a depth of more than 1700 mm from the rail head and then steel pipes to be placed where the HDPE pipes to be laid down. When passing through bridges and other ground structures, the steel pipes are welded to fittings or supporting structures.

In 2014, with a letter out. № ЖИ-36674/21.11.2014 NRIC informed the competent authority MoEW for an investment proposal "Optical fiber cable construction along Plovdiv-Burgas railway

line". With letter out. № OBOC-83/05.01.2015 MoEW notified that the presented IP for optical cable construction along Plovdiv - Burgas Railway Line did not exist independently within the scope of any of the positions of Annexes 1 and 2 of the EPA, as the MoEW ruled, that the IP did not require a procedure under Chapter Six of the EPA.

Conceptual Design for Position 1 - "Optical fiber cable construction along Plovdiv-Burgas Railway Line" was prepared in 2016 and as a part of "Rehabilitation of the Plovdiv - Burgas Railway Line, Phase 2" Project, **this design development is a subject of the EIA report.**

- **Signalling systems construction along Plovdiv-Burgas Railway Line (ETCS level 1, version 2.3.0d);**

The project was developed in 2016. The choice of a realistic scenario under project 2, position 3 "Signalling systems construction along Plovdiv-Burgas Railway Line (ETCS level 1, version 2.3.0d)" was made on the basis of a meeting regarding Contract № 4700/24.07.14 "Preparation of "Rehabilitation of Plovdiv – Burgas Railway Section, Phase 2" Project" between representatives of the Consultant, Unit for preparation of "Rehabilitation of the Plovdiv – Burgas Railway Line, Phase 2" Project and "Signaling and Telecommunications" Division. **Option 2** of the realistic scenario was proposed for development, including the construction of new ETCS level 1, version 2.3.0d along Manole - Burgas Section.

In 2016 NRIC informed the competent authority MoEW for an investment proposal "Signalling systems construction along Plovdiv-Burgas Railway Line (ETCS level 1, version 2.3.0d)". With letter out. № OBOC-8/03.02.2016 MoEW notified that the presented IP did not exist independently within the scope of any of the positions of Annexes 1 and 2 of the EPA, as the MoEW ruled, that the IP did not require a procedure under Chapter Six of the EPA and CA Ordinance.

Conceptual Design for Position 1 - "Signalling systems construction along Plovdiv-Burgas railway line (ETCS level 1, version 2.3.0d)" was prepared in 2016 and as a part of "Rehabilitation of the Plovdiv - Burgas Railway Line, Phase 2" Project, **this design development is a subject of the EIA report.**

- **Implementation of computer based interlocking systems in the railway stations along Plovdiv-Burgas Railway Section**

In 2016 NRIC informed the competent authority MoEW for an investment proposal "Installation of station interlocking systems in 18 stations along Plovdiv-Burgas Railway Section and installation of a dispatching interlocking system". With letter out. № OBOC-61/19.08.2016 MoEW stated that the project is not a subject of the procedures under Chapter Six of the EPA abd Chapter Two of the CA Ordinance.

Conceptual design for installation of computer-based interlocking systems was prepared in 2016 for the following stations: Kaloyanovets, Kalitinovo, Han Asparuh, Nova Zagora, Konyovo, Bezmer, Yambol, Zavoy, Straldzha, Tserkovski, supply and installation of dispatching interlocking system in Plovdiv – Burgas Section, supplement of the conceptual design and technical specifications for "Optical fiber cable construction along Plovdiv-Burgas Railway Line", as second optical fiber cable with 36 optical single-fiber in Stara Zagora-Karnobat Section and elaboration of technical specifications and applications for delivery and installation of route computer based interlockings in Kaloyanovets-Karnobat Section and for dispatching interlocking with a view to its application in Plovdiv-Burgas Section.

Conceptual Design for "Installation of station interlocking systems in 18 stations along Plovdiv-Burgas Railway Section and installation of a dispatching interlocking system" was prepared in 2016 and as a part of "Rehabilitation of the Plovdiv - Burgas Railway Line, Phase 2" Project, **this design development is a subject of the EIA report.**

- **Component 2: „Construction of Overpasses/Underpasses for Plovdiv – Burgas Railway Section to Replace Existing Level Crossings"**

Its main objective is demolition of railway level-crossings along Plovdiv-Burgas Railway Line and their replacement with two-level crossings (overpasses and underpasses) in order to ensure the safe exploitation of the crossing road and railway infrastructure and minimise the risk of incidents at crossing points.

Due to its considerable scope, the activity is provisionally divided into two sections:

- Section 1 includes the development of 10 level crossings from km 18 + 607 (Skutare) to km 102 + 020 (Stara Zagora);

- Section 2 includes the development of 21 level crossings from km 115 + 115 (Kalithinovo) to km 260 + 921 (Aytos).

During Stage I, Conceptual Design phase, options for demolition of the railway level crossings along Plovdiv - Burgas Railway Line and the their replacement with crossings at two levels (overpasses and underpasses) are developed and a selection option to be developed during Stage II, Conceptual Design phase is made.

The options are related to the overpasses underpasses construction:

- Plain reinforced concrete with double "T" type beams or rectangular beams and reinforced concrete retaining walls;

- Plain reinforced concrete with double "T" type beams or rectangular beams and reinforced retaining walls of high-strength geogrids.

No options are considered regarding the overpasses and affected areas location. The location and gauge of the overpasses/underpasses is the same.

Two options regarding the location of the transition bridge are developed.

Option I includes keeping the place of the transition bridge immediately before the existing level crossing that will be closed.

Option II includes displacement of the transition bridge 500 m to the west and its deployment

Option I is developed qua an open and covered facility during Stage II.

For the implementation of Component 2, NRIC informed MoEW, as MoEW issued Decision № ЕО-3/2016 (ЖИ-15576/13.04.2016) that an environmental assessment shall not be carried out.

In the EIA report on Component 2 "Construction of Overpasses/Underpasses for Plovdiv – Burgas Railway Section to Replace Existing Level Crossings" from "Rehabilitation of Plovdiv – Burgas Railway Line, Phase 2" Project the selected options are considered and estimated and designed during Stage II Conceptual Design phase in 2016, **detailed in paragraph 1.A.**

- **Component 3: „Planting of Protective Forest Belt along Chernograd – Aytos Open Line"**

The investment proposal „Planting of Protective Forest Belt along Chernograd – Aytos Open Line" envisages the formation of a snowdrift retention in two sections: section I – from km 244+060.00 to km 244+760.00 with a length L=700 m and section II – from km 245+365.00 to km 246+390 with length L=1025 m, with the aim to secure an adequate protection of the permanent way from the unfavourable wind conditions during the winter months.

Its palnting will prevent the snowfall and drifts formation, as well as the accumulation of fine soil particles on railway track, endangering the safety of the traffic.

The safety belt has a width of 8 m, in compliance with the recommended 4 m at a distance of 15 m and 9 m at a distance of 30 m. It is planted parallel to the railway line at a distance of 20 m from its axis along the whole length of the track.

Its structure is with a rising height from the wind direction and a sharp descending of the height from the side of the track. This will be achieved by planting shrubs from the side of the wind

and trees from the side of the track. The planting of the shrubs and trees is according to the design scheme shown in the design development. Four belt gaps (for passgaeways) are envisaged to ensure passage of people, machines and animals. At these places on the side of the railway track, the shrub belt changes its direction at a distance of 4 - 5 m. Plowing and harvesting will take place along the entire length of the belt and within a width of 9 m before planting the trees and shrubs. The rows of trees will be planted at a distance of 3 m from each other and the shrubes - at 1.5 m. The distance between the rows is 2 m The trees will be planted using 3-6 year old saplings in holes 50/50/50, and the shrubes - 3 years old ones in holes 40/40/40. The plantspecies composition is selected according to the local conditions, the height and the density of the crown.

To improve the drainage and reduce water flow to Precast Concrete Ditch Element 200/50 type ditch, an additional protective channel is envisaged between the ditch and the snow protective belt. It is built along the entire length of the section with its axis parallel to the axis of the railway line and at a distance of 17 m. The depth of the channel is 0.95 m.

In connection with the implementation of "Rehabilitation of the Plovdiv-Burgas Railway Line, Phase 2" Project in April 2015 NRIC notified RIEW Burgas about the IP **„**Planting of Protective Forest Belt along Chernograd – Aytos Open Line", Component 3 of the project.

The competent environmental authority RIEW Burgas declares that the IP is not included in the Annexes 1 and 2 of the EPA and it is not a subject of the procedures for assessing the necessity of EA or EIA and Chapter Two of CA Ordinance.

The detailed design prepared in 2015 for „Planting of Protective Forest Belt along Chernograd – Aytos Open Line" is a part of "Rehabilitation of the Plovdiv - Burgas Railway Line, Phase 2" Project and **this design development is a subject of the EIA report.**

- **Component 4: „Rehabilitation of Skutare – Orizovo Railway Section"**

NRIC notified MoEW in 10.2010 about IP Component 4: „Rehabilitation of Skutare – Orizovo Railway Section". With letter out. № OBOC-2395/15.11.2010 (0406-37/17.11.2010) MoEW stated that the project is not a subject of the procedures under Chapter Six of the EPA abd Chapter Two of the CA Ordinance.

The investment proposal „Rehabilitation of Skutare – Orizovo Railway Section" is classified as repair, restoration/rehabilitation of the existing railway infrastructure. Its main objective is to bring the technical parameters of the track in accordance with the requirements of the European Union and to achieve more comfortable conditions of movement, transport of increased quantities of goods with secured train operation safety.

The renewal and reconstruction of Skutare - Orizovo Railway Section is essential for the completion of Plovdiv - Burgas Railway Line rehabilitation. The railway line under consideration along Skutare - Orizovo Section is single and electrified (with 25 kV/50 Hz voltage) railway line with a length of 26,198 m.

The investment proposal includes: track optimization, renewal of the permanent way, rehabilitation of the substructure and trackside facilities, fiber optic duct network, surface water discharging, reconstruction and new catenary system, pillars and foundations, modernization of the signaling and telecommunication systems, rehabilitation of the station buildings, technical buildings for RCI, sanitary units and turnout booths in the stations and open lines along Skutare – Orizovo Section, Manole Station, Belozem Station and Opalchenets Halt.

The detailed design prepared in 2017 for „Rehabilitation of Skutare – Orizovo Railway Section" is a part of "Rehabilitation of the Plovdiv - Burgas Railway Line, Phase 2" Project and **this design development is a subject of the EIA report.**

- **Component 5: „Modernization of Orizovo – Mihaylovo Railway Section"**

Based on the selected, during the Feasibility Studies, Option 2 of a scenario for development, three conceptual variants of the route were presented, as one of them was chosen for the complete development of the conceptual design.

In order to realize the overall modernization of Orizovo – Mihaylovo Railway Section from km 43 + 029 to km 80 + 722, due to the large difference between the parameters of the geometric elements of the existing and the new track, for certain sections of each of the developed options **the new route is envisaged to leave the existing easement**.

The following route variants corresponding to potential scenarios have been developed:

The basic option is for recnstruction of the existing route without leaving the existing easement.

Option 1 is for a new railway line crossing Trakiya Highway at an existing overpass (km 56 + 611), tunnel structure (L = 3150 m) for bypassing the town of Chirpan and bypass (L = 12 098 m) for entering the city.

Option 2 is for a new railway line crossing the Trakiya Highway at an existing overpass (km 56 + 514), tunnel structure (L = 970 m) for bypassing the town of Chirpan and bypass (L = 6 215 m) for entering the city.

Option 3 is for a new route with two large reinforced concrete bridges, respectively, at the new crossing of Trakiya Highway (km 56 + 790/L = 4 x 26 m) and Tekirska River (km 56 + 790/L = 6 x 26 m). The option includes detour of the town of Chirpan from the south and it is with a new connection to the existing Chirpan Station (L = 2,139 m).

After analyzing by the Contracting Authority, NRIC of the technical and economic indicators regarding the options considered, *Option 2*, developed for a speed of 160 km/h with a bypass and double track, was preferred for designing.

Option 2 is developed for a route with a design speed of 160 km/h for a single and double line.

The geometric solution is determined under the legal requirements for a design speed of 160 km/h. Due to the large difference between the parameters of the geometric elements of the existing and the new track, for the section from km 56+601 to km 61+033, the new route leaves the existing easement and requirea track acquisition. Furthermore, OPTION 2 envisages doubling of the existing single railway line along the whole section from Orizovo to Mihaylovo. The total area expected to be subject of expropriation procedures is about 1545,455 decares. A key point for the route of OPTION 2 is the crossing with the Trakiya Highway at an existing overpass at km 56 + 514. For the new route, the crossing is set to be fulfilled using the existing facility

In 2016, a procedure under Chapter Six of the EPA on IP "Modernization of Orizovo - Mihaylovo Railway Section" was carried out. Information for assessing the necessity of EIA was prepared and with Decision № СЗ-6-ПР/2016 RIEW Stara Zagora decides that EIA and CA "shall not to carry out".

Subsequently MoEW was notified about IP "Rehabilitation Plovdiv – Burgas Railway Line, Phase 2" for changes occurred in the scope of the investment proposals: Component 5: „Modernization of Orizovo – Mihaylovo Railway Section" and Component 6: „Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station". In response, with letter out. OBOC-74 and OBOC -51/15.11.2017 MoEW stipulates that the so stated IP with the changes occured falls within the scope of item 7.1 of Annex 1 and in relation with item 25 of this annex it shall be a subject to a mandatory EIA.

The planned changes concern stations and halts within Component 5, as follows:

♦*Orizovo Station*

Changes in the planning for provision of an accessible environment - instead of the envisaged pedestrian underpss, a transition bridge with lifts and approaches to the platforms connecting the northern and southern terminals of the station to accommodate passengers and residents in the village on both sides of the railway is planned to build.

♦ *Svoboda Halt*

In Svoboda Village construction of a new halt is envisaged on an entirely new platform. Displacement of Svoboda Halt is palnned by about 500 m to the west for connection with the existing road.

♦ *Samuilovo Halt*

Instead of closing the halt, new Samuilovo Halt near its existing position when entering the new alignment is envisaged to be constructe with access provided to the new halt. The halt is provided with all necessary facilities for its normal operation.

♦ *Spasovo Halt*

Instead of closing the halt, new Spasovo Halt near the planned new road overpass at km 55+841, including provision of an access to the new halt. The halt is planned to be provided with all necessary facilities for its normal operation.

♦ *Mihaylovo Station*

Instead a route correcting along Mihaylovo - Dimitrovgrad Railway Line, keeping the existing position of the Mihaylovo - Dimitrovgrad Railway Line and dropping of the reconstruction of the railway line and of the third - class road in this section is envisaged.

The elaborated Conceptual design from 2015 for „Modernization of Orizovo – Mihaylovo Railway Section", including the changes planned is a part of "Rehabilitation of Plovdiv - Burgas Railway Line, Phase 2" Project and **this design development with the changed occurred is a subject of the EIA report.**

- **Component 6 „Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station"**

According to the decisions of NRIC Expert Technical Council, described in the minutes of 13.11.2012, the technical design is developed for a new alignment of the railway line, including:

- double railway line with regard to*: geometric solution, bridge structures, culverts, ditches, drainages and implementation of expropriation procedures and environmental procedures;*
- single railway line with regard to: *earth bed, catenary, signaling and telecommunications.*

EIA procedure for the component was carried out. Information for assessing the necessity of EIA was prepared and with Decision № 127-ПР/2015 RIEW Stara Zagora decides that EIA and CA "shall not be carried out".

Subsequently MoEW was notified about IP "Rehabilitation Plovdiv – Burgas Railway Line, Phase 2" for changes occurred in the scope of the investment proposals: Component 5: „Modernization of Orizovo – Mihaylovo Railway Section" and Component 6: „Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station". In response, with letter out. OBOC -74 and OBOC -51/15.11.2017 MoEW stipulates that the so stated IP with the changes occured falls within the scope of item 7.1 of Annex 1 and in relation with item 25 of this annex it shall be a subject to a mandatory EIA.

The changes planned concern Zavoy Station, namely:

♦ Building of a double grade pedestrian structure to ensure safe movement between the platforms is planned. The pedestrian crossing will be located on the territory of the Zavoy Station,

around km 192 + 000 and it will be situated in accordance with the new track development of the station. The new structure is envisaged to be steel, with one-sided opening with a minimum headroom height of 6800 mm (+300 mm reserve for construction and operating tolerances) - 7100 mm. To ensure access for disabled people using wheelchairs, installation of lifts is planned;

♦ Closure of the existing level crossing in the area of Zavoy Station and construction of a road overpass.

The elaborated Conceptual design from 2015 and the technical design from 2013 for „Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station", including the changes planned is a part of "Rehabilitation of the Plovdiv - Burgas Railway Line, Phase 2" Project and **this design development with the changed occurred is a subject of the EIA report.**

- **Component 7: „Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the Catenary at Zimnitsa and Straldzha Stations"**

The project for Reconstruction **of Switches Development at Zimnitsa Station** was developed on the basis of an open public procurement procedure launched in 2013.

On the basis of an approved version of the feasibility study, the following options were developed as a proposal for the development of a Conceptual design:

- **Option 1 –** seven acceptance and devivery tracks are retained. The effective length compared to Option 2 of the pre-feasibility studies is improved.
- **Option 2** - six acceptance and devivery tracks, seventh acceptance and delivery track is dismantaled.
- **Option 3-А** – five acceptance and devivery tracks, seventh acceptance and delivery track is dismantaled. Sixth track is used for a shunting one.
- **Option 3-Б** – five acceptance and devivery tracks, seventh acceptance and delivery track is dismantaled. Sixth track is used for a shunting one. To access the shunting track by the even throat, a hump track is used.
- **Option 5 and 6** - six acceptance and devivery tracks are retained. The even throat is developed for Zavoy - Zimnitsa Open Line doubling.

Option 6 is developed in a Conceptual design during the next phase.

In 2016 NRIC informed RIEW Stara Zagora about the investment proposal „Reconstruction of Switches Development at Zimnitsa Station from km 198+144 to km 199+360 within the station in the area of Zimnitsa Village, Straldzha Municipality.

In response to the notification, RIEW Stara Zagora announced, that the investment proposal is not a subject of the regulated under Chapter Six of the EPA procedures for assessing the need of EIA and Chapter Two of the CA Ordinance.

The elaborated Conceptual design from 2015 for „Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the Catenary at Zimnitsa and Straldzha Stations" is a part of "Rehabilitation of the Plovdiv - Burgas Railway Line, Phase 2" Project and **this design development is a subject of the EIA report.**

- **Component 8: „Rehabilitation of Straldzha – Tserkovski Railway Section from km 217+210 to km 219+059"**

The section envisaged for rehabilitation is the remaining part from Straldzha-Tserkovski Open Line, which was not renewed in 2001-2002. The construction was carried out under PHARE LSIF BG9811-01 "*Renewal of railway lines in Bulgaria - Straldzha - Tserkovski Railway Line along Eighth Railway Line from km 206 + 745 to km 218 + 997 - Track 1 from km 206 + 679 to km 219 + 051 - Track 2",* developed in 2001.

At present, the rehabilitation of the railway track in Tserkovski Station is completed under "Rehabilitation of the Railway Infrastructure Rehabilitation along Section of Plovdiv – Burgas Railway Line" Project, under Position 3 "Rehabilitation of Tserkovski – Karnobat Railway Section, including the Main Tracks in Tserkovski Station with an Approximate Total Track Length of 28 km and Renewal of the Track in Karnobat-Burgas Section, including the Main Tracks in Karnobat and Burgas Stations and all Stations and Halts between them, with an Approximate Total Track Length of 122 km".

Under the Project for "Preparation of "Rehabilitation of Plovdiv – Burgas Railway Section, Phase 2" Project", Position 2 - Position 9, a review and update of the existing project for Straldzha-Tserkovski Railway Section from 2001 was carried out. The project was developed at the technical design level and was approved in April 2015. When the project was updated, the design development for rehabilitation of Tserkovski Station (revision "C" from 07.2013) was taken under consideration.

The present project is the next phase of designing the approved technical project Component 8 - Rehabilitation of Straldza - Tserkovski Railway Section from "Preparation of Rehabilitation of Plovdiv – Burgas Railway Section, Phase 2" Project.

The present detailed design is the next phase of designing the approved technical design Component 8 - Rehabilitation of Straldza - Tserkovski Railway Section from "Preparation of "Rehabilitation of Plovdiv – Burgas Railway Section, Phase 2" Project".

For the IP, a procedure under Chapter Six of the EPA was carried out with RIEW Burgas.

In response to the notification, RIEW Burgas announced, that the investment proposal does not fall within Annex № 1 и № 2 of the EPA and is not a subject of the regulated under Chapter Six of the EPA procedures and Chapter Two of the CA Ordinance.

Currently, the project for rehabilitation of Tserkovski Station is in a stage of construction and assembly works implementation.

The elaborated Conceptual design from 2017 for „Rehabilitation of Straldzha – Tserkovski Railway Section from km 217+210 to km 219+059" is a part of "Rehabilitation of the Plovdiv - Burgas Railway Line, Phase 2" Project and **this design development is a subject of the EIA report.**

- **6.2. Alternatives for location subject to EIA procedure**

NRIC as an Employer has started EIA procedure of "Rehabilitation of the Plovdiv – Burgas Railway Line, Phase 2" Project comprising eight components.

The design routes for Component 5 – "Modernization of Orizovo - Mihaylovo Railway Section" and Component 6 – "Modernization of Yambol - Zimnitsa Railway Section at Zavoy Station were developed along a new terrain.

The design developments for the remaining components are within the scope of the NRIC-owned transport area and no alienations are required.

Subject of the EIA procedure is the investment intent in its entirety, which includes the envisaged activities under the eight components of "Rehabilitation of Plovdiv – Burgas Railway Line, Phase 2" Project, as well as the accompanying sites and activities related to the construction and operation.

The design developments for the separate eight components of the investment proposal, including planned changes are subject of EIA procedure:

- **Component 1:** „Design and Construction of Signalling and Telecommunication Systems along Plovdiv-Burgas Railway Line" including:

- Optical fiber cable construction along Plovdiv-Burgas Railway Line

Beginning of Filipovo Station – station building (border of Plovdiv – Svilengrad coverage) km 5 + 652 - Burgas Station km 293 + 500

According to the design the fiber optic cable route is in the area of the NRIC easement and no alienation is required for its construction.

All the passings under the railway line and crossings of roads from the national road network are carried out only underground with drilling.

Along the entire 8th railway line from Plovdiv to Burgas, an optical cable will be installed along the railway line.

- One optical cable will be installed underground along the sections Plovdiv - Filipovo - Skutare and Plovdiv - Plovdiv Marshalling Yard - Trakiya – Skutare.

-Two underground cables will be installed together with the corresponding HDPE pipes in a duct network along Skutare - Orizovo Section.

- An overhead line optical cable will be installed along Orizovo - Chirpan - Mihaylovo Section on the pillars of the catenary. **The second optical cable will be installed along the future track 2 between Orizovo and Mihaylovo**.

- Along Mihaylovo - Burgas Section two optical cables will be installed underground, which along the open lines will be laid down in excavations on both sides of the railway track, and in the stations - in the duct network.

- Signalling systems construction along Plovdiv-Burgas Railway Line (ETCS level 1, version 2.3.0d)

Complete dismantling of the track equipment of the system for automatic locomotive signaling JZG-703 type in the section Skutare Station - Stara Zagora Station. Dismantling of all the balises of ALTRACS BDZ system at Plovdiv Railway Node and Stara Zagora - Balgarovo Section. Delivery and installation of new balises (markers placed between the rails) in return for the existing balises of ALTRACS BDZ system. Revision of all track encoders (LEUs) of ALTRACS BDZ system. Dismantling of faulty LEUs at Plovdiv Node and mounting of the regular ones in their place along Stara Zagora - Balgarovo Section. Use of laid LEU cables and boxes at Plovdiv Railway Station and Stara Zagora - Balgarovo Section and installation of new electronics for ETCS level 1 system version 2.3.0d. Creation of new ETCS level 1 database, version 2.3.0d for the track equipment of the existing ALTRACS BDZ version 1.2.0 system. The existing system can not migrate to ETCS Level 1, version 2.3.0d.

The modernization will contribute also to qualitative servicing of passengers at the stations by providing real-time information on trains timetable, directions and connections, as well as messages related to safety and security of passengers.

- Implementation of computer based interlocking systems in the railway stations along Plovdiv-Burgas Railway Section

The implementation envisaged installation of computer-based interlockings at the stations: Kaloyanovets, Kalitinovo, Han Asparuh, Nova Zagora, Konyovo, Bezmer, Yambol, Zavoy, Straldzha, Tserkovski, which are located along Kaloyanovets-Karnobat railway section; Burgas, Vladimir Pavlov, Lozovo Duty Point, Dolno Ezerovo and Druzhba Station, and at the stations Chernograd, Aytos and Balgarovo. The activities within the scope of Component 1 are supply, installation, testing and putting into operation of route computer based interlockings at the stations.

- **Component 2:** "Construction of Overpasses/Underpasses along Plovdiv-Burgas Railway Section to Replace Existing Level Crossings"

Demolition (closure) of 31 existing level-crossings is foreseen. În their place (or in the vicinity of the existing level crossings) new structures – 28 road overpasses, 1 road underpass and 1 pedestrian oberpass (transition bridge) are planned to be constructed.

- **Component 3:** „Planting of Protective Forest Belt along Chernograd – Aytos Open Line"

The belt will be set up in two sections by planting two rows of trees with shrubs between them and three rows of shrubs with a descending height. The rows of trees will be planted at a distance of 3 m from each other and the shrubes - at 1.5 m. The distance between the rows is 2 m, which will ensure better plant development and more convenient access for their maintenance.

Belt gaps are envisaged in three places in Section I (for passgaeways) to ensure passage of people, machines and animals. Four passageways are envisaged for Section II.

- **Component 4:** „Rehabilitation of Skutare – Orizovo Railway Section"

The design solution in the section is for a single electrified railway line. The rehabilitation of the Skutare - Orizovo Railway Section covers a section from km 16 + 905 to km 43 + 030.

The main rehabilitation activities in the section include track optimization, renewal of the permanent way, rehabilitation of the substructure and trackside facilities, fiber optic duct network, surface water discharging, reconstruction and new catenary system, pillars and foundations, modernization of the signaling and telecommunication systems, rehabilitation of the station buildings, technical buildings for RCI, sanitary units and turnout booths in the stations and open lines along Skutare – Orizovo Section, Manole Station, Belozem Station and Opalchenets Halt.

- **Component 5:** „Modernization of Orizovo – Mihaylovo Railway Section"

The design is developed for an **existing and new route** of 160 km/h for single and double line. Due to the large difference between the parameters of the geometric elements of the existing and the new route, for the section from 56 + 611 to km 61 + 033 the new route leaves the existing easement and land acquisitions will be required. Furthermore, the design envisages doubling of the existing single railway line along the entire section from Orizovo to Mihaylovo.

The two tracks in the section are separated as single railway lines before the town of Chirpan - Bypass beginning - km 56 + 919 (Track 2). The route of Track 1 (Vd = 80 km / h) passes through the town of Chirpan and has a total length of L = 5 842 m (from km 56 + 916.11 to km 62 + 757.86).

The bypass aims to provide a connection with the existing Chirpan Station for the trains stopping there, while the remaining traffic passes transit along the main route. The bypass route follows the existing one and it is designed for a design speed of 80 km/h. Mileage continues the mileage of the main track. Within the bypass, the track is the same as the existing one except the connecting geometric elements.

The design envisages changes concerning stations and halts as follows:

Orizovo Station: Changes in the planning for provision of an accessible environment - instead of the envisaged pedestrian underpss, a transition bridge with lifts and approaches to the platforms connecting the northern and southern terminals of the station to accommodate passengers and residents in the village on both sides of the railway is planned to build.

Svoboda Halt: In Svoboda Village construction of a new halt is envisaged on an entirely new platform. Displacement of Svoboda Halt is palnned by about 500 m to the west for connection with the existing road.

Samuilovo Halt: Instead of closing the halt, new Samuilovo Halt near its existing position when entering the new alignment is envisaged to be constructe with access provided to the new halt. The halt is provided with all necessary facilities for its normal operation.

Spasovo Halt: Instead of closing the halt, new Spasovo Halt near the planned new road overpass at km 55+841, including provision of an access to the new halt. The halt is planned to be provided with all necessary facilities for its normal operation.

Mihaylovo Station: Instead a route correcting along Mihaylovo - Dimitrovgrad Railway Line, keeping the existing position of the Mihaylovo - Dimitrovgrad Railway Line and dropping of the reconstruction of the railway line and of the third - class road in this section is envisaged.

- **Component 6** „Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station"

The design is developed for a **new alignment** of the railway line, including:

- double railway line with regard to*: geometric solution, bridge structures, culverts, ditches, drainages and implementation of expropriation procedures and environmental procedures;*
- single railway line with regard to: *earth bed, catenary, signaling and telecommunications.*

The length of the new railway route is 2 116 m. This section will be completed with a new reinforced concrete bridge with a length of 119 m over Tundzha River and a smaller reinforced concrete bridge with a length of 10 m.

- Building of a double grade pedestrian structure to ensure safe movement between the platforms is planned. The pedestrian crossing will be located on the territory of the Zavoy Station, around km 192 + 000 and it will be situated in accordance with the new track development of the station. The new structure is envisaged to be steel, with one-sided opening with a minimum headroom height of 6800 mm (+300 mm reserve for construction and operating tolerances) - 7100 mm. To ensure access for disabled people using wheelchairs, installation of lifts is planned;

- Closure of the existing level crossing in the area of Zavoy Station and construction of a road overpass.

- **Component 7:** „Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the Catenary at Zimnitsa and Straldzha Stations"

The implementation of complete reconstruction of the switches development of Zimnitsa Station does not envisage displacement of the design axis from the existing one and does not disturb the boundaries of ownership.

Six acceptance and devivery tracks are retained under the design. The even throat is developed for Zavoy - Zimnitsa Open Line future doubling.

- **Component 8:** „Rehabilitation of Straldzha – Tserkovski Railway Section"

For the implementation of the overall rehabilitation of Straldzha - Tserkovski Railway Section from km 217 + 210 to km 219 + 059, where displacement from the existing design axis towards the existing one up to 70 cm without disturbing the boundaries of ownership are envisaged.

The purpose is rehabilitation of Staldzha - Tserkovski Railway Section for a design speed of 130 km/h.

Design decisions for the individual components do not address options for track locations. Components 1, 4, 7 and 8 are within the scope of the existing railway line. Overpasses/underpasses under Component 2 will be built at the place of the level crossings that will be demolished. For Components 5 and 6, procedures are carried out to assess EIA need under Chapter Six of the Environmental Protection Act, together with a procedure for assessing the likely degree of a negative impact under the Biological Diversity Act. The location of the railway track on a new terrain under components 5 and 6 is coordinated with the procedure for assessing the need of EIA carrying out.

The design decisions of the different eight components, subject of the investment proposal, are described in detaisl in section 2.3."Description of the main features of the investment proposal ....."""

We apply drawings with the location/situation of the project routes for the different components of the investment proposal for "Rehabilitation of the Plovdiv - Burgas Railway Line, Phase 2" (Annex 5).

- **6.3. Alternatives for technologies**

The technology for construction of railway lines and railway infrastructure is regulated in Ordinance № 55/29.01.2004 for the design and construction of railway lines, railway stations and other sites and structures from the railway infrastructure as well as railway level crossings.

The designs for the different components take into account the approved technology for construction of railway lines and and railway infrastructure. No other alternatives for technologies have been investigated and considered by the Contracting Authority and Designer.

- **6.4. "Zero Alternative"**

The "Zero" alternative for the project "Rehabilitation of Plovdiv – Burgas Railway Line, Phase 2", comprising eight components is "no change" option and meets the conditions of the existing Plovdiv – Burgas Railway Line for passenger and freight transport and the related technological processes and infrastructure with minimal investments (existing track maintenance), which ensures the retention of the existing condition without its deteriorating.

Plovdiv-Burgas Railway Line is a part of the Pan-European Transport Corridor VIII linking the Italian ports Bari and Brindisi and Albanian Durres to the Adriatic Sea with the Black Sea ports of Burgas and Varna and through them the countries of TRACEKA Corridor (the international transport corridor Europe – Caucasus - Asia). The link TRACEKA-Corridor VIII is extremely perspective for Bulgaria, because it is the most direct link between Central Asia and Western Europe. Plovdiv – Burgas Railway Line is a part of TINA network (according to the Ordinance on categorization of the railway lines in the Republic of Bulgaria, included in the railway infrastructure and closing of separate lines or sections of lines) (prom., SG, issue 112 from 2001) has a ststus of railway highway and it is a link between Pan-European Corridors IV and IX.

The high traffic intensity and traffic are typical for this railway line. Actually, all the passenger and freight traffic from Sofia to Burgas port is carried out allong it.

It should also be taken into account that the activities for the "Rehabilitation of Plovdiv - Burgas Railway Line, Phase 2" are not related to the construction or operation of an entirely new railway line. The project includes optimization of the existing track, renewal of the railway track, rehabilitation of the substructure, railway rehabilitation, modernization of certain sections as well as construction of new structures, closure of level crossings and construction of road overpasses, development of stations, construction of new halts, etc. repair and recovery activities.

The railway network requires development in accordance with the transport and social needs of the society, the infrastructure of the settlements and the requirements of the legal acts related to the national security, environment protection and traffic safety.

The "zero" alternative does not lead to an increase in the sustainable development of the national transport market and the competitive integration of the Bulgarian railway network into the European and Eurasian transport markets.

7. Description, analysis and estimated impact assessmont on the environmental components and factors and on the material and cultural heritage, which will be affected by the investment proposal: population, human health, bio-diversity (for example flora nad fauna), soil (for example organic substances, erosion, comsolidation, sealing), water (for example hydro-morphological changes, quality and quantity), air, climate (for axample greenhouse gas emissions, impacts of adaptation), material assets, cultural heriatage, including architectural and archaeological aspects and the landscape (the description of the likely significant consequences for the elements under Article 95 (4)) shall cover the direct effects and all indirect, secondary, cumulative, cross-border, short, medium and long-term permanent and temporary positive and negative consequences of the investment proposal and all the environmental objectives that are relevant for the investment proposal are taken into account)

7.1. Atmosphere air

7.1.1. Summary and analysis of climatic and meteorological factors related to the specific impact and the quality of the ambient air

The route of investment proposal "Rehabilitation of Plovdiv-Burgas Railway Line, Phase 2" Project falls falls in the climatic regions of Eastern Middle Bulgaria from the Trans-Continental Climatic Sub-Area of the European Continental Climate Area and the climatic region of the Burgas Lowland from the Black Sea Climatic Sub-Area of the Continental-Mediterranean Climate Area.

Climate region of Eastern Central Bulgaria

The climatic region of Eastern Central Bulgaria covers the biggest part of the lowlands of Maritsa and Tundzha rivers, where the terrain is mostly flat with an altitude of 150-200 m. The mild winter with frequent warming under the influence of the Mediterranean cyclones and the protective effect of the Balkan Mountain with regard to invasions of cold continental air, as well as a hot summer with a small 24-hour temperature amplitude and a relatively low relative humidity air are typical for the western parts of the climatic region of Eastern Central Bulgaria. Maritsa River, crossing the territory of the Municipality, has an additional softening effect on the winter temperature regime, but at the same time it contributes to the formation of fogs. The frequency of phenomena associated with inverse atmospheric conditions (mist and frost etc, combined with negative average daily temperatures) are also typical for the area.

Winter in the region is relatively mild - the average temperature in January is between - 0.5 and 1.0 ° C, i.e. significantly higher than this temperature in northern Bulgaria. Despite the mild winter in some cases and invasions of very cold continental air the minimum temperatures fall to - 12 / -14 ° C, and during some years below -20 ° C. The sum of the winter precipitation is slightly higher than the sum for northern Bulgaria - an average of 110 to 130 mm, but only a small percentage is snow.

Spring in the climatic region of Eastern Central Bulgaria comes early – at the beginning of March and sometimes at the end of February. The average daily temperatures are ketp resistant above 5°C, but in the more eastern parts of the area, its advent is delayed by an average of about a week. Generally, spring frosts in the area are quite late - on average around the middle of April, due to the favorable orographic conditions for night-time cooling

Due to the protective role of the mountains from thr south and north, another feature in the rainfall regime is long periods without rainfalls. Well expressed tendency of equalizing the seasonal sums of rainfalls at a limited average annual quantity of 540 mm sets Plovdiv region in climatic terms. A special feature of the precipitation regime is the lengthy period of rainfall with an average number of days without rainfall of 295 for the last five years, and there are places differentiated around the town and east of it with the smallest rainfalls in the Upper Thracian Plain

Another typical feature of Plovdiv climate is the high frequency of temperature inversions in the atmosphere (up to 81% of the days of the year) and small speeds (a significant percentage of "quiet time"). Specifically, under the conditions of Plovdiv, there are possibilities for reorientation

of wind into the ground layers, for dynamic changes in the flow of the hills and damping in the central city districts with a dense building construction.

Summer in the region is quite hot, with an average temperature in July everywhere above 22°C, in some places up to 23.5°C. The number of days with a maximum temperature above 25°C is almost 95% of all the days in the month. In summer, the proportion of "dry weather" is significant (34-35% in July and August) and in some days the maximum temperature reaches 34-36°C.

The precipitations sum in the area during summer months averages from 140 to 160 mm, but although they remain maximum for the year, they are almost equal to the spring ones. Autumn is much warmer than spring, especially in the central and eastern parts of the area. The average date of the first autumn frosts is at the end of October or early November. The sum of precipitations for the autumn months is approximately equal to the spring and is between 120 and 140 mm.

Climatic region of Burgas Lowland

It covers the plain of the coast between Cape Emine and Cape Maslen Nos, as its western border is about 20 - 30 km from the coast. Winter here is even softer than in the Northern Black Sea Coast. On the very coast, the heaviest rainfall in the year is November, and inland the peak is in June. However, seasonally, the maximum rainfall is in winter or autumn and it is within 120-150 mm. The average temperature in January is from 2 to 3°C (for the most recessed in the sea parts) and the minimum temperature rarely falls below -6-8°C. As a result of the relatively high temperatures on the coast, the snow cover is kept for 10 to 15 days throughout winter. Spring in the area is cool, with an average temperature in April remaining 2 to 2.5°C lower than in the Thracian Plain. Nevertheless, the last spring frosts are about 2 weeks earlier than in the inland. The impact of the sea on minimum temperatures is evident even during the months when the average water temperature remains below the average air temperature. Summer is sunny, warm and quite dry. The lowest rainfalls are in August, when there are are an average of 18-20 mm of rain. The total rainfall sum for the season is 90 to 130 mm. Also the atmospheric fronts from the West and the North-west are often passing each other here and they are expressed more by clouds increasing and wind accelerating. Due to the proximity of the sea, the maximum temperatures in the hottest days rarely exceed 32-33°. Autumn is considerably warmer than spring, and in the first half it is quite dry. Only at the end of October, and especially in November, the rainfalls significantly increase and in some places their amount even becomes maximum for the year.

7.1.2. Available data on atmospheric air pollution in the area of the site. Sensitive zones

Ambient air quality (AAQ) on the territory of Plovdiv Municipality. The biggest pollution is reported in the area with the so-called concentrated human presence, where a large part of the population of the town of Plovdiv lives and works. There are also hospitals, schools, kindergardens and universities. All modeled maximum concentrations of fine dust particles (PM10) are located in this area, where the measured concentrations of PM10 are high and a large percentage of them exceed the average annual pollution levels. These values are observed in almost the whole area surveyed. The highest concentrations of PM10 are available to the north of Maritsa Blvd. (southern part) up to Nikola Vaptsarov Blvd. to the south and from Koprivshtitsa Blvd. to the west up to East Blvd. to the east. The data published from Local System for Air Quality Management (AQM) on the territory of Plovdiv Municipality in real time confirm the conclusions regarding the increased concentrations of PM10 during the winter months of 2016. It can be seen that the areas with over-sized values cover mainly the central part.

AAQ on the territory of Stara Zagora Municipality. The analysis carried out shows that by 2015 the goals set for reaching the established levels for PM10 content in the ambient air on the territory of the town of Stara Zagora have not been achieved yet, namely: the number of exceedances of the average daily rate for human health protection does not meet the requirements (not to be exceeded more than 35 times within one year), 45 numbers per day with exceedances of the threshold value for an average hourly rate of 50 μg/m3. The average annual concentration (AAC) of 41.91 μg/m3 for 2014 exceeds the threshold value for an average hourly rate of 40 μg/m3.

The analysis carried out shows that the goals set for reaching the established levels for PM10 content in the ambient air on the territory of the town of Stara Zagora have not yet been achieved, namely: the number of exceedances of the average daily rate for human health protection up to 2014 including, does not meet the requirements (not to be exceeded more than 35 times within one year), as at the three monitoring points (Automatic Measuring Station (AMS) "Meden Rudnik", AMS "Dolno Ezerovo" and Differential Optical Absorption Spectroscopy (DOAS) "RIEW") exceedances of AAC over the admissible number are registered.

According to preliminary data for 2015 compliance with regulatory requirements has already been achieved for the regions of AMS "Meden Rudnik" and DOAS "RIEW" - the number of exceedances registered is 22 and 26 respectively. The number of exceedances of the average daily standard for human health protection in the AMS "Dolno Ezerovo" not only remains significantly higher than threshold value, but also grows, and in recent years their number (114 to 121 exceedances) exceeds the standart 3 times. The main part (about 80%) of the exceedances at all three checkpoints are registered in winter months during the heating season. In summer months (July - August), a number of over-rate concentrations, as a result of the intense road traffic in the region are also registered in DOAS "RIEW". Exceedance of the annual average rate for for human health protection of 40 μg/m3 is recorded only in AMS "Dolno Ezerovo". In 2014, an average annual concentration of 48.13 μg/m3 was registered at the site, with a 1.2 times increase in the average annual rate (AAR). According to preliminary data for 2015, the AAC in AMS "Dolno Ezerovo" is 49.3 μ m3 and again exceeds the threshold value of the annual average rate. Compared to 2010, the average annual concentration of PM10 in the region has been increased by 33%. In general, the area of AMS "Dolno Ezerovo" has the highest levels of PM10 contamination, where in the winter months as a result of the burning of solid fuels in households the maximum AACs reach values of and above 120 μg/m3 and the frequency of over rated concentrations reach up to 55% of the total number of daily average concentrations recorded during the heating season.

7.1.3. Sources of ambient air pollution related to investment proposal implementation - during construction, during operation and at completion and recultivation.

Sources of ambient air pollution during construction

During the construction of the investment intention for the different components there will be a release of harmful substances depending on the envisaged activities: in the course of railway track ***repair***, renewal of the worn superstructure elements, consolidation of the track substructure, as well as repair of its adjacent facilities will be carried out; in the course of ***rehabilitation*** of the railway track, a permanent restoration or increase of the design speed in the open line will be achieved by bringing the substructure and superstructure to the corresponding requirements (without leaving the easement of the railway line); in the case of ***"modernization"*** improvement of the overall functioning of the construction or part of the construction of the railway track (additional areas utilization and expropriations are possible); in the case of ***reconstruction***, the structural elements, main parts, facilities or installations are restored and replaced or completely new ones are placed, that will increase the load-bearing capacity, the stability and the durability of the constructions (additional areas utilization and expropriations are possible).

The construction works on rehabilitation and modernization of sections along the railway line and the reconstruction of switches development are mechanized. Initially, the preparatory works related to the preparation of construction and storage sites (within the construction site) are carried out; servicing roads, temporary storage sites for excavation masses, temporary landfills for

bulk materials from and for the railway ballast prism and etc are built. The excavation works are preceded by humus layer raking out (e.g. during the construction of overpasses), transportation and temporary storage on a depot. Earth-excavation works, excavation and embankment making, replacement of ballast prisms, etc. are carried out according to the requirements for quality and performance technology, prescribed in the design.

The construction works are primarily related to emissions of total suspended dust. Emissions will be disorganized and will mainly be related to repair and restoration activities before and during excavation and replacement of ballast prisms. During these processes dusts with different fractional composition will be emitted, due to the use of specialized trench machines and machines for ballast prism formation. The use of these machines will also be related to the exhaust emissions in which the main types of pollutants emitted are nitrogen oxides; volatile organic compounds; methane; carbon monoxide; carbon monoxide; nitric oxide; sulfur dioxide; ammonia; cadmium; lead; polycyclic aromatic hydrocarbons; dioxins and furans; as well as particles (soot) when burning diesel fuel. When landfills and inert materials are downloaded at a depot, the main emissions are dust and waste gas from on-site engine operation. During vehicles operation and route preparation along the service roads (without asphalt), the same pollutants will be released as above. The amount of dust released in this case depends on many factors, the main ones being: road condition, vehicle speed, traffic, duration, etc. When placing, spreading, aligning, etc., inert materials from the ballast prisms, the emissions are also from the same dust and waste gases from the engines of the machines used for fulfillment of these processes.

Activities during operation

Due to the electrification provided, no operation of diesel locomotives along the railway line is foreseen. In the case of electrically driven train compositions, air pollution can only occur in case of re-emission of dust particles from the ground in the front of the locomotive and after the last wagon.

7.1.4. Assessment of the impact on the atmospheric air in compliance with the regulations and standards in force in the country.

Transport is a major source of emissions of nitrogen oxides, reaching up to 40% of national emissions. The use of rail transport in its various scenarios under the **Integrated Transport Strategy in the period up to 2030** will reduce the amount of gas emissions from 13% to 16%. Regarding the reduction of emissions by using rail transport, "B" scenario is preferred with about 16% reduction of the total polluters amount emitted by transport.

As no exceedance of the relevant PM10 standards and correspondingly large differences in the ground concentrations during the operation of the railway sections and the components considered, modeling only for the sections planned to be rehabilitated and modernized with the planned new track of the railway line, is performed. The results of the forecasting regarding the ground concentrations along the entire railway line alignment do not take into account atmospheric air pollution (exceeding the annual average rate for human health protection for PM10) along the route and around it, and no other pollutants are expected to be emitted by the electrified railway line. Potential possibilities for rates exceedance (in case of unfavorable weather conditions) along the route are also not expected. The maximum possible single contamination with PM10 is in the range of 4-7% of their respective average daily rate.

7.2. Surface and underground water

Assessment of the type and quantity of expected residual substances and emissions (such as water, air, soil and subsoil layer, noise, vibration, non-ionizing radiation, radiation)

and the quantities and types of waste generated during the construction phase, operation phase and completion and recultivation

No emissions of pollutants in surface and underground water are expected during the construction and operation of the IP. This is due to the fact that the implementation of the relevant components of the IP is not related to the use of additional substances and reagents that can pollute them. No significant quantities of water are used, respectively no significant waste water is released.

Specially, rehabilitation and construction of duct networks is envisaged only under components 1, 4, 7 and 8. The construction - reconstruction and rehabilitation works are carried out by insignificant activities in depth, the corrections are made mainly in the adjacent boundaries of the track.

Completely new construction, not requiring the use of significant amounts of water, except in the process of sealing the embankments and dust suppressing dust during dry periods is carried out under Component 2. No waste water is released.

The implementation of Component 3 requires use of water for irrigation of plantations - saplings and bushes. According to the elaborated Detailed design for cultivation of plantations, 10 times watering with 10 l water per plant is envisaged - a total of about 310 m^3.

The largest volume of construction work is foreseen to be performed under components 5 and 6. There are substantial track adjustments to achieve the train speed requirements. Here (under Component 5) a new tunnel is planned to be built without the use of blasting works, so there is no need of water quantities except for concrete and mortar solutions.

During the engineering-geological study of the tunnel underground crack-porous water at a depth of 5.4-6.6 m are found. Partial drainage can be expected during the tunnel construction until laying its waterproofing. The tunnel itself runs at a relatively small depth below the ground surface - no more than 30 m. From the total length of the tunnel - 835 m. 190 m are planned built in an open manner - along the initial sections (105 + 85 m).

A major impact is expected on surface water, as far as reconstruction, and in some cases also building of new bridges for doubling of the railway line is needed.

For the above activities, obtaining permits for use of a water body for crossing the linear infrastructure and for water discharging (drained from the tunnel) is necessary.

For the staff working on rehabilitation, reconstruction and modernization, chemical toilets will be provided.

The water supply of the repaired stations and newly designed halts will be carried out by the water and sewerage operator for the area.

Description of the relevant aspects of the current state of the environment (basic scenario) and a brief statement of their likely evolution if the investment proposal is not implemented, as far as the natural changes from the basic scenario can be assessed on the basis of the availability of environmental information and scientific knowledge

The area of the investment proposal falls within the scope of two Basin Directorates - East Aegean Basin Directorate (EABD) from Plovdiv Station to Chernograd Station (about km 244 + 619) and the Black Sea Region Basin Directorate (BSRBD) - from Chernograd Station to Burgas Station.

In the direction of development of the route from Plovdiv Station to Burgas Station, along the rivers Maritsa and Tundzha (within EABD) and Aytoska River, which is a part of the river basin of North Burgas Rivers Basin (within the scope of the BSRBD), are affected respectively. Larger and smaller flows of these rivers are being crossed mainly, as the main rivers are being crossed once.

The basic status of the water bodies to be affected by the investment proposal is determined by the available monitoring data on their ecological, chemical and quantitative status. The use of

this water in the process of implementation of the investment proposal, its use for various economic purposes - water supply, irrigation etc., as well as the areas for protection of water bodies - mainly areas for water protection for drinking purposes, protected areas and Natura 2000 areas.

A major impact can be expected in the case of surface water bodies crossing, as during the IP implementation, prohibitions under Art. 134 (bans on deposits in flood strips) and Art. 143 (bans required for protection against harmful impact on water of the WA) shall be kept.

Brief description of the hydrological and hydrogeological conditions and factors of water resources in the area of the investment proposal

General description and characteristics of the affected surface water bodies

The affected surface water bodies are 30 in number, 26 of which are in the East Aegean Region Basin Directorate and the other 4 in the Black Sea Region.

Nearly half of surface water bodies are defined as highly modified water bodies, i.e. they or parts of them are heavily modified compared to their natural state as a result of human activity aiming at protecttion against floods, water use, land drainage or other economically or socially significant activity and whose recovery in the natural state is unjustified because it is disproportionately expensive or would have an impact on the economic activities and the environment. Artificial water bodies (IVTs) are water bodies created as a result of human intervention

Significant types of pressure and impact on surface water bodies as a result of human activity are determined by point and diffuse sources.

It is clear from the River Basins Management Plan (RBMP) data that in this case, the transport is defined as a diffuse source of pollution such as road, sea and river transport.

Affecting areas for water protection under Article 119a (1) of the Water Act, as described in the report has a general meaning for water impact determination. Table 7.2-1 presents the availability or absence of water protection areas.

Table № 7.2-1: Availability of water protection areas in the region of the investment proposal

Water protection area	Type of the area	IP does not fall / fall (name, code) in the protection area
	East Aegean Region	
Art.119a, (1), item 1 от ЗВ	Area for the protection of drinking water from surface water bodies	Does not fall
	Area for the protection of drinking water from underground water bodies	All the affected underground water bodies (UWBs)
	Sanitary-security area (SSA) determined under Ordinance №3 of 16.10.2000	SSA of about 6 water supply sites are affected
Art.119a, (1), item 2 of WA	Leisure and water sports area	Does not fall
Art.119a, (1), item 3 of WA	Sensitive area	BGVZ01,south area, BG3G000000Q012, BG3G000000Q013, BG3G00000NQ015, BG3G00000NQ018, BG3G00000NQ054
	Vulnerable area	Falls

Art.119a, (1), item 4 of WA	Area for economically valuable fish species	Falls
Art.119a, (1), item5 of WA	Habitat area	Falls *
	Birds area	Falls *
	Black Sea Region	
Art.119a, (1), item 1 of WA	Area for the protection of drinking water from surface water bodies	Does not fall
	Area for the protection of drinking water from underground water bodies	Falls
	SSA determined under Ordinance №3 of 16.10.2000	SSA around water supply sites and mineral sources are affected
Art.119a, (1), item 2 of WA	Leisure and water sports area	Does not fall
Art.119a, (1) item 3 of WA	Sensitive area	Falls
	Vulnerable area	Falls
Art.119a, (1), item 4 of WA	Area for economically valuable fish species	Falls
Art.119a, (1), item 5 of WA	Habitat area	Falls *
	Birds area	Does not fall

Note: * The water protection zones under Art. 119a, para 1, item 5 of the Water Act, as well as in the Report on the Degree of Impact Assessment (RDIA).

Availability of water protection areas in accordance with Ordinance №3/2000 on SSA

These protection areas are determined in accordance with the requirements of *Ordinance №3 of 16.10.2000 on the conditions and procedure for investigation, design, validation and operation of the sanitary-protection areas around the water sources and the facilities for drinking water supply and around the water sources of mineral water, used for healing, prophylactic, drinking and hygienic needs (promulgated, State Gazette, issue 88 of 27.10.2000).*

Consultations with the Basin Directorates as well as with the water and sewerage companies affected by the implementation of the IP have resulted in information receiving on the availability of sanitary security areas and it is presented in the report with information and mapping material. Belts II and III of SSA around such facilities are affected.

Generally, in our opinion, the IP implementation will have no impact on SSA and the facilities for drinking water supply or for extraction of mineral water. The latter are self-outflowed and in practice can not be affected.

Water protection objectives are related to achieving good water status, aiming at preventing further deterioration of its status.

The achievement of the objective „good environmental status" is related to the reduction of nutrient load (mainly from urban waste water, food industry, river waste and livestock), reduction of contamination with specific substances (mainly iron, manganese, copper and zinc from industrial activities and mining), improvement of biological parameters and overcoming problems with eutrophication (algae blooms) in large dams, improvement of rivers hydromorphology.

There are no specific measures regarding the surface and groundwater in the East Aegean and Black Sea basins to be applicable to the implementation of the IP.

It is necessary to observe the requirements included in the legal documents.

The area of the investment proposal according to the Floods Risk Management Plan (FRMP) 2016 - 2021 for the East Aegean and Black Sea region concerns 4 areas with significant potential flood risks.

The Program of Measures set out in FRMP 2016 - 2021 **does not** provide for any prohibitions and restrictions concerning the implementation of the IP. Observation of the prescriptions included in the legal documents, and in particular those in Chapter Nine "Protection from the Harmful Impact on Water" of the Water Act is needed.

Sources of drinking water and industrial water supply for the needs of the investment proposal. Required quantities

During the implementation of the investment proposal water for drinking and household needs and for technological (industrial) needs will be used.

These quantities are limited and are related as follows:

- For drinking and household purposes

✓ For the working staff, mineral and table bottled water will be supplied

✓ The new halts will be supplied by the local water and sewerage operators, which serve the settlements in the area, on the basis of a contract;

- For technological needs

✓ For dust suppression, sealing of embankments, construction of the tunnel in the town of Chirpan, watering of shrubs and saplings from the fores belt - from surface water sources – by the appropriate permit for water taking from a water body

- Wastewater

✓ Chemical toilets will be provided for the working staff on the basis of a contract with a company authorized for this purpose;

✓ For newly built stations - construction of watertight sewerage pits, which will be maintained by authorized companies or by the local water and sewerage operator until the construction of urban sewerage and Waste Water Treatment Plant (WWTP).

Water supply sources. Availability of SSA

Water supply sources

The sources of water supply are pointed out in item 4.2.2. of the EIA report.

The quantification shall be determined according to the water consumption norms set out in Ordinance № 4 of 17 June 2005 for the design, construction and operation of building plumbing and sewerage systems prom. SG. No. 53/2005).

The quantities for technological needs are according to the specific technological necessity - for sealing of embankments and suppression of dust separation and they are supplied by surface water sources.

Waste water treatment

Waste water of domestic character will be collected in watertight pit pits and chemical toilets will be used during construction works outside the stations and halts.

Availability of SSA

The investment proposal affects belts II and III of sanitary security areas.

The IP is not expected to have a negative impact on the water quality of the water taking facilities.

Sources of influence on the surface and underground waters related to the realization of the investment proposal

Surface water

Effects on surface water can only be expected with regard to rivers and gullies crossing. Details about bridge structures are given in item 2.3. of the EIA report. Hydrological calculations are made for bridge structures taking high water levels in the rivers.

With respect to the culverts, a hydraulic sizing is done to prove the carrying capacity of the profiles adopted. During the inspection carried out, many existing culverts are dropped out due to their inefficiency. After irrigation and drainage system building, these facilities fall under elevation.

Prior to construction of the envisaged bridge structures and culverts, it is necessary to obtain

a Permit for use of a water site pursuant to Art. 46, (1) (1) (b) (linear infrastructure crossing water bodies - aqueducts, bridges, transmission networks and ducts) of the Water Act. Consequently, keeping the conditions in these Permits is necessary.

In general, these are routine activities and no negative impact on the status of surface water is expected, subject to compliance with the conditions set out in the permits, including those for discharging drainage water from component 5 (with or without their use).

Underground water

In general, the investment proposal with its eight components is being implemented on the ground without significant excavation work. The latter are carried out in a utilized terrain, which in its most part falls within the alignment of the railway line.

A negative impact on underground water is not expected having in mind the IP scope.

A real impact on the underground water can be expected during the construction of the tunnel along the direct route north of the town of Chirpan - **Component 5 „Modernization of Orizovo – Mihaylovo Railway Section" from km 43 + 029 to km 80 + 722**.

The impact on underground water in the tunnel will be expressed mainly in quantitative terms - drainage of the massif. As can be seen from the information presented, the maximum depth of the tunnel is up to 30 m below the ground. The tunnel will pass through the high parts of the area, which is hypsometricly drained, and the presence of groundwater in this case is a consequence of the low filtration properties of the rocks in the region.

Taking into account the above information – construction of the tunnel under the new Austrian method, with making a primary tunnel lining at about 10 m from the tunnel, respectively the drainage of the massif will be limited.

On other hand, drained water has a composition that would not have a negative impact on the composition of the water receiver of these drainage water.

Summarizing it can be concluded that the tunneling activities will not have a significant negative impact on the status of the underground water, and this impact will mainly be expressed during the construction. No negative impacts on underground water are expected during the operation of the tunnel.

The IP implementation involves reconstruction of engineering networks of other institutions (described in item 2.3.) - water supply and sewerage companies, underground electricity and water mains, road infrastructure, etc., including the reconstruction of Overhead line "Venets" and construction of the substitute underground cable line under Component 8. The existing Overhead line 20 kV "Venets" crosses the new railway line at km 218 + 649. The crossing is fulfilled by cable disconnectors, in protective tubes, through new shafts ШІ1 and ШІ3, in a pipe network within the alignment of the railway line.

Reconstruction of these engineering networks does not affect the state of water.

The assessment of the effect on surface water from the implementation of:

Component 1, 2, 3, 4, 7 and 8 of the investment proposal on the surface water status is defined as such <u>without impact.</u>

For Component 5: „Modernization of Orizovo Mihaylovo Railway Section" and Component 6: „Modernization of Yambol - Zimnitsa Railway Section at Zavoy Station"the impact during the construction is considered to be insignificant and no impact is expected during the operation.

The assessment of the effect on underground water from the implementation of:

Component 1, 2, 3, 4, 7 and 8 of the investment proposal on the underground water status is defined as such <u>without impact.</u>

For Component 5: „Modernization of Orizovo Mihaylovo Railway Section"(mainly during the tunnelin construction along the direct route) the impact is considered to be **insignificant.**

7.3. Earth bowels

A brief characterization of geological conditions

A major impact on the earth bowels is expected during the implementation of component 5 "Modernization of the Orizovo-Mihaylovo Railway Section", which envisages tunnel construction. The total amount of excavation work for the tunnel is 112 435 m3 and backfill - 42 750 m3.

Surplus rock masses should be stored on a construction waste depot coordinated with the municipal authorities, or used during other construction activities, where they are suitable.

The region of the investment proposal falls in the Transitional mountain-valley area (Galabov, 1966), situated between the Stara Planina Chain and the Rila-Rhodope Massif.

More precisely, the eastern part of the area, occupied by the Upper Thracian-Middle Strandzha suburb, covering Pazardzhik-Plovdiv field, Stara Zagora, Elhovo, ourgas field and the hills of the Monasteries, St. Ilia and Hissar-Bakadzhik heights.

The lithological characteristic is determined by the tectonic-structural development of the area.

The area of the investment proposal falls within the Sredna Gora Tecton Zone, which has been formed mainly in the Maritsa Fracture Zone.

According to data from the Ministry of Energy in the region of the IP do not affect deposits of underground wealth.

No negative geodynamic phenomena are identified in the area of the IP. Due to their large scope, respectively, parts of the IP fall into different zones in terms of seismic hazard from IIV to IX degree on the MSK scale.

Assessment of the possible changes in the geological environment in the state of the earth bowels as a result of the investment proposal implementation

The investment proposal will not adversely affect the condition of the earth bowels. The deposits of underground resources listed in the National Balance of Reserves and Resources, Concession areas, search and/or Exploration Areas are not affected. At present, there is information about the area under the conditional name „Yambol", which is under a procedure for granting permission for prospecting and exploration of metallic minerals and therefore there is no specific data about it.
There is also no evidence of negative geological phenomena.
No significant excavations are foreseen.

The assessment of the influence on the earth bowels from the realization of:
Component 1, 2, 3, 4, 6, 7 and 8 of the investment proposal on the condition of the earth bowels is defined as such <u>without impact</u>.

Only in the case of ***component 5*** a negative impact will be realized in connection with the construction of the railway tunnel along the direct route north of the town of Chirpan.

In general, the effects on the earth bowels can be determined from insignificant to average for Component 5.

7.4. Land and soils

⇨ Characteristic of soil condition. Land disturbances. Contaminated land. Degradation processes

With regard to soils, the railway line "Plovdiv-Burgas" falls in the Balkan-Mediterranean soil sub-area, Middle-Thracian-Tundzha province. The province refers to the Upper Thracian Lowland and the northern part of the Tundzha lowland-hilly land. The western part (Plovdiv Field), built from contemporary deposits rich in groundwaters, is occupied by dense soils; salt evaporation pond, planosols occupying the leveled slightly drained terrains. The eastern part of the province is almost entirely covered with vertisoils. There are also found leached soils. On the ungrounded

terrains there are planosols, solonchaks, salt evaporation pond, and in the river valleys - dense and even gelee chernozems. In the high parts of the hills there are also shallow soils.

Land use

The land use in the range of the railway line is mainly developed in three directions: for agricultural use (grain production, vegetable production, fruit growing, viticulture, livestock breeding), forestry and hunting exploitation, tourist recreation.

Land and soil disturbances

The railway line Plovdiv-Burgas is part of the main Trans-European railway network and part of corridor "Orient East Mediterranean". The existing railway line Plovdiv-Burgas is electrified and its total length is 293.5 km, 140 km of which is single-track and 153 km – double railway track. The existing land and soil disturbances are in the range of the railway line in the railway sections between stations, the station spaces, the level crossings - underpasses and overpasses and other elements of the railway infrastructure.

Land and soil contamination

No soil contamination has been detected for the territories of the examined components along the railway line (railway sections between stations). In the immediate area of the railway line there are no large atmospheric pollutants. There is no evidence of contamination of soils with heavy metals, pesticides, petroleum products, nitrates and other pollutants as a result of emergency situations.

In some sections of railway stations, between the tracks, have been identified leakage of oil leaks.

Degradation processes

The erosion processes to one degree or another have been developed on the areas through which the railway line passes. The prevailing flatness predetermines the development of surface erosion. Significant impact on wind erosion has coverage of soil with vegetation
, which in all cases reduces the intensity of wind erosion. This depends on the type of vegetation, the biomass power (height and leaf surface) and the durability. The woodland and shrub vegetation has the greatest soil-protecting effect. Where there is woodland vegetation, no wind erosion of the soil is observed. Best perennial grasses are the best soil protection.

⇨Size of land and soil disturbances

The investment proposal for "Rehabilitation of the railway line Plovdiv-Burgas, Phase 2" comprises 8 components for rehabilitation and modernization of the railway line, the realization of which will be related to some extent to lands and soil disturbances.

The realization of Components 1, 4, 7 and 8 is related to disturbances along the railway line in land and soils that have suffered during the period of main construction works and are not subject of additional land aquisition. These are owned by the National Railway Infrastructure Company (NRIC).

For Components 2, 3, 5 and 6, the envisaged activities are related to land acquisition procedures and their alienation from the land fund**.**

⇨ **Component 2.** Construction of overpasses/underpasses for Plovdiv-Burgas railway line on the place of existing level crossings - total affected land 517.547 decares, of which 271.455 decares with land acquisitions.

⇨ **Component 3**. Planting of Protective Forest Belt in Chernograd – Aytos – total affected land of 41.010 decares, of which 36.257 decares with land acquisitions.

⇨ **Component 5**. Modernization of Orizovo – Mihaylovo Railway Section – total affected land of 2 673.834 decares, of which 1545.455 decares with land acquisitions.

⇨ **Component 6.** Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station – total affected land of 57.674 decares, of which 6.077 decares with land acquisitions.

Component 1: "Design and Construction of systems for signalling and telecommunications of railway line Plovdiv-Burgas, including:

- ***Construction of optical fiber cable along Plovdiv – Burgas line" –project 2016.***

The implementation of the project in the cable laying procedures involves machine excavation with a depth of 1.1 m. The activity is related to disturbances in the range of the railway line in lands and soils that have been damaged during the construction of the railway line.

The implementation of the investment proposal **does not require further land acquisitions**, as the activities on implementing the system will be carried out in land owned by the National Railway Infrastructure Company. No additional areas for temporary activities are foreseen during the implementation of the system. Temporary sites and camps for workers are not foreseen.

- ***Constructing of signalling systems along Plovdiv - Burgas railway line" (ETCS level 1, version 2.3.0d) – project 2016.***

Activities are not relevant to the "Land and Soil" component.

- ***Implementation of computer-based interlocking systems in railway stations in the section Plovdiv– Burgas – project 2015 and 2016.***

The activity is classified as a modernization of the existing railway infrastructure - the provision of computer-based interlocking systems (CBIS) at railway stations.

The implementation of the investment proposal **does not require further land acquisitions**, as the activities on implementing the system will be carried out in land owned by the National Railway Infrastructure Company.

Component 2: Construction of overpasses/underpasses along the railway line Plovdiv – Burgas to replace existing level crossings

The main objective is removing of level crossings, mentioned below, along the Plovdiv-Burgas railway line and to replace them with crossings at two levels (overpasses and underpasses), which ensures the safe operation at crossings of road and railway infrastructures and minimizes the risk from the occurrence of incidents at crossing points. The project envisages replacing of 31 existing level crossings and construction of 28 overpasses and 1 underpass and 1 pedestrian footbridge in:

- Section 1 from km 18+607 (Skutare) to km 102+020 (Stara Zagora);

- Section 2 from km 115+115 (Kalitinovo) to km 260+921 (Aytos).

Land and Soil disturbances, Detailed Development Plans – DDPs/Parcelar Plan

Section I from km 18+607 (Skutare) to km 102+020 (Stara Zagora) – considered are totally 22 level crossings.

In the elaboration of the Parcelar plans was used a copy of the cadastral map of the land, in digital form with data about the ownership.

⇨ Overpass at km 18+607 (between Skutare and Manole)

The site is located east of the village of Skutare, outside the urban area of Rogosh village.

The elaborated Parcelar plan affects 33 properties that are located on the territory of **Rogosh village**. The total area for land aquisition is 4.129 decares. The state property and municipal property, without compensation, are respectively 1.588 dka and 18.005 decares.

⇨Overpass at km 21+890 – Manole village

The site is located in the western part of village of Manole and falls both in the urban and non-urban area of the Manole village.

The elaborated Parcelar plan affects 7 properties that are located on the territroy of the **Manole village**. All affected properties are private property. The total expropriation area is 2.710 decares.

⇨Overpass at km 23+800 – section between stations Manole-Belosem

The site is located east of the village of Manole. It falls outside the urban area of the village of Manole.

The elaborated Parcelar plan affects 28 properties, which are located in the territory of **Manole village**. The total area for land aquisition is 8.468 decares. The state property and municipal property, without compensation, are respectively 0.075 decares and 9.191 decares.

⇨Overpass at km 26+306 – section between stations Manole-Belosem

The site is located east of the village of Manole. It falls outside the urban area of the village of Manolsko Konare and the village of Manole.

The elaborated Parcelar plan affects 12 properties, which are located in the territory of **Manolsko Konare village** and 4 properties, which are located on the territory of Manole village. The total area for land aquisition is 7.619 decares and the areas of state and municipal property, without compensation, are respectively 0.221 decares and 5.557 decares for the territory of the village of Manolsko Konare and 0.010 decares municipal property for the territory of the village of Manole.

⇨Overpass at km 32+000 – Belozem vilage

The site is located in the western part of the village of Belozem. It falls both in the urban and non-urban area **of Belozem village**.

The elaborated Parcelar plan affects 3 properties, that are located on the territory of **the village of Belozem**. All affected properties are private property. The total area for land aquisition is 2.551 decares.

⇨Overpass at km 39+092 (Opalchenets – on the side of Belozem)

The site is located south of the village of Opalchenets. It falls outside the urban territory of the villages of Mirovo and Opalchenets and in the urban area of the village of Opalchenets.

The elaborated Parcelar plan affects 16 properties, that are located on the territory of the **village of Mirovo** and 8 properties, that are located on the territory **of the village of Opalchenets**. The total area for land aquisition for the first village is 0.986 decares and for the second one - 2.019 decares. For the village of Mirovo municipal property area, without compensation is 6.648 decares. The state property and municipal property, without compensation, for the village of Opalchenets, are respectively 0.651 decares and 0.728 decares.

⇨Overpass at km 85+083 (Mihaylovo – on the side of Kaloyanovets)

The site is located east of the village of Mihaylovo. It falls outside the urban area of the village of Mihaylovo.

The elaborated Parcelar plan affects 15 properties, that are located on the **village of Mihaylovo.** The total area for land aquisition is 6.652 decares. The state and municipal property, without compensation, are respectively 5.856 decares and 14.557 decares.

⇨Overpass at km 92+598 – Kaloyanovets village

The site is located in the western part of the village Kaloyanovets. It falls outside the urban area of the village Kaloyanovets.

The elaborated Parcelar plan affects 9 properties, that are located on the territory of **Kaloyanovets village**. The total area for land aquisition is 4.619 decares. The areas of state and municipal property, without compensation, are respectively 0.165 decares and 3.151 decares.

⇨Overpass at km 97+617 (Hristianovo village)

The site is located in the eastern part of the village of Hristiyanovo. It falls into the urban and out-of-urban area of the village of Hristiyanovo.

The elaborated Parcelar plan affects 7 properties, that are located on the territory of the **village of Hristiyanovo**. The total area for land aquisition is 2.287 decares. The area of municipal property, without compensation, is 1.942 decares.

⇨Overapass at km 100+113 (village of Elenino – a street to a municipal road SZR1190)

The site is located at the eastern end of the village of Elenino, where at km 10+175 the railway line crosses a street. It falls into and out of the urban area of the village of Elenino.

The elaborated Parcelar plan affects 5 properties, that are located on the territory of the **village of Elenino**. The total area for land aquisition is 11.869 decares. The state and municipal property, without compensation, are respectively 1.540 decares and 10.252 decares.

⇨Overpass at km 114+729/(115+115) (Kalitinovo)

The site is located on the northern side of Kalitinovo. It falls within the construction boundaries of the regulation plan and the rest of the territory is outside urban area.

The elaborated Parcelar plan affects 8 properties that are located on the territory of the **village of Kalitinovo**. The total area for land aquisition is 6.076 decares, and the areas of municipal property, without compensation, are 0.171 decares and of state property, without compensation - 0.016 decares.

On the territory of the **village of Hrishteni**.

The elaborated Parcelar plan affects 15 properties that are located in the **village of Hrishteni**. The total area for land aquisition is 4.004 decares, and the areas of municipal property, without compensation, are 1.159 decares. The area for land aquisition does not affect state property.

⇨Overpass at km 119+450 (Gorno Botevo)

The site is located north-west of Gorno Botevo between Kalitinovo and Ploska Mogila, where the railway line crosses a municipal road. It falls outside the urban area of **the village of Gorno Botevo.**

The elaborated Parcelar plan affects 11 properties that are located in the **village of Gorno Botevo**. The total area for land aquisition is 3.843 decares, the areas of municipal property, without compensation, are 3.988 decares and the areas of state property, without compensation, are 0.063 decares.

In the **village of Dalboki**.

The elaborated Parcelar plan affects 17 properties that are located in the **village of Dalboki**. The total area for land aquisition is 9.057 decares, the areas of municipal property, without compensation, are 6,194 decares and the areas of state property, without compensation, are 0.973 decares.

⇨Overpass 124+657 (Han Asparuhovo)

The site is located northeast of Han Asparuhovo. It falls into urban areas and outside urban areas.

The elaborated Parcelar plan affects 12 properties that are located on the territory of the **village of Han Asparuhovo**. The total area for land aquisition is 3.801 decares, the areas of state property, without compensation, are 0.328 decares and the areas of municipal property, without compensation, are 9.157 decares.

⇨Overpass 127+805 (Sabrano)

The site is located between Han Asparuhovo and Nova Zagora railway stations. It falls outside the urban area.

The elaborated Parcelar plan affects 33 properties that are located on the territory of the **village of Sabrano**. The total area for land aquisition is 15.550 decares, the areas of state property, without compensation, are 2.530 decares, and the areas of municipal property, without compensation, are 5.887 decares.

⇨Overpass 134+350 (Stoil Voyvoda)

The site is located between Han Asparuhovo and Nova Zagora railway stations. It falls outside the urban area.

The elaborated Parcelar plan affects 27 properties that are located on the territory of the **village Stoil Voyvoda**. The total area for land aquisition is 26.378 decares, the areas of municipal

property, without compensation, are 2.326 decares and the areas of state property, without compensation, are 0.067 decares.

⇨Overpass 145+787 (Sadievo)

The site is located south of Sadievo, between Nova Zagora and Konyovo railway stations. It falls outside the urban area.

The elaborated Parcelar plan affects 26 properties that are located on the territory of the **village of Sadievo**. The total area for land aquisition is 11.572 decares, the areas of state property, without compensation, are 2.666 decares and the areas of municipal property, without compensation, are 12.040 decares.

⇨Overpass 151+770 (Konyovo)

The site is located southwest of Konyovo (railway section between stations Konyovo - Kermen). It falls outside the urban area.

The elaborated Parcelar plan affetcs 26 properties that are located on the territory of the **village of Konyovo**. The total area for land aquisition is 12.475 decares, the areas of state property, without compensation, are 3.501, and the areas of municipal property, without compensation, are 4.864 decares.

⇨Overpass at km 158+777 (Kermen)

The site is located west of Kermen /railway section between stations Konyovo and Kermen/. Part of the level crossing at km 158+777 falls within the construction boundaries of the city of Kermen, and the rest of the territory is out of the construction boundaries.

The elaborated Parcelar plan affects 18 properties that are located on the territory of the **town of Kermen.** The total area for land aquisition is 10.230 decares, the area of state property, without compensation, are 3.966 decares, and the areas of municipal property, without compensation, are 7.699 decares.

⇨Pedestrian footbridge at km 160+300 (Kermen)

The site is located in the southeastern part of Kermen (railway section between stations Konyovo and Kermen). The crossing is with street. **No land aquisitions.**

⇨ Overpass at km 171+620 (Bezmer)

The site is located southwest of Bezmer, between railway stations Kermen-Bezmer. It falls outside the urban area.

The elaborated Parcelar plan affects 17 properties that are located on the territory of the village of Bezmer. The total area for land aquisition is 8.077 decares, and the areas of municipal property, without compensation, are 11.413 decares.

⇨Overpass at km 187+590 (Kabile)

The site is located to the east of Kabile, between railway stations Yambol and Zavoy /local road between the village of Kabile, the town of Yambol and "Ormana" area/. It falls outside the urban area.

The elaborated Parcelar plan affects 19 properties located on the territory of the **village of Kabile**. The total area for land aquisition is 15.208 decares, and the areas of municipal property, without compensation, are 6.626 decares.

⇨Overpass at km 192+625 (Zavoy)

It is located southeast of Zavoy between the village of Zavoy and village of Veselinovo. The crossing is with third class road on the national road network. It falls outside the urban area.

The elaborated Parcelar plan covers 27 properties that are located on the territory of the **village of Zavoy**. The total area land aquisition is 7.965 decares, and the areas of state property, without compensation, are 8.924 decares and the areas of municipal property, without compensation, are 9.145 decares.

⇨Overpass at km 219+390 (in the area of Tsekovski railway station)

The site is located north-west of Tserkovski /to the dam of Tsanko Tserkovski/. It falls within the territory of the village of Venets - outside the urban area and on the territory of the village of Tserkovski - in the urban area and outside the urban area.

The elaborated Parcelar plan affects 5 properties that are located on the territory of the **village of Venets**. The total area for land aquisition is 1.891 decares, the areas of municipal property, without compensation, are 10,380 decares, and the areas of state property, without compensation, are 2,870 decares. The elaboration of project for Detailed Development Plan - PP includes property 12.1, which is located in the territory of the **village of Tserkovski**, Municipality of Karnobat, Burgas district. The total area of expropriation is 0.183 decares.

⇨Overpass at km 222+220 (Tserkovski)

The site is located north-west of the town of Karnobat, between the railway stations of Tserkovski and Karnobat West. It falls outside the urban area.

The elaborated Parcelar plan affects 20 properties in the village of Tserkovski. The total area for land aquisition is 19.035 decares, and the areas of municipal property, without compensation, are 4.204 decares and the areas of state property, without compensation are 0.007 decares.

⇨Overpass at km 230+320 (Karnobat)

The site is located north-west of Karnobat, between the railway stations of Tserkovski and Karnobat West. The crossing is with dirt road. It falls outside the urban area.

The elaborated Parcelar plan affects 19 properties that are located on the territory of the **town of Karnobat**. The total area for land aquisition is 17.157 decares, and the areas of municipal property, without compensation, are 4.643 decares, and the areas of state property, without compensation are 0.038 decares.

⇨Overpass at km 241+285 (Klikach)

It is located north of the village of Klikach, between Karnobat and Chernograd railway stations. The crossing is with dirt road. The level crossing falls into and out of urban territory.

The elaborated Parcelar plan affects 10 properties that are located on the territory of the **village of Klikach**. The total area for land aquisition is 3.236 decares, and the areas of state property, without compensation, are 0.050, and the areas of municipal property, without compensation, are 4.403 decares.

⇨Overpass at km 244+619 (Chernograd)

The site is located north-west of Chernograd, between Chernograd and Aytos railway stations. The crossing is with municipal road BGS1002 between the village of Topolitsa and the village of Chernograd. The level crossing falls outside urban areas.

The elaborated Parcelar plan affects 10 properties that are located on the territory of **village of Chernograd**. The total area for land aquisition is 13.922 decares, and the areas of municipal property, without compensation, are 1.518 decares and areas of state property, without compensation – 1.200 decares.

⇨Overpass at km 248+202 (Topolitsa)

The site is located southeast of Topolitsa /village of Topolitsa/ between Chernograd and Aytos railway stations. The crossing is with dirt road. It falls outside the urban area.

The elaborated Parcelar plan affects 24 properties that are located on the territory of the **village of Topolitsa**. The total area for land aquisition is 11.020 decares, the areas of municipal property, without compensation, are 4.500 decares and the areas of state property, without compensation – 0.315 decares.

⇨Overpass at km 253+520 (Polyanovo)

The site is located northeast of Polyanovo. Crossing is with municipal road. The level crossing is outside urban areas.

The elaborated Parcelar plan affects 23 properties that are located on the territory of the **village of Karageorgievo**. The total area for land aquisition is 7.053 decares, the areas of municipal property, without compensation, are 10.809 decares, and the areas of state property, without compensation, are 0.124 decares.

⇨Overpass at km 260+921 (Aytos)

The site is located between the town of Aytos and the village of Malka Polyana on the VIII-th railway line. Its category is fourth and the crossing is with municipal road. It falls outside urban area.

The elaborated Parcelar plan affects 19 properties that are located on the territory of the **town of Aytos**.The total area for land aquisition is 12.583 decares, the areas of municipal property, without compensation are 7.751 decares, and the areas of state property, without compensation, are 0.229 decares.

TOTALLY FOR THIS COMPONENT OF THE PROJECT – 517.547 decares

- properties – 525 pieces;

- land acquisitions with compensations - 271.455 decares;

land acquisitions without compensations – 246.092 decares, 39.913 of which are state property and 206.179 decares are **municipal property.**

Component 3: „Planting of Protective Forest Belt along Chernograd – Aytos Open Line" for relible protection of the railway track from the adverse weather impact and as snowdrift retention – project 2015:

Section I – from km 244+060.00 to km 244+760.00 with lenght L=700 m

Section II – from km 245+365.00 to km 246+390.00 with lenght L=1025 m

It is envisaged to be build a snow-guard belt in the section between railway stations Chernograd-Aytos i from km 244+060 to km 246+390 in order to ensure reliable protection of the railway line from the unfavorable wind influences during the winter months. The section for afforestation is located on the territory of Burgas district, municipality of Aytos, in the territory of Topolitsa village. The existing railway line is outside the urban areas, while the DDP-PP will affect the properties on the left site of the Main Track №2 (in the direction of increasing the kilometers) and properties on the right site of the Main Track №1, which are located in land use areas 13 and 14 of the Recovery Property Map of Chernograd and land use area 29 of the Recovery Property Map of Topolnitsa village.

The forest belt passes through arable land, which are located on the left site of the track (in the direction of increasing the kilometers).

The elaborated Parcelar plan affects 14 properties that are located in the village **of Topolnitsa.** The total area for land acquisition is 29.461 decares, the areas of municipal property, without compensation, are 0.374 decares.

The elaborated Parcelar plan affects 13 properties that are located on the territory of the **village of Chernovgrad**. The total area is for land acquisition is 6.796 decares and the areas of municipal property, without compensation, are 4.379 decares.

TOTALLY FOR THIS COMPONENT OF THE PROJECT – 41.010 decares

- properties – 27 pieces;

- land acquisitions with compensations - 36.257 decares;;

- land acquisitions without compensations – 4.753 decares, which are municipal property.

Component 4: „Rehabilitation of Skutare – Orizovo Railway Section" project 2015.

The existing railway line in the section "Skutare - Orizovo" is electrified single-track with length of 26 198 m.The rehabilitation of the railway section "Skutare - Orizovo" covers a section from km 16 +905 to km 43+030.

The implementation of the investment proposal **does not require land aquisition**, as the rehabilitation works along the railway section and in the railway station areas are envisaged within territories, property of the National Railway Infrastructure Company (NRIC).

Component 5: „Modernization of Orizovo – Mihaylovo Railway Section"– km 43+029 – km 80+722, project 2015.

It envisages the change of r track of VIII railway line "Plovdiv-Burgas" in the section from Orizovo railway station - (km 43+029) to Mihaylovo railway station (km 80+722). The existing track in the section is with the length of 37 693 m and includes 4 railway stations - Orizovo, Cherna gora, Chirpan and Svoboda. The component is designed for single and double track.

For the railway section from km 56+611 to km 61+033 the new track leaves the property of NRIC and land aquisitons are imposed. In addition, the project envisages doubling the existing single railway line along the entire railway section from Orizovo to Mihaylovo.

Tunnel

Within the scope of the component it is envisaged the construction of a tunnel (single track tunnel) on Track №2 with length L=835 m from km 57+750 to km 58+585 in the railway section between stations "Orizovo - Mihaylovo". The tunnel crosses a hill north of Chirpan - Chirpan Heights.

Bridge at km 44+170.00

The bridge is existing and will be removed and on its place will be constructed a new double track reinforced concrete bridge.

Bridge at km 47+125.68

The structure is located at km 47+125.68, where the railway line crosses the bed of an existing irrigation canal.

Bridge at km 50+110.23

The structure is located at km 50+110, where the railway line crosses the riverbed of Omurovska River.

Bridge at km 64+778.92

The structure is located at km 64+778.92, where the railway line crosses the riverbed of Starata River.

Bridge at km 74+182.26

The structure is located at km 74+182.26, where the railway line crosses the riverbed of Starata River.

Agricultural underpass (Passgeway) at km 61+383.63 – the railway line crosses existing agricultural road.

Bridge at km 69 + 917.01 - the railway line crosses existing agricultural road.

For the six above-mentioned structures are envisaged only rehabilitation activities.

For the six above-mentioned structures are envisaged only restoration activities.

Overpass at km 44+212.33

The site is located east of the village of Orizovo where it is envisaged the construction of new road overpass on the III-65 "Skutare - Cherna gora" road from the national road network to cross the railway line. The route of the road will be moved by a new trace.

Overpass at km 48+777.60

The structure is located north-east of the village of Cherna gora where the railway line crosses road from the national road network III-65 "Skutare - Cherna gora". It is envisaged the route of the road to be moved by a new trace.

Overpass at km 52+114.46

The site is located north-west of the town of Chirpan where the railway line crosses road from the national road network III-64. It is envisaged the construction of new road overpass along the existing route of the road.

Overpass at km 55+840.82

The site is located north of the town of Chirpan where the railway line crosses road from the national road network III-608 "Spasovo-Chirpan" at km 60+800 with level crossing. It is envisaged the construction of new road overpass along the existing route of the road.

Overpass at km 59+317.22

The site is located west of the town of Chirpan where the new track of the railway line crosses road from the national road network III-66 "Stara Zagora-Chirpan". It is envisaged the construction of new road overpass along the existing route of the road.

Underpass at km 62+816.91

The structure is located north-west of the village of Volovarovo, where the railway line crosses municipal road by level crossing. It is envisaged the construction of underpass where the railway line undertake the municipal road, without the need of situation change of the road.

Underpass at km 65+164.26

The site is located north-west of the village of Svoboda, where the newly designed track of the railway line will cross municipal road. It is envisaged the construction of underpass where the railway line undertake the municipal road without the need of situation change of the road.

Underpass at km 66+961.80

The site is located north of the village of Svoboda, where the newly designed track of the railway line will cross municipal road. It is envisaged the construction of underpass where the railway line undertake the municipal road without the need of situation change of the road.

Parcelar Plans –DDPs/PP

The elaborated Parcelar Plan affects 65 properties that are located on the territory of the **village of Orizovo**. The total area for land aquisition is 58.803 decares, the areas of municipal property, without compensation are 34.552 decares, and the areas of state property, without compensation, are 42.253 decares.

The limiting construction line, located 60 m from the newly designed axes.

The elaborated Parcelar Plan affects 118 properties that are located on the territory of the **village of Cherna gora**. The total area for land aquisition is 57.654 decares, the areas of municipal property, without compensation are 63.784 decares, and the areas of state property, without compensation, are 85.992 decares.

The elaborated Parcelar Plan affects 44 properties that are located on the territory of the **village of Partizanin**. The total area for land aquisition is 14.391 decares, the areas of municipal property, without compensation are 6.342 decares, and the areas of state property, without compensation, are 22.638 decares.

The elaborated Parcelar Plan affects 54 properties that are located on the territory of the **village of Rupkite**. The total area for land aquisition is 42.282 decares, the areas of municipal property, without compensation are 5.665 decares, and the areas of state property, without compensation, are 9.529 decares.

The elaborated Parcelar Plan affects 370 properties that are located on the territory of the **town of Chirpan**. The total area for land aquisition is 321.915 decares, the areas of municipal property, without compensation are 87.907 decares, and the areas of state property, without compensation, are 316.933 decares.

The elaborated Parcelar Plan affects 215 properties that are located on the territory of the **village of Svoboda**. The total area for land aquisition is 354.280 decares, the areas of municipal property, without compensation are 70.140 decares, and the areas of state property, without compensation, are 45.613 decares.

The elaborated Parcelar Plan affects 22 properties that are located on the territory of the **village of Malko Trynovo**. The total area for land aquisition is 56.431 decares. The areas of municipal property, without compensation are 0.528 decares.

The elaborated Parcelar Plan affects 33 properties that are located on the territory of the **village of Vodenicharovo**. The total area for land aquisition is 85.375 decares, the areas of municipal property, without compensation are 24.818 decares, and the areas of state property, without compensation, are 40.503 decares.

The elaborated Parcelar Plan affects 49 properties that are located on the territory of the **village of Samuilovo**. The total area for land aquisition is 45.377 decares, the areas of municipal property, without compensation are 93.101 decares, and the areas of state property, without compensation, are 96.289 decares.

The elaborated Parcelar Plan affects 35 properties that are located on the territory of the **village of Mihaylovo**. The total area for land aquisition is 19.130 decares, the areas of municipal property, without compensation are 26.140 decares, and the areas of state property, without compensation, are 65.597 decares.

TOTALLY FOR THIS COMPONENT OF THE PROJECT – 2 673.824 decares

- properties – 1664 pieces;
- land acquisitions with compensations - 1545.455 decares;
- land acquisitions without compensations – 1128.369 decares, of which 402.977 are municipal property and 725.392 – state property.

Component 6: "Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station"

Component 6 covers 2,116 km of Plovdiv-Burgas railway line. The activities will be implemented in the railway section from km 190+590 (new km 190+200) within the section between railway stations "Yambol - Zavoi" to km 192+706 (new km 192+557) within the section between railway stations Zavoi - Zimnitsa. The activities within the scope of Component 6 consist of construction of a new track along the railway line, including a new level crossing of the Tundzha River with a reinforced concrete bridge.

Parcelar Plans – DDPs/PP

The elaborated Parcelar plan affects 34 properties that are located on the territory of the village of Zavoy. The total area for land aquisition is 6.077 decares, the areas of state property, without compensation, are 13.875 decares, and the areas of municipal property, without compensation, are 14.274 decares.

Землище гр. Ямбол

Засяга се горска територия – 2 имота широколистна гора на площ от 23.538 дка.

Land of Yambol

It affects forest territory - 2 deciduous forests on an area of 23,538 decares.

TOTALLY FOR THIS COMPONENT OF THE PROJECT – 57.764 decares

- properties– 36 броя;
- land acquisitions with compensations – 6.077 decares;
- land acquisitions without compensations – 51.687 decares of which 14.274 decares are municipal property and 37.413 decares are state property.

Component 7: „Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the Catenary at Zimnitsa and Straldzha Stations" – preliminary design 2015

The implementation of the Component 7 investment proposal **does not require additional land aquisition** because the activites including the installation of computer interlocking system is carried out exclusively in land which is property by the National Railway Infrastructure Company (NRIC). No additional areas for temporary activities are foreseen. All land and soil disturbances will be within the area of the railway line - disturbed soils during the main construction activities.

Component 8: „Rehabilitation of Straldzha – Tserkovski Railway Section" within the railway section from km 217+210 to km 219+059, detailed design 2017

The railway section, envisaged for rehabilitation under Lot 2, is a railway section between stations Straldza - Tserkovski from km 217+210 to km 218+919 (Track 1) and from km 218+586 to km 218+973 (Track 2).

For the realization of the entire rehabilitation of the section from the railway station Straldzha - Tserkovski from km 217+210 to km 219+059, there are envisaged shifts of the axis of the design axis from the existing one up to 70 cm without leaving the boundaries of the property of NRIC. All land and soil disturbances will be within the area of the railway line - disturbed soils during the main construction activities. The realization of the investment proposal **does not require additional land aquisition.**

Class II - Contaminated land

During the period of construction

The construction of the sites along the railway line will be related to indirect impact on soils because of the pollution of the ground air with dust and pollutants from internal combustion engines of construction and transport equipment and its subsequent deposition on the adjacent lands and soils.

The impact on the adjacent soils during the construction of non-organized sources - dust and pollutants from internal combustion engines will be negligible, locally in the place (within the apeac оф тхе construction sites), shortly during the construction period.

During the period of operation

The electrified railway transport does not usually generate environmental pollution and greenhouse gas emission reductions are achieved by transferring passengers and freight from road transport to the modernized railway line. The Plovdiv-Burgas railway line is electrified and therefore no harmful emissions to the atmosphere, including greenhouse gases, are emitted during its operation.

During the operation of the railway line it is possible to get contamination with oils from the trains. Contamination can also occur in case of unforeseen accidents - spillage of fuels and oils in case of malfunction of machines, etc., which will lead to local soil contamination. Contaminated areas should be identified and the contaminated earth mass has to be removed as soon as possible and be replaced with clean soil recultivation material. The removed contaminated soil, should be transported to landfills, defined for this purpose, in accordance with the requirements of the Waste Management Act.

Decommissioning

The decommissioning of the site or parts of it shall be carried out in accordance with the Ordinance for categorization of the railway lines in the Republic of Bulgaria, which are included in the railway infrastructure and closing of individual lines and sections of railway lines.

By dismantling the facility(s), in order to minimize the amount of waste, it is required that those that are subject to subsequent recovery, recycling or reuse have to be collected separately and delivered to licensed companies for subsequent treatment according to the current legislation in force at the time of decommissioning of the facility.

Thus, on the one hand, will reduce the amount of waste that will be disposed of at the landfills by the corresponding permits and, on the other, the loss of resources will be prevented.

After dismantling the facility(s) it is necessary to be carried out the recultivation of the land, provided in the investment proposal, in accordance with the current legislation in force at the time of of decommissioning.

Such activities are foreseen only for Component 6, but no recultivation design has been developed at this stage.

7.5. Flora and Fauna

Flora

Based on the climate conditions (Geography of Bulgaria, Bulgarian Academy of Sciences, 2002), the area where Plovdiv-Burgas railway line is developed, the most part is related to the Transitional Continental region and a very small part - in the region of Burgas, which is related to the Continental-Mediterranean climate region in the area of broadleaf desert forests and shrub communities. The track of the Plovdiv-Burgas railway line falls into the Macedonian-Thracian and Euxinian provinces of the European broadleaf forest area, crossing three districts: Upper Thracian district (Plovdiv region, Chirpan region, Stara Zagora region); Straldzha-Aytos district (Straldzha-Sliven region, Aytos region); West Coast district (region South Coast).

• Upper Thracian District

It covers Plovdiv, Chirpan and Stara Zagora regions. It occupies a diverse terrain with a varied green cover, currently occupied almost entirely by arable land - agrocenoses.

• Straldzha-Aytos District

It covers the territory around the town of Nova Zagora, Sliven and Yambol. The predominant part of the Straldzha-Aytos geobotanic district is occupied by arable lands, where different types of agrophytocenoses are formed, and on the abandoned agricultural lands by secondary successions there are derived communities, included in different succession rows.

• West Coast District – region South Coast

Naturally widespread in this zone are the pure and mixed oak and vergil oak forests and, to a lesser extent, of Blagun oak and Turkey oak, with participation of common hornbeam and oriental hornbeam.

The track of the railway line passes mostly through agricultural areas - arable lands mainly with growning of cereals - wheat, barley, corn, sunflower. The green cover is varied, represented primarily by xerothermic species, such as Blagun oak, Turkey oak, young oak and vergil oak, oriental hornbeam. Currently there are small sparsely lying areas, highly diluted, replaced almost entirely by the Christ's thorn communities or xerothermic grassland dominated by the Belize and the bulbous meadowgrass, and in some places by the saddle and the Vallesian fescue. The lowlands are almost arable lands.

Description and analysis of the impacts of the investment proposal on Flora.

The track of the railway line is developed in areas with a predominantly flat to slightly hilly characteristics. For the most part, the land belongs to the land fund, where different types of agrophytocenoses are formed, and on the abandoned agricultural lands by secondary successions there are derived communities, included in different succession rows. Grown are mainly cereals (wheat, barley, corn, sunflower), the affected permanent crops (vineyards, orchards) are relatively a few. Forest communities are predominantly presented by Blagun oak and Turkey oak, oriental hornbeam and are strongly influenced by human activity. After eradication of forests and forests degradation there have been left small areas of forests which are predominantly occupied by coppice forests and relatively larger sections of xerothermal shrub grasslands. The non-cultivated land that falls within the scope of construction sites are occupied with derived grass plant communities, anthropogenically influenced by the grazing of farm animals. Widespread semi-natural, secondary derivative herbaceous plant communities belonging to the formations of

Vallesian fescue, bulbous meadowgrass, the sadda. Because of grazing and soil trampling, they are all highly degraded.

Component 1: "Design and Construction of systems for signalling and telecommunications of railway line Plovdiv-Burgas", including:

- ***Construction of optical fiber cable along Plovdiv – Burgas line" –project 2016.***

For the implementation of the project in the cable laying part is envisaged a mechanical excavation with a depth of 1.1 m. The total length of the two optical cables, determined in the preliminary design, taking into account of all reserves, level crossings, entries, deviations and others is 680 km optical cable underground and above-ground. The activity is related to disturbances of the range of the railway line in lands and soils, including vegetation damaged during the construction of the railway line as well as in the period of operation of the line.

Impacts

The activity is related to disturbances of the range of the railway line in lands and soils demaged during the construction of the railway line. Grass vegetation is secondary, a derivative of many ruderal species. Shrub species are observed in some places. The realization of the investment proposal does not require additional land aquisition, as the deployment of the system is carried out exclusively in land which is property of the National Railway Infrastructure Company. No additional areas for temporary activities are envisaged during the deployment of the system. Temporary sites and camps for workers are not envisaged. The impact is considered negligible.

- Constructing of signalling systems along Plovdiv - Burgas railway line" (ETCS level 1, version 2.3.0d) – project 2016.

The implementation of the system is not related to impact on the component.

- Implementation of computer-based interlocking systems in railway stations in the section Plovdiv– Burgas – project 2015 and 2016.

The implementation of the system is not related to impact on the component.

Component 2: "Construction of overpasses/underpasses along the railway line Plovdiv – Burgas to replace existing level crossings"

The desing envisages replacing of 31 existing railway crossings of one level and construction of 28 overpasses and 1 underpass and 1 pedestrian overpass.

Section I from km 18+607 (Skutare) to km 102 + 020 (Stara Zagora) – there are considered totally 22 crossings of one level.

Overpass at km 18+607 (between Skutare and Manole)

The site is located east of the village of Skutare, where the railway line crosses the national road III-565 Skutare-Manole at km 5+450. It is located outside the urban territory of the Rogosh village, southerly of the overpass. The total area required for the construction of the overpass is 23.722 decares, of which 23.292 decares are anthropogenically influenced lands (fields, rice fields, farmyard, roads, railway line). Affected is grassland area (2.4 decares), located north of the railway line and parts of a drainage and irrigation canal (4 decares). Small spots on the canals dykes are overgrown with reed (Phragmites australis). The non-cultivated land is strongly anthropogenically influenced by grazing of farm animals.

Overpass at km 21+890 – village of Manole

The site is located in the western part of Manole village. It falls both in the urban and non-urban territory of Manole village. The total area required for the construction of the overpass is 2.210 decares, occupied by fields.

Overpass at km 23+800 – section between railway stations "Manole – Belozem"

The site is located east of the Manole village where the railway line crosses an agricultural road. It falls outside the urban territory of the village of Manole. The total area necessary for the

construction of the overpass is 17.732 decares, of which 17.226 decares are anthropogenically affected lands (fields, roads, railway line). Affected is grassland area (0.064 decares), north of the railway line and the irrigation canal (0.064 decares).

Overpass at km 26+306 – section between railway stations Manole – Belozem

The site is located east of the Manole village where the railway line crosses an agricultural road. The crossing falls outside the urban territory of the village of Manolsko Konare and the village of Manole. The total area necessary for the construction of the overpass is 13.407 decares, of which 12.292 decares are anthropogenically affected lands (fields, field road). Affected are a few grassland areas (0.385 decares) and a drainage canal (0.110 decares). The drainage canal is free of fossils.

Overpass at km 32+000 – village of Belozem

The site is located in the western part of the village of Belozem. It is designed as an alternative to the existing crossing at km 32+905. It falls both in the urban and non-urban territory of Belozem village. The total area required for the overpass is 2.551 decares, occupied by fields.

Overpass at km 39+092 (Opalchenets – on the side of Belozem)

The site is located south of the village of Opalchenets, where at km 39+092 the railway line crosses a municipal road. The crossing falls outside the urban territory of the villages of Mirovo and Opalchenets and in the urban territory of the village of Opalchenets. The total area necessary for the construction of the overpass is 11.032 decares, of which 8.884 decares are anthropogenically affected lands (abandoned fields, roads). Affected are 0.555 decares of an irrigation canal.

Overpass at km 85+083 (Mihaylovo – on the side of Kaloyanovets)

The site is located east of the village of Mihaylovo, where at km 85+083 the railway line crosses a municipal road. It falls outside the urban territory of the village of Mihaylovo. The total area necessary for the construction of the overpass is 27.065 decares, of which 15.505 decares are anthropogenically affected lands (fields, roads, railway line). Affected are 11.560 decares. The non-cultivated land, which is within the range of the overpass, is occupied with derived herbaceous plant communities, anthropogenically affected by the grazing of farm animals.

Overpass at km 92+598 – Kaloyanovets village

The site is located in the western part of the village of Kaloyanovets, where the railway line crosses a municipal road. The crossing falls outside the urban territory of the village of Kaloyanovets. The total area required for the construction of the overpass is 7.935 decares, of which 2.602 decares are anthropogenically affected lands (fields, roads, solid waste landfill). Affected area is 1.105 decares and 4.227 decares of forest territory. The forest is located north of the village of Kaloyanovets and for the purposes of the overpass the required area is from the southern end of the massif and does not fragment it.

Overpass at km 97+617 (Hristianovo village)

The site is located in the eastern part of the village of Hristianovo, where at km 97+617 the railway line crosses a municipal road. It falls outside the urban territory of the village of Mihaylovo. The total area necessary for the construction of the overpass is 4.229 decares, of which 4.041 decares are anthropogenically affected lands (fields, roads, solid waste landfill). Affected areas are 0.125 decares of canals and 0.063 decares forests in agricultural lands. The forest territory is located south of the village of Mihaylovo, as a small part of the forest territory will be affected by the construction of the overpass - dewormed, degraded and turned into shrubs of Carpinus orientalis - hawthorn, dogwood.

Overapass at km 100+113 (village of Elenino – a street to a municipal road SZR1190)

The site is located at the eastern end of the village of Elenino, where, at km 10+175, the railway line crosses a street. The overpass falls outside the urban territory of the village of Elenino. The total area necessary for the construction of the overpass is 23.661 decares, of which 12.874 decares are anthropogenically affected lands (fields, roads, railway line). Affected area is 9.583 decares of country non-cultivated land, west of the village and is 1.204 decares gully.

Section 2 – from km 115+115/Kalitinovo/ to km 260+921/Aytos/ are considered totally 20 crossings of one level

Overpass at km 114+729/(115+115) (Kalitinovo)

The site is located on the northern side of Kalitinovo, where the railway line crosses a municipal road. It falls within the construction boundaries of the Zoning plan and the rest of the territory is outside urban area. The total area needed for the construction of the overpass is 11.426 decares, all the anthropogenically affected - fields, the territories for the needs of transport, the country roads.

Overpass at km 119+450 (Gorno Botevo)

The site is located north-west of Gorno Botevo between Kalitinovo and Ploska Mogila, where the railway line crosses a municipal road. The crossing falls outside urban areas. The total area needed for the construction of the overpass is 24.118 decares, all the anthropogenically affected - fields, the territories for the needs of transport, the country roads.

Overpass 124+657 (Han Asparuhovo)

The site is located northeast of Han Asparuhovo. The crossing is with a road on the national road network. The overpass falls within the building boundaries of the village of Han Asparuhovo and the rest of the territory is outside the building boundaries. The total area necessary for the construction of the overpass is 13.286 decares, of which 20,950 decares are anthropogenically affected lands (fields, roads, railway line). Affected area is 3.068 decares.

Overpass 127+805 (Sabrano)

The examined site is located between the stations of Han Asparuhovo and Nova Zagora, north-west of the village of Sabrano. The crossing is with an agricultural road. It falls outside the urban area. The total area necessary for the construction of the overpass is 23.967 decares, of which 19.768 decares are anthropogenically affected lands (fields, roads). Affected area is 6.595 decares of forest territory, falling in the southern part of the area of the overpass, the massif is fragmented.

Overpass 134+350 (Stoil Voyvoda)

The site is located between the railway stations Han Asparuhovo and Nova Zagora and is crossing with a dirt road/agricultural road. It falls outside the urban area. The total area necessary for the construction of the overpass is 28.771 decares, of which 28,120 decares are anthropogenically affected lands (fields, vineyards, roads). Affected areas are small areas of pasture - 0.58 decares, and a drainage canal - 0.072 decares.

Overpass 145+787 (Sadievo)

The site in question is located south of Sadievo, between Nova Zagora and Konyovo stations. Crossing is on agricultural road / dirt road /. The crossing falls outside urban area. The total area necessary for the construction of the overpass is 26.278 decares, of which 24.784 decares are anthropogenically affected lands (fields, roads, water basin/reservoir). Affected area is 1.494 decares of irrigation canal, overgrown with reed (Phragmites australis).

Overpass 151+770 (Konyovo)

The site is located southwest of Konyovo (section between railway stations Konyvo and Kermen). The crossing is with a municipal road - fourth class and falls outside the urban territory. The total area needed for the construction of the overpass is 20.900 decares, of which 20.585 decares are anthropogenically affected lands (fields, roads, farmyard). Affected area is 0.200 decares of pastureland and 0.115 decares gully.

Overpass at km 158+777 (Kermen)

The site is located west of Kermen /section between railway stations Konyovo - Kermen/. The crossing is with agricultural road. Part of the territory of the crossing falls within the building boundaries of Kemer, and the rest of the territory is out of the construction boundaries. The total area necessary for the construction of the overpass is 21.895 decares, of which 17.931 decares are anthropogenically affected lands (fields, roads). Affected area is section of drainage canal - 3.966 decares.

Pedestrian footbridge at km 160+300 (Kermen)

The site is located in the southeastern part of Kermen (section between railway stations Konyovo and Kermen). The crossing is with a street.

Overpass at km 171+620 (Bezmer)

The site is located southwest of Bezmer, between Kermen-Bezmer railway stations. The crossing is a municipal road. It falls outside the urban territory. The total area necessary for the construction of the overpass is 19.895 acres, anthropogenically affected lands (another kind of land, country/agricultural roads).

Overpass at km 187+590 (Kabile)

It is located east of Kabile, between the Yambol and Zavoy railway stations /local road between the village of Kabile, the town of Yambol and the Ormana area./ The crossing falls outside urban area. The total area necessary for the construction of the overpass is 21.834 decares, all of them anthropogenically affected (abandoned fields, roads).

Overpass at km 192+625 (Zavoy)

The site is located southeast of Zavoy, between Zavoy village and Veselinovo village. The crossing is with a road from the nationa road network - third class. It falls outside urban area. The total area necessary for the construction of the overpass is 26.034 decares, of which 21.786 decares are anthropogenically affected lands (other types of fields, country/agricultural roads, roads form the national road network, motorway). Affected area is an area of pasture/non-cultivated land – 4.248 decares, falling in the north-west part of the territory of the overpass.

Overpass at km 219+390 (in the area of Tsekovski railway station)

The site is located north-west of Tserkovski /at Tsanko Tserkovski dam/. The crossing is with a municipal road. It falls within the territory of the village of Venets - outside urban territory and in the territory of the village of Tserkovski - in the urban territory and outside the urban territory. The total area necessary for the construction of the overpass is 15.342 decares, of which 10.170 decares are anthropogenically affected lands (fields, other type of undustrial areas, parking, dam). Affected area is a section of pasture with shrubs – 5.177 decares.

Overpass at km 222+220 (Tserkovski)

It is located north-west of Karnobat, between Tserkovski and Karnobat West railway stations. The crossing is with a local /black/ road in the territory of the village of Tserkovski. It falls outside urban area. The total area required for the construction of the overpass is 23.246 decares, of which 22.380 decares are anthropogenically affected lands (fields, railway line, company/service road). Affected areas are areas of pasture - 0.934 decares and irrigation canal - 0.864 decares. The plant diversity of species is comparatively poor, with predominant contribution of the types of Poaeta bulosae, Chrysopogoneta grylli, Festuceta valesacae, growing on grazed terrain with deteriorated water balance.

Overpass at km 230+320 (Karnobat)

The site is located north-west of Karnobat, between Tserkovski and Karnobat West railway stations. The crossing is with local (black) road. It falls outside urban area. The total area necessary for the construction of the overpass is 23.246 decares, of which 19,156 decares are anthropogenically affected lands (fields, railway line, coal production). Affected is a section of pasture – 2.683 decares, in the southeast part of the territory of the overpass. The cenoses in the non-cultivated land are anthropogenically affected. In these territories the grass vegetation is entirely derivative and secondary formed.

Overpass at km 241+285 (Klikach)

It is located north of the village of Klikach, between Karnobat and Chernograd railway stations. The crossing is with local (black) road. The overpass falls within the building boundaries of the village of Klikach and the rest of the territory is in the non-construction boundaries of the Zoning plan. The road overpass is designed on an existing agricultural (black) road from the village of Klikach to agricultural land, between Karnobat and Chernograd railway stations. The total area necessary for the construction of the overpass is 7.689 decares, of which 5.167 decares are

anthropogenically affected lands (fields, railway line, other kind of construction). Affected is an area of pasture – 2.522 decares, in the north-west part of the overpass.

Overpass at km 244+619 (Chernograd)

The site is located north-west of Chernograd, between Chernograd and Aytos railway stations. The crossing is with municipal road BGS1002 between the towns of Topolitsa and Chernograd. It falls outside urban area. The total area necessary for the construction of the overpass is 15.640 acres, all of them anthropogenically affected - fields, roads.

Overpass at km 248+202 (Topolitsa)

It is located southeast of Topolitsa /Topolitsa station/ between Chernograd and Aytos railway stations. The crossing is with local (black) road. It falls outside urban area. The total area necessary for the construction of the overpass is 15.835 decares, of which 14,753 decares are anthropogenically affected lands (fields, company road, other types of construction). Affected is a section of meadow - 0.482 decares, lucerne plantation and water flow - 0.600 decares, Aytoska River. In the area are affected seedling forms of Salix fragilis and Populus nigra.

Overpass at km 253+520 (Polyanovo)

The site is located northeast of Polyanovo. The crossing is with a municipal road and falls outside urban territory. The total area necessary for the construction of the overpass is 17.896 decares, of which 13.183 decares are anthropogenically affected lands (fields, other type of construction, local road). Affected is a section of a meadow (lucerne) – 1.931 decares, in the northern part of the area and 2.717 decares forest area, in the southern part of the area.

Overpass at km 260+921 (Aytos)

It is located between Aytos and Malka Polyana on the 8th railway line and the crossing is with a municipal road. It falls outside urban area. The total area needed for the construction of the overpass is 20.563 decares, of which 19.650 decares are anthropogenically affected lands (fields, road). Affected is an area of pasture - 0.913 decares.

Impacts

According to the envisaged construction activities, the impacts of the realization of the investment proposal on the plant component will be related to a permanent violation of the areas of the plant communities within the boundaries of the construction sites. Because most of the sites are on long-established agricultural land and suburban areas, the synanthropic and ruderal vegetation in the affected areas is significantly covered. The species plant diversity in the meadows is comparatively poor with the predominant participation of the formations of the Poaeta bulbosae and Festuceta valeiaca, growing on the grazed terrain with deteriorated water balance. In these territories the grass vegetation is entirely derivative and secondary formed, anthropogenically affected. Most of the communities and their species are widespread in most of the territory and there is no probability of their disappearance. In affected forest areas /wood-producing forests, forest cenoses are heavily affected by periodic felling.

During the construction of the new overpasses are used areas of non-cultivated lands in the amount of about 44.2 decares and forest areas - 15 decares. In the range of some of the overpasses there are drainage canals of 9.2 decares, in some places overgrown with cane.

The impact on the vegetation from the realization of the sites within Component 2 of the project will be direct and long-lasting but insignificant in regards of nature of the affected vegetation.

Component 3: „Planting of Protective Forest Belt along Chernograd – Aytos Open Line" for relible protection of the railway track from the adverse weather impact and as snowdrift retention – project 2015:

Section I – from km 244+060.00 to km 244+760.00 with lenght L=700 m

Section II – from km 245+365.00 to km 246+390.00 with lenght L=1025 m

It is envisaged planting of protective forest belt in the section between railway stations Chernograd-Aytos from km 244+060 to km 246+390 for relible protection of the railway track from the adverse weather impact and as snowdrift retention during the winter months. The area for planting is located on the territory of Burgas region, Municipality of Aytos, in the lands of Topolitsa village (29.853 decares) and Chernovgrad village (11.175 decares). It will be built/plant parallel to and on the left side of the railway line, in the direction of the railway traffic.

The protective forest belt has a width of 8 m, at a distance of 15 m and 9 m at a distance of 30 m. Its construction is with increasing height from the wind direction and with a sharp decrease on the side of the track. This will be achieved by planting of bushes on the side of the wind and trees on the side of the track. The protective foerest belt will be constructed by planting of two rows of trees with bushes between them and three rows of bushes with a decreasing height. The rows of trees will be planted at a distance of 3 m apart and the bushes at 1.5 m. The distance between the rows is 2 m, which will ensure better development and more convenient access for maintenance.

For the planting of the protective forest belt are necessary 41.010 decares land affecting: fields/arable land, perennials, local road. Between the two sections of the forest belt there are 1.061 decares of pasture/ country non-cultivated land. This is highly ruderalized due to its use as an unregulated waste disposal site.

The project foresees the following species composition and quantity of the forest:

Composition and Bill of Quantities of the species for the forest belt
Section I - from km 244+060.00 to km 244+760.00 with length L=700m
- 3-6 years old saplings - Acacia and Acer tataricum
- 3-years old bushes – Honeysuckle, Black acacia and Ligustrum vulgare

Composition and Bill of Quantities of the species for the forest belt
Section II - from km 245+365.00 to km 246+390.00 with length L=1025m
- 6 years old saplings - Acacia and Acer tataricum
- 3-years old bushes - Honeysuckle, Black acacia and Ligustrum vulgare

Impacts

The planting of the forest belt is in arable land, with 1.061 decares country non-cultivated land between the two affected areas. The grass vegetation is highly ruderalized. The site is used as an unregulated waste disposal site. The effects on growth will be negligible. The planting of the forest belt will have a positive impact not only on the limitation of wind erosion which create difficulties for train traffic during the winter months, as well as on the enrichment of the plant diversity in the immediate area. The impact is considered negligible.

In the dendrologic list of bushes species intended for planting, the invasive species of black acacia is included. The same should be replaced with another native species.

Component 4: „Rehabilitation of Skutare – Orizovo Railway Section" project 2015.

The rehabilitation of the railway section "Skutare - Orizovo" covers a section from km 16+905 to km 43+030. The investment proposal is classified as repair and recovery of the existing railway infrastructure. During the renewal of the track in some places, there will be shifts from the existing axis and replacement of 490 catenary pillars, and all these activities will be carried out along the railway line. The vegetation is grassy, of secondary origin under the influence of carried out periodical support activities.

Impacts

During the renewal of the railway line in some places, there will be shifts from the existing axis and replacement of 490 catenary pillars, and all these activities will be carried out along the railway line. The vegetation is grassy, of secondary origin under the influence of carried out

periodical support activities. The impact on vegetation from the implementation of the component is considered **negligible**.

Component 5: „Modernization of Orizovo – Mihaylovo Railway Section"– km 43+029 – km 80+722, project 2015.

The existing track in the section is with lenght of 37 693 m. The component is developed for construction of single and double track. For the section from km 56+611 to km 61+033 the new track leaves the existing range of the railway line and it will be developing on a new terrain. In addition, the project envisages doubling the existing single railway line along the whole section from Orizovo to Mihaylovo. A key point for the railway section is the level-crossing with the Trakia motorway on the existing overpass at km 56+514. For the new track is envisaged level-crossing by using the existing facility. This condition and the regulatory constraints for a design speed of 160 km/h do not allow following the existing track after the crossing and require the construction of tunnel and development of a turn around the town of Chirpan along totally new track. It is envisaged the construction of tunnel (single railway tunnel) on Track 2 with length L = 835 m from km 57+750 to km 58+585 in the section between railway stations Orizovo and Mihaylovo. The tunnel crosses a height hurdle north of the town of Chirpan.

Section Orizovo railway station – Cherna gora railway stop, from km 43+029 to km 56+968.670

The new track is optimized and follows the existing one with minimal deviations. Cherna gora railway station turns into a stop by using the platform of the existing station.

The track deviates from the existing one in completely new track in the section from km 52 + 300 to km 56+563 - L=4 263 m. Key point is the existing overpass on Trakia Motorway (km 56 + 557).

Within the range of the new track are mainly affected arable fields, territories serving transport, roads.

Large structures

Bridge at km 44+170.00

The bridge is existing and will be removed and on its place will be constructed a new double- track reinforced concrete bridge.

The construction (about 4.6 decares) affectes riverside community of willows (Salix alba, S. fragilis) with the participation of Black poplar (Populus nigra) and summer oak (Quercus robur).

Overpass at km 44+212.33

The site is located east of the village of Orizovo where it is envisaged to be constructed a road III-65 "Skutare - Cherna gora" from the national road network, which will cross the railway line with road overpass, following a new trace.

Overpass at km 48+777.60

The site is located north-east of the village of Cherna gora where the railway line crosses road III-565 "Skutare – Cherna gora" from the national road network, following a new trace.

Overpass at km 52+114.46

The site is located north-west of Chirpan, where the railway line crosses road III-64 from the national road network. It is envisaged the construction of a road variant with overpass, along the trace of the existing road.

Overpass at km 55+840.82

The site is located north of the town of Chirpan, where the railway line crosses road III-608 "Spasovo-Chirpan" at km 60+800 from the national road network with crossing on one level. It is envisaged the construction of a road variant with overpass, along the trace of the existing road.

Overpass at km 59+317.22

It is located west of the town of Chirpan, where the new railway line will cross road II-66 "Stara Zagora-Chirpan" from the national road network. It is envisaged the construction of a road variant with overpass, along the trace of the existing road.

Underpass at km 62+816.91

The site is located north-west of the village of Volovarovo, where the railway line crosses municipal road with crossing on one level. It is envisaged the construction of overpass where the railway line will overtake the municipal road without the need for a situation shift of the road.

Underpass at km 65+164.26

It is located north-west of the village of Svoboda, where the newly designed railway line will cross a municipal road. It is envisaged the construction of underpass where the railway line will overtake the municipal road without the need for a situational shift of the road.

Underpass at km 66+961.80

The site is located north of the village of Svoboda, where the newly designed railway line will cross a municipal road. It is envisaged the construction of underpass where the railway line will overtake the municipal road without the need for a situation shift of the road.

Impacts

For the realization of the component will be disturbed 2 673.8 decares of land, mostly arable lands occupied by agrocenoses. Disturbances of pasture/non-cultivated lands are in six sections, with a total area of 134.6 decares. Plant communities mainly belong to the formations of bulbous bluegrass, Vallesian fescue, Belize. They are of secondary origin. The communities and their species are widespread in the area and there is no probability of their disappearance. No species which are subject to protection are found in the grass variety area.

The affected forest territories with area of 83.5 decares are forests in agricultural lands, wood-producing, creeping and are under strong anthropogenic impact.

The impact on the plant component will only occur during the construction works (direct impact) when new areas will be used for construction of the railway line.

Plant communities will be permanently disturbed within the construction boundaries. For the reason that most of the area of the site is situated on long-time cultivated farmland, the synanthropic and ruderal vegetation in the non-cultivated areas in these sections is significantly covered.

The negative impacts on vegetation caused by the construction of the railway line will be in:

- Direct destruction of plant habitats within the range of the railway line;
- Fragmentation of habitats - when crossing of forest territories and pastures.

Component 6: "Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station"

Component 6 covers 2.166 km of Plovdiv-Burgas railway line. The activities for the construction will be executed in the section from km 190+200 to km 192+557. By its nature Component 6 will be a construction of new track, including as well construction of new crossing of the Tundzha River with 119 m long reinforced concrete bridge and one smaller 10 m long reinforced concrete bridge. The railway line is divided into two sections:

Section I (track in section between railway stations) - From km 190+200 to the beginning of switch № 2 (beginning of switch 2 - km 191+693.11) from Zavoy station

The railway line is along new trace and in section between stations. In this section is situated the newly designed bridge over Tundzha River. The investment proposal includes the construction of new five-holes reinforced concrete bridge over Tundzha River. The length of the bridge is 119 m from km 191+401.02 to km 191+520.02. Tundzha River in the area of the level crossing with the railway line has a riverbed limited by dikes. There are also areas foreseen for passing of agricultural roads on both sides of the river – one-hole bridge with 10 m opening, two drains with opening of 4

m, one passage for small animals. The river banks are overgrown with willows and poplars with a rich undergrowth of coppicing and herbaceous vegetation.

It is also envisaged the construction of one smaller reinforced concrete bridge at km 191+ 125 with length of 10 m in order to overcome marshland, thus avoiding drainage of the territory.

From the km 190+200 to km 191+100 the new railway line affects the peripheral part of a forest (23.538 decares) dominated by summer oak (Quercus robur).

Section II (Zavoy station) - From the beginning of switch № 2 (beginning of switch 2 - km 191+693.11) to km 193+080. In the section is located in Zavoy railway station. The newly designed track, in its main part, follows the existing one and the railway line is designed for major repair.

The track of the newly designed railway line - km 192+400 - km 192+600 affects the periphery of wood-producting forest dominated by Turkey oak (Quercus cerris), strongly influenced by human activity, and from km 192+600 - km 192+800 it passes through highly ruderalized non-cultived land.

Impacts

In Section I - from km 190+200 to km 191+100 the new track of the railway line affects the peripheral part of a forest (23.538 decares) dominated by a natural formation of summer oak.

The construction of the new five-holes reinforced concrete bridge over Tundzha River is envisaged on a place where the riverbed is limited by dikes. The river banks are overgrown with willows and poplars with a rich undergrowth of coppicing and herbaceous vegetation. It covers an area of 5 decares.

The realization of the component in Section II is related to disturbances within non-cultivated area of 7.7 decares, highly ruderalized, as the shrub vegetation with predominance of Christ's thorn occupies almost half of the pasture. The affected forest area of 9.5 decares is wood-producting forest, coppice.

The impact on the plant component will only occur during the construction works (direct impact) when new areas will be used for construction of the railway line and bridges.

Considering the fact that 23.538 decares of natural oak formation and riverside habitats are affected during the construction of the new bridge, the impact is determined **with an average degree**.

Component 7: „Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the Catenary at Zimnitsa and Straldzha Stations" – preliminary design 2015

It covers territory along 8th railway line from km 198+144 to km 199+360 and includes:

The realization of the investment proposal does not require additional land aquisition. No shifts from the design axis is envisaged in relation to the existing one and it is not expected that the land property of NRIC will be affected. No additional areas for temporary activities are envisaged.

The realization of the project is not related to vegetation disturbances. **No impact.**

Component 8: „Rehabilitation of Straldzha – Tserkovski Railway Section" within the railway section from km 217+210 to km 219+059, detailed design 2017

The section envisaged for rehabilitation is a railway section between atations Straldzha-Tserkovski from km 217+210 to km 218+919 (Track 1) and from km 218+586 to km 218+973 (Track 2).

For the realization of the overall rehabilitation of this section from the railway section "Straldzha - Tserkovski" from km 217+210 to km 219+059, on some places are envisaged shifts of the project axis in relation to the existing one with up to 70 cm. All disturbances will be within the range of the railway line during the construction works. The realization of the investment proposal does not require additional land aquisitions. Damaging of grassland habitats will be within the range

of the railway line where they are anthropogenically affected. The impact is assessed **as insignificant.**

Fauna

The railway line Plovdiv-Burgas crosses two zoogeographic regions - Thracian region and Black Sea region. Along its mainly part, it crosses arable lands - fields. In many places there is a marshland. Within the section Rogosh-Manole the track passes by rice fields and within the section Polyanovo Aytos - by abandoned orchards. Larger grassy areas - pastures and meadows are crossed in Belozem, Svoboda, Mochuritza River, which is west of Karnobat and the village of Balgarovo. Two larger forests are crossed - Chirpan Koria and the Ormana Forest by the town of Yambol, and the line passes by three smaller forests - north-west of Samuilovo, southeast of Arnautito, north-west of Sabrano. Two of the big rivers in Bulgaria are crossed - Maritza River and Tundzha River as well as a number of their tributaries - Stryama, Omurovska, Martinka, Sazliyka, Mochuritza and others. After Chernograd, the railway line enters the Black Sea region, crossing a number of lowwater gullies, many of them adjusted, left tributaries of Aytos River. The railway line passes by a number of marshlands - swamps east of Belozem, south of Mihaylovo, east of Zora district (Stara Zagora), around the Blatnica River, located between Nova Zagora and Konyvo, fishponds east of Konyvo, remnants of Solata and White puddle marshlands, located south from Skobelevo and Bozadji, swamps south of Bezmer, abandoned fishponds east of Kabile, swamps between Atolovo and Tsanko Tserkovski dam (remnants of the Strandzha marshland), as well as the dam itself, swamps around Mochuriza River north of Klikach, two dams on Aytos River between Chernograd and Polyanovo.

Although the area of the investment proposal is dominated by arable land, the proximity of the two large rivers as well as a number of wetlands and forests have a positive impact on the species diversity of the fauna.

The type of the activities related to the realization of the investment proposal implies some negative impacts on fauna. The summarized potential impacts as a result of each component are presented in Table No 7.5-1.

Table № 7.5-1: Potential impacts on fauna.

Component	**1**	**2**	**3**	**4**
Activities	optic fiber cable, replacement of facilities/structures	construction of overpasses/ underpasses	afforestation	optimization of the track
Temporary impact on habitats	construction	no	no	contruction
Permanent destruction of habitats	no	construction and operation	no	no
Fragmentation of habitats	no	construction and operation	no	no
Barrier effect	no	no	no	operation
Anxiety	construction	construction	no	construction and operation
Mortality	no	no	no	operation

Component	**5**	**6**	**7**	**8**

Activities	construction of new track, doubling of the railway line	new track	rehabilitation of catenary	optimization of the track
Temporary impact on habitats	construction	construction	no	construction
Permanent destruction of habitats	construction and operation	construction and operation	no	no
Fragmentation of habitats	construction and operation	construction and operation	no	no
Barrier effect	construction and operation	construction and operation	no	operation
Anxiety	construction and operation	construction and operation	no	construction and operation
Mortality	construction and operation	construction and operation	no	operation

For most of the groups, the degree of impact is assessed as very low. The degree of impact of Components 4, 5, 6 and 8 on amphibian and reptile species is assessed as low, due to the risk of increased mortality and iabarrier effect during the period of operation. The degree of impact of Components 5, 6 and 8 on bird species due to the risk of increased mortality during the period of operation is also assessed low. The impact of Component 6 on bats is estimated to be average, due to probability of mortality and anxiety during the period of construction. By implementing the appropriate measures, all possible impacts can be reduced to insignificant.

Protected Areas. Elements of the National ecological network

Protected Areas

Component 1 does not affect protected areas. Close to it (up to 500 m) are located the following:

- Natural attractions (NA) "Youth hill"; it is located about 25 m away from the railway line, with a busy city street between it and the boundary of the NA.
- Protected terrain (PT) "Chirpan Koria"; it is located about 12 meters away from the railway line.
- Protected terrain (PT) "Hissarya"; it is located more than 300 m away from the railway line.

Components 2, 3, 4, 5, 6, 7 and 8 do not affect protected areas. Close to them (up to 500 m) there is also lack of protected areas.

- Protected terrain (PT) "Chirpan Koria". The range of Component 5 tangents with the boundaries of the PS.

Protected areas upon NATURA 2000

Component 1 passes through the following protected areas:

- BG0000578 „Maritza River" for preservation of the natural habitats and of wild flora and fauna;
- BG0000444 „ Pyasachnik River" for preservation of the natural habitats and of wild flora and fauna;
- BG0000429 „Stryama River"for preservation of the natural habitats and of wild flora and fauna;

- BG0000443 „Omurovska River"for preservation of the natural habitats and of wild flora and fauna;
- BG0000442 „Martinka River"for preservation of the natural habitats and of wild flora and fauna;
- BG0000425 „Sazliyka River"for preservation of the natural habitats and of wild flora and fauna;
- BG0000418 „ Kermenski Vazvisheniya"for preservation of the natural habitats and of wild flora and fauna;
- BG0000192 „Tundzha River 1"for preservation of the natural habitats and of wild flora and fauna;
- BG0000205 „Straldzha River"for preservation of the natural habitats and of wild flora and fauna;
- BG0000196 „ Mochuritsa River"for preservation of the natural habitats and of wild flora and fauna;
- BG0002028 „Straldzha Complex"for conservation of the wild birds.

Component 2 affects the following protected areas:
- BG0000418 „Kermenski Vazvisheniya "for preservation of the natural habitats and of wild flora and fauna;
- BG0000196 „ Mochuritsa River"for preservation of the natural habitats and of wild flora and fauna;

Component 3 does not affect protected areas. Close to it (up to 500 m) there is also lack of protected areas.

Component 4 affects the following protected areas:
- BG0000429 „ Stryama River " for preservation of the natural habitats and of wild flora and fauna;

Component 5 affects the following protected areas:
- BG0000443 „Omurovska River"for preservation of the natural habitats and of wild flora and fauna;
- BG0000442 „Martinka River"for preservation of the natural habitats and of wild flora and fauna;

Component 6 affects the following protected areas:
- BG0000192 „Tundzha River 1"for preservation of the natural habitats and of wild flora and fauna;

Component 7 does not affect protected areas. Close to it (up to 500 m) there is also lack of protected areas.

Component 6 affects the following protected areas:
- BG0000205 „Straldzha River"for preservation of the natural habitats and of wild flora and fauna;
- BG0002028 „Straldzha Complex"for conservation of the wild birds.

The characteristics of the separate protected areas, as well as an analysis of the expected impacts, are presented in the EIAR.

7.6. Waste

The investment proposal envisaged "Rehabilitation of Railway line Plovdiv-Burgas, Phase 2" and the project consist of the following components: Component 1: "Design and Construction of systems for signalling and telecommunications of railway line Plovdiv-Burgas"; Component 2: Construction of overpasses/underpasses along the railway line Plovdiv – Burgas to replace existing level crossings"; Component 3: „Planting of Protective Forest Belt along Chernograd – Aytos Open Line"; Component 4:„Rehabilitation of Skutare – Orizovo Railway Section"; Component 5: „Modernization of Orizovo – Mihaylovo Railway Section"; Component 6: "Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station"; Component 7: „Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the Catenary at Zimnitsa and Straldzha Stations"; Component 8: „Rehabilitation of Straldzha – Tserkovski Railway Section".

On the territory which will be affected by the investment proposal there are no non-organized landfills that have a negative impact on the environment.

The scope of the investment proposal concerns territory of the municipalities: Rodopi, Plovdiv, Maritsa, Rakovski, Bratya Daskalovi, Chirpan, Stara Zagora, Nova Zagora, Sliven, Tundzha, Straldzha, Yambol, Karnobat, Aytos, Burgas and Kameno.

Waste generated in the affected municipalities are handed over to regional waste management systems following the waste management hierarchy in order to prevent, reduce or limit their harmful impact on human health and the environment.

Expected by type and amount of generated waste during the period of construction and period of operation of the investment proposal.
Classification of waste

- **Generation of waste during the period of construction of the investment proposal**

The main activities generating waste during the period of construction are excavation of earth, excavation of ballast prism, removal of curbs and reinforced concrete slabs, removal of large and small structures, destruction of station platforms, dismantling of reinforced concrete catenary pillars and foundations; rehabilitation and repair of railway stations and stops, cutting and milling of asphalt etc.

Under the separate components will mainly generated, typical for the excavation and construction works on railway sections, construction waste: excavated earth during excavation; ballast from track; concrete; metal waste; wood material; milling asphalt pavement; asphalt mixtures; mixed construction waste; fluorescent tubes and other wastes containing mercury; cables.

After completion of construction, waste will be generated by the final cleaning of the sites for storage of earth and rocks, temporary storage sites, storage areas for aggregates and the surrounding spaces.

In the area of construction activities will be generated waste by the reconstruction of engineering networks of other institutions.

The waste will be generated only **once** during the execution of the construction works of the separate components, subject of the investment proposal.

A/DANGEROUS WASTE
Hydraulic oils

Waste hydraulic oils (non-chlorinated, synthetic and other hydraulic oils) will be generated in case of emergency/unexpected replacement of hydraulic oils by the hydraulic systems of transport and construction equipment. Waste composition - petroleum products, high molecular weight hydrocarbons.

Gear oils

Waste engine oils from gears, motors and gearboxes (non-chlorinated, synthetic and other engine oils) will be generated in case of emergency/unexpected replacement of oils from automotive and construction equipment. Waste composition - petroleum products, high molecular weight hydrocarbons.

Oil filters

Waste oil filters will be generated in case of emergency/unexpected replacement of waste oils from automotive and construction equipment and replacement of waste oil filters. Waste composition - petroleum products, high molecular weight hydrocarbons, impregnated cellulose.

Brake fluids

Waste brake fluids will be generated in emergency/unexpected replacement of brake fluid from faulty braking systems of service vehicles and construction equipment. Waste composition - petroleum products, high molecular weight hydrocarbons.

Rechargeable batteries

The waste will be generated in case of unexpected replacement of amortized rechargeable batteries from the automotive and construction equipment. Waste composition - lead, sulfuric acid.

Packaging containing residues of dangerous substances or contaminated by dangerous substances

Plastic/metal packaging of paints, varnishes will be generated after the consumption of delivered paints and varnishes for finishing works on the facilities/structures of the separate components within Plovdiv-Burgas railway line. Waste composition: hydrocarbons, plastic, steel and others.

Cleaning towels for equipment and protective clothing

The waste is formed by cleaning of transport and construction equipment and by the contamination of working clothes during work.

Luminescent tubes and other wastes containing mercury

The waste will be generated from waste luminaires separated from buildings and area lighting during the repair works of existing and construction works of new railway stations and stops. Solid waste. Content - Mercury.

B/CONSTRUCTION WASTE

Excavated earth

When excavation of earth will be generated earth as follows: by underground laying in HDPE pipes of optical fiber cable and making of excavations for laying of cables (component 1); removal of overpasses and construction of overpasses/underpasses (Component 2); excavation during the renewal of the railway track for rehabilitation of the Skutare - Orizovo railway section and construction of temporary access roads to the construction sites (Component 4); modernization and construction of a new track and tunnel construction (Component 5); modernization and construction of a new track (component 6); reconstruction of switches development (component 7); rehabilitation of Straldzha - Tserkovski railway station (component 8) and by construction of temporary and service access roads and reconstruction of engineering networks of other institutions.

The tunnel within the scope of Component 5 will be constructed on weak and low-rock places - gravel-sand and particulate clay in places pieces of vapid friable sandston, by mechanical, non-explosive way.

At this stage, the quantities of excavated earth that do not meet the design specifications for contruction use have not been determined. Excavated earth which do not meet the design specifications for employment in the construction works will be determined during the period of construction after testing and analysis.

Excavated earth containing dangerous substances

Contaminated excavated earth will be generated in emergency situations with the construction and transport equipment, and leakage of petroleum oils/products. When excavating of earth on separate construction sites it is also possible to be generated excavated earth containing dangerous substances. Waste composition - soil, petroleum products, high molecular weight hydrocarbons.

Concrete

Waste concrete will be generated by the construction of concrete facilities/structures along the railway line, curbs, concrete bands, concrete drains, cement trenches, etc. Waste concrete will be also generated by removing of curbs and reinforced concrete slabs, removing of existing station platforms, rehabilitation of large and small facilities/structures (bridges, culverts, lined ditches), removing of foundations by dismantling of reinforced concrete catenary poles. The waste is transported for landfill or recycling. Waste composition - cement, sand, gravel, mineral additives, reinforced concrete.

Iron and steel

Metal waste will be generated by the construction of facilities/structures along the railway line - tunnel, bridges, culverts, passages, underpasses, overpasses, stops, stations, dismantling of metal structures, dismantling of metal pillars etc. and by the reconstruction of facilities of other institutions, single elastic fence, protective steel railings. Iron and steel will be generated by steel reinforcement and high-strength reinforcing steel.Waste composition - iron and steel.

Ballast of ballast prism

Ballast will be generated under components for rehabilitation and removal of existing ballast prism. Upon the modernization of the Yambol - Zimnitsa railway section, at Zavoy station (component 6) will be generated ballast by the closure of the existing railway line - removal of the ballast prism and recultivation of the terrain. Waste composition - rock, sand and gravel.

Asphalt mixtures

The waste will be generated by laying of asphalt concrete pavement and minor amounts of milling of existing asphalt pavement in areas envisaged for reconstruction and construction of new stops and road connections. The waste will be generated by the construction of the roadways of the overpasses within components 2 and 5. Asphalt residues (connecting asphalt layer - binder and wear layer) by the surface coating of the asphalt coatings. Waste composition - mineral fractions, mineral flour, bitumen, tar, asphalt and polymers.

Cables

Cables will be generated by the construction of signaling and telecommunication systems - laying of an optical fiber cable, wiring by the installation of the ETCS system, building of a cable channel network by the implementation of computer-based interlocking systems (CIS), downloading of new power cables, disconnection of the contact wire and cables and devices of signaling and telecommunication systems. Cables will be generated during rehabilitation of the catenary and repair activities on buildings of railway stations and stops. Waste composition - non-ferrous metals.

Wood material

Waste wood material (beams, boards) will be generated for shuttering activities by the construction of new stops, tunnel, bridges, overpasses, drainage facilities, curbs, etc. Waste composition - wood, cellulose.

Mixtures of concrete, bricks, tiles and ceramics different from those mentioned in 17 01 06

In the process of construction of new stops, repair of technological buildings for CIS, rehabilitation and repair of station buildings and waiting rooms, demolishing of station platforms, reconstruction of facilities/structures will be generated waste concrete, bricks, tiles, etc. Waste composition - bricks, concrete, tiles, plaster and others.

C/OTHER NON-HAZARDOUS WASTE GENERATED DURING CONSTRUCTION

Forestry residues

Forestry residues are generated in the initial phase of the construction in tracing the railway track (Component 5 and 6) and clearance of the site in realtion to removal of tree and shrub vegetation. The waste is transported for recovery (composting) to a Regional Waste Management System. Waste composition - wood, cellulose.

Disused tires

Disused tires will be generated by the rehabilitation and modernization of the railway line (replacement of rubber pads) by the separate components. Waste composition - solid waste, elastomers, hydrocarbons.

Furthermore to these wastes, waste will be also generated in the area of the construction activities (for the construction site of each component) after completion of the construction works for modernization and rehabilitation of the Plovdiv - Burgas railway line, the facilities/structures belonging to it and the reconstruction of the engineering networks of other institutions. These are wastes generated by the final cleaning of waste disposal sites, leveling and clearing of temporary roads, temporary storage sites, storage buldings for aggregates and their surrounding spaces.

D/DOMESTIC WASTE

During the construction works on the separate components, as well as in the temporary camps and places for parking of transport vehicles, construction and installation equipment, domestic waste will be generated from the everyday life of the workers.

- **Waste is expected to be generated during the period of operation of the railway line Plovdiv - Burgas, within the scope of components 4, 5, 6, 7 and 8.**

During the operation of the railway line and all belonging to it facilities/structures will be generated different types of waste from the traffic and during repair works along the railway line. The different types of waste that will be generated during the operation of the railway line are divided into: domestic waste; non-hazardous and hazardous waste and mixed construction waste from repairs as follows:

♦ spills/leakages from tanks and cargoes carrying hazardous waste, hazardous substances, incl. fuels.

The waste will be formed by removing of spills/ leakages and cleaning the area in case of accidents, accidents with freight trains carrying adsorbent materials.

➢ aggregates and parts of train compositions and old used equipment, disusedtrain compositions (suffered by accidents), railway supplies, etc.

The waste will be formed by removing of parts from the train compositions and railway supplies.

➢ spills /leakage /spillage from tanks and cargoes carrying liquid or wetted materials.

The waste will be formed by removing spills/leaks and cleaning the area in case of accidents, accidents with freight trains carrying adsorbent materials.

➢ waste from cleansing of the areas on and along the railway line.

During the period of operation of the railway line by the separate components, it is expected that waste will be generated mainly by repair works on the line and buildings within the railway stations and stops: Concrete; Mixtures of concrete, bricks, tiles and ceramics; Cast Iron and Steel; Soil and stones; Disused tires; Disused equipment; Lead rechargeable batteries; Luminescent tubes and other wastes containing mercury.

Domestic waste: wastes disposed on and along the railway line; discarded packaging of food, beverages and cigarettes - plastic, glass, metal and paper; in the case of repair work on the line - domestic waste from the everyday life of the workers.

- **Wastes expected to be generated by closedwon and recultivation**

By the realization of the investment proposal, waste from closedown and recultivation will be only generated under Component 6.

Waste will be generated by dismantling of contact wire and suspending devices, dismantling of reinforced concrete and metal catenary pillars, dismantling of the railway track, demolition of old ballast, dismantling of cables and devices from the signaling and telecommunication systems along the existing railway line after commissioning on the new railway section of Yambol - Zimnitsa. When closedown the existing line, the following wastes will be generated: metals, concrete, ballast ballast prism, cables and domestic waste.

The amount of diffrenet types of waste is unpredictable and will be specified in the Waste Management Plan.

The dismantled rails and sleepers as well as old ballast are transported to to grounds determined for the purpose beforehand for the storage of construction materials and waste, in properties owned by the NRIC. The rails and sleepers are graded, sorted, stored and kept for reuse.

Collection, transportation, recovery and storage of waste

The contractor, responsible for the construction works for each separate component within the project for rehabilitation of the railway line Plovdiv-Burgas, the construction of its belonging facilities/structures (tunnel, overpasses, underpasses, bridges, culverts, etc.) and railway infrastructure, the reconstruction of the existing stations and stops and the construction of new stops and the reconstructions of affected facilities of other institutions should carry out planned repairs activities of the construction equipment and planned replacement of oils, rechargeable batteries, tires and other services of his vehicles and transport construction machinery in its own main place.

Collection, transport and recovery of waste during the period of construction and reconstruction of engineering networks of other institutions. Sites for storage of construction waste

A/Dangerous waste

Mineral-based non-chlorinated hydraulic oils, synthetic hydraulic oils, other hydraulic oils, non-chlorinated engine oils, mineral-based lubricating and gear oils, synthetic motor and lubricating oils and gear oils and other lubricating oils, gear oils filters, brake fluids, rechargeable batteries.

The generated waste in case of emergency/unexpected replacement should be collected separately on the place of their formation (in the parking places or established ground on the site) in closed metal drums/containers and should delivered for further treatment based on written contracts to persons holders of a document under Art. 35 of the Waste Management Act (WMA).

An emergency replacement of supplies should be carried out on sites with a sealed insulating material that prevents the penetration of petroleum products into the soil.

Earths containing dangerous substances

By emergency situations with transport vehicle or construction machinery, the contaminated with oil products soils and stones (earth) generated during excavation works on the construction site should be eliminated in a short time and to be delivered for further treatment based on written contracts to persons holders of a relevant document under Art. 35 of the WMA.

Packaging containing residues of dangerous substances or contaminated by dangerous substances

Plastic/metal packaging of paints, varnishes will be generated after using of the delivered paints and varnishes for finishing works on the railway facilities/structures upon the separate

components, will be stored on the defined site for temporary storage and will be transported to the main contractor's site and submit for subsequent treatment, based on written contracts to persons holders of a document under Art. 35 of the Waste Management Act.

Cleaning towels for equipment and protective clothing

The waste is formed by cleaning the used construction equipment and from contaminating of working clothes during construction activities. The waste will be collected and pre-stored in a metal barrel at the place of their appearance on a defined site and will be transported to the main contractor's site and delivered for subsequent treatment based on written contracts to persons holders of a document under Art. 35 of the Waste Management Act.

Luminescent tubes and other wastes containing mercury

The disused fluorescent lamps and mercury lamps dropped during the repair works and rehabilitation of railway stations, stops, waiting rooms will be separately collected and stored in a metal container at the place of their appearance on a defined site and will be transported to the main contractor's site and delivered for subsequent treatment based on written contracts to persons holders of a document under Art. 35 of the Waste Management Act.

B/Construction waste

Excavated earth and rocks

Excavated earth which meet the design specifications for employment in the construction works are stored at sites within the railway line or on temporary storage sites before transportation and use in embankment, as well as for recultivation purposes on the site.

The location of sites for excavated earth storage (outside the range of the railway line) will be determined at a later stage and will be coordinated with therespective municipal administration, according to Art. 19, para. 1 of the WMA.

During the construction of the separate components, the generated excavated earths, which do not meet the design specifications for employment in the construction works, (after tests and analyses) will be transported and stored on grounds for storage of excavated earth, defined at the next stage or will be delivered for utilization and/or disposal to the Regional authority for waste management.

By managing the excavated earth that are formed during the construction have to applied the requirements of the WMA and the ordinances under Art. 22 of the WMA of the respective municipalities in which territory the investment proposal will be implemented.

Disused concrete

The generated disused concrete by the construction of concrete facilities belonging to the railway line, curbs, concrete strips, concrete drains, cement trenches and by removal of curbs and reinforced concrete slabs, removal of existing station platforms, rehabilitation of large and small facilities/structures (bridges, culverts, lined ditches), removal of foundations during the dismantling of reinforced concrete pillars will be collected separately and pre-stored at a defined site within the range of the railway line till the delivery to legal entities which apply the waste management hierarchy and/or to be delivered to installations that meet the legal requirements regulated by the waste management legislation or to a Regional Waste Management authority for recovery in accordance with the Ordinance for Management of Construction Waste and for the recycling of construction materials.

Iron and steel

Metal waste generated during the construction and installation of the belonging to the railway line facilities/structures - tunnel, bridges, culverts, passages, underpasses, overpasses, stops, stations, dismantling of reinforced concrete pillars etc. and by the reconstruction of facilities of other institutions a single elastic fence, steel guard railings, will be collected separately and will be delivered for further treatment based on written contracts to persons holders of a document under Art. 35 of the Waste Management Act (WMA).

Balast from railway line

The generated in the sections of rehabilitation and modernization of the railway line ballast prism from the existing ballast is transferred to pre-determined sites for storage of construction materials and waste in properties owned by NRIC. The old ballast is graded, sieved, sorted and stored for reuse.

Asphalt mixtures

Asphalt residues (connecting asphalt layer - binder and wear layer) when breaking the existing asphalt flooring and surface laying of the asphalt coatings of roadbeds planned for construction will be collected in metal containers and will be transported to the main contractor's site and delivered for further treatment of legal entities which apply the waste management hierarchy and possess a relevant document under Art. 35 of WMA for carrying out recovery activities (preparation for reuse - asphalt mixtures for non-repacking, recycling, other utilization) on the basis of a contract signed.

Cables

Cables generated by the construction of signaling and telecommunication systems - laying of optical fiber cable, wiring by the implementation of ETCS system, construction of cable channel network for the implementation of computer-based interlocking systems, downloading of new power cables, disassembly of the contact wire and cables and devices for the signaling and telecommunication systems will be collected separately and will be delivered for subsequent treatment based on written contracts to persons holders of a relevant document under Art. 35 of the Waste Management Act (WMA).

Woody material

Disused woody (beams, boards) generated by formwork activities during the construction of new stops, tunnel, bridge structures, overpasses, underpasses, drainage facilities, curbs, etc. will be collected separately and pre-stored on a defined site till the accumulation of quantities for submittion for utilization of legal entities which apply the waste management hierarchy and possess a document under Art. 35 of the WMA.

Concrete mixtures, bricks, tiles, plates and ceramics

Mixed construction waste will be collected and pre-stored on determined sites and will be transported by the owner of construction waste or by another person meeting the requirements of Art. 35 of the WMA based on a written contract, according to Art. 40 of the WMA and in compliance with Ordinance under Art. 22 of the Waste Management Act of the Municipal Council for the conditions and procedure for the collection, transportation, recovery and disposal of construction waste. The generated waste to be delivered to a Regional Waste Management authority for preparation for reuse and recycling in accordance with the Ordinance for Management of Construction Waste and the use of recycled construction materials.

The Employer is responsible for preparing of a Construction Waste Management Plan in accordance with the Waste Management Act and the Ordinance for Management of Construction Waste before starting of construction works and/or removing of construction. The treatment of construction waste should be carried out in accordance with an approved Construction Waste Management Plan.

C/Other non-hazardous waste generated during the period of construction

Forestry residues

Waste tree-shrub vegetation formed by clearing the areas within the range of the railway line in connection with felling and grass mowing is collected at a determined site and transported to a Regional Waste Management authority for composting.

Disused tires

Disused tires generated during the rehabilitation and modernization of the railway line (replacement of rubber pads) will be separately collected in a metal container, pre-stored at a

defined site and transported to the main contractor's site. Generated waste should be delivered for subsequent treatment, based on written contracts to persons holders of a relevant document under Art. 35 of the Waste Management Act (WMA).

After the completion of the construction works for the rehabilitation and modernization of the railway line, the envisaged reconstruction of switches development, construction of new track, construction of new facilities on the separate components and reconstruction of facilities of other institutions, waste will be generated during the final cleaning of the sites for storage of waste and construction materials, sites for temporary storage of excavated earth, humus layer and waste, storage areas for aggregates and the belonging areas, as well as alignment and cleaning of temporary roads. The generated by the construction works waste will be transported by the waste holder (the contractor) and delivered to the legal entities which apply the waste management hierarchy and/or delivered to a Regional Waste Management authority for preparation for reuse and recycling in accordance with the Ordinance for Management of Construction Waste, and for use of recycled construction materials, before starting of construction and/or removal of construction.

D/Domestic Waste

Domestic waste generated by the everyday life of workers carrying out excavation, and construction activities will be collected in metal containers of "Beaver" type and delivered for separation (separation of paper, metal, plastics for recycling, separation of biodegradable waste for composting and reducing the amount of biodegradable waste destined for waste disposal) to the Regional Waste Management authority and disposal of the residual fractions of regulated landfill for non-hazardous DW (Domestic waste) together with domestic waste from the concerned municipalities. Disposal of DW should be done only at landfills and/or installations meeting the regulatory requirements regulated by the waste management legislation.

The Regional Waste Management authorities where the generated domestic waste will be delivered are described in Section IV, point 6.

The treatment of the waste generated during the construction works upon the separate components of the Plovdiv - Burgas railway line shall be carried out in compliance with the requirements of the WMA and the legislation for its implementation.

Grounds for storage of construction waste

Excavated earth that meet the design specifications for employment in the construction works, are stored on grounds within the range of the railway line or on temporary storage grounds before transportation and use in embankment, as well as for recultivation purposes on the site.

The locations of the temporary grounds for storage of excavated earth (outside the range of the railway line) will be determined at a later stage and will be coordinated with the respective municipal administration, according to Art. 19, para. 1 of the WMA.

Grounds for temporary storage of aggregates and waste from construction works may be determined by the contractor (within the preparation and the scope of Management implementation Plan) in accordance with the tender documentation prepared by the Employer. The grounds for temporary storage are presented in the Waste Management Plan, coordinated and approved with the respective municipal administration and the respective Regional Inspectorate of Environment and Water (RIEW).

Regarding the requirements of the WMA, Art. 10, para. 6, it is necessary to be taken into account the future design stages and activities with the requirement that "... the Employer of design and construction works, with exception of closedown of construction, includes in the

conditions/requirements for the selection of a contractor and within the contracts obligations to the future contractors for the employment of recycled construction materials according to the requirements of the ordinance under Art. 43, para. 4 ..... ".

- **Collection, transportation and storage of waste during operation of the separate components 4, 5, 6, 7 and 8**

Different types of waste generated in emergency situations, accidents or derailments of train compositions have been scattered/spilled on and along the railway line. Spilled liquid waste will be collected by adsorbents.

Waste and agglomerates from waste and adsorbents should be collected in metal containers/ barrels and delivered for subsequent treatment based on written contracts to persons holders of a relevant document under Art. 35 of the Waste Management Act (WMA).

Spilled and discarded wastes along and around the railway line are in small quantities, most of them are scattered by the wind or washed away by the rain. Part of the waste remain around the area of the railway line. In order to be limited the contamination of the area along the railway line, respective services responsible for maintaining the spaces around and along the railway line will remove the accumulated solid waste, generated during the operation period of the line and will deliver them for subsequent treatment.

The disused fluorescent and mercury lamps are replaced with new ones, and the unusable ones are packed in the packaging of the new ones and stored temporary in metal container. The container is kept in an indoor warehouse with access only to a person in charge. The container has been inscribed in accordance with the requirements of the Ordinance on the Disposal of Electrical and Electronic Equipment (adopted by Council of Ministers Decree No.256/13.11.2013, promulgated in State Gazette No. 100/19.11.2013, in force since 1.01.2014), and the lamps are delivered for subsequent treatment, based on written contracts to persons holders of a relevant document under Art. 35 of the Waste Management Act.

Waste formed in the form of iron by the repairing of stations and stops and along the railway line will be collected at certain grounds until delivery for subsequent treatment based on written contracts to persons holders of a relevant document under Art. 35 of the Waste Management Act (Waste Management Act).

Disused tires (rubber pads) are formed during repair works along the railway line. The waste is collected in metal containers and is temporary stored on a certain ground until accumulation of surrendered quantities for subsequent treatment based on written contracts to persons holders of a relevant document under Art. 35 of the Waste Management Act (Waste Management Act).

Construction waste generated during the repair works along the railway line and on the building at stations and stops will be treated and transported by the Employer, the owner of Construction waste or another person pursuant to Art. 40 of the WMA and an Ordinance of the Municipal Council in accordance with Art. 22 of the Waste Management Act.

By the construction of the railway during the excavation works, will be generated negligible quantities of excavated earth. The generated waste will be collected and directly transported by the waste holder (the organization that carries out the repair), according to Art. 40 of the WMA and an Ordinance of the Municipal Council in accordance with Art. 22 of the Waste Management Act and disposed the waste at the regional landfill in coordination with the respective municipal authorities.

The waste generated during the period of operation, cleaned/removed of the railway line, including domestic waste, will be transported (by the organization in charge of the maintenance of the railway line) and shall be delivered for subsequent treatment, based on written contracts to persons holders of a document under Art. 35 of the Waste Management Act for each specific type of waste. Disposal of domestic waste should be done only at landfills and/or installations meeting the regulatory requirements regulated by the waste management legislation.

The organization responsible for the maintenance of the railway line shall provide containers for collection of waste and transportation of them to facilities for treatment.

In the period of operation of the railway line, the management of the waste is responsibility of NRIC.

➢ **Collection, transportation, recovery and storage of waste during closedown and recultivation**

By the realization of the investment proposal, waste from closedown and recultivation will be generated only under Component 6.

Waste will be generated by dismantling of contact wire and suspending devices, dismantling of reinforced concrete and metal pillars, dismantling of tracks, demolition of old ballast, dismantling of cables and devices from signaling and telecommunication systems along the existing railway line after commissioning of the new railway track between Yambol - Zimnitsa railway stations. By closedown of the existing line, the following wastes will be generated: metals, concrete, ballast prism, cables and domestic waste.

The dismantled rails and sleepers as well as old ballast are transported to pre-defined grounds for storage of construction materials and waste, in properties owned by the NRIC. The rails and sleepers as well as old ballast are graded, sieved, sorted and stored for reuse.

It is also possible to be generated hazardous waste from construction equipment, such as used hydraulic oils, gear oils, engines and gearboxes and brake and antifreeze fluids, oil filters and lead-acid batteries. Generated hazardous waste in emergency/unexpected replacement should be collected separately on the place of formation in closed metal drums/containers and should be delivered for subsequent treatment based on written contracts to persons holders of a relevant document under Art. 35 of the Waste Management Act (Waste Management Act).

Transport Plan for the transportation of waste. Necessity of grounds for waste storage

The Transport Plan for the transportation of construction waste should be coordinated with the Employer and the Contractor after the approval of the design, certain traces on the existing roads and grounds for waste storage and sites for the temporary storage of construction waste. Waste disposal sites will be also used in properties owned by NRIC. For the transportation of waste have to be used the service and existing roads.

The routes and the transport organization, incl. determining of locations of the grounds for treatment (recovery /disposal) of the construction waste will be coordinated with the respective municipal administration, in accordance with the Ordinance under Art. 22 of the WMA.

Impact assessment by waste storage

The impact of construction waste by storage on the environmental components is classified as insignificant and temporary over the construction period. Landfills for the temporary storage of construction waste, subject to the prescriptions and implementation of the proposed measures to prevent or reduce negative impacts on the environment components, do not result to a negative impact on clean air, soil, surface and groundwater and human health.

After the completion of the rehabilitation and modernization of the railway line, construction of a tunnel, bridges and other facilities/structures (overpasses, underpasses, culverts, drains, stops and railway infrastructure) and reconstruction of the facilities of other institutions, the waste storage sites, aggregates and humus layer and earth and rock will be cleaned and recultivation activities will be carried out.

Environmental Impact Assessment and impact on the human health

During the period of construction and the period of operation

The separate collection, transportation and pre-storage of the waste at the site where the waste is generated by realization (construction and operation) of the examined components of the

railway line Plovdiv-Burgas and the reconstruction of the facilities of other institutions and the delivery of the waste for subsequent treatment o based on written contracts to persons holders of a relevant document under Art. 35 of the WMA does not result to a negative impact on the components of the environment and human health.

During closedown and recultivation

The separate collection, transportation and pre-storage of the waste on the place of their formation by closedown and recultivation under Component 6 and the delivery of the waste for subsequent treatment based on written contracts to persons holders of a relevant document under Art. 35 of the WMA does not result to a negative impact on the components of the environment and human health.

7.7. Dangerous substances

In the territory that is going to be affected by the components which are the object of the investment proposal, there are no nearby industrial zones and warehouses for the storage of dangerous substances and pesticides. No industrial plants using dangerous substances have been found nearby.

In proximity to the territory of the single components of the investment proposal for the project: "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2", which area will be affected, have been found factories and/or facilities, classified according to Chapter Seven of the Environmental Protection Act (EPA), as such having "a high or low hazard potential", according to the letter Ref. No. OBOC - 83/12.02.2018 of the Ministry of Environment and Water (MEW), and the letter of the Regional Inspectorate of Environment and Water (RIEW), Burgas, Ref. No. ПД-205(5)/14.02.2018, covered by item 4.7 of the Environmental Impact Assessment Report (EIAR).

The factories and/or facilities situated near the investment proposal components 1 and 4 under consideration, are classified under the procedure of Chapter Seven of the EPA, as such having "a high or low hazard potential", after accounting for the safe distances determined by the operators in the reports on the policy for prevention of major accidents, and the reports on the safety near the existing routes of the Plovdiv-Burgas railway line.

No factories and/or facilities classified under the procedure of Chapter Seven of the EPA as ones with "a high or low hazard potential" were found close to the new tracks (on a new terrain) of components 5 and 6.

No use of dangerous chemical agents, preparations or products subject to prohibition is provided for the period of execution of the scheduled activities on the single components, comprising: Rehabilitation, including an insignificant displacement of the railway track in terms of axis and level, within the scope of the railway line; Modernization, including the construction of a new track and the Reconstruction of railway track switching systems (a change in the system of tracks) of a railway station.

During the period of construction for the transport and construction equipment will be used substances qualified as dangerous, mainly fuels – petrol, diesel oil, LPG, non-chlorinated motor oils and lubricating oils, grease, required to perform the activities of rehabilitation, reconstruction and modernization of the railway line and its facilities/structures, including also the reconstruction of facilities of other institutions.

No activities involving dangerous chemical agents shall be carried out during the period of operation of the Plovdiv-Burgas railway line.

During the period of closing down and recultivation (component 6) will be used the same dangerous substances as in the construction, mainly fuels and oils.

The chemical substances and mixtures that will be used during the construction, operation, and closing down and recultivation of the components under consideration of the Plovdiv-Burgas railway line, are classified according to their physicochemical, toxicological and ecotoxicological

properties, in compliance with the requirements of Regulation (EC) 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP).

Toxicological characteristics of fuels, used by transport vehicles, construction and installation equipment, during the construction of the components under consideration, and at closedown and recultivation under Component 6

Petroleum products – high concentrations of the hydrocarbons have a lethal effect. In smaller concentrations – headache, nausea and psychic excitement. The chronic intoxication causes functional disturbances.

At high concentrations of the vapours is possible a fulminant poisoning. There is a loss of consciousness and a fast transition to death, if the injured person remains in the poisoned atmosphere.

The alkanes (propane and butane) are pretty strong narcotics, but their effect on the human body dwindles because of their low solubility in the blood. At normal conditions they happen to be virtually innocuous.

Benzines – Low-boiling oil [A component combination of light hydrocarbons, with prevailing alcanes, naphthenic (cycloalcane) aromatic hydrocarbons and olefines. Length of the carbon chain in the interval of C4-C12. Boiling point within the range of 30°C to 220°].

Substances known to present a danger of toxicity to the people at inhalation, or which should be considered as causing a risk of toxicity when inhaled.

Health hazards: Corrosion/irritation of the skin. It can cause cancer. Mutagenicity with embryonic cells. Cancerogenicity, inhalation hazard.

Acute toxicity: Reproductive toxicity. Inhalation risk. The inhalation of high concentrations can cause vertigo, dizziness, headache, nausea and loss of coordination. The prolonged inhalation can lead to loss of consciousness. Irritating effect on the skin. It can bring about annoyance and can cause stomach pain, vomiting, diarrhoea and nausea. The evidence about people shows that this product has a very low acute oral, cutaneous or inhalation toxicity. Nevertheless it can cause a serious lesion, if it penetrates the liver in the form of a fluid, and can bring about a deep depression of the central nervous system at a prolonged exposure to high levels of evaporations.

Physical risks: Inflammable liquid

Environmental hazards: Hazardous to the aquatic environment, long-term danger for the aquatic environment. The product is not soluble in water and it will spread on the water surface, although some of the components will eventually precipitate in the aquatic systems. The volatile components of the product will spread to the atmosphere. Spontaneous decomposition is expected. It has the potential for bioaccumulation. It has a low potential for absorption into the soil. It is not a persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) substance or mixture. Toxic for the aquatic organisms, with long lasting effect. The product contains volatile organic compounds, which have a potential to synthesize photochemical ozone. On the whole the oil spills are hazardous to the environment.

Diesel

Fuels, diesel oil, gas oil – non-certified

[A component combination of hydrocarbons in the distillation of crude oil. It consists of hydrocarbons with a length of the carbon chain in the range of C9 to C20, and a boiling point of the order of approximately 163°C to 357°C.]

The inhalation of high concentrations of fumes can cause vertigo, dizziness, headache, nausea and loss of coordination. The prolonged inhalation can lead to loss of consciousness. The prolonged or multiple contact with the skin can cause erubescence, itching, irritation, eczema/cracking and fatty acne. The product ingredients can penetrate the body through the skin.

Health hazards: Corrosiveness, skin irritation. Cancerogenicity. Can cause damage to the liver. Suspected danger of cancer. Harmful: can cause lung damage if swallowed. The product

droplets aspired in the lungs by ingestion or vomiting can cause a serious chemical pneumonia. The professional exposure to the substance or the mixture can cause harmful effects on the health.

Acute toxicity: Acute toxicity at inhalation. Harmful if ingested: it can penetrate the lungs at ingestion or vomiting. The inhalation of high concentrations can cause vertigo, dizziness, headache, nausea and loss of coordination. The prolonged inhalation can lead to loss of consciousness. Can cause irritation and bring about stomach aches, vomiting, diarrhoea and nausea.

Physical risks: Inflammable liquid.

Environmental hazards: Hazardous to the aquatic environment, long-term danger for the aquatic environment. Toxic for the aquatic organisms, with long lasting effect. Can cause long lasting adverse effects to the aquatic environment. It is not a persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) substance or mixture.

Propane-butane

Liquefied petroleum gas under pressure. The direct contact with the liquid can cause freezing. If inhaled it can fast lead to suffocation. Thanks to its physical form, the product is not dangerous when inhaled.

Health hazards: Cancerogenicity. Can cause cancer. Can cause hereditary genetic lesions. Mutagenicity with embryonic cells. Can cause genetic defects. Can damage the fetus in pregnancy.

Acute toxicity: The inhalation of high concentrations can cause vertigo, dizziness, headache, nausea and loss of coordination. The prolonged inhalation can lead to loss of consciousness. Irritating effect on the skin. It can bring about annoyance and can cause stomach pain, vomiting, diarrhoea and nausea. The evidence about people shows that this product has a very low acute oral, cutaneous or inhalation toxicity. Nevertheless it can cause a serious lesion, if it reaches the liver in the form of a fluid, and can bring about a deep depression of the central nervous system at a prolonged exposure to high levels of evaporations.

Physical risks: Exceptionally flammable gas. It contains compressed gas; it can explode when heated.

Environmental hazards: Easy spontaneous decomposition. No bioaccumulation, and it is not a persistent, bioaccumulative and toxic (PBT) or highly persistent and very persistent and very bioaccumulative (vPvB) substance or mixture. It does not spread to the soil. The product is a volatile organic compound with the potential of forming photochemical smog.

Machine oils

Light gas oil containing petroleum distillates, treated by acids; Unrefined and semi-refined essential oils; (Component combination of hydrocarbons, resulting as raffinates when using methods for treatment with sulphuric acid. It consists of hydrocarbons with a length of the carbon chain of C15 to C30, and a finished product is derived with viscosity lower than 19cSt at 40°C). It containes relatively few normal paraffins.)

Health hazards: Skin irritation. Harmful at contact with the skin and when inhaled. Allergens. They damage the nervous system, the lung. Mutagenic and cancerogenic. They contain polycyclic aromatic hydrocarbons.

Acute toxicity: Serious lesion of the eyes. Serious irritation of the eyes. Transitional irritation at casual contact with the eyes. Little likely to cause skin damage at a short contact, but at prolonged contact or at repetitive exposition it could lead to dermatites. It is unlikely to be dangerous when ingested in small doses, but if larger quantities are swallowed, it could lead to nausea and vomiting. At normal ambient temperature this product is less likely to be dangerous at inhalation, because it has low volatility. It may be harmful when inhaled, provided the exposition to fumes, mist or vapours is the result of the decomposition of thermal insulation products.

Chronical toxicity: The combustion products, resulting from the operation of internal combustion engines, pollute the motor oils during the work. The used motor oils contain a lot of dangerous ingredients, which could potentially cause carconoma of the skin. The frequent or

prolonged contact with all kinds of used machine oils should be avoided, and a high degree of personal hygiene must be maintained as well.

Environmental hazards: Toxic for the aquatic organisms, with long lasting effect. A spill may form an oil film on the water surface, which could give rise to physical damage to the organisms. The oxygen transfer is impeded, too.

No risk is possible under normal conditions.

Grease

Lubricants; greases;

[A component combination of hydrocarbons, with a length of the carbon chain in the interval of C12-C50. It might contain organic alkali metal salts, alkali-earth metals and/or aluminium compounds].

The inhalation of the oil mist or oily vapours when the product is heated, irritates the respiratory system and causes coughing.

Health hazards: Cancerogenicity. Skin irritation. Allergic skin reaction. Serious eye irritation.

Products having penetrated beneath the skin under the effect of high pressure, might cause serious cellular lesion or subcutaneous mortification. Prolonged or frequent contact with the skin could cause erubescence, irritation, eczema, cracking. At a contact with the skin grease is not absorbed through the skin in acutely toxic amounts.

At eye contact it may cause temporary irritation of the eyes.

Environmental hazards: Toxic for the aquatic organisms, with long lasting effect.

Way of storage

During the rehabilitation, modernization and reconstruction of the railway track layout systems of the considered components of the Plovdiv-Burgas railway line, the construction and installation equipment will use as auxiliary materials fuels, machine oils and greases.

The maintenance of the machines shall be carried out in the base of the construction organization. The generated dangerous wastes at an emergency/unforeseen replacement shall be collected separately at the spot of generation (at the places of sojourn or on an established ground on the site) in closed metal drums/containers, and shall be transported in due time to the principal base of the organization contractor of the construction and erection works, and delivered for further treatment to legal entities which apply the waste management hierarchy.

Under the project of "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2", machine oils or greases shall not be stored on the construction sites of the single Components.

No activities involving dangerous chemicals shall be carried out during the period of operation of the Plovdiv-Burgas railway line.

Impacts

The implementation of the investment proposal comprises three periods of time, during which can be expected spills or leaks of dangerous substances in emergency and unexpected situations – during the construction and erection activities, during the period of operation of the railway line, and at closedown and recultivation (Component 6). At rectification of spills/leaks of dangerous substances is generated hazardous waste when cleaning the polluted area, covered by section 5, item 5.6.

D*uring construction, and closedown and recultivation*

No impacts are expected – storage of dangerous substances on the single construction sites is not envisaged.

Provided that the use of dangerous substances is done in compliance with the measures for prevention of accidents, leaks or spills, and for control of the exposition, supported by the relevant regulatory/administrative act, by the Safety Data Sheets and the instructions on the safe use, no adverse impacts on the environment or the people's health are expected.

During operation

No activities involving dangerous chemical agents shall be carried out during the operation of the Plovdiv-Burgas railway line.

7.8. Physical factors

The Investment Proposal refers to the rehabilitation and modernization of the Plovdiv-Burgas railway line, including eight components of various kinds of activities in the single sections of the railway line. The investment proposal implementation involves emission of noise to the environment during the periods of construction, operation, and closedown and recultivation.

The construction activities are related to the performance of various types of works in the eight components concerned: excavation, backfilling, shuttering, concreting, disassembly and erection, transport works. The source of noise emission to the environment during the execution of such works is the traditionally used construction plant and specialized equipment. The entire plant used is concentrated on the construction sites along the route of the railway line at the respective components, except the servicing transport vehicles.

The levels of the noise emitted by the main machines that will be used, are within a wide interval – from 70 to 105 dBA. In the EIAR for each component are described the scheduled types of works and the expected equivalent noise level near the respective operating machines.

The construction activity shall be carried out only during the daylight period. The report states the areas of noise impact, mainly the residential areas of the populated places, adjacent to the construction sites. The expected noise levels reaching them have been determined, as well as the expected values in excess of the quota for the respective type of territory, set forth in Ordinance No. 6 on the environmental noise indicators.

During the construction works the expected noise impact is negative, exceeding the regulatory requirements, but for a limited period of time (only during the daylight period). The EIAR puts forward measures for limitation (reduction) of the noise impact in the construction stage.

During the operation, the chief source of noise to the environment next to the railway line, is the rail transport on it. In the EIAR is determined the noise characteristic of the flow for the forecast year 2045.

The objects suffering noise impact from the railway traffic, are the nearby areas with normalized noise emission regime, situated along the railway line (components 4, 5, 6 and 7).

During the operation, as a basis for evaluation has been taken the strictest requirement – for the night time period. For the residential areas of some populated places, through or beside which the railway line passes – the villages of Rogosh, Manole, Belozem, Orizovo, Cherna Gora, Mihaylovo, Zimnitsa – the excess beyond the regulated noise threshold limit value for the night time period is between 2 dBA and 9 dBA. It has been emphasized about those sites, that noise protection facilities should be provided (noise protection screens/walls are appropriate for the purpose). The dimensioning of the noise protection facilities is an object of designing apart.

No noise impact above the norm is expected during the operation for the industrial zones of the populated places in proximity to the railway line, as long as the components under consideration are concerned.

By design, activities on closedown and recultivation are provided in component 6. There are no sites with normalized noise emission regime in that section nearby.

In the EIAR are given recommendations on the Own Monitoring Plan of the factor "Noise".

7.9. Landscape

⇨Description of the main characteristics of the landscape in the investment proposal area

The investment proposal is a section of the "Plovdiv-Burgas" railway line from the axis of the reception building of the Plovdiv station – km 0+000 to km 293+500 – to the axis of the Burgas station reception building.

According to the landscape zoning of Bulgaria, the route of the "Plovdiv-Burgas" railway line passes through parts of the following landscape areas and landscape subareas:

D. Intermountain zonal area of the lowlands and low mountains of southern Bulgaria

XIX Upper Thracian subarea;

XXII Bakajik-Hisarya subarea;

XXIII Burgas-Aytos subarea.

The relief has a predominantly flat and hilly morphographic character, whose altitude rises from south to north. Typical are the Chirpan heights, the low heights of Sarnena Gora between Stara Zagora and Nova Zagora, the Kermenski Vazvisheniya and the Bakajiks near Yambol, the Karnobat hollow bottom and the Hisarya heights, and to the east the Aytos Mountain.

The landscape characteristics in the investment project area are of mixed type – natural anthropogenic. The anthropogenic components of the landscape are expressed in the populated places, infrastructure sites, economic and forestry enterprises situated near the railway line. The landscape has undergone changes with respect to both its vegetation cover and its surface displacement. There is no entirely preserved pristine landscape within the trunk railway line area. The natural vegetation consists mainly of grasslands, and the broad-leaved trees prevail, without dominating the landscape. Plain to slightly hilly fields are dominating, covered substantially by grass and shrub vegetation, subjected to erosion processes. Of the anthropogenized landscapes are the settlement agglomerations and the agrolandscapes, which dominate.

Impacts

The adverse impact as a result of the execution of the investment proposal projects, will be expressed in several directions:

- physical removal of lands and soils;
- destruction of plant and animal habitats;
- change in the quality of the environment components.

The activities for implementation of the objects of the investment proposal will be related to two stages of landscape changes:

• **First stage** – it will be in the process of the civil works on the sites with:

- land acquisition of new territories for construction of the railway tracks;
- construction of the new overpasses, bridge facilities, a tunnel

and the involved insignificant changes in the relief, disturbances of lands and soils, plant and animal habitats.

- the collected construction plant for the execution of civil works, of excavation and backfill activities on the construction of the new railway lines and the other subprojects of the investment proposal, which will have a temporary impact on the landscape general condition.

• **The second stage** will be related to the operation of the railway line, with the brought in new technogenic elements of the landscape – linear structures, new bridges, overpasses, underpasses, etc. This phase will involve continuous changes in the condition of the environment, and visual changes in the landscape condition as a result of the railway line modernization. The technogenic structures will stand out against the background of the surrounding landscape, and will reproduce and enhance the urbanized environment.

Expected changes in the local landscape under the project components:

Component 1: "Design and construction of systems for signalling and telecommunication of railway line Plovdiv-Burgas".

All activities shall be carried out within the range of the railway line, without bringing in new technogenic elements to the landscape.

Without an impact.

Component 2: "Construction of overpasses/underpasses along the railway line Plovdiv – Burgas to replace existing level crossings"

The project envisages on the places of the existing level crossings – 31 level crossings to be removed, and 28 overpasses, 1 underpass and 1 pedestrian gangway to be built.

Period of construction

The execution of the projects will lead to an insignificant change in the existing landscape characteristics in the respective areas. The implementation of the projects involves the taking away of lands and soils totalling to 517.547 decares, and turning them into anthropogenic territories. The changes will consist in intervention into the organization of the territories, related to the removal of mainly agricultural lands, and to a smaller extent of plant habitats. Within the same range, the civil works will involve the removal of the present humus horizon, through which the soils function as a unique land accumulator and distributor of energy related to the humus and required for the normal exchange and circulation of substances in nature.

With the removal of the humus horizon will be entirely destroyed the present vegetation, including habitats of animal species. The vegetation cover within the range of the civil works is relatively uniform. The destruction of semi natural grass vegetation and forest vegetation will not be sizable, but it is unavoidable.

In the process of construction of the single projects, there will be an impact on the landscape also with the brought in construction plant for execution of civil works, as well as of excavation and backfill activities for the construction of the new overpasses, which will have a temporary effect on the general condition of the landscape. The time during which such impact will take place, will be relatively short and limited – until the civil works will last.

Period of operation

The impacts consist in impaired visuality for the permanently residing population – presence of new technogenic objects, increasing the anthropogenic character for the respective territory.

Component 3: "Planting of Protective Forest Belt along Chernograd-Aytos Open Line" for reliable protection of the railway track from adverse weather impact and as snowdrift retention – project 2015:

Section I – from km 244+060.00 to km 244+760.00 with a length L=700m

Section II – from km 245+365.00 to km 246+390.00 with a length L=1025m

The landscape character in these sections is completely flat. The windbreak shall be built parallel with the railway line, at a distance of 20 m from its axis, throughout the route. The belt width has been fixed to 8 m, according to the recommendatory 4 m with a 15 m distance of the belt, and 9 m with a 30 m distance. The belt structure has a growing height from the wind direction, and an abrupt lowering on the side of the railway.

For the erection of the windbreak according to the design are needed 41.010 decares, comprising: fields/arable land, permanent plantations, a local road. Between the two sections within the windbreak range happen to be 1.061 decares of pasture-ground/grassland. It is highly ruderalized for being used as unauthorized place for garbage dump.

Impacts:

Period of construction

Shrubs are scheduled to be planted on the side of the wind and trees on the side of the railway. The windbreak shall be built by planting two rows of trees with shrubs between them, and three rows of shrubs with descending height.

Period of operation

The impact is related to the bringing in of a new element into the structure of the local landscape, but with a positive impact, including limitation of the development of erosion processes in the adjacent areas.

Component 4: "Rehabilitation of Skutare-Orizovo railway Section"

The investment proposal is classified as repairs and restoration of the existing railway infrastructure.

The renovation of the railway 26 provides displacements on some spots of the design axis with respect to the existing one, by up to 150 cm, without disturbing the integrity of the range.

New technogenic elements are not going to be brought into the existing landscape.

Without an impact.

Component 5: "Modernzation of Orizovo-Mihaylovo railway Section – km 43+029 – km 80+722, project 2015.

The existing railway line in the section is 37 693 m long. The component has been developed for a single and double track. In the section from km 56+611 to km 61+033 the route leaves the existing range and it is on a new route with disturbances of 1545.445 decares. Furthermore the project provides the doubling of the existing single track line in the whole section from "Orizovo to Mihaylovo".

Construction of a tunnel facility (one-way tunnel) is planned along Railway 2 with a length L=835 m from km 57+750 to km 58+585 in the path "Orizovo – Mihaylovo" The tunnel crosses a height obstacle north of the town of Chirpan.

Impacts:

Period of construction

The implementation of the component necessitates new land disturbances in the amount of 2 674 decares, with elements of the landscape being disturbed – arable lands, grasslands, ravines, water courses, forest territories, but with no significant changes in the relief. The construction of the sites will lead to a change in the existing landscape characteristics in the respective territories. More sizable changes in the local landscape will take place on the lands of the town of Chirpan and the village Samuilovo, where forest territories are removed, of respectively 31.4 decares and 28.3 decares. At km 44+170.00 the existing bridge shall be suppressed, and in its place shall be built a new two-way reinforced concrete bridge. The building of 8 overpasses is planned; they will replace the existing level crossings.

Period of operation

The impact is related to the bringing of new technogenic objects into the structure of the local landscapes – new railway routes and the elements that go with them. The railway line operation will be related to the visual perception by the passengers of the new and old large facilities adjacent to it.

Component 6: "Modernization of Yambol-Zimnitsa Railway Section, at Zavoy Station".

Component 6 comprises 2,116 km of the Plovdiv – Burgas railway line. The activities involved in its implementation shall be carried out in the section from km 190+590 (new km 190+200) in the Yambol – Zavoy path to km 192+706 (new km 192+557), situated in the Zavoy –

Zimnitsa path. By its nature Component 6 consists in the building of a new route of the railway line, to include also a new crossing of the Tundzha River by a reinforced concrete bridge.

Section I (Open road) – From km 190+200 to the beginning of switch No. 2 (HC2 – km 191+693.11) from Zavoy station.

The railway line is new and in open road. There is a reinforced concrete bridge in that section, and in approximately the same place shifted to the right in the direction of movement, is designed a new one across the Tundzha river. It will be a five-span reinforced concrete bridge. The bridge length is 119 мм from km 191+401.02 to km 191+520.02. Tundzha River at the spot of its crossing with the railway line has its bed confined by dykes.

The construction of a smaller reinforced concrete bridge is planned at km 191+125, with a length of 10 m, with the aim of getting over a swampy area, and in this way there will be no drainage of the territory.

Section II (Zavoy station) – from km 191+693.11 to km 193+080. Zavoy station lies in that section. The newly designed railway coincides in its main part with the existing one and the railway line has been scheduled for a general overhaul.

Impacts:

Period of construction

For the implementation of the component are required according to the design 57.767 decares. From the natural elements of the landscape further to the removal of new lands to lay the track on, on the lands of the village Zavoy are affected 7.704 decares of pasture-ground/ grassland, and 9.517 decares of lumber producing forest, as well as changes in the banks of the Tundzha during the civil works on the new bridge facility. From km 190+200 to km 191+100, the railway line crosses a forest area, where 23.538 decares of forest are removed.

Period of operation

During the period of operation of the railway line the changes in the landscape will be related to the brought in new technogenic elements of the landscape – a new linear structure and the elements that go with it, of the two new bridge facilities.

This period will be associated with constant changes in the environment condition and visual changes in the landscape condition, as a result of the new railway section built and the facilities that go with it. The technogenic structures will stand out against the background of the surrounding landscape and will reproduce and enhance the urbanized environment.

Component 7: "Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the catenary Zimnitsa and Straldzha Stations";

Thorough renovation is scheduled of the existing catenary and reconstruction in connection with the introduction of new switches.

The project implementation does not involve disturbances of the landscape.

Without impact.

Component 8: „Rehabilitation of Straldzha - Tserkovski railway section".

For the implementation of the entire rehabilitation of the section of the „Straldzha – Tserkovski" railway section from km 217+210 to km 219+059 are scheduled shifts at places of the design axis with respect to the existing one, by up to 70 cm. All disturbances will be within the range of the railway line, carried out during the execution of the permanent works.

The project implementation does not involve disturbances of the landscape.

Without impact.

7.10. Cultural heritage – availability of cultural and architectural monuments within the scope of the investment proposal

The character of the investment proposal on "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2" implies that in the process of the planned rehabilitation and modernization of the railway line could be endangered or compromised mainly archaeological cultural values. The outcome of the explorations commissioned by the State Enterprise "National Railway Infrastructure Company" (SE"NRIC") and carried out in 2016, by specialists of the National Archaeological Institute with Museum – Bulgarian Academy of Science (NAIM-BAS), give the most complete idea of the presence of archaeological sites within the range along the project routes of the single components. The information on the known objects of cultural heritage has been supplemented also by other sources of information:

Component 1: No specialized investigations have been conducted. The inquiry in the Automated Information System – Archaeological Map of Bulgaria (AIS-AMB) has shown that within a general range of 400 m along the route of the railway line, from Plovdiv to Burgas there are about 230 archaeological sites.

Component 2: According to the opinion of the National Institute of Immovable Cultural Heritage (NIICH) in the lands of the populated places where civil works are about to be performed, have been registered altogether 128 archaeological sites. During the implementation of field research in the areas of the future overpasses it will be found out whether some of them will be endangered.

Component 3: It was found that within a distance of 260 m south of the railway line there is a settlement mound, which is not going to be directly endangered by afforestation initiatives.

Component 4: According to the opinion of the NIICH, no immovable cultural property has been registered in this section. The inquiry at the AIS-AMB however has shown that at least four archaeological sites are situated in dangerous proximity to the railway line.

Component 5: According to the scientific report by the NAIM-BAS along the route have been registered 11 archaeological sites, which will be endangered to various extents by the future construction activities.

Component 6: During the research carried out by the NAIM-BAS in this section it was found that the railway line passes through the territory of one archaeological site.

Component 7: The research carried out by specialists of the NAIM-BAS in the railway tation areas has not found endangered archaeological sites.

Component 8: According to the scientific report by the NAIM-BAS no archaeological sites have been registered in this section.

Impact forecast

A considerable danger of upsetting the integrity of some cultural property is posed by the construction works, and first of all the so called earth works. The degree of threat to the archaeological sites depends also on their specificity – type, chronology, cultural layer thickness, presence of architectural elements, the parameters of the security zones, etc.

As a result of the preliminary analysis of the expected negative impacts in the construction of the single components, it was clarified that every one of them may be a potential danger to cultural property.

Component 1:

During the construction works. Since this investment proposal is going to develop entirely in the range of the existing railway line and its facilities, the risk for a new disturbance of the integrity of the known archaeological sites is minimal.

The operation of the signalling and telecommunication systems is not going to produce direct negative effect with respect to the cultural property.

Component 2:

During the construction works. There is a real danger of threatening archaeological cultural property.

The operation of the overpasses and the underpasses is not going to produce direct negative effect on the cultural property.

Component 3:

During the afforestation. There is some risk of affecting unknown archaeological cultural property.

Component 4:

During the rehabilitation. This activity shall develop entirely in the range of the existing railway line, and the probability for the integrity of the archaeological sites to be disturbed is not high.

The operation of the railway line is not going to produce direct negative effect on the cultural property.

Component 5:

During the modernization. The construction of a section of the railway line on a new route and the doubling of the existing single-track line will endanger to various extents 11 archaeological sites.

The operation of the railway line is not going to produce direct negative effect on the cultural property.

Component 6:

During the construction of a new railway track. The construction will certainly disturb the cultural stratification of one archaeological site.

The operation of the railway line is not going to produce direct negative effect on the cultural property.

At recultivation the activities related to the entry into the soil layer may endanger archaeological structures or a cultural stratum.

Component 7:

During the reconstruction and rehabilitation. Since this investment proposal will develop entirely in the range of the existing railway line and the stations, the risk for disturbance of the integrity of the known archaeological sites is minimal.

The operation of the railway stations is not going to produce direct negative effect with respect to the cultural property.

Component 8:

During the rehabilitation. The danger of disturbance of the integrity of the known archaeological sites is minimal.

The operation of the railway line is not going to produce direct negative effect with respect to the cultural property.

The measures to prevent negative impacts on the cultural heritage sites must be taken prior to the commencement and during the execution of the construction works. For some of the components a part of the legally defined protection measures have already been fulfilled. The implementation of each component could to various extents endanger cultural property.

Component 1:

Because of the large number of potentially endangered sites it is necessary for archaeologists to carry out monitoring during all phases of construction involving excavation works.

Component 2:

Prior to the commencement of the construction activities it must be determined whether within the range of every one of the 30 designed overpasses/underpasses there are tracks of archaeological sites. For this reason it is obligatory prior to the commencement of the construction to carry out preliminary archaeological exploration. Depending on the results, specific measures shall be determined for protection of each endangered site, including the performance of rescue excavations before the beginning of the construction works.

Component 3:

As there is a probability during the afforestation works for some unknown archaeological sites to be impacted, it is necessary to conduct such works under the supervision of an archaeologist.

Component 4:

The probability for the integrity of the archaeological sites to be disturbed during the execution of this investment proposal is not high, but due to the ascertained high saturation with archaeological sites in the area, the construction works should be carried out under the supervision of an archaeologist.

Component 5:

In 2016 was carried out archaeological exploration along the new route and the existing one of this section of the railway line, as a result of which it was found that 11 archaeological sites are going to be endangered to various extents. The railway line passes through the territory of six sites under the numbers 2, 4, 5, 6, 9 and 11. The scientific report requires for those sites to be conducted preliminary rescue excavations in a limited area within the range. For other three sites under the numbers 3, 8 and 10, which are going to be impacted on the periphery, has been imposed the measure of archaeological monitoring. The last two sites under the numbers 1 and 7 shall not be threatened directly. Their condition shall be controlled while conducting archaeological monitoring along the route of this section, as provided for in the scientific report.

Component 6:

It was found that the railway line passes through the territory of one archaeological site. This necessitates for rescue excavations to be carried out within the range. Conducting archaeological monitoring during the construction works and recultivation in the whole section is also planned.

Component 7:

Due to the possibility for the integrity of an unknown site to be disturbed, it is recommended to carry out archaeological monitoring of the construction works.

Component 8:

Probability exists for an unknown site to be threatened and that is why in the scientific report is set out a measure for protection and archaeological monitoring during the construction throughout the section.

All protection steps set out in the scientific reports from the conducted archaeological exploration in various sections of the Plovdiv-Burgas railway line meet the requirements of the Cultural Heritage Act (CHA). The measure of preliminary archaeological monitoring prior to the implementation of the investment projects is set forth in Art. 161, paragraph 1 of the CHA. It should be applied to component 2. Archaeological rescue excavations prior to the commencement of the construction must be carried out on six sites of component 5 and on one of component 6. This protection measure is set forth also in Art. 161, para. 1 of the CHA. Monitoring by archaeologists must be conducted during any activities involving excavation works along the entire length of all sections of the railway line, which are the single components. Furthermore constant monitoring by archaeologists shall be carried out also on the areas of three of the registered sites in the section of component 5. In this way it will be found out whether unregistered archaeological sites or structures will be affected, whose specifics do not allow to localize them at nondestructive testing. Such action is required by the provisions of Art. 161, para. 2 of the CHA.

It is possible while conducting excavation or construction works to come across an archaeological site, not registered before, due to its features. Such case must be handled in compliance with the requirements of Art. 160, para. 2 of the CHA.

7.11. Health and hygiene aspects

The investment proposal for the project: "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2" is a large-scale undertaking, which should be assumed as an investment project of particularly high national and European importance.

The main goal in terms of health care in the implementation of the project is to provide safety to both the traffic on the railway track and the population living nearby, under a proved and a predicted high intensity of the railway traffic.

The hygienic expert analysis has proved that the envisaged activities on rehabilitation and modernization of the railway line on the eight single components, conformed to the requirements for such kind of facilities, and by taking the necessary steps for protection, will not lead to a significant change in the health status of the population, and the risk for the health can be predicted as low.

The new and better technical parameters of the railway route compared with the existing railway, will contribute to a more even and efficient movement of the train compositions, whereby the increase of the noise, dust and toxic chemical emissions is virtually avoided. This will have beneficial influence on the sanitary and hygienic conditions of the natural environment, and on the living environment of the population.

The implementation of the aforesaid investment, provided modern, environment friendly machines and equipment are used, and on the other hand by adhering to the recommendations made with respect to the care of the health of the workers and the population, no worsening is expected of the health status of the area residents throughout the railway route, and of the people working on the high speed railway line "Plovdiv-Burgas".

A conclusion can be drawn that in the conditions of correct operation, the investment proposal is not expected to jeopardize the health condition of the population of the area in proximity to the railway line, for the eight components both during the construction and during the operation of the railway line.

From a communal hygiene perspective the positive facts should be taken into consideration, too:

- The rehabilitation and modernizazion of the railway line will take place in relatively inhabited areas and populated places;
- For the construction and erection works shall be used state-of-the-art technology and plant;
- In the operation of the high speed railway line will not be used diesel traction locomotives.

7.12. Cumulative effects

7.12.1. Atmospheric air

No cumulative effect is expected during the realization of the components of the investment proposal on "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2". In the construction of the fiber optic cable, of signalling systems, and in the introduction of station interlocking systems, is not expected a cumulative effect, considering the character of the scheduled activities and the insignificant earth moving works with a small excavator (trench dimensions – 0.6 x 0.3 x 1.1 (depth)) for the laying of the fiber optic cable. When overpasses are built (component 2) during the execution of the construction works on components 6 and 7, no cumulative effect is expected in the residential areas. The overpass at km 192+625 (component 6) is 450 m distant from Zavoy village. The overpass at km 219+390 (component 7) is near the industrial zone. The construction activities on the other components shall be completed before the deadline for construction of the overpasses on component 2.

No cumulative effect is expected either during the operation of the components of the investment proposal, sections of the electrified railway line Plovdiv – Burgas. As the atmospheric air pollution with respect to the Fine Dust Particles10 will be due basically to the road sections which the railway line crosses, and not to the railway line itself, simulation was carried out only for the components with rehabilitation, modernization, and a new route of the railway line being planned.

The nearest industrial sites around the routes of the railway line, which are going to have a cumulative effect, are several large deposits of underground natural resources, as follows: - a deposit of sand and gravel for concrete aggregates "Kaloyanovets", with the sections "Dartata

Koriya" and "Smetishteto", about which a commercial discovery has been issued; - the deposit "Svoboda" in operation; - the deposit "Volovarovo"; - the deposit "Trilistnik", section "Trilistnik Sever" for uranium ores (the deposit has been liquidated). However the power (the thickness?) of the dust emission sources from the deposits is of extents higher than those of the railway line, for which reason they have not been taken into account in the considerations about the effect of the insignificant emissions along the route.

The pollution of the air near the ground with the electrically driven train compositions, although being commensurate, is minimum and lower than the fine dust particle (soot) pollution from road sections. That is why only the cumulative effect of the railway line with "Trakia" motorway has been valuated in respect of fine dust particles (FDP10). Data on the forecast intensity of the automobile traffic on "Trakia" motorway for the year 2035 has been used from the section Stara Zagora – Nova Zagora (Lot 2 of "Trakia" motorway); - section Nova Zagora – Yambol (Lot 3 of "Trakia" motorway); - section Yambol – Karnobat (Lot 4 of "Trakia" motorway).

7.12.2. Noise

During the construction

At the crossing of a railway line with a road (from the national and municipal road networks), the noise emitted by the construction machinery is determining for the nearby sites with normalized noise regime.

During the operation

When the railway line crosses roads (from the national and municipal road networks), cumulative impact can be expected on closely situated sites with normalized noise regime, from the superposition of the noise emited by the two transport flows – rail and road ones. The now existing level crossings shall be replaced by overpasses, whose locations are indicated in the design.

In the section of Component 4 are planned two overpasses on the territories of populated places: at the village Manole (km 21+850) and the v. Belozem (km 32+000) – crossing with streets in the villages. The noise characteristic of the railway transport, during the night time period, in the populated places, is 63.8 dBA, which is considerably higher than that of the road transport on the respective streets of both villages. Under these conditions no cumulative effect is expected on the residential areas, near the overpasses, as the railway transport noise is the determining one.

In the section of Component 5 is scheduled an overpass on the territory of the village Mihaylovo (km 85+083) – crossing with the municipal road SZR 1190 on the territory of the village. There is no information about the traffic load on the municipal road. In the most general case, the noise characteristic of the transport flows, for the municipal roads, is approximately 60 dBA for the daylight period, and up to approx. 50 dBA for the night time period, at an average movement speed of 50 km/h. The noise characteristic of the railway transport, during the night time period, in the populated places, is 63.8 dBA, which is considerably higher than that of the road transport on the municipal road. Under these conditions no cumulative effect is expected on the residential areas, in close proximity to the overpass, since the noise from the railway transport is the determining one. About the residential areas situated next to the municipal road, after the overpass, can be expected a minor cumulative effect (up to 0.5 dBA) from the superposition of the noise coming from both sources (parallel with one another), with the noise from the railway transport as the determining one.

7.12.3. Population and human health

The main factors influencing the health of the population and the workers in the Investment Proposal are the dust and the noise, and they are dealt with in detail below

No cumulative effect is expected during the construction of the components of the investment proposal on "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2".

No cumulative effect is expected either during the operation of the components of the investment proposal, sections of the electrified railway line Plovdiv – Burgas.

The supposed cumulative effect *of fine dust particles* is from the railway route and "Trakia" motorway. From the presented distribution of the isolines of the FDP10 concentration on the ground when assessing the cumulative effect at all subsections, it becomes evident that there are no zones with a concentration in excess of 100% of the Average Annual Rate for protection of the human health (0.04 mg/m3). Pollution of the air on the ground beyond the rate is not expected for sulphur oxides (the average daily rate for protection of the human health is 0.125 mg/m3).

Example: The reported maximum concentration of FDP10 with the joint effect from the railway line in component 6 (subsection Zavoy – Zimnitsa – Straldzha) and "Trakia" motorway, is 0.00306 mg/m3 at an average annual rate for protection of the human health (AARPHH) of 0.04 mg/m3 or up to 7 - 8% of the rate.

Cumulative effect from another harmful factor – noise:

During the construction

At a crossing of the railway route with roads (from the national and municipal road networks), the noise emitted by the construction equipment is determining for the nearby siutes with normalized noise regime.

During the operation

At a crossing of the railway route with roads (from the national and municipal road networks), a cumulative effect can be expected on sites with normalized noise regime located nearby, from the superposition of the noise emited by the two transport flows – rail and road ones. In component 5 in the section of village Mihaylovo, on the residential areas located next to the municipal road, after the overpass, can be expected a minor cumulative effect (up to 0.5 dBA) from the superposition of the noise coming from both sources (parallel with one another) with the noise from the railway transport as the determining one.

Example:

In the section of Component 4 are planned two overpasses on the territories of populated places: at the village Manole (km 21+850) and v. Belozem (km 32+000) – crossing with streets in the villages. The noise characteristic of the railway transport, during the night time period, in the populated places, is 63.8 dBA, which is considerably higher than that of the road transport on the respective streets of both villages. Under these conditions no cumulative effect is expected on the residential areas, near the overpasses, since the noise from the railway transport is determining.

8. Description of the probable major consequences from the impacts of the investment proposal on the environment

- **Construction and operation of the investment proposal, including from the activities of demolition, destruction and decommissioning, if applicable**

The various stages of implementation of the investment proposal are described in detail in item 2 of this Report of the Environmental Impact Assessment (EIA).

The likely consequences from the impact of the Investment Proposal on the environment, ensuing from the implementation of the various stages, are examined in detail in Section 5 of the EIA Report.

- **Utilization of the natural resources, in particular of the bowels of the earth, soil, water and biodiversity, considering as much as possible, the sustainable presence of such resources**

Water

The use of water during the construction is limited, and is related to the requirement for compaction of the embankments and suppression of the dust formation. A limited quantity is used

for rooting of trees and shrubs at the windbreak (component 3). For domestic needs are used legally regulated amounts, which are accounted for according to the contract with the water supplier.

Bowels of the earth

The necessary excavated material – for embankments they exceed the volume of the excavated earth at the components 2 and 6, and are presented in table No. 5.3.1. – 1 of the EIA Report. Their delivery shall be carried out, according to the requirements for quality of such material, by external suppliers.

Soils

The implementation of **Components 1, 4, 7 and 8** involves disturbances in the range of the rail line in lands and soils which have undergone disturbances during the permanent works on the railway line, and for them is not required additional appropriation of land.

For the Components 2, 3, 5 and 6 the scheduled activities are related to acquiring new lands and appropriating them from the land fund.

⇨ Component 2. Construction of overpasses/underpasses along the railway line Plovdiv-Burgas to replace of existing level crossings.

The project has planned on the places of existing level crossings – suppression of 31 level crossings and construction of 28 overpasses and 1 underpass and 1 pedestrian gangway.

TOTAL OF DISTURBED LANDS FOR THE COMPONENT – 517.547 decares

⇨ Component 3. Planting of Protective Forest Belt along Chernograd – Aytos Open Line".

A snow protection windbreak is planned to be erected in the "Chernograd - Aytos" path in order to provide reliable protection of the railway from adverse wind impacts during the winter months.

TOTAL OF DISTURBED LANDS FOR THE COMPONENT – 41.010 decares

⇨ Component 5. Modernisation of the railway section "Orizovo – Mihaylovo"

The route is scheduled to be changed in the section from km 56+611 to km 61+033, and land appropriations are required. The project provides for the doubling of the existing single track line throughout the section from Orizovo to Mihaylovo.

TOTAL OF DISTURBED LANDS FOR THE COMPONENT – 2 673.824 decares

⇨ Component 6. Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station."

By its nature Component 6 is construction of a new route of the railway line, including also another crossing of Tundzha River with a reinforced concrete bridge.

TOTAL OF DISTURBED LANDS FOR THE COMPONENT – 57.764 decares

Plant kingdom

⇨ Component 1: "Design and construction of systems for signalling and telecommunication of railway line Plovdiv-Burgas"

- Construction of optic fiber cable of Plovdiv – Burgas line – project 2016.

Impacts

The activity is related to disturbances in the easement of the railway line in lands and soils which have undergone disturbances during the construction of the railway line. Grass vegetation is secondary derivative, with many ruderal species. At places can be seen shrub species.

The impact is defined as having low degree of significance.

- Construction of signalling systems along Plovdiv – Burgas railway line (ETCS level 1, version 2.3.0d) - project 2016.

The system implementation does not involve impact on the component. **Without an impact**.

- Introduction of computer-based interlocking systems in railway stations in the section Plovdiv – Burgas - project 2015 and 2016.

The system implementation does not involve impact on the component. **Without an impact.**

⇨ Component 2. Construction of overpasses/underpasses along the railway line Plovdiv-Burgas to replace of existing level crossings.

The project provides on the places of existing level crossings – suppression of 31 level crossings and construction of 28 overpasses, 1 underpass and 1 pedestrian gangway.

Impacts

The impacts from the implementation of the investment proposal on the plant component will involve permanent disturbance of the areas of the plant communities within the construction sites. As most of the sites are among long cultivated farmland and territories around settlements, therefore the synanthropic and ruderal vegetation in the affected areas is abundantly represented. The species diversity of the various grasses in the grasslands is relatively poor, with prevailing participation of the formations of bulbous bluegrass (*Poaeta bulbosae*) and Volga fescue (*Festuceta valeiaca*), growing on trampled terrains from the grazing of the farm animals, with worsened water balance. In those territories the grass vegetation is entirely derivative, secondarily formed, anthropogenically affected. Most plant communities and the species that make them up, are widespread for the most part of the territory, and there is no probability for them to disappear. In the affected forest territories/lumber producing forests, the forest cenoses are largly subjected to periodic felling.

By the construction of the new overpasses are acquired tracts of grassland in the amount of approx. 44.2 decares, and forest territories – 15 decares. In the range of some of the overpasses fall also drainage canals on an area of 9.2 decares, at places with reed overgrowth.

The impact is defined as having low degree of significance.

⇨ Component 3. Planting of Protective Forest Belt along Chernograd – Aytos Open Line" – project 2015.

The erection of a snow protecting windbreak in the „Chernograd – Aytos" path is planned from km 244+060 to km 246+390, with the purpose of providing reliable defence of the railway from the adverse effect of the wind during the winter months. The area subject to afforestation is situated in the lands of village Topolitsa (29.853 decares) and v. Chernograd (11.175 decares). It shall be erected parallel with the railway line, to the left in the direction of movement

Impacts

The erection of the windbreak is in arable lands, and between the two sections is affected grassland of 1.061 decares. The grass vegetation is highly ruderalized. The place has been used as unauthorized place for garbage dump. The windbreak erection will have positive effect not only with regard to the restriction of the wind erosion and the impeding of the train traffic during the winter months, but also in terms of enriching the plant diversity in the specific area.

In the dendrological list of the shrub species scheduled for planting, is included the invasive species black acacia. It has to be replaced by another local species.

The impact is defined as having low degree of significance.

⇨ Component 4: "Rehabilitation of Skutare-Orizovo railway Section" - project 2015.

It covers the section from km 16+905 to km 43+030. The investment proposal is classified as repair and restoration of the existing railway infrastructure.

Impacts

At the renovation of the railway line in several places there will be displacements from the existing axis and replacement of 490 poles, and all those activities will be carried out in the easement area of the railway line. The vegetation is herbaceous, of secondary origin under the effect of the periodically conducted supporting activities in the easement area.

The impact is defined as having low degree of significance.

⇨ Component 5. Modernisation of the railway section "Orizovo – Mihaylovo"– km 43+029 – km 80+722, project 2015.

The existing route in the section is 37 693 m long. For the section from km 56+611 to km 61+033 the new route leaves the existing easement area and is developing on a new terrain.

Impacts

For the implementation of the component are disturbed 2 673.8 decares of land, most of it arable land, covered by agrocenoses. The disturbances of pasture-ground/grassland are in six sections, with a total area of 134.6 decares. The plant communities belong mainly to the formations of the bulbous bluegrass, Volga fescue, bluestem. They have secondary origin. The plant communities and the species that make them up are widespread in the area and there is no probability for them to disappear. Among the various grasses no species have been found to be subject to protection.

The affected forests with the area of 83.5 decares, are forests in agricultural lands, lumber producing forests, of coppice type and subject to a strong anthropogenic impact.

The bridge at km 44+170.00 exists and shall be suppressed, and in its place shall be built a new two-way reinforced concrete bridge. Within the range of the construction (approx. 4.6 decares) is impacted a riverside community of willows (Salix alba, S. fragilis), with the participation of black poplar (Populus nigra) and common oak (Quercus robur).

The negative impacts on the vegetation, caused by the construction of the projects, will consist in:

- Direct destruction of plant habitats within the rail line range;
- Fragmentation of habitats – on the crossings of forest territories and pasture-grounds.

The impact is defined as having medium degree of significance.

⇨ Component 6. Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station."

Component 6 covers 2,116 km of the "Plovdiv – Burgas" railway line. By its nature Component 6 consists in the construction of a new route of the railway line, to include also a new crossing of the Tundzha River by a reinforced concrete bridge with a length of 119 m, and a smaller reinforced concrete bridge with a length of 10 m.

Impacts

In section I - from km 190+200 to km 191+100 the new route of the railway line affects the peripheral part of a forest (23.538 decares) dominated by a natural formation на common oak. The construction of the new five-span reinforced concrete bridge over Tundzha River is in a place where the river bed is confined by dykes. The banks are with willow and poplar overgrowth, with luxuriant undergrowth of coppice type and grass vegetation. An area of 5 decares is affected.

The implementation of the component in section II involves disturbances in grassland on an area of 7.7 decares, highly ruderalized, and the shrub vegetation with prevalence of Paliurus,

occupies nearly half of the pasture-ground. The affected forest section on an area of 9.5 decares, is lumber producing forest, of coppice type.

The impact is defined as having medium degree of significance.

⇨ Component 7: "Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the catenary Zimnitsa and Straldzha Stations"- prliminary design 2015

The project implementation does not involve disturbances of vegetation.

Without an impact.

⇨ Component 8: „Rehabilitation of Straldzha - Tserkovski railway section" in the section from km 217+210 to km 219+059, detailed design 2017.

For the implementation of the thorough rehabilitation of the section of the railway stretch „Straldzha – Tserkovski" from km 217+210 to km 219+059, are planned displacements at some spots of the design axis with respect to the existing one by up to 70 cm. All disturbances will be in the range of the easement area, made during the permanent works. The disturbance of the grass habitats will be in the range of the easement area, where they are anthropogenically affected.

The impact is defined as having low degree of significance.

Landscape

The unfavourable impact on the landscape as a result of the implementation of the investment proposal projects, will be expressed in several directions:

- physical removal of lands and soils;
- destruction of plant and animal habitats;
- change in the quality of the environment components.

Expected changes in the local landscape on the project components:

Component 1: "Design and construction of systems for signalling and telecommunication of railway line Plovdiv-Burgas"

All activities shall be carried out in the easement area of the railway line, without bringing new technogenic elements in the landscape.

Without impact.

Component 2. Construction of overpasses/underpasses along the railway line Plovdiv-Burgas to replace of existing level crossings.

The project provides in the places of existing level crossings – suppression of 31 railway level crossings and construction of 28 overpasses, 1 underpass and 1 pedestrian gangway.

Period of construction

The construction of the projects will lead to a minor change in the existing landscape characteristics in the respective territories. The implementation of the projects involves the removal of lands and soils for a total amount of 517.547 decares, and their transformation into anthropogenic territories. The changes will consist in interference in the organization of the territories, related to the subtraction of mainly agricultural lands, and to a lesser extent of plant habitats in the affected tracts of the grasslands and the woodlands.

In the process of construction of the single projects, the brought in construction plant for execution of construction works as well as of excavation and backfilling works, will also affect the landscape during the construction of the new overpasses, which will have a temporary impact on the general condition of the landscape. The time during which such impact will take place, will be relatively short and limited – until the construction works are under way.

Period of operation

The impacts consist in impaired visuality for the permanently residing population – the presence of new technogenic objects, increasing the anthropogenic character for the respective territory.

Component 3. Planting of Protective Forest Belt along Chernograd – Aytos Open Line" – project 2015:

Section I – from km 244+060.00 to km 244+760.00 with a length L=700 m

Section II – from km 245+365.00 to km 246+390.00 with a length L=1025 m

The landscape character in these sections is completely flat. The windbreak shall be built parallel with the railway line, at a distance of 20 m from its axis, throughout the route. The belt width has been fixed to 8 m, according to the recommendatory 4 m with a 15 m distance of the belt, and 9 m with a 30 m distance. The belt structure has a growing height from the wind direction, and an abrupt lowering on the side of the railway.

For the erection of the protective windbreak according to the project are needed **41.010 decares,** affecting: fields/arable land, orchards, local road. Between the two sections in the windbreak range are 1.061 decares of pasture-ground/grassland. It is highly ruderalized for being used as unauthorized place for garbage dump.

Impacts:

Period of construction

The windbreak shall be built by planting two rows of trees with shrubs between them, and three rows of shrubs with descending height. The planting of the trees shall be performed with 3-6 year saplings in 50/50/50 holes, and of the shrubs with 3-year old ones in 40/40/40 holes. The species composition has been selected in conformity with the local conditions, the height and the thickness of the crown.

Period of operation

The impact is related to the bringing in of a new element into the structure of the local landscape, but with a positive impact, including limitation of the development of erosion processes in the adjacent areas.

Component 4: "Rehabilitation of Skutare-Orizovo Railway Section"

The investment proposal is classified as repairs and restoration of the existing railway infrastructure.

The renovation of the railway provides displacements on some spots of the design axis with respect to the existing one, by up to 150 cm, without disturbing the integrity of the range.

New technogenic elements are not going to be brought into the existing landscape.

Without impact.

Component 5. Modernisation of the railway section "Orizovo – Mihaylovo"– km 43+029 – km 80+722, project 2015.

The component has been developed for a single and double track. In the section from km 56+611 to km 61+033 the route leaves the existing easement area and is on a new route with disturbances of 1545.445 decares. Furthermore the project provides the doubling of the existing single track line in the whole section from "Orizovo to Mihaylovo".

The key point for the route is the crossing with "Trakia" in the existing road overpass at km 56+514. With the new route the crossing shall be done by making use of the existing facility. This firm point and the regulatory restrictions on a design speed of 160 km/h do not make it possible to join the existing route after the intersection, and necessitate the construction of a tunnel (L=835 m) and bypass of the town of Chirpan all along the new route. Construction of a new tunnel facility is scheduled (one-way tunnel) along Road 2 with a length L=835 m from km 57+750 to km 58+585 in the "Orizovo to Mihaylovo" interstation path. The tunnel crosses a height obstacle north of the town of Chirpan.

S***ection Orizovo station – Cherna Gora halt, from km 43+029 to km 56+968.670***

The new route is optimized and follows the existing one with minimum deviations. The route departs from the existing one on a completely new direction in the section from km 52+300 to km 56+563 – L=4 263 m. A key point is the existing overpass of "Trakia" motorway (km 56+557).

Section Chirpan Bypass

In the section the two roads separate as single railway lines at Beginning Bypass - km 56+919 (Road 2). The route of Road 1 (Vпр=80 km/h) passes through the town of Chirpan and has a total length L=5 842 m (from km 56+916.11 to km 62+757.86).

Section End Bypass (km 60+970- Road 2), from km 61+100.00 to km 76+500.00

A key zone in the section is the disturbed territory and the quarry for building materials located in it, owned by "KAOLIN" AD, before Svoboda station. The new route bypasses the quarry to the south of it, Svoboda station is reconstructed into a halt and is shifted to a new place south of the existing station.

Impacts:

Period of construction

The implementation of the component necessitates new land disturbances in the amount of 2 674 decares, with elements of the landscape being disturbed – arable lands, grasslands, ravines, water courses, forest territories, but with no significant changes in the relief. The construction of the sites will lead to a change in the existing landscape characteristics in the respective territories. More sizable changes in the local landscape will take place on the lands of the town of Chirpan (km 60+000 – km 60+800) and the village Samuilovo (km 73+500 – km 74+500), where forest territories are removed, of respectively 31.4 decares and 28.3 decares. At km 44+170.00 the existing bridge shall be suppressed, and in its place shall be built a new two-way reinforced concrete bridge. The building of 8 overpasses is planned; they shall replace the existing level crossings.

Period of operation

The impact is related to the bringing of new technogenic objects into the structure of the local landscapes – new railway routes and the elements that go with them. The railway line operation will be related to the visual perception by the passengers of the new and old large facilities adjacent to it.

Component 6. Modernization of Yambol – Zimnitsa Railway Section, at Zavoy Station."

By its nature Component 6 consists in the building of a new route of the railway line, to include also a new crossing of the Tundzha River by a reinforced concrete bridge.

The total length of the railway is divided in 2 specific sections:

Section I (Open road) – From km 190+200 to the beginning of switch No. 2 (HC2 – km 191+693.11) of Zavoy station.

The railway line is new and in open road. There is a reinforced concrete bridge in that section, and in approximately the same place shifted to the right in the direction of movement, is designed a new one across Tundzha river. It will be a five-span reinforced concrete bridge. The bridge length is 119 m from km 191+401.02 to km 191+520.02. Tundzha River at the spot of its crossing with the railway line has its bed confined by dykes. Provision has been made also for a place where rural roads shall pass on both sides of the river – a one-span bridge with a 10 m span, two culverts with 4 m holes, one passage for small animals. The construction of a smaller reinforced concrete bridge is also planned at km 191+125, with a length of 10 m, with the aim of getting over a swampy area, and in this way there will be no drainage of the territory.

Section II (Zavoy station) – from km 191+693.11 to km 193+080. Zavoy station lies in that section. The newly designed railway coincides in its main part with the existing one, and the railway line has been scheduled for a general overhaul.

Impacts:

Period of construction

For the implementation of the component are required according to the project 57.767 decares. From the natural elements of the landscape further to the removal of new lands to lay the track on, on the lands of the village Zavoy are affected 7.704 decares of pasture-ground/grassland, and 9.517 decares of lumber producing forest, as well as changes in the banks of Tundzha river during the civil works on the new bridge facility. From km 190+200 to km 191+100, the railway line crosses a forest area, where 23.538 decares of forest are removed.

Period of operation

During the period of operation of the railway line the changes in the landscape will be related to the brought in new technogenic elements of the landscape – a new linear structure and the elements that go with it, of the two new bridge facilities.

This period will be associated with constant changes in the environment condition and visual changes in the landscape condition, as a result of the new railway section built and the facilities that go with it. The technogenic structures will stand out against the background of the surrounding landscape and will reproduce and enhance the urbanized environment.

⇨ Component 7: "Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the catenary Zimnitsa and Straldzha Stations"

Thorough renovation is scheduled of the existing catenary and reconstruction in connection with the introduction of new switches.

The project implementation does not involve disturbances in the landscape.

Without impact

Component 8: "Rehabilitation of Straldzha – Tserkovski Railway Section".

For the implementation of the entire rehabilitation of the section of the „Straldzha – Tserkovski" railway section from km 217+210 to km 219+059 are scheduled shifts at places of the design axis with respect to the existing one, by up to 70 cm. All disturbances will be within the range of the easement area, carried out during the execution of the permanent works.

The project implementation does not involve disturbances of the landscape.

Without impact

Migration of pollutants

The electrified transport railway sites usually do not generate environmental pollution. The "Plovdiv-Burgas" railway line is electrified, for which reason no harmful emissions are spread during its operation to the atmosphere and the waters.

♦ Emissions of pollutants, noise, vibrations, ionizing and non-ionizing radiation; occurrence of harmful effects and waste disposal and utilization

Atmospheric air

A detailed inventory of the gases emitted by the implementation of the eight considered components of the investment proposal on "Modernization of the railway section Yambol – Zimnitsa, at Zavoy station", is stated in item 5.1.1 от the EIAR "Atmospheric air pollution sources, related to the implementation of the investment proposal – during the construction, during the operation, and at closing down and recultivation".

Water

No significant harmful emissions are expected in the ground and surface water. Such are expected during a limited period of time mainly as regards the surface water during the repair of existing and the construction of new bridge facilities. Such emissions consist mostly of undissolved substances – clay particles from the removed excavated material.

The impacts have been evaluated by importance as insignificant for the surface and ground water.

Entrails of the earth

No emissions (pollution) from the entrails of the earth are expected.

Noise

During the construction

During the construction stage, for the residential areas of most populated places, situated near the railway route, can be expected excessive noise impact from the construction plant and specialized equipment used. The exceedances of the limit value for noise during the daylight period are considerable – up to 35 dBA, for components 2,4,5 and 7.

During the operation

During the operation stage, in residential areas of several populated places situated near the railway route, might be expected excessive noise impact from the railway transport – the village Manole, v. Rogosh, v. Belozem, v. Orizovo, v. Cherna Gora, v. Mihaylovo, v. Zimnitsa, v. Straldzha, v. Atolovo, with exceedances of the limit value for noise in the night time period – between 2 and 10 dBA. For such objects of noise impact it is necessary to plan noise protection facilities (screens – walls are appropriate). The dimensioning of the noise protection facilities (determining their height, length and position) is an object of designing apart.

During closedown and recultivation

Activities on closedown and recultivation are provided for in Component 6 "Modernization of railway section Yambol – Zimnitsa, at Zavoy station" for a speed of 160 km/h".

There are no sites with normalized noise emission regime in proximity to the route, and noise impact is not expected.

Vibrations

During the construction: the vibrations emitted during the operation of some machines and equipment are factors of the working environment, and they have an impact on the people working with them. The construction activity is not a source of vibrations in the environment.

During the operation: The railway transport is not a source of vibrations in the environment. The railway structure provides by design fast attenuation of the vibrations in the subgrade. The vibration impact from the various kinds of train compositions on the environment is within the limits of 0.3 – 2.0 mm/sec, which is assumed to be acceptable, according to the JACA requirements.

Electromagnetic radiation

During the construction: The construction on the single components of the Plovdiv – Burgas railway line is not a source of luminous or thermal radiation and electromagnetic radiation.

During the operation: The Plovdiv – Burgas railway line is electrified. Sources of EMF (Electromagnetic fields) can be found in the part for the power supply to train compositions, the overhead power lines and substations for medium and high voltage. The traction power substations, 110 kV transmission lines, and in particular the 27.5 kV distribution network, are not sources of

electromagnetic radiation in the frequency range of 30 kHz to 30 GHz, specified as harmful according to Ordinance No. 9/03.05.1991 of the Ministry of Health and the MEW on the maximum allowable levels of electromagnetic fields in populated territories. The industrial frequency of the electric current by which the sites of the railway line in question operate, is 50 Hz and it is outside the indicated frequency range.

Investigations of the active electrified railway transport in our country show that the power lines emit electrical magnetic fields within the standards in force, in compliance with our national legislation. During the implementation of the Investment Proposal the values of the electric and magnetic fields of the electric transport facilities (power supply, signalling) are not expected to be higher than the now existing ones.

As regards the facilities which are used for communications, the analysis of the measured values has shown that no health risk is expected from radiation of the population with EMFs, created by the sites of basic stations for mobile communication.

Waste

The investment proposal provides for "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2".

The fulfilment of the investment proposal comprises three phases of its implementation – construction, operation, closedown and recultivation, during which generation of waste as well as emergency situations is expected.

During the construction

A/ Dangerous waste

Mineral based non-chlorinated hydraulic oils, synthetic hydraulic oils, other hydraulic oils, non-chlorinated motor oils, lubricating oils and mineral based gearing oils, synthetic motor and lubricating oils, and gearing oils and other motor, lubricating and gearing oils, oil filters, braking fluids, rechargeable batteries generated during an emergency/unexpected replacement, should be collected separately on the place of their formation (at the places of sojourn or on an established ground on the site) in closed metal drums/containers, and should be delivered for further treatment, based on written contracts, to persons holders of a document under Art. 35 of the Waste Management Act (WMA).

The excavated material polluted at emergency situations of construction plant and transport vehicles with petroleum products, and the polluted soil and stones (excavated material) generated during excavation works on the construction site, should be disposed of in time and delivered for further treatment, based on written contracts, to persons holders of the relevant document under Art. 35 of the WMA.

Plastic/metal packages of paints, varnishes and cloths for the cleaning of equipment and protective clothes, shall be kept on a site set aside for such purpose for preliminary storage, and will be transported to the principal base of the organization contractor of the construction and erection works and delivered for further treatment, based on written contracts, to persons holders of the relevant document under Art. 35 of the Waste Management Act.

The unfit for use fluorescent and mercury-vapour lamps, removed after repairs or rehabilitations of railway stations, halts, concourses, shall be collected separately and kept in a metal container on a designated site and shall be transported to the principal base of the organization contractor of the construction and erection works, and delivered for further treatment, on the basis of written contracts, to persons holders of the relevant document under Art. 35 of the Waste Management Act.

B/ Construction waste

Excavated material which meets the design specifications for use in the construction, must be stored on sites within the range of the railway line, or on temporary storage sites before being transported or put in a fill, as well as be used for reclamation purposes on the construction site.

The generated waste shall be delivered to installations which meet the statutory requirements regulated by the waste management legislation, or to a Regional Waste Management System, in otder to be utilized in compliance with the Ordinance for construction waste management and for utilization in recycled construction materials

Metal refuse, cables, wood, asphalt remnants (asphalt binder layer and surface course) shall be collected separately and delivered for further treatment, based on written contracts, to persons holders of a document under Art. 35 of the Waste Management Act (WMA).

The ballast generated in the sections of rehabilitation and modernizazion of the railway from removed existing ballast prisms, shall be transported to predetermined sites for the storage of construction materials and waste, in properties owned by the NRIC. The old ballast shall be graded, sieved, sorted and stored for reuse.

Mixed construction waste shall be collected and stored in advance on predetermined sites, and shall be transported by the construction waste owner, or by another person meeting the requirements of Art. 35 of the WMA, based on written contracts, as per Art. 40 of the WMA and in compliance with the Ordinance set forth in Art. 22 of the WMA, of the Municipal Council under the conditions and the procedure of collecting, transporting, utilizing and disposing of construction waste.

C/ Other not dangerous waste, generated during the construction

Residual tree and shrub vegetation formed upon the clearing of the areas within the range of the railway line, related to felling plants and mowing down grass, shall be collected to a predetermined site and transported to the Regional System for Management of the Waste, for utilization (composting).

Tires which have fallen into disuse, generated during the rehabilitation and modernization of the railway line (replacement of rubber pads) shall be collected separately in a metal container, shall be stored on a predetermined site and transported to the principal base of the organization contractor of the construction.

During the operation of the single Components 4, 5, 6, 7 and 8

The various types of waste, generated in emergency situations, incidents or derailment of trains, are scattered/spilt on the railway line and beside the railway line. The spilt liquid waste shall be collected by means of adsorbents.

The agglomerates thus formed from waste and adsorbents, should be collected in metal containers/barrels, and passed for further treatment, based on written contracts, to persons holders of the relevant document under Art. 35 of the Waste Management Act (WMA).

The waste spilt or thrown away on or beside the railway line is in small quantities, and it gets substantially blown away by the wind, or washed away by the rains.

The unfit for use fluorescent and mercury-vapour lamps shall be put into the packages of the new ones and stored temporarily in a metal container, then the lamps shall be passed for further treatment, based on written contracts, to persons holders of the relevant document under Art. 35 of the Waste Management Act.

The waste generated in the form of iron during the repairs of railway stations and halts and along the railway line, shall be collected on designated grounds before being passed for further treatment, based on written contracts, to persons holders of the relevant document under Art. 35 of the Waste Management Act (WMA).

Tires which have fallen into disuse (rubber pads) shall be collected in metal containers and stored temporarily on a predetermined ground until a quantity sufficient to be delivered for further

treatment has been gathered, based on written contracts, to persons holders of the relevant document under Art. 35 of the Waste Management Act (WMA).

The formed construction waste, generated during repair activities on the railway line and on the buildings of the railway stations and halts, shall be treated and transported by the construction project employer, by the owner of construction waste or by another person, according to Art. 40 of the WMA and the Ordinance of the Municipal Council set forth in Art. 22 of the WMA, for further treatment.

During the execution of the earth works on repairs of the railway line will be generated minor quantities of excavated earth material. The generated waste shall be collected and transported directly by the waste owner (the organization that carries out the repair), according to Art. 40 of the WMA and the Ordinance of the Municipal Council in compliance with Art. 22 of the WMA, and dumped in a regional depot, in coordination with the Municipal authorities.

The waste removed from the railway line, generated during the operation, including domestic waste, shall be transported (by the organization responsible for the maintenance of the railway line) and shall be passed for further treatment, based on written contracts, to persons holders of the relevant document under Art. 35 of the Waste Management Act, for the single types of waste. Detoxification of domestic waste shall be carried out only in depots and/or installations which meet the statutory requirements regulated by the waste management legislation.

During the closedown and recultivation

During the implementation of the investment proposal waste from closedown and recultivation will be generated only at Component 6.

At the closure of the existing line will be generated the following types of waste: metals, concrete, ballast from the ballast prism, cables and household garbage.

The dismantled rails and sleepers as well as old ballast shall be transported to grounds determined for the purpose beforehand for the storage of construction materials and waste, in properties owned by the NRIC. Rails and sleepers as well as old ballast shall be graded, sieved, sorted and stored for reuse.

Generation of dangerous waste is possible also to come from construction machinery and equipment, such as used hydraulic oils, used motor oils from gear drives, engines and reducers, braking and antifreezing fluids, oil filters and lead rechargeable batteries. The dangerous waste generated at an emergency/unforeseen replacement, should be collected separately on the place of its formation in closed metal drums/containers, and should be delivered for further treatment, based on written contracts, to persons holders of the relevant document under Art. 35 of the Waste Management Act (WMA).

♦ **Risks for the people's health, for the cultural heritage or the environment, those as a consequence of accidents or crashes included**

Health aspects

Bursts of contamination will occur only in emergency situations and/or transport accidents, derailing of trains carrying dangerous substances and hazardous waste, or at criminal disposal of hazardous waste. In emergency situations the competent authorities (Police, the National Service "Fire safety and protection of the population", the Regional Health Inspectorate, Civil Protection, the RIEW, the Ministry of Health and the Ministry of Communications, shall be informed immediately.

The emergency situations with tank cars transporting dangerous substances are hardly likely to occur and are impredictable in terms of time, place and intensity of the contamination. In such case actions should be undertaken in compliance with Ordinance 46 on the railway transportation of dangerous cargo, which has been drawn up and updated with respect to the Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID) with the Convention Concerning International Carriage by Rail (COTIF).

The supervisory authority on compliance to the requirements for carriage of dangerous goods, is the Executive Agency "Railway Administration".

The actions under emergency situations are carried out according to instructions and documents accompanying the hazardous cargoes during their transportation, while the limitation and liquidation of the consequences from them is carried out jointly by employees of the SE "NRIC" and the carrier that is the owner of the train or the railway wagon, units of Civil Protection, the Police and Fire Safety.

Water

Risks for the human health exist solely with respect to the surface water, and more precisely from the crossing of areas with considerable potential inundation risk. Data on the latter are presented in item 4.2 of the EIAR. 4 such areas intersect.

This concerns intersections of the water bodies with bridge facilities. To the designs, where necessary, is prepared a part "Hydrology" to determine the water quantities with a degree of security of 1%, which has been adopted considering the dimensioning of the facilities.

Cultural heritage

Since the Plovdiv – Burgas railway line passes through a territory highly saturated with archaeological cultural property, there is a probability as a consequence of accidents or crashes, to be threatened the integrity of both the known and unknown archaeological sites. With a strict observance of the requirements of the regulatory base in the sphere of preservation of the cultural heritage, the risk for it to be threatened will be reduced to a minimum.

♦ The combination of the impact with the impact of other existing and/or approved investment proposals, having in mind all existing problems in the environment, related to areas of particular ecological importance, which are likely to be affected, or involved in the utilization of natural resources

Atmospheric air

No cumulative effect is expected during the implementation of the components of the investment proposal on the "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2". During the laying of the fiber optic cable, signalling systems and introduction of station interlocking systems, no cumulative effect is expected, considering the character of the envisaged activities and the insignificant excavation activities with a small excavator (trench overall dimensions – 0.6 x 0.3 x 1.1 (depth)) for the laying of the fiber optic cable. When overpasses are built (component 2) during the execution of the construction works on components 6 and 7, no cumulative effect is expected in the residential areas. The overpass at km 192+625 (component 6) is 450 m distant from Zavoy village. The overpass at km 219+390 (component 7) is near an industrial zone. The construction activities on the other components shall be completed before the deadline for construction of the overpasses on component 2.

No cumulative effect is expected, either, during the operation of the components of the investment proposal, sections of the electrified railway line Plovdiv – Burgas. As the atmospheric air pollution with respect to the Fine Dust Particles10 will be due mainly to the road sections which the railway line crosses, and not to the railway line itself, simulation was carried out only for the components with rehabilitation, modernization, and a new route of the railway line being planned.

The nearest industrial sites around the routes of the railway line, which are going to have a cumulative effect, are several large deposits of underground natural resources, as follows: - a deposit of sand and gravel for concrete aggregates "Kaloyanovets", with the sections "Dartata Koriya" and "Smetishteto", about which a commercial discovery has been issued; - the deposit "Svoboda" in operation; - the deposit "Volovarovo"; - the deposit "Trilistnik", section "Trilistnik Sever" for uranium ores (the deposit has been liquidated). However the power of the dust emission

sources from the deposits is of extents higher than those of the railway line, for which reason they have not been taken into account in the considerations about the effect of the insignificant emissions along the route.

The pollution of the air near the ground with the electrically driven train compositions, although being commensurate, is minimum and lower than the fine dust particle (soot) pollution from road sections. That is why only the cumulative effect of the railway line with "Trakia" motorway has been valuated in respect of fine dust particles (FDP10). Data on the forecast intensity of the automobile traffic on "Trakia" motorway for the year 2035 has been used, from the section Stara Zagora – Nova Zagora (Lot 2 of "Trakia" motorway); - section Nova Zagora – Yambol (Lot 3 of "Trakia" motorway); - section Yambol – Karnobat (Lot 4 of "Trakia" motorway).

Noise

During the construction

At the crossing of a railway line with roads (from the national and municipal road networks), the noise emitted by the construction machinery is determining for the nearby sites with normalized noise regime.

During the operation

When the railway line crosses roads (from the national and municipal road networks), cumulative impact can be expected on closely situated sites with normalized noise regime, from the superposition of the noise emited by the two transport flows – rail and road ones. The now existing level crossings shall be replaced by overpasses, whose locations are indicated in the design.

In the section of Component 4 are planned two overpasses on the territories of populated places: at the village Manole (km 21+850) and the v. Belozem (km 32+000) – crossing with streets in the villages. The noise characteristic of the railway transport, during the night time period, in the populated places, is 63.8 dBA, which is considerably higher than that of the road transport on the respective streets of both villages. Under these conditions no cumulative effect is expected on the residential areas, near the overpasses, as the railway transport noise is the determining one.

In the section of Component 5 is scheduled an overpass on the territory of the village Mihaylovo (km 85+083) – crossing with the municipal road SZR 1190 on the territory of the village. There is no information about the traffic load on the municipal road. In the most general case, the noise characteristic of the transport flows, for the municipal roads, is approximately 60 dBA for the daylight period, and up to approx. 50 dBA for the night time period, at an average movement speed of 50 km/h. The noise characteristic of the railway transport, during the night time period, in the populated places, is 63.8 dBA, which is considerably higher than that of the road transport on the municipal road. Under these conditions no cumulative effect is expected on the residential areas, in close proximity to the overpass, since the noise from the railway transport is the determining one. About the residential areas situated next to the municipal road, after the overpass, can be expected a minor cumulative effect (up to 0.5 dBA) from the superposition of the noise coming from both sources (parallel with one another), with the noise from the railway transport as the determining one.

Population and human health

The main part of the Investment Proposal will be implemented within the borders of the range of the existing route. Actual impact on new territories and areas will be carried out during the implementation of components 5 and 6, where a bypass connection will be built (the town of Chirpan) as well as a new bridge over Tundzha River. That is why no cumulative effect is expected during the construction and operation of the components of the investment proposal on the on "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2".

♦ **Impact of the investment proposal on the climate (for example the nature and extent of the emissions of greenhouse gases) and the vulnerability of the investment proposal with respect to the climate change**

Greenhouse gas emissions

Greenhouse gas emissions during construction

The area on which the construction excavation and filling works will be carried out, and also the replacement of the ballast prism in the sections of rehabilitation and modernizazion of the railway line, is going to be a source of predominantly dust, as well as of exhaust gas emissions from the internal combustion engines (ICE) of the utilized plant – carbon and nitrogen oxides, easily volatile organic compounds, ammonia, soot (FDP10) and relatively small quantities of resistant organic pollutants.

They are emitted directly to the atmospheric air by the ICEs, and in order to reduce the harmful emissions during construction, should be used construction machines meeting the requirements of Ordinance No. 10/2004, harmonized by Directive 2002/88/EC, complementing the Directive 97/68 – measures for reduction of gaseous and dust pollutants from the internal combustion engines, installed on off-road or construction machines.

The determined amount of greenhouse gases equivalent to carbon dioxide, during the performance of transport activities related to the building of fiber optic cable on the Plovdov – Burgas line, is approx. 47 tonnes.

The determined amount of greenhouse gases equivalent to carbon dioxide, during the performance of transport activities related to the building of overpasses/underpass for the Plovdiv-Burgas railway section, is 157 tonnes.

The determined amount of greenhouse gases equivalent to carbon dioxide, during the performance of transport activities related to the rehabilitation of the Skutare – Orizovo railway section, is approx. 911 tonnes.

The determined amount of greenhouse gases equivalent to carbon dioxide, during the performance of transport activities related to the modernization of the Orizovo-Mihaylovo railway section, is approx. 1 578 tonnes.

The determined amount of greenhouse gases equivalent to carbon dioxide, during the performance of transport activities related to the modernization of the Yambol – Zimnitsa railway section, at Zavoy station, is approx. 105 tonnes.

The determined amount of greenhouse gases equivalent to carbon dioxide, during the performance of transport activities related to the reconstruction of the railway track switching system of Zimnitsa station, and rehabilitation of the catenary in the railway stations of Zimnitsa and Straldzha, is approx. 245 tonnes.

The determined amount of greenhouse gases equivalent to carbon dioxide, during the performance of transport activities related to the rehabilitation of the Straldzha-Tserkovski railway section, is approx. 70 tonnes.

Main problems related to the climate change, which might affect the investment proposal:

- heat waves;
- torrential rains and floods;
- storms and strong wind;
- bitter cold;
- damages caused by snow melting.

In addition are considered also other natural hazards, such as: forest/field fires, earthquakes.

The location of the project "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2" falls in the region of the transitional continental climatic zone and the Black Sea climatic zone. The transitional continental climatic zone, depending on the climatic features, falls in the moderate continental and continental-Mediterranean climatic zone. The climate in this transitional zone is influenced by both the geographical position of the transition between two climatic zones, and the continental air masses of the moderate latitudes, and the air masses coming from the Mediterranean Sea and the Aegean Sea.

Most of the railway infrastructure elements are directly exposed to the impact of the environment factors. This circumstance makes them potentially vulnerable from the point of view of the general processes in nature, including the climatic processes, their regime and the level of extreme. The typical average values of the components of the environment, the geographical position of the project and the weather features, are factors which influence considerably the designing, construction, operation and maintenance of the railway infrastructure.

The project as well as the railway infrastructure as a whole, could be affected by the changes in the air temperature.

Meteorological events which can disturb the traffic and compromise the safety in the railway transport, include for example rain storms and the resulting floods, heat waves, freezing, snowfall, strong winds, thunderclaps and rising sea levels.

The railway transport is particularly vulnerable by disturbances in service, since there are/?/ a few alternative routes. That is why just one incident can affect a plurality of trains, and the disruptions can take a long time to remedy them.

Strong winds are expected to be more common following a climatic change, so the trees come under the pressure of strong winds. The increase of the probability for trees to be laid on railway tracks or on the catenary, would lead to damages in the railway transport and the power supply.

On the other hand the climate change has also positive consequences for the railway transport. The increasingly soft winters are expected to reduce the probability for damages because of railway freeze.

The higher summer temperatures could increase the rail track warping. The thermal dilatation can cause curving of the catenary system in hot weather and the safety devices could overheat. The thunder frequency is expected to increase to a certain extent with the climate change. The thunders could interrupt the power supply to the railway transport and cause faults in the signalling systems on the roads and the safety devices.

No drastic impact is expected in the short run from the climate change on the transport system and on the level of its economic efficiency. The impact on the railway infrastructure will consist chiefly in augmented expenditure for maintenance and construction of infrastructure as a result of the expected increase in the heat stress on the road and railway infrastructure.

As regards the changes in the temperature regime, the measures which can be undertaken were set as early as during the designing stage of the considered components of the investment proposal. The technical equipment and the railway network as a whole were designed to resist temperature impacts.

To forestall the negative consequences from the occurrence of extreme weather phenomena, such as strong winds and storms, it is advised to build windbreaks made of suitable trees and other vegetation, which is resistant to these phenomena and is unassuming as regards the soil. This is accompanied also by additional measures to maintain the protective tree windbreak in good condition. With respect to the strong winds, another precaution is to fell trees in risky areas, and to deforest the area around the railway line.

With regard to the floods it is necessary to fulfil the measures set in the Risk Management Plan – the reliable forecasts on the flood risk are essential in planning and designing the railway infrastructure.

Technologies and substances used

The technology for construction of railway lines and railway infrastructure is regulated by Ordinance No. 55/29.01.2004 on the designing and construction of railway lines, railway stations and other units and facilities of the railway infrastructure, as well as of level crossings.

The designs of the single Components are conformed to an established technology for construction of railway lines and railway infrastructure. No other technology alternatives have been investigated or examined by the Employer and the Designer.

9. Plan for implementation of the measures planned to prevent, reduce or, wherever possible, cease the significant harmful impacts on the environment

Plan for implementation of the measures under Art. 96, (1), point 7 of the EPA

No. in order	Measures	Period for execution	Results from the execution
	Atmospheric air		
1.	Control of out-of-gauge loading with aggregates, excavated earth and material from ballast prism, in bulk	Construction	Reduction of the additional dust loading
2.	Use of closed transport vehicles, or ones covered with tarpaulins when transporting ex-cavated earth and material from ballast prism	Construction	Reduction of the additional dust loading
3.	When using open transport vehicles for bulk loads (such as belt conveyors) – they have to be closed or encapsulated	Construction	Reduction of the additional dust loading
4.	The places for loading and unloading outdoors should be wetted, as long as that will not impede the subsequent treatment of the materials and will not impair their qualities	Construction	Reduction of the additional dust loading
5.	Sprinkling of the transport roads within the range of the crossed populated places at very dry and hot weather	Construction	Reduction of the additional dust loading
	Water		
6.	Obtaining Licenses for the use of a water facility for the construction of bridges within the meaning of Art. 46, (1), letter "b" (b) a linear infrastructure, crossing water facilities – aqueducts, bridges, transmission networks and ducts) of the Water Act (WA)	Designing	Observance of the regulatory framework on the use and protection of water
7.	In the designing of the route and the facilities on it, the prohibitions and restrictions on conducting activities which may lead to a direct or indirect discharge of hazardous and noxious substances to ground waters, regulated by Ordinance No. 3/2000 on Sanitary Protection Zones, must be observed	Designing and operation	Observance of the regulatory framework on protection of water
8.	The requirements of Art. 125 of the WA need to be taken into account, to the effect that the inclusion of new quantities of sewage water should be conformed to the capacity and efficiency of the existing sewerage system	Designing	Observance of the regulatory framework
	Contracts should be concluded with licensed	Designing	Observance of the

9.	firms for the cleaning of water-tight disposal pits		regulatory framework
10.	A licence should be obtained for the discharge of drained ground water from the tunnel (if such is present), and if its use is necessary – a permit for water abstraction	Designing	Observance of the regulatory framework on the use and protection of water
11.	No building materials should be used, that contain priority hazardous substances, and observance of the prohibitions set out in Art. 118a of the Water Act must be ensured, against pollution from the priority substances. The requirements of the Water Act must be abided by	Designing and construction	Soil and water protection
12.	In designing the bridges there must be compliance with the requirements of Art. 143, (1) of the WA, for protection against the harmful impact of the water, and no activities should be allowed, with which the natural state and conductivity of the river beds, the river banks, and the coastal floodplains, is disturbed	Designing and construction	Observance of the regulatory framework on restricting the harmful effect of the water
13.	Use of construction equipment in good working order	Construction	Protection of water
14.	No activities should be performed that might lead to direct or indirect discharge of pollutants to the ground waters	Construction	Protection of water
15.	There must be no storage, deposition or treatment of waste, washing and service of transport vehicles and equipment, and waste disposal in the coastal floodplains and the adjacent lands of reservoirs according to Art. 134 points 1, 3, 4 and 6 of the WA	Construction	Protection of water
16.	Chemical toilets must be provided for the personnel, when they carry out construction activities outside the area of the existing railway stations/halts	Construction	Protection of water
17.	The discharges of the drainage, collecting rainwater from the line route in the areas passing through Sanitary Protection Zones of water sources, should be situated outside such areas	Designing	Protection of water
18.	The requirements for prohibitions and restrictions on the use of plant protection products , employed along the line route falling in the Sanitary Protection Zones of the water sources, must be strictly observed	Operation	Protection of water
19.	During the repairs of the railway stations, included in the Investment Proposal, should be included also the repairs of the sanitary facilities	Designing	Protection of water
20.	When areas with a significant potential risk of floods are crossed, should be taken into consideration the measures set in the Plan for the Management of the Risk of Floods, related to the protection against the adverse water impact, also including the clearing of river stretches and gullies in the sections where Investment Proposal facilities get over them, so that flood water can pass	Operation	Protection from the adverse effect of water
	Entrails of the Earth		

21.	Adherence to the established projects in the part of "Earth Works"	Construction	Observance of the regulatory framework on the use and protection of the entrails of the earth
	Soils		
22.	Removal and conservation of the humus under the conditions regulated by the Soils Act and its use for recultivation, as per the requirements of Ordinance No. 26 on the recultivation of disturbed terrains.	Construction	Conservation of the humus layer. Utilization of the humus during the recultivation activities on disturbed terrains.
23.	The recultivation of the decommissioned sites under Component 6 should be performed in compliance with the requirements of "Ordinance No. 26/02.12.1996 on the recultivation of disturbed terrains, improvement of poorly producing lands, removal and utilization of the humus layer *(published in the Official Gazette, No. 89/22.10.1996, subsequent amendment in the Official Gazette, No. 22/2002)*"	Closedown and recultivation	Restoration of disturbed terrains
	Biodiversity		
24.	The construction activities must be limited within the range of the railway line and the construction sites	Construction	Prevention of destruction/damaging of adjacent plant communities
25.	During construction the transport vehicle movement should take place on fixed marked routes. No traffic of the technical plant must be allowed outside the roads and the approaches to the construction sites	Construction	Prevention of the additional destruction of vegetation and habitats in the areas of movement of the technical plant
26.	No felling of trees and shrubs should be allowed outside the railway line range	Construction	Protection against destruction / damaging of habitats
27.	At afforestation under Component 3 and at recultivation under Component 6 no invasive or potentially invasive species should be used - Ailanthus altissima, Robinia pseudoacatia, Lonicera tatarica, Caragana arborescens, Elaeagnus angustifolia, Spiraea thunbergii, Symphoricarpos spp. (Symphoria spp.), Forsythia suspensa, Amorpha fruticosa, Acer negundo, Fallopia japonica, Gleditsia triacanthos, Pueraria lobata, Phytolacca americana, etc.	Construction and recultivation	Reduction of the risk of appearance of invasive species, and preservation of the current composi-tion of species of the terrestrial invertebrate communities. Preservation of the vegetation character in the neighbouring grounds, including the protected area "Tundzha River 1"
28.	Designing and laying of two new passages for animals (rectangular with a section of at least 50/50 cm) at km 51+000 and km 51+550 (Component 5)	Designing and construction	Prevention of the possibility of causing a barrier effect during the operation of Component 5
29.	The railway line route within the range of Component 5 from km 50+700 to km 52+100 should be fenced on both sides with wire/enclosing net at least 4 m high from the rail elevation	Designing, construction and Operation	Prevention of the risk of mortality at collision with the railway transport to some bird species
30.	Clearing of the tree and shrub vegetation upon the crossing of forest tracks on Component 5 should be carried out outside the birds breeding season (from 15 March to 30 June).	Construction	Preventing destruction of nests with eggs/young or being abandoned due to harassment

31.	In the construction works under Components 4, 5 and 6, when working in the river flows of the rivers Stryama, Omurovska and Tundzha, the river flows must be protected from increase in turbidity (muddiness) by installing the so called sludge screens (turbidity curtains) or appropriate construction technologies	Construction	Reduction of the risk of mortality and damaged area of potential habitats of aquatic invertebrate and fishes, including ones that are the object of safeguarding in the protected areas "Stryama River", "Martinka River" and "Tundzha River 1"
32.	Application of effective measures for dust reduction throughout the construction period, especially in transport activities on roads (without paving) and not allowing pollution of the roads with oils, fuel or dangerous chemicals	Construction	Protection of adjacent habitats; Prevention of pollution of soils and vegetation
33.	The fire safety rules must be observed and no fire should be set to vegetation	Construction	Preventing destruction of habitats
	Waste		
34.	To develop a Plan for Management of the Construction Waste (PMCW), in compliance with Art. 11, (1) of the WMA with range and content as defined by the ordinance on management of the construction waste and for employment of recycled building materials. The construction waste treatment should be carried out according to an approved PMCW, included in the scope of the investment projects under chapter VIII of the Law on Spatial Planning, approved according to the procedure of Art. 11, (7) of the WMA. According to Art. 11. (2), the PMCW must be approved by the mayor of the municipality or by a person authorized by the latter, at the request of the employer of the construction project after the building permit has taken effect and before the opening of the construction site and/or prior to the commencement of the activities of construction or suppression of a site. Moreover, as per Art. 11, (7), for construction sites situated on the territories of more than one municipality, the PMCWs are approved by the mayors of the respective municipalities or by a person authorized by them for the project portion which is to be carried out within the territorial range of the respective municipality	Before the beginning of the construction activities on the respective component	Waste management in compliance with the WMA and the requirements of the regulations on waste management
35.	The grounds for temporary storage of building materials and waste must be located within the borders of the range of the railway line in the expropriated strip, where there are enough areas.	Construction	Waste management in compliance with the WMA.
36.	Prior to the commencement of the construction works for every component, the locations of the temporary grounds for storage of excavated earth, which will be used on the site and grounds for excavated earth material, which do not meet the design specifications for employment in the	Prior to the commencement of the construction activities	Waste management in compliance with the WMA.

	construction works, must be coordinated with the respective municipal administration, on whose territory the respective ground is, in compliance with Art. 19, (1) of the WMA		
37.	The resulting dangerous waste should be collected separately and stored on grounds with sealed insulating material until they are handed over for treatment, as per the requirements of the WMA and the by-laws on its implementation	Construction, closedown and recultivation	Collection and storage of the waste in compliance with the requirements of the regulations on waste management
38.	The construction waste should be treated and hauled by the the employer of the construction project, by the owner of the construction waste, or by another person responsible for the requirements of Art. 35 of the Waste Management Act, based on a contract in writing	Construction, closedown and recultivation	Waste management in compliance with the WMA and the by-laws on its implementation
39.	Roadworthy transport vehicles should be used for the carriage of dangerous and industrial waste on the territories of the construction sites, and also out of them. The transportation of dangerous waste must be carried out only in closed metal containers/barels. Use of construction machinery in good working order	Construction, closedown and recultivation	Preservation of soils and water
40.	Upon conclusion of the construction works of certain construction sites, the places for temporary storage of aggregates and construction waste must be cleared in due time, and the waste must be transported to the places reserved for the treatment of construction waste, in compliance with the WMA. Recultivation should be made of the places, using the conserved humus	Construction, closedown and recultivation	Preservation of soils and air. Recovery of the disturbed terrains
41.	The petroleum oils resulting after an emergency replacement must be collected in a way which permits their regeneration – in closed containers, which must be chemically resistant, not allowing spilling or leakage, being marked and being held indoors	Construction, closedown and recultivation	Preservation of soils and water
42.	In the cases of accidental discharge of oils or other pollutants it is necessary to remove immediately the contaminated soil and to haul it to a waste ground, that has got a document under Art. 35 of the WMA for such type of waste	Construction, closedown and recultivation	Preservation of soils and water
43.	The organization dealing with maintenance and operation of the railway infrastructure (the NRIC), as well as the waste cleaning beside the railway route and facilities and service areas, should dispose in time of the waste and treat it autonomously and/or consign it for collection, transportation and treatment to persons that have the right to perform such activities in compliance with the WMA	Operation	Prevention of spillage and pollution of the areas adjacent to the railway line Waste management in compliance with the WMA
44.	The organization of the maintenance and operation of the railway infrastructure must collect separately the discarded packages	Operation	Possibility of recycling
	Dangerous substances		
	The use of dangerous substances (fuels and oils)	Construction,	Preservation of the

45.	should be carried out in compliance with the measures for prevention of accidents, spillage or pollution, and for control of the exposition, determined through the relevant regulatory/administrative act, in the Safety Data Sheets and the instructions for safe use	closedown and recultivation	environment and of the human health from the impact of dangerous chemical substances and mixtures
	Noise		
46.	Preparation of technical projects for noise protection screens-walls, between the railway line (incl. the railway stations) and the sites of impact adjacent to it: the village Manole, v. Rogosh, v. Belozem, v. Orizovo, v. Cherna Gora, v. Mihaylovo, v. Zimnitsa	Designing	Limitation of the noise impact, in order to achieve the noise threshold limit values
47.	The machines and equipment must meet the requirements of the Ordinance on the substantial requirements and evaluation of the conformity of the machines and equipment, which work outdoors, with respect to the noise emited by them to the air (Official Gazette, No. 11/2004)	Construction	Mitigation of the noise impact on the construction site and the areas nearby with normalized noise regime
48.	In the sections of the route through and beside the concerned objects of impact, the construction activity must be carried out only during the daylight period, with good organization	Construction	Mitigation of the noise impact on the areas in proximity, with normalized noise regime
49.	No idle running of the construction machines should be allowed	Construction	Mitigation of the noise impact on the construction site and the areas nearby, with normalized noise regime
50.	The motor transport serving the construction works should move on routes coordinated with the respective municipalities, and abide by the established limitations on the speed through populated places	Construction	Mitigation of the noise impact on the areas near the route, with normalized noise regime
51.	Construction of the designed noise protection facilities, between the railway line route and the objects of impact, in accordance with the prepared technical designs	Construction	Limitation of the noise impact in order to achieve the threshold limit values for noise
52.	A Plan of own monitoring should be drawn up	Prior to the commencement of the construction works	Monitoring and control of the impacts on the environment and on the people's health
	Landscape		
53.	The recultivation of the decommissioned railway line on Component 6 must be carried out in accordance with the requirements of "Ordinance No. 26/02.12.1996 on recultivation of disturbed terrains, improving of poorly productive land, removal and utilization of the humus layer *(published in the Official GazetteNo. 89/22.10.1996, latest modification in O.G. No. 22/2002)*"	Closedown and recultivation	Acceptable landscaping of the disturbed terrains
	Cultural heritage		
54.	Preliminary archaeological prospecting – search for archaeological sites (on component 2)	Prior to the commencement of	Localization of the archaeological sites that are

		the construction works	visible on the ground, and clarification to what extent their integrity is going to be threatened
55.	Rescue excavations (for components 5 and 6). In case archaeological sites are discovered during the preliminary prospecting or the observation – also with the other components	Prior to the commencement of the construction works	Investigation and documentation of the cultural layers and archaeological structures
56.	Archeological observation throughout the section length (for all components)	Prior to the commencement of the construction works	In order to avoid the destruction of unknown archaeological sites or structures
57.	Archeological observation within the borders of three archaeological sites (for component 5)	Prior to the commencement of the construction works	In order to avoid the destruction of archaeological structures
	Health and hygiene aspects		
58.	The areas of hygienic protection should be determined as well the location and the commissioning of all sources of non-ionizing radiation (base stations under Component 1 – "designing and construction of signalling and telecommunication systems") and they should be coordinated under the relevant procedure set forth in Ordinance No. 9 on the maximum allowable levels of electromagnetic fields in populated territories, and establishment of areas of hygienic protection around radiating objects	Designing and operation	Providing healthy and safe conditions in the working environment and the living environment
59.	The periodical medical examinations by means of a contract concluded with the Office of Occupational Medicine should take place regularly.	Construction	Reduction in the negative professional impacts
60.	The workers must be equipped with personal protective equipment – ear muffs. Their serviceability and correct use should be controlled.	Construction	Reduction in the negative professional impacts
61.	The workers must be equipped with working clothes suitable for the season.	Construction	Reducing the health risk in the living environment
62.	Use of new, highly efficient and reliable machines for the construction of railway lines.	Construction	Reducing the health risk in the working environment and the living environment
63.	Providing to the workers cooling or hot drinks respectively during the hot or cold periods of the year;	Construction	Providing healthy and safe working conditions
64.	Development and carrying in practice of a regime of work and rest during working activities.	Construction and operation	Reduction in the occupational traumatism

Plan of own monitoring

After the noise protection screens have been built and the railway line has been commissioned, the noise levels should be measured on the borders of the terrains closest to the railway line, with normalized noise regime, during the three periods of the day (daylight time, evening and night). The measured parameter is the equivalent noise level in dBA. It is

recommended to carry out the measurements for every period during a maximum load, according to the train schedule, with a duration pursuant to the requirements of the normative documents.

10. Description of the expected considerable adverse impacts of the investment proposal on the environment and the human health, stemming from the vulnerability of the investment proposal of a risk of major accidents and/or calamities, which are of importance to it

The location of the project "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2" falls in the region of the transitional continental climatic zone and the Black Sea climatic zone. The transitional continental climatic zone, depending on the climatic features, falls in the moderate continental and continental-Mediterranean climatic zones. The climate in this transitional zone is influenced by both the geographical position of the transition between two climatic zones, and the continental air masses of the moderate latitudes, and the air masses coming from the Mediterranean Sea and the Aegean Sea.

Most of the railway infrastructure elements are directly exposed to the impact of the environment factors. This circumstance makes them potentially vulnerable from the point of view of the general processes in nature, including the climatic processes, their regime and the level of extreme. The typical average values of the components of the environment, the geographical position of the project and the weather features, are factors which influence considerably the designing, construction, operation and maintenance of the railway infrastructure.

The project as well as the railway infrastructure as a whole, could be affected by the changes in the air temperature.

The meteorological events which can disturb the traffic and compromise the safety in the railway transport, include for example rain storms and the resulting floods, heat waves, freezing, snowfall, strong winds, thunderclaps and rising sea levels.

The railway transport is particularly vulnerable by disturbances in service, since there are a few alternative routes. That is why just one incident can affect a plurality of trains, and the disruptions can take a long time to be remedied.

Strong winds are expected to be more common because of the climatic change, so the trees come under the pressure of strong winds. The increase of the probability for trees to be laid on railway tracks or on the catenary, would lead to damages to the railway transport and the power supply.

On the other hand the climate change has also positive consequences for the railway transport. The increasingly moderate winters are expected to reduce the probability for damages because of railway freeze.

The higher summer temperatures could increase the rail track warping. The thermal dilatation can cause curving of the catenary system in hot weather and the safety devices could overheat. The thunder frequency is expected to increase to a certain extent with the climate change. The thunders could interrupt the power supply to the railway transport and cause faults in the signalling systems on the roads and the safety devices.

Main issues related to the climate change

- heat waves (including an impact on the human health, damages to the crops, forest fires, etc.);
- torrential rains and floods;
- storms and strong winds (including damages to the infrastructure, buildings, crops and forests);
- cold weather;
- earthquake.

11. Conclusion, in compliance with Art. 83, (5) of the Environmental Protection Act

The evaluation report of the impact on the environment by the investment proposal on "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2", presents the investment proposal by components: Component 1: "Design and Construction of systems for signalling and telecommunication of railway line Plovdiv-Burgas"; Component 2: "Construction of overpasses/underpasses along the railway line Plovdiv-Burgas to replace existing level crossings"; Component 3: "Plant ing of Protective Forest Belt along Chernograd-Aytos Open Line"; Component 4: "Rehabilitation of Skutare-Orizovo Railway Section"; Component 5 "Modernzation of Orizovo-Mihaylovo Railway Section"; Component 6: "Modernization of the Yambol – Zimnitsa Railway Section, at Zavoy station"; Component 7: "Reconstruction of Switches Development at Zimnitsa Station and Rehabilitation of the Catenary at Zimnitsa and Straldzha Stations", and Component 8: „Rehabilitation of Straldzha-Tserkovski railway Section". The nature of the investment proposal has been presented, and also the expected results from the assessment of the impacts on the components and factors of the environment and the people's health as a result of the implementation of the investment project for the site "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2" in the following aspects:

- The condition of the components and factors of the environment and prediction of the impact following the implementation of the investment proposal;
- Fulfilment and compliance with the applicable normative documents in the country;
- An evaluation has been made of the impact on the atmospheric air during the construction and operation of the investment proposal;
- An evaluation has been made of the impact on the surface and underground water as a result of the construction and operation of the single components, including on the crossings of surface water courses;
- An evaluation has been made of the expected disturbances and pollutions of the lands and soils as a result of the construction of the single components of the investment proposal;
- An evaluation has been made of the impact on the biodiversity, as a result of the implementation of the investment proposal;
- An analysis and a comparative assessment have been presented of the health status of the population from the affected municipalities, with the average indicators for the country and other regions of the country.

The independent experts who have elaborated the assessment, are familiar with the written opinions presented by the competent authorities and other specialized administration offices/organizations, and they have been taken into consideration in the process of developing the EIA Report;

Based on the performed analyses, predictions and evaluations by the independent experts, were suggested measures to guarantee the operation of the components of the Plovdiv-Burgas railway line and that the construction works will be carried out in compliance with the best practices available, and that the negative impacts will be minimized down to levels provided in the normative documents of the country and the EU.

The impact of the emitted pollutants during the construction and operation on the environment components can be classified as insignificant, short-term during the period of construction, constant during the operation, direct and reversible, with a small territorial coverage, with a minor cumulative effect, in compliance with the adopted national and European normative requirements, and it does not imply negative effects on the people's health, on the components and factors of the environment.

The construction and operation of the components of the Plovdiv-Burgas railway line will have a minor impact on the integrity and structure of the affected protected areas of the ecological network Natura 2000, as well as on the natural habitats and the habitats of the species, objects of

preservation in them, with the fulfilment of the recommended measures and conditions. The investment proposal is compatible with the object and goals of the preservation of the protected areas: BG0000578 "Maritza River"; BG0000444 "Pyasachnik River"; BG0000429 "Stryama River"; BG0000443 "Omurovska River"; BG0000442 "Martinka River"; BG0000425 "Sazliyka River"; BG0000418 " Kermenski Vazvisheniya "; BG0000192 "Tundzha River 1"; BG0000205 "Straldzha" and BG0000196 "Mochuritsa River" for preservation of the natural habitats and of the wild flora and fauna, and BG0002028 "Straldzha Complex" for the conservation of the wild birds.

In conclusion, guided by the principle of preventing the risk for the human health, and providing sustainable development in conformity with the environment quality standards in force in the country, we deem that the activities scheduled in the investment proposal meet the normative requirements of the Bulgarian and European legislation on the environment. In this regard no significant negative impact is expected on the components and factors of the environment and on the people's health, both on the territory of the railway route and or in proximity to it, and in a transborder context.

On the basis of the analysis and the assessment of the investment proposal for "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2", the conducted inspections, investigations, studies, calculations, and the estimate made of the project's impact on the components and factors of the environment and on the people's health, and in compliance with the environmental legislation, the conclusions made in the Report on the Degree of Impact Assessment comprised, the authors of the EIA Report propose to the esteemed Supreme Environmental Expert Council with the MEW to approve the implementation of the investment proposal on **"Rehabilitation of the Plovdiv-Burgas railway line, Phase 2", in the components 1, 2, 3, 4, 5, 6, 7 and 8.**

List of the enclosures:

Enclosure No. 1	Letters by the MEW, Ref. No. OBOC-74 and No. OBOC-51/15.11.2017, and No. OBOC-83/10.01.2018.
Enclosure No. 2	A letter by the MEW, Ref. No. OBOC-83/12.02.2018.
Enclosure No. 3	A letter by the Ministry of Health, Ref. No. 92-6, dated 16.02.2018.
Enclosure No. 4	A Google map with the locations and the exact distances of the railway line in the single components, to the nearest residential areas and other areas and sites, subject to health protection within the meaning of §1, point 3 of the Additional Provisions to the Ordinance on the conditions and procedure of conducting the environmental impact assessment
Enclosure No. 5	Location situations/situation of the project routes of the single components of the investment proposal for "Rehabilitation of the Plovdiv-Burgas railway line, Phase 2"