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SITE SPECIFIC ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN INCLUDING BASELINE DATA MONITORING - ROAD SECTION NEUM-STOLAC

March 2018

FBiH Roads Modernization Project

Site Specific Environmental and Social Management Plan Including Baseline Data Monitoring

Road Section Neum-Stolac

Project:	FBiH Roads Modernization Project
Report:	Site-specific Environmental and Social Management Plan Including Baseline Data Monitoring for Road Section Neum-Stolac
Prepared by:	Public Enterprise Roads of Federation of Bosnia and Herzegovina
Financed by:	World Bank / Public Enterprise Roads of Federation of Bosnia and Herzegovina
Consultant:	Joint Venture Enova d.o.o. Sarajevo and Zagrebinspekt d.o.o. Mostar

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List of Abbreviations and Acronyms

AADT	Annual Average Daily Traffic
BiH	Bosnia and Herzegovina
BIHAMK	Bosnia and Herzegovina Automobile Club
CSOP	Construction Site Organization Plan
CWMP	Construction Waste Management Plan
DNP	Defect Notification Period
E&S	Environmental and Social
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
ESAP	Environmental and Social Action Plan
ESMP	Environmental and Social Management Plan
EU	European Union
FBiH	Federation of Bosnia and Herzegovina
FMoPP	Federal Ministry of Physical Planning
IFI	International Financial Institution
ISO	International Organization for Standardization
JV	Joint Venture
LCO	Local Community Office
NGO	Non-governmental Organization
OHS	Occupational Health and Safety
OP	Operational Policies
PAP(s)	Project Affected Person(s)
PE	Public Enterprise
PIU	Project Implementation Unit
PPE	Personal Protective Equipment
PR	Performance Requirement
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SFRY	Socialist Federal Republic of Yugoslavia
SRBIH	Socialist Republic of BiH
SS ESMP	Site-specific Environmental and Social Management Plan
UXO	Unexploded ordnance
WB	World Bank

1 EXECUTIVE SUMMARY

The Public Enterprise "Roads of Federation of Bosnia and Herzegovina" (PE FBiH Roads[1]), a limited liability company wholly owned by the Government of Federation of Bosnia and Herzegovina (FBiH), has launched an overarching program for the modernization of the main roads on the territory of the FBiH, to be financed with credit funds from International Financial Institutions (IFIs).

This Site-specific Environmental and Social Management Plan including baseline monitoring (SS ESMP) was developed for construction of the main road M 17.3 Buna - Neum, specifically **section Neum-Stolac** which is a mid-size investment scheme within the Project. Section Neum-Stolac is situated in Herzegovina-Neretva Canton, at the territory of Municipalities of Neum and Stolac. The suggested new road is part of the main road M17.3 Buna-Neum, which is a branch of the major road M17 Sarajevo-Mostar-Čapljina-Metković.[2] M17 connects north of BiH with the country's south and is 433 km long. The road M17 is a part of the European Route E73 that connects Central Europe, stretching from Hungary and eastern Croatia to BiH and the Adriatic Sea in the port of Ploče (Croatia).

The future road alignment Neum-Stolac is divided into following sub-sections:

1. Sub-section Babin Do (Tunnel Oštrovac)-Broćanac (length = 6.4 km)
2. Sub-section Broćanac-Hutovo-Cerovica (length = 11.2 km), and
3. Sub-section Cerovica-Drenovac (length = 15.3 km)
4. Sub- section Stari Neum – Kiševo (length = 3km), missing only the final layer of asphalt
5. Sub-section Kiševo – Babin Do (length = 2.3 km), missing only the final layer of asphalt.

Sub- sections Stari Neum – Kiševo and Kiševo – Babin Do (in total 5.3 km long), has already been constructed, missing only the final layer of asphalt. These two sub-sections were constructed during 2005, financed by the Company's own financial resources in accordance with relevant local legislations at the time of construction and Construction Permit issued by the Ministry of Construction, Spatial Planning and Environmental Protection of Herzegovina-Neretva Canton.[3] The total section of unconstructed road is 32.9 km long and consists of the dual carriageway, with the total of 1.5 km long line for slow vehicles, with 2 tunnels, 2 bridges, 18 passages and 8 deviations. The road does not pass through protected areas of natural heritage and passes nearby 13 settlements with total of 1,108 population. There are no major industrial facilities along the route. The new road will be a single carriageway road, each lane 3.5 m wide with two hard shoulders of 1.5 m each, making a new road corridor with a width of 10.0 m.

The World Bank (WB) is considering providing finance for this Project and the PE FBiH Roads will be responsible for implementing the Project. Due to involvement of the World Bank as one of the financiers, it was necessary to prepare SS ESMP, which follows the outline of ESMPs as per World Bank Operational Policies for **Category "A" projects**. During development of the SS ESMP, the Consultant has taken into consideration all relevant applicable national legislation and World Bank standards, guidelines and requirements. Triggered World Bank Safeguard Policies, in line with the ESIA prepared for the Project, included: (i) OP/BP 4.01 on Environmental Assessment, (ii) OP/BP 4.04 on Natural Habitats, (iii) OP/BP 4.11 Physical Cultural Resources,

[1] JP Ceste FBiH in local language
[2] In Republic of Croatia
[3] There was no Environmental Permit at the time of construction since the *Law on Environmental Protection* (Official Gazette of FBiH, No. 33/03 and 38/09) is first proclaimed during 2003, and the *Regulation on Facilities Subject to Obligatory Environmental Impact Assessment and Facilities Which May be Constructed and Operated Only with a Valid Environmental Permit* (Official Gazette of FBiH, No. 19/04) during 2004. Construction activities were conducted during 2005 in line with Construction Permit No. UP.I-09-03-25-37/05 issued by the Ministry of Construction, Spatial Planning and Environmental Protection of Herzegovina-Neretva Canton

(iv) OP/BP 4.12 on Involuntary Resettlement as well as World Bank EHS standards (IFC standards). Environmental and other requirements in FBiH included:

i. Law on Environmental Protection (Official Gazette of FBiH, No. 33/03 and 38/09)
ii. Law on Air Protection of FBiH (Official Gazette of FBiH, No. 33/03 and 4/10)
iii. Law on Nature Protection of FBiH (Official Gazette of FBiH, No. 66/13)
iv. Law on Waste Management of FBiH (Official Gazette of FBiH, No. 33/03, 72/09 and 92/17)
v. Law on Waters (Official Gazette of FBiH, No. 70/06)
vi. Law on Noise Protection of FBiH (Official Gazette of FBiH, No. 110/12)
vii. Law on Physical Planning and Land Use at the Level of FBiH (Official Gazette of FBiH, No. 2/06, 72/07, 32/08, 4/10, 13/10 and 45/10)
viii. Law on Roads (Official Gazette of FBiH, No. 12/10, 16/10 and 66/13)
ix. Law on Basis of Road Traffic Safety in BiH (Official Gazette of FBiH, No 6/06, 75/06, 44/07, 84/09, 48/10 and 18/13)
x. Law on Safety at Work (Official Gazette of SRBiH, No. 22/90)
xi. Law on Protection against Fires and Protection of Fire-fighters (Official Gazette of FBiH, No. 64/09)
xii. Law on Agricultural Land (Official Gazette of FBiH, No. 52/09)
xiii. Law on Expropriation of FBiH (Official Gazette of FBiH, No. 70/07, 36/10 and 25/12
xiv. Law on Proprietary Rights (Official Gazette of FBiH, No. 66/13, 100/13
xv. Law on Protection and Use of Cultural, Historical and Natural Heritage (Official Gazette of SR BiH, No. 20/85, 12/87 and 3/93)

This SS ESMP ensures that the relevant provisions included in the project design are sufficient for environmental protection measures called upon in the EIA and ESIA prepared for the Project. For the purpose of the development of the SS ESMP the Consultant[4] provided additional updated baseline information on following issues: (i) *Physical environment* (i) *Biological environment*, and (iii) *Socio-economic environment*. This SS ESMP also provides monitoring results, values and numbers of testing and findings from the complete survey of the site for any endemic species or other environmental issues (baseline monitoring of air quality (10 samples), soil quality (32 samples), water quality (5 samples) and noise levels (10 samples)) as well as a complete survey of the site for any cultural/historical heritage objects in the zone of the road corridor. The SS ESMP provides (a) an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the SS ESMP.

For the purposes of this SS ESMP, the following terminology has been used by the Consultant:

- **Project area** - implies the narrow area of the planned Project infrastructure -Project footprint[5] (i.e. planned new main road width)
- **Project area of influence** (hereinafter referred to: area of influence) is the area likely to be affected by the Project separated into the following belts:
    - <10 m - possible additional disturbance of environment during construction phase (due to the unnecessary movement of machinery away from the construction site), air emissions, including gaseous and fugitive dust
    - 10-100 m - possible additional disturbance of environment (migration of timid species due to noise from everyday traffic, decrease in population of fauna species at area near the road and/or cultural heritage during operation phase, air emissions, including gaseous and fugitive dust

[4] Refers to the Joint Venture ENOVA Ltd. Sarajevo & Zagrebinspekt Ltd. Mostar
[5] Project footprint: The land or water area covered by a project. This includes direct physical coverage (i.e., the area on which the project physically stands) and direct effects (i.e., the disturbances that may directly emanate from the project, such as noise).

- 100-200 m - includes the Project area as well as all its ancillary aspects, such as power transmission corridors, pipelines, canals, tunnels, relocation and access roads and construction camps, as well as unplanned developments induced by the project (e.g., spontaneous settlement, logging, or shifting agriculture along access roads)
- >200 m – in area where the route goes through or next to a populated area, the area of influence was extended to include and identify all potential socio-economic impacts of the new main road, or in case of accidental situation (such as accidental leakage of oil that may lead to contamination of groundwater, or air emissions, including gaseous and fugitive dust. However, fast dispersion and reduction of air pollution is expected).

Alternatives considered: There were no specific alternatives that were based exclusively and solely on environmental impacts or environmental sensitive areas. However, five alternatives between Broćanac and Hutovo were analysed in 2013, of which one was the basis for the Preliminary Design. The alternative without the tunnel Žaba was also considered as a solution with significantly lower costs, but the alternative with the tunnel was selected at the insistence of Municipality of Neum in order to reflect the priorities of the local community. One of the reasons for choosing the alternative with the tunnel was also the vicinity of the cultural historical heritage site of Hutov grad (Hadžibegov grad). The road alignment in the alternative without the tunnel would pass very near this cultural historical site and would imply a large cut in the terrain in the close vicinity of the site which would affect the vissual value of the heritage. Other adjustments included by-passing olive groves along the sub-section Babin Do-Broćanac, including the intersection for the Papratnica settlement. In addition to that, in the area of the Queen of Peace Sanctuary, a request by the local community was accepted to place the route more to the north because of the unique features of the terrain and access to the Sanctuary, which was accepted by the investor and implemented into the final version of the Main Design. The other possible alternative is the 'do-nothing' option. The 'do-nothing' option is considered unfavorable, as it will lead to the unwanted 'status quo' of the current transportation system of the south of the FBiH. Namely, no improvements would be made to road safety as well and tourism potential will remain unused to the full potential.

Description of the Physical Environment: Project area is mostly hilly and mountainous terrain. The major part of the route passes through hilly parts of the terrain (altitudes approx. 200-300 m aSl), while the central part around Prapratnica, Hutovo and Crnoglav have higher altitudes (approx. 300-500 m aSl). At the area of Hutovo, the road bypasses the mountain range Žaba (Mala Žaba) and is directed through the Tunnel Žaba (950 m). Regarding the geological and geomorphological features of the terrain, road route passes through the area which consists of extremely karstic rocks, i.e. area of high karst with expressed occurrence of karst forms. Karstic relief comprises 94% of the area, fluvial accumulative relief comprises app. 5% of the area and fluvial karstic relief comprises 1% of the total area that will be directly affected by the road route. The soils are mostly shallow and undeveloped, and only luvisol and terra rosa are considered as valuable and fertile soils. Luvisol soils found in the area of Hutovo settlement represent only 0.7% of the total area that will be directly under impact of the Project and 0.8% that will be indirectly under impact. Terra rosa is developed together with kalkomelanosol, kalkokambisol and regosol, which indicates that this type of soil is also shallow. The Project area belongs to the Mediterranean climate. Such area is characterized by moderately warm, rainy climate with dry summers. The wider coastal area has an average of 215 sunny days a year with 2.623 sunny hours. Annual mean value of air temperature is 15.6 °C; the lowest monthly mean value of the air temperature is in January (8.2 °C), while the highest mean value is in July (24.1°C). Annual allocation of precipitation is typical Adriatic. In total there is a proportionally high quantity of precipitation per year of 1,122.4 mm. There are about 110 days with precipitation in average per year. There are no industrial air pollutants in the Project area. Existing sources of air emissions are represented by rare traffic on the existing main road 17.3 and individual heating units during the winter season from the settlements located along the route (Crnoglav, Vininie, Cerovica, Hutovo, Papratnica, Broćanac, Dobrovo, Babin Do, Kiševo and Stari Neum). Crucial features of almost all karsts forms on terrain surface are lack of surface water and karst collector features with deep levels of groundwater.

Infiltration of surface water (rainwater) is very high with an estimated very high infiltration coefficient of about 0.8. There are no available data on groundwater quality since the monitoring of groundwater is not conducted on a regular basis. There are no surface watercourses in the area of the road route. However, several water resources were identified along the road route, some of them being occasional (e.g. pond on location Kiševo near the road route at approx. 5-10 m). Wells comprising the Water Source Blace are located approx. 280-450 m from the constructed sub-section Stari Neum-Kiševo (missing only the final asphalt layer). Since the karst area is represented with high water permeability, the Water Source Blace falls under the Project area of influence. The surface water of Hutovo Blato Nature Park is located at the smallest distance of 2.5 km from the planned road corridor. There are no industrial water discharges in the area of the road. Existing water discharges include sewage waters from the settlements located along the road route (Crnoglav, Vininie, Cerovica, Hutovo, Papratnica, Broćanac, Dobrovo, Babin Do, Kiševo and Stari Neum). There are no data on sewage water quality. According to the ESIA (2016) there is a possibility that endangered or rare plant species of flora and fauna may be found on the area that corresponds to the type of natural ecosystems represented in the areas from Stolac to Neum.

According to the Red List of Flora of FBiH (2013), the woody shrub *Petteria ramentace* (dalmatian laburnum, categorised as Near Threatened) can be found on peninsula Klek[6] which is not envisaged by any activity pertinent to the implementation of the Project and at location of settlement Hutovo that is envisaged by the Project area. Peninsula Klek is located south-south west from the Project area and is approx. 2 km distant from the closest point of the road section Neum-Stolac, which is the end point of the sub-section Stari Neum-Kiševo), and settlement Hutovo is one of the Project related settlements.

According to the site specific information regarding the found flora species, one critically endangered species was identified according to the Red List of FBiH (*Crocus biflorus* – crocus) and six species are identified that are classified as least concerned according to the IUCN Red List (*Punica granatum* – pomegranate, *Juniperus oxycedrus* - prickly juniper, *Hedra helix* – ivy, *Avena fatua* - Common wild oat, *Vitis vinifera* - common grape vine and *Pistacia terebinthus* - turpentine tree. Crocus *(Crocus biflorus)* has been found sporadically at 3 out of 29 locations and only few plants were present due to the lack of soil substrate (kalkokambisol, terra rossa and regosol). During the site visits, *Petteria ramentace* wasn't found on site of the road route. Therefore, this area is not classified as critical habitat of significant importance to Critically Endangered (CR) and/or Endangered (EN) species, and as such it represents the **natural habitat for flora according to the World Bank OP 4.04.**

Specific mitigation measures are suggested. According to the Red List of FBiH following fauna species belong to the Least Concern category: European pine marten (*Martes martes*), fox (*Vulpes vulpes*), rabbit (*Lepus europaeus*), wild boar (*Sus scrofa*), squirrel (*Sciurus vulgaris*), horned viper (*Vipera ammodytes*), European green lizard (*Lacerta viridis*), *Larus* sp. (gull, seabird), black-eared wheatear (*Oenanthe hispanica*), European turtle dove (*Streptopelia turtur*), barn swallow (*Hirundo rustica*), house sparrow (*Passer domesticus*), the European green woodpecker (*Picus viridis*), buteo (*Buteo buteo*), the Eurasian sparrowhawk (*Accipiter nisus*), the mistle thrush (*Turdus viscivorus*), song thrush (*Turdus philomelos*), common blackbird (*Turdus merula*). Specie Erinaceus sp. is categoriesd as Endangered. Species rock partridge (*Alectoris graeca*) and jack snipe (*Lymnocryptes minimus*) are categorised as Data Deficient. Species black-headed bunting (*Emberiza melanocephala*) and nightingale (*Luscinia megarhynchos*) are categorised as Near Threatend. The fieldfare (*Turdus pilaris*) is categorized as Critically Endangered according to the Red List of FBiH (2013). According to the site specific information regarding the fauna species determined *in situ*, two species from the Annex 1 EU Birds Directive were identified (*Ciconia ciconia* - white storck and *Larus sp.* – seabird were identified) that are also classified as endangered and least concern, respectively, as well as two species (*Ophisaurus apodus* -

[6] According to: Red List of Flora of Federation Bosnia and Herzegovina (2013). EU „GreenWay“ and Faculty of Science, University of Sarajevo, Sarajevo.

European legless lizard and *Lacerta viridis* - European green lizard) from the Annex IV of the EU Habitat Directive. European green lizard is also classified as least concern according to Red List of FBiH and IUCN Red List Categories and Criteria. White stork *(Ciconia ciconia)* has been identified at one out of 29 locations - the pond near the Water Source Blace, which is approx. 100-700 meters distant from the sub-section Stari Neum-Kiševo. However, this sub-section has been constructed in 2005 and missing only the final layer of asphalt. This area is not classified as critical habitat of significant importance to Critically Endangered (CR) and/or Endangered (EN) species since it is not supporting significant global concentrations of migratory species and/or congregatory species and it is therefore classified as the **natural habitat for fauna according to the World Bank OP 4.04.** Regarding the endangered hedgehog species *Erinaceus* sp., two locations where the presence of this specie is indirectly identified are not assessed as habitats of significant importance to *Erinaceus* sp. During the site visit conducted in March 2017, no visible migration routes (e.g. animal corridors on the ground) of wild game were observed along the road route nor does the planned road intersect any visible migration routes. There are no protected areas, parks and preserves on the Project area. The nearest protected area is the Nature Park Hutovo Blato, declared as a protected area in 1995, at the smallest distance of 2.5 km from the road corridor at locations Crnoglav, Vivine, Cerovica. Forest resources in the area around the corridors have limited options in terms of their development, due to natural (climate, geology) and anthropological constraints in the past. In recent years, frequent fires were recorded in the Mediterranean and sub-Mediterranean area. Vegetation and trees in these areas have little economic value, mainly due to limited size and the degradation phase, but do serve a number of environmental functions that are valuable to the karst area. Around 72% of the forest vegetation area is represented by the Submediterranean forests of oriental hornbeam and pubescent oak and only 28% is represented by the Eumediterranean zone of evergreen vegetation (macchia and garrigue) of holm oak which mostly corresponds to the area of already constructed sub-sections from Stari Neum to Kiševo and Babin Do. Additionally, Submediterranean forests of oriental hornbeam and pubescent oak covers the area of app. 28% that will/may be affected by the Project (directly by the road or indirectly during the construction works, respectively) of the total Project area, and Eumediterranean zone of evergreen vegetation (macchia and garrigue) of holm oak covers the area of 11% of the total Project area, that will/may be affected by the Project (directly by the road or indirectly, respectively).

Description of the Socio-economic Environment: Both Neum and Stolac municipalities belong to the Herzegovina-Neretva Canton (HNC) - one of the ten cantons in the FBiH) HNC covers an area of 4,401.0 km^2 and, as such, is the second largest canton in FBiH. HNC makes app. 17% of the total area of FBiH and 8.6% of the total area of BiH. HNC consists of nine municipalities, with its headquarters in Mostar. It occupies the southern and southwestern part of BiH. The new main road connects the two towns (also namesake municipalities) Neum and Stolac. Both municipalities have approximately the same surface area and the same number of settlements, while Stolac has almost 3 times a larger population. In both municipalities, the majority of the population is Croats, while in Stolac there is a significantly larger share of Bosniaks (38%) than in Neum (1%). The new main road Stolac-Neum will pass through mostly rural areas in these two municipalities, with the exception of the area of Old Neum, which is much more urbanized. It will pass through the following 7 settlements in the municipality of Neum: Crnoglav, Vinine, Cerovica, Prapratnica, Dobrovo, Kiševo and Neum (Project area), and close to two settlements: Broćanac and Babin Do (area of influence). The settlements Gradac and Hutovo (municipality of Neum) are closer to the existing road than the new main road (area of influence). There are no settlements in the project area or the area of influence in the municipality of Stolac. Other settlements that are at a greater distance (>2 km) from the road are: Hotanj, Hutovski, Moševići, Brštanica, Dubravica, Glumina, Gornje Hrasno, Dobri do, Donji Zelenikovac, Rabrani, Duži, Previš, Cerovo, Žukovica, Borut, Donji Drijen and Brestica in the Municipality of Neum, and three settlements in the Municipality of Stolac: Burmazi, Bjelojevići and Stolac center. Both municipalities have a similar gender ratio, age structure of the population and mortality rate. Natural growth in both Municipalities is in decline, although the decline is somewhat slower in Stolac. The Municipality of Neum is significantly more developed than the Municipality of Stolac. Although the trade balance is much more favorable in Stolac, the economy of Neum is

more developed due to tourism. Stolac has a higher number of enterprises overall, however, the number of enterprises per 1,000 inhabitants is twice as high in Neum than in Stolac. The employment rate is higher in Neum primarily due to the tourist industry. In Stolac, largest portion of the population is employed in the public sector and in the sector of small and medium enterprises (manufacturing and construction). The average salaries are similar in both municipalities. The majority of agricultural production in the Municipality of Stolac takes place in the northern part of the Municipality, not in the area of the planned construction of the new main road. The reason for the poor development of agriculture in the southern part of the Municipality is scarcity of water, as water supply infrastructure does not exist in this part, so the rural population mostly pursues cattle breeding as their main source of income. The population has access to water only through their own wells which are filled with rainwater or by bringing water in cisterns during the summer months. There are a few small plots of plowed/sown land and permanent plantations (olives). There are 83,480 square meters (8.3 ha) of agricultural land in the Project area, which is app. 3% of all land in the Project area. According to the results of the survey of a sample of land owners/users affected by land acquisition in the framework of the Project[7], the majority of respondents (51%) reported that they do not use the affected land plots. According to the ESIA, vulnerable groups are recorded and supported in both municipalities if they meet the criteria for social benefits, at the request of the vulnerable person themselves. Such systems may overlook persons who do not ask for help. The Municipality of Neum has 55, and the Municipality of Stolac has 176 beneficiaries of social welfare. The majority of vulnerable people belong to the category of old and frail living in the remote villages of the municipalities. In several locations along its course, the alignment is in collision with overhead transmission towers of the electrical network set on wooden or concrete posts, so it will be necessary to relocate some of the towers bearing in mind the need to have a free profile of the new road. In several locations along its course, the alignment is in collision with water supply systems. Specific mitigation measures are suggested. Based on the field visits to the route and field observations, it has been determined that **there are no protected cultural and historic assets at the Project area** (new main road route or its access roads or planned crossroads). However, in the area of influence there are following visible assets (chance finds are possible and mitigation measures are provided): (i) 13 recorded tumuli on a planned route of the new main road- the stone tumuli as the archaeological site will not have any material and monumental value after the excavations, but the moveable artifacts can be stored at museums and presented to the public, (ii) the narrow-gauge railway which was protected according to the regional plan together with other structures within the railway (in the area of the Municipality of Neum). According to the main design, the new main road crosses the railway by the overpass.

Environmental impacts: Environmental impacts associated with pre-construction phase are pertinent to inadequate organisation of construction site, which may reflect to disruption of natural environment outside of the area envisaged by the Project. This is possible in cases when the construction area is not organised in the manner of good construction practices or good environmental practices, as well in cases when the Construction Waste Management Plan (CWMP) and Construction Site Organization Plan (CSOP) which the Contractor is obliged to design are not developed or implemented. Another impact pertinent to the pre-construction phase is potential conflict with illegal construction of other facilities along the road. Environmental impacts associated with construction phase are mainly adverse and can be listed as follows: (i) **land** (conversion of the total area of 363,716 m^2 of the present natural state that will be directly affected by the road / possible disruption of additional 218,244.8 m^2 that have the potential to be indirectly affected by the road, physical loss of fertile soil, physical loss of forest land due to construction of the road, accompanying facilities and access roads - forest land and vegetation is classified as natural habitat since it does not represent the highly threatened and/or unique ecosystems or area associated with key evolutionary processes, land destruction and creation of erosive surfaces, possible soil contamination, soil disturbance due to the

[7] JP Ceste FBiH (2016). Ressetlement Action Plan Neum-Stolac. Sarajevo

temporary disposal of construction waste; (ii) **water** (possible groundwater contamination (e.g. water source Blace), generation of sanitary wastewater, degradation of water quality due to inadequate management of hazardous waste, possible groundwater contamination due to dissipation of solid material such as asphalt, which contains VOC and PAH); (iii) **air** (air emission due to traffic and work of transport and construction vehicles i.e. polluters such as sulphur dioxide (SO_2), carbon dioxide (CO_2), carbon monoxide (CO), nitrogen oxides[8] (NO_x), volatile organic compound (VOC) may be expected, dust generation as a result of site preparation activities (excavation of earth material, trenching, blasting and tunnelling), due to movement of machinery and transport vehicles and during construction of cut and infill and during manipulation of construction materials, emission of volatile organic compounds (VOC) containing polycyclic aromatic hydrocarbons (PAH) in the phase of placing asphalt mass on road route, disruption of landscape and visual values); **flora and fauna** (physical loss of vegetation and fauna species in the phase of works on preparation of construction site and possible disruption of additional areas of natural environment due to performance of construction works, fragmentation of habitat and increase of edge effect, disturbance of fauna species due to increased level of noise and vibration in the zone of construction works (especially during blasting activities); **noise** (noise and vibration emission from the construction activities, noise emission from the everyday traffic related to supply of construction materials and construction activities). Environmental impacts associated with operation phase are: air emission from the vehicles comprising the everyday traffic, noise emission from the everyday traffic, fatalities of terriastric fauna species during attempt to cross roads and possible fatalities of avio fauna during low flyover of the road, possible soil contamination due to deposition of products from the vehicle exhaust on the surrounding soil, possible groundwater contamination due to deposition of combustion products on the surrounding soil, inadequate maintenance of the system for drainage and inadequate maintenance of the system for treatment of run-off rainwater, generation of waste during the maintenance of the road and inadequate management of both non-hazardous and hazardous waste, possible migration of timid fauna species due to edge effect and noise from everyday traffic, potential conflict with illegal construction of other facilities along the road. Environmental impacts associated with decommissioning phase are similar to the ones identified during construction phase including significant impact from generation of demolition waste (old asphalt and earth material).

Social Impacts and opportunities: Socio-economic impacts during pre-construction and construction phases are: (i) permanent land acquisition and livelihood impact for families identified in the Resettlement Action Plan prepared for this Project (only during the pre-construction phase) ; (ii) possible temporary land acquisition for placing of equipment and mechanization; (iii) disrupted traffic and traffic congestions due to increase in local traffic; (iv) possible and temporary disruptions in the present functional organization of space (i.e. access to agricultural land and pastures in several cases referring to people crossing the road to reach their remote farms and pastures) ; (v) impacts on living conditions of local communities during construction works - negative impacts refer to disturbances to surrounding communities related to increased noise and dust, disruptions to water and electricity supply due to construction works etc., (vi) negative impacts duo to labour influx could be expected to a lesser extent –the maximum expected number of workers that will be hired per one construction site is approx. 70. The demand for local staff will very likely occur for administrative personnel, qualified, semi-qualified and unskilled persons. According to the experience of the Company in similar projects in the country, it is most likely that workers will be selected among the local population, but probably not all of them will instantly (at the beginning of construction) be part of the contractor's team (excluding key personnel). Worker accommodation will most likely be found in the private leasing market as the cheapest option, so labour camps will not be required; (vii) increased dust concentration due to movement of work machines and transport vehicles which might cause adverse consequences on population and workers, (viii) possible minimal impacts on existing cultural assets below and above ground level in terms

[8]NOx is a generic term for the mono-nitrogen oxides (NO) and nitrogen dioxide (NO_2). They are produced from the reaction of nitrogen and oxygen gases in the air during combustion, particularly at high temperatures

of vibration and potential damage to new archaeological findings, (ix) possible physical damage to structures such as fences due to construction works (vibrations, material disposal, forming access roads). The implementation of the Project will contribute to socio-economic improvement and will have positive impacts on the life quality of local communities. Possible socio-economic benefits and opportunities during the pre-construction and construction phase are direct employment and service opportunities and trigger of the "multiplier effect" of the industry duo to construction works. Potential socio-economic impacts that could be expected during the operation phase are: risk of direct contact (accidents) or physical damage to facilities in close vicinity of the road, potential risks to illegal construction of structures along the road and possible road safety issues due to increased number of vehicles and increased vehicle speed on the new road. Socio-economic impacts during the decommissioning phase are: disrupted traffic and traffic congestion, increased dust concentration due to movement of work machines and transport vehicles which might cause adverse consequences on population and workers, possible physical damage to structures and objects due to decommissioning works and disruption of landscape and visual values. Possible socio-economic benefits and opportunities during the operation phase are as follows: (i) improvement of connections between municipalities at national and regional level and stimulation of the socioeconomic development of the areas, (ii) more efficient and safe road transport system through reduced travel times, vehicle operating and maintenance costs and transportation costs for goods, (iii) faster and better transport connections and accessibility to the Nature Park Hutovo Blato as well as other cultural and historical assets and locations in both municipalities, (iv) improved transport system, accessibility and communication, (v) reduction of erosion rate, (vi) developed road infrastructure with improved access to and within settlements in the Project area, (vii) enhancement of quality of life of the community in general, (viii) benefits to vehicle travellers and users of public transportation means due to improved traffic connections and road capacity, (ix) benefits for the industrial sector and development of industrial activity due to improved connections with the international highway network, and the cost savings and reliability associated with a decrease in congestion. Socio-economic benefits and opportunities during the decommissioning phase are related to direct employment only.

Management and mitigation measures: This SS ESMP includes management and mitigation measures that have been developed on the basis of the principles of a mitigation hierarchy, i.e. measures have been developed to avoid creating impacts from the outset of development activities, and where this is not possible, to implement additional measures that would minimize, mitigate and, as a last resort, offset and/or compensate any potential residual adverse impacts. During the design phase, the PE FBiH Roads ensured that engineering designs drafted for the Project are in line with the national by-laws. Mitigation measures are incorporated as part of the standard design and, as such, their costs are included in the construction costs. For the purpose of preparation of construction works, several management plans need to be developed and implemented in order to ensure the adequate implementation of the Project, in line with national legislation (according to the *Decree on Construction Site, Mandatory Documentation on the Site and Participants in Construction*[9]) during the pre-construction phase: **Construction Site Organization Plan (CSOP)**[10] that is consist of: 1a) Construction Environmental Management Plan (CEMP), 1b) Fire and Explosion Management Plan and 1c) Occupational Health and Safety Management Plan, and **Construction Waste Management Plan (CWMP)**. The PE FBiH Roads is responsible for monitoring that the SS ESMP requirements are incorporated into the CSOP. During the construction phase, Contractors will be required to allocate the responsibility of overseeing day-to-day compliance with the SS ESMP to a senior member of staff. Contractors will be responsible for the implementation of all measures included in the SS ESMP for all activities undertaken in terms of the

[9]Required by the *Decree on Construction Site, Mandatory Documentation on the Site and Participants in Construction*- Official Gazette of FBiH, No. 48/09, 75/09, 93/12, 74/13, 89/14, 99/14, 53/15 and 101/15
[10]Required by the *Decree on Construction Site, Mandatory Documentation on the Site and Participants in Construction*- Official Gazette of FBiH, No. 48/09, 75/09, 93/12, 74/13, 89/14, 99/14, 53/15 and 101/15

construction contract (including work undertaken by subcontractors). Compliance of Contractors with these measures will be assessed by the Construction Supervisor appointed by the PE FBiH Roads, in line with the *Decree on Construction Site Organisation, Mandatory Documentation on Construction Site and Construction Work Participants*. The Company PE FBiH Roads will engage a Contractor for Maintenance Works, whose obligations include maintenance of Road Inspection Logs, Road Maintenance Logs and Log of Construction Works in line with the *Guidelines for the Design, Construction, Maintenance and Supervision.*

Mitigation section of the SS ESMP includes: (i) identification of all anticipated significant adverse social and environmental impacts, (ii) description of each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate, (iii) estimation of any potential environmental impacts of these measures, and (iv) linkage with any other mitigation plans (e.g., for involuntary resettlement, or cultural property) required for the project.

Site Specific Environmental and Social Management Plans: Site Specific Environmental Management Plan as well as Site Specific Social Management Plan for Road Section Neum-Stolac are presented as a separated tables (Table 23 and Table 24, respectively) that provides information on issues/impacts, mitigation measures for each identified issues/impact, estimated costs for the implementation of foreseen mitigation measures (both install and operate), institutional responsibility for the implementation of each mitigation measure and additional comments per each phase. Examples for one issue / impact per every phase, both for environmental or social issues, are provided below:

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
Environmental							
Pre-construction	Potential conflict with illeagal construction of other facilities along the road	• Communication with Department of Spatial Planning of Municipalities Neum and Stolac in order to prohibit construction in area of protective zone of the main road of 20 m on each side of the main road in accordance with the Article 58 of the *Law on FBiH Roads* (Official Gazette of FBiH, No, 12/10, 16/10) • Conduct regular inspection in order to identify any illegal constructed	-	-	PE FBiH Roads	Municipality Neum Municipality Stolac – Inspectorate Department and Department of Spatial Planning	n/a

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		facilities					
Construction	Generation of sanitary wastewater	• Temporary installation of portable toilets for workers as part of the regular organisation of construction site (e.g. foam-enveloped toilets using foam instead of water, to block waste odours. As a result, the foam-enveloped toilet uses considerably less water (less than 50 ml), preserving water and reducing disposal costs) • Measures are to be implemented during the implementation of all construction activities along the whole section Neum-Stolac[11]	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a
Operation/ Maintenance	Noise emission from everyday traffic	• Plantation and maintenance of protective green belt along the road that passes through residential areas such as settlements: Kiševo, Babin Do, Dobrovo, Papratnica, Hutovo, Cerovica, Vinine and Crnoglav • Conduct monitoring of air quality during	Included in the bid price except for monitoring cost. For monitoring price please refer to Chapter 3.2.1, Table 25	-	The Contractor	PE FBiH Roads	n/a

[11] All proposed mitigation measures shall be incorporated in the CEMP during the development of the CEMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		operation phase of the road at 10 locations (refer to Chapter 3.2.1)					
Decommissioning	Air emission due to traffic and work of demolition vehicles (polluters such as sulphur dioxide (SO_2), carbon dioxide (CO_2), carbon monoxide (CO), nitrogen oxides[12] (NO_x), volatile organic compound (VOC) may be expected; dust will be generated as a result of demolition and due to movement of machinery and transport vehicles	• Sand and gravel materials need to be transported in covered trucks • Machines and vehicles must have installed filters to reduce soot emission. If applicable, vehicles with at least EURO 4 emission standard should be used • High quality fossil fuels (with low percentage of sulphur and lead) need to be used as motor fuel for machinery and equipment • Vehicles need to be regularly maintained • The equipment and machinery need to be shut down when not in use • Machines and vehicles to be used in construction activities must have use/operation permits • Measures are to be implemented along the whole road	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a

[12] NO_x is a generic term for the mono-nitrogen oxides (NO) and nitrogen dioxide (NO_2). They are produced from the reaction of nitrogen and oxygen gases in the air during combustion, particularly at high temperatures

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		section Neum-Stolac and during the implementation of all decommissioning activities					
Social							
Pre-construction	Cultural Heritage	• Implement measures included in the Expert Opinions obtained from the Federal Institute for the Protection of Monuments - develop expert studies on executed preventive archaeological research for subsections: Broćanac-Hutovo-Cerovica (probe works), Cerovica-Drenovac (sporadic archaeological research) and Kiševo-Broćanac (sporadic archaeological research), according to the Expert Opinions obtained from the Federal Institute for the Protection of Monuments • Implement detailed archaeological research and conservatory inspection of recorded sites along the route; recording the present state of objects and sites (tumuli, stone walls, tombstones, etc.) or other requirements	60,000	-	PE FBiH Roads	Contractor	n/a

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		specified in the opinion(s). Submit results from research to relevant institutions					
Construction	The influx of workers	• The contractor is obliged to arrange suitable worker accommodation for non-local workers. Taking into consideration the fact that the road will be built between two urban settlements (one of which is Neum as a tourist center with high lodging availability), it is envisioned that the contractor will lease worker accommodation from the local private market. Renting of suitable worker accommodation should be done prior to beginning of construction works. In advance of the civil works, the affected Municipalities should communicate to the local communities the upcoming demand for worker lodging and encourage private owners to early advertise lodging vacancies thus promoting leasing arrangements	In the framework of construction works (to be included in the contract with Contractor)	-	PE FBiH Roads Municipalities/Contractor	PE FBiH Roads Municipalities	- Boosting local economy

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		for vacancies that can accommodate construction workers. • Managing public expectations by regular dissemination of information about temporary worker in-migration by PE FBiH Roads (at local level). • Negative impacts due to influx of workers could be expected to a lesser extent i.e. conflicts with the local population. Code of conduct for the workers should be developed and distributed					
Operation	Possible road safety issues due to increased number of vehicles and increased vehicle speed on the new road	• Install road safety measures / signage (the road is to be equipped with appropriate horizontal and vertical signalization, which includes necessary prohibitions and notifications, such as speed limits, curve ahead)	-	-	Contractor	PE FBiH Roads	n/a
Decommissioning	Increased dust concentration (OHS and Community safety)	• Contractor is required to implement all OHS measures foreseen by OHSMP in frame of the Construction Site Organization Plan (CSOP) that will be developed for the Project • Provide			Contractor	Supervisory body	n/a

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		information (at least weekly) to the public about the scope and schedule of construction activities and expected disruptions and access restrictions • Prepare an emergency response plan in case of emergency transportation to allow transport without delay to the intended destination • Maintenance all mitigation measures proposed in the CEMP					

Environmental and Social Monitoring Plan: Monitoring during Project implementation provides information on the key environmental and social aspects of the project, particularly on the environmental and social aspects of the project and effectiveness of the mitigation measures. Such information enables the borrower and the Bank to evaluate the success of mitigation as part of project supervision, and allows corrective action to be taken when needed. Therefore, the SS ESMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the ESIA report and the mitigation measures described in the SS ESMP. The Contractors are required to develop Environmental Monitoring Plans in accordance with the requirements of the monitoring table and this SS ESMP. Monitoring of the water quality, soil quality, air quality and measurement of noise levels will be conducted based on provisions of the Environmental Permit (analysis of 5 samples of water resources, analysis of 32 soil samples, especially near the agricultural areas, analysis of air quality at 10 locations near the settlements and measurement of noise levels at 10 locations near the settlements). PE FBiH Roads will be responsible for reviewing the Environmental Monitoring Plans prepared by the Contractors and for ensuring that the monitoring programmes provided are consistent with this document. A field-monitoring checklist will be prepared based on this SS ESMP. The field-monitoring checklist will be used by the PE FBiH Roads's Supervising Engineers (monitoring of implementation of the measures proposed by the SS ESMP the PE FBiH Roads contracts with the Supervising Engineer). The signed checklists will be provided to the Company that will be responsible for the follow-up and compliance reporting. The main components of the monitoring plans are: (i) parameters that will be monitored, (ii) location of monitoring of parameters with focus on specific chainage of the planned main road, (iii) in what way the monitoring will be performed, (iv) when will the monitoring be performed, (v) rationale of the monitoring to be performed, (vi) cost of the monitoring activities and (vii) responsibility to perform monitoring. Example of monitoring plan table provided below including one parameter for every phase, both for environmental and social issues, as follows:

Which parameter is to be monitored ?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
BASELINE/INITIAL STATE[13]								
Soil quality: • pH value • Heavy metals (cadmium, lead)	Along road route (right or left side of the road), especially near settlements and agricultural land (precise locations with coordinates are given in Table 30) Total of 32 sampling locations	Sampling and laboratory testing at least once a year. Methods and laboratory standards are defined in Chapter 4.1 Development of reports of monitoring results	Monitoring of baseline parameters for soil quality is already conducted as part of this assignment. For results of monitoring please refer to Chapter 4.1	Same as above	-	60 $ for one sample x 32 locations = 1,000 $ for air soil quality analysis	Consultant engaged for development of SS ESMP Authorized laboratory	PE FBiH Roads
CONSTRUCTION PHASE								
Soil quality: • pH value • Heavy metals (cadmium, lead)	Along road route (right or left side of the road), especially near settlements and agricultural land (precise locations with coordinates are given in Table 30) Total of 32 sampling locations	Sampling and laboratory testing at least once a year. Methods and laboratory standards are defined in Chapter 4.1 Development of reports of monitoring results	Monitoring of soil quality should be conducted during construction works	In order to track any possible changes of soil quality and adverse impacts that might appear during construction of the road	60 $ for one sample x 32 locations = 1,000 $ for air soil quality analysis	-	Authorized laboratory	PE FBiH Roads
OPERATIONAL PHASE								
Soil quality: • pH value • Heavy metals (cadmium	Along road route (right or left side of the road), especially near settlements and agricultural land (precise locations with coordinates are given in Table	Sampling and laboratory testing at least once a year. Methods and laboratory	Monitoring of soil quality should be conducted during operation phase of the road (e.g. next	In order to track any possible changes of soil quality and adverse impacts that might appear during	60 $ for one sample x 32 locations = 1,000 $ for air soil quality	-	Authorized laboratory	PE FBiH Roads

[13] Monitoring of baseline parameters for soil quality, water quality, air quality and measurement of noise levels are already conducted as part of this assignment. For results of monitoring please refer to Chapter 4

Which parameter is to be monitored ?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
, lead)	30) Total of 32 sampling locations	standards are defined in Chapter 4.1 or even better methods and laboratory standards should be used If the monitoring shows that the tested parameters are below permissible values, sampling and testing should be conducted once in three years Development of reports of monitoring results	70 years)	operation phase of the road	analysis			
DECOMMISSIONING PHASE								
Soil quality: • pH value • Heavy metals (cadmium, lead)	Along road route (right or left side of the road), especially near settlements and agricultural land (precise locations with coordinates are given in Table 30) Total of 32 sampling locations	Sampling and laboratory testing once a year during demolition activities. Methods and laboratory standards are defined in Chapter 4.1 or even better methods and laboratory standards should be used Development of reports of monitoring results	Monitoring of soil quality should be conducted during demolition activities	In order to track any possible changes of soil quality and adverse impacts that might appear during demolition of the road	60 $ for one sample x 32 locations = 1,000 $ for air soil quality analysis	-	Authorized laboratory	PE FBiH Roads
CONSTRUCTION PHASE								
• State of	At locations/chainage	Field	In line with the work	Protection of the cultural	10,000	-	Contractor	Contractor

Which parameter is to be monitored ?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
cultural heritage	s provided in Table 20 and any other locations according to the results of preliminary archaeological researches	verification Three times during construction works at specific location	dynamic. At the beginning, in the middle and in the end of constructio n works at specific location (implies plus / minus 5 km of the specific chainage)	heritage.				
OPERATIONAL PHASE								
• Travel time	From beginning to the end of the new main road compared with the old road (from Stari Neum to Drenovac)	Field verification	Once after all constructio n works are finished	Time travel in general shall be decreased and accessibility to targeted destinations (jobs, services, social infrastructure) shall be improved.	50	-	PE FBiH Roads	PE FBiH Roads

Implementation: Indicative cost for implementation of the SS ESMP is estimated to 1,310,039.20 USD as shown in table below:

	Heading	Cost Estimate in US$
1.	Environmental Mitigation Measures	(Environmental Mitigation Measures are part of the Main Designs and are included in the bid price (e.g. 5,000), except for monitoring of air quality, water quality, soil quality and noise levels)
2.	Social Mitigation Measures	1,193,106,38
3.	Environmental Monitoring Programme	34,500
4.	Social Monitoring Programme	10,050
5.	Capacity Building and Training	5.000
6.	Environmental Sub Total	44,500
7.	Social Sub Total	1,203,156.38
8.	Contingency (5% of the Sub Total (6+7))	62,382.82
	Total (6+7+8)	**1,310,039.20**

Additionally, this SS ESMP defined relevant implementation and reporting mechanisms. The Contractor is obligated to immediately inform PE FBiH Roads for any grievances received directly in the field, which should be logged in the central log in the PE FBiH Roads. All grievances received directly in the field should be addressed to: The Contractor shall prepare a compliance report in respect to this ESMP as a monthly progress report and submit it to the PE FBiH Roads, in both local B/H/S and English language, in hard copy and electronic versions. These reports will include a list and description of all undertaken activities at the site, as well as recommendations for future activities and protection measures. If any type of accident or

endangerment to the environment or local communities occurs, reporting will be immediate. Contractor is obliged to inform the PIU and the local authorities about any accidents immediately after occurrence. The findings of the regular monitoring activities, including activities specified in the ESMP carried out by the Contractor will be included in the quarterly progress reports of the PIU. Annual Monitoring Reports on the environmental and social performance of the Project will be prepared by the PE FBiH Roads and submitted for WB's review. The PE FBiH Roads shall also submit reports to the FMoPP in line with the requirements of the local legislation, i.e., the Law on Physical Planning of FBiH. In case of fatalities or major incidents on site the PE FBiH Roads will immediately report to the WB.

Public discussions and information disclosure: For the new main road section covered by this ESMP, a set of consultations with the local communities for the previous Environmental Impact Study has already been carried out, two sets of consultations for the ESIA and multiple consultations for RAPs. In order to complement the secondary data and allow for the full range of relevant baseline to be presented, public surveys, public consultations, community meetings - focus groups and key informant interviews were conducted to gather qualitative data (baseline conditions of relevance to the environmental characteristics and socio-economic environment of the Neum and Stolac area of influence) during the ESIA development (November and December, 2015). Surveys and public consultations were conducted for the purposes of RAP too (December 2015-February 2016).

The draft ESMP has been disclosed on the website of PE FBiH Roads (http://www.jpdcFBiH.ba/ba/) and on the web sites of Municipalities Neum and Stolac in local language, and on the website of the WB in English. Public consultation regarding the draft ESMP has been organized by PE FBiH Roads at location Hutovo Municipality of Neum during February 2018. In order to ensure an adequate and timely consultation process, the PE FBiH Roads has established a PIU, consisting of representatives from the PE FBiH Roads that will be responsible for the communication with Local Community Offices, PAPs, representatives of government authorities and all other stakeholders. The PE FBiH Roads has developed a system for regular and direct communication with stakeholders, including the following channels of communication and information disclosure: (i) Official websites of the PE FBiH Roads and BIHAMK (http://www.jpcfbih.ba/ba/ and http://bihamk.ba/), (ii) Disclosure of information through the Local Community Offices (LCOs), (iii) Telephone, mail, fax or e-mail inquiries and online question forms, (iv) Public announcements communicated to the media (local radio and television stations, daily newspapers). In addition, a Project-specific grievance mechanism has been established. A Beneficiary Feedback Commission (BFC) has been established as a forum for grievances and comments in relation to expropriation in the Municipalities of Neum and Stolac. The BFC is supported by the Central Feedback Desk (CFD) at the level of PC Roads FBiH, which is tasked with keeping comments/grievances received through the BFC through a Central Grievance Log.

Any comments or concerns can be brought to the attention of the BFC or the Contractor verbally (personally or by telephone) or in writing by filling in the grievance form (by post, fax or personal delivery to the addresses/numbers given below or by e-mail to zalbena@jpcfbih.ba), without any costs incurred to the complainant. Grievances can also be submitted anonymously. More information on grievance mechanism is available in RAP. Any request for information or complaint can be addressed to:

Attention: Head of CFD/ Head of BFC
PE FBiH Roads
Address: Terezija 54, 71 000 Sarajevo
T:+387 33 250 370, F:+387 33 250 400
E: zalbena@jpcfbih.ba

The grievance form is available in Annex 2 of this ESMP.

2 BACKGROUND INFORMATION AND FINDINGS SUPLEMENTAL TO THE ESIA

2.1 Introduction

The Public Enterprise "Roads of Federation of Bosnia and Herzegovina" (PE FBiH Roads[14]), a limited liability company wholly owned by the Government of Federation of Bosnia and Herzegovina (FBiH), has launched an overarching program for the modernization of the main roads on the territory of the FBiH to ensure adequate road infrastructure by 2020. For this purpose, PE FBiH Roads has requested the Government of FBiH to ensure credit funds from International Financial Institutions (IFIs). The Government of FBiH has supported the initiative to ensure credit resources from IFIs in the amount of up to EUR 150 million for the Project "Modernization of the Main Roads in FBiH" (the Project). Modernization of the road network has high priority in terms of raising the level of services, adjustment with the socio-economic development and improvement of the road safety. The beneficiaries of the Project are road users and communities neighboring the selected sub-projects across FBiH.

Construction of the main road M 17.3 Buna - Neum, **section –Neum-Stolac** is a mid-size investment scheme within the Project. Construction of this road section will open up the coast and the area leading to the coast and enable the development of a promising area with great possibilities for agriculture and tourism. Opening up this part of the country for easier tourist access would also create development opportunities.

Construction of the main road M 17.3 section Neum-Stolac was subject to an Environmental Impact Assessment (EIA) in accordance with the *Law on Environmental Protection* (Official Gazette FBiH, No. 33/03, 38/09). The EIA was carried out as part of a special study document (Feasibility Study), including development of both Preliminary EIA and EIA Study. The EIA Study for this Project was prepared in July 2009 by the consultant Roughton Int. in cooperation with Energoinvest Jsc. Sarajevo, and formally accepted by the Federal Ministry of Environment and Tourism. The Environmental Permit was issued in May 2010.

The World Bank (WB) is considering providing finance for sovereign guaranteed loans for the Project. The Borrower will be the Ministry of Finance and Treasury of Bosnia and Herzegovina (BiH), whereas PE FBiH Roads will be responsible for implementing the Project on behalf of FBiH. Due to involvement of the World Bank as one of the financiers, the Environmental Impact Study was revised in March 2016 by the consultant Ecoplan Ltd. Mostar to reflect the existing situation, address specific gaps (e.g. social aspects, gender issue) and to meet the World Bank criteria for Category A projects, including a generic Environmental and Social Management Plan (ESMP). A two-step consultation process was conducted for the Environmental and Social Impact Assessment (ESIA) package in November 2015 and March 2016.

The objective of the Consultant's assignment was to prepare a Site-specific Environmental and Social Management Plan including baseline monitoring (SS ESMP), which follows the outline of ESMPs as per World Bank Operational Policies – OP 4.01 on Environmental Assessment and guidelines for Category "A" projects. The SS ESMP has been developed based on the recommendations and findings of the 2009 EIA and the 2016 ESIA, as well as the relevant issued permits, including the Environmental Permit and Water Permit. The SS ESMP ensures that the relevant provisions included in the project design are sufficient for environmental protection measures called upon in the EIA and ESIA. This SS ESMP also provides monitoring results, values and numbers of testing and findings from the complete survey of the site for any endemic species or other environmental issues. Additionally, a complete survey of the site for any cultural/historical heritage objects

[14] JP Ceste FBiH in local language

was conducted in the zone of the road corridor. The SS ESMP has been prepared in the manner consistent with the World Bank standards and procedures for category "A" projects, EU standards and national environment management authority requirements.

2.2 Objectives and Methodology Of SS ESMP

2.2.1 Objectives

Construction of the new road Neum-Stolac is characterized as a category A project according to the World Bank´s OP 4.01 Environmental Assessment, for which it is obligatory to develop the ESIA. The ESMP is an integral part of the ESIA. The objective of the SS ESMP is to:

a) provide site specific details on the environmental and social impacts already defined in the ESIA
b) set forth a practical implementation plan, identify the set of mitigation measures to eliminate/minimize potentially adverse impacts, determine requirements for ensuring that mitigation measures are made effectively and in a timely manner
c) develop a monitoring plan to ensure that the mitigation measures are implemented.

The SS ESMP provides (a) an implementation schedule for measures that must be carried out as part of the project, showing phasing and coordination with overall project implementation plans; and (b) the capital and recurrent cost estimates and sources of funds for implementing the SS ESMP.

2.2.2 Methodology

Development of the SS ESMP included the following:

- analysis of the existing relevant documentation, including the Main Designs[15] with accompanying documents, ESIA Report (2016), EIA (2009), valid Environmental Permit and Water Permit
- baseline monitoring of air quality, soil quality, water quality and noise level emission
- survey of the site for any endemic or endangered species and cultural-historical heritage objects
- desk research for additional data collection
- development of the document SS ESMP.

Survey of the site was conducted in March 2017 in zone of corridors of direct and indirect impacts. The Consultant visited the area of the planned main road Neum-Stolac. The inspection and observation of the terrain was conducted between the two consecutive observation points (1 to 29) as show in Table 1 and Figure 1. GIS Computer programme was used with the aim to calculate the surface (m^2) of areas of direct and indirect impacts of the Project, where one micropolygon is the area between two observation points.

For the purposes of this SS ESMP, the following terminology has been used by the Consultant:

- **Project area** - implies the narrow area of the planned Project infrastructure -Project footprint[16] (i.e. planned new main road width)
- **Project area of influence** (hereinafter referred to: area of influence) is the area likely to be affected by the Project separated into the following belts:

[15] Including Main Designs for sub-sections: Stari Neum-Kiševo, Kiševo-Broćanac, Broćanac-Cerovica, Cerovica-Drenovac, Preliminary Design for Landfill of Civil Material
[16] Project footprint: The land or water area covered by a project. This includes direct physical coverage (i.e., the area on which the project physically stands) and direct effects (i.e., the disturbances that may directly emanate from the project, such as noise).

- <10 m - possible additional disturbance of environment during construction phase (due to the unnecessary movement of machinery away from the construction site), air emissions, including gaseous and fugitive dust
- 10-100 m - possible additional disturbance of environment (migration of timid species due to noise from everyday traffic, decrease in population of fauna species at area near the road and/or cultural heritage during operation phase, air emissions, including gaseous and fugitive dust
- 100-200 m - includes the Project area as well as all its ancillary aspects, such as power transmission corridors, pipelines, canals, tunnels, relocation and access roads and construction camps, as well as unplanned developments induced by the project (e.g., spontaneous settlement, logging, or shifting agriculture along access roads)
- >200 m – in area where the route goes through or next to a populated area, the area of influence was extended to include and identify all potential socio-economic impacts of the new main road, or in case of accidental situation (such as accidental leakage of oil that may lead to contamination of groundwater, or air emissions, including gaseous and fugitive dust. However, fast dispertion and reduction of air pollution is expected).

Table 1: *Locations of the Observation Points on Road Section Neum-Stolac*

No. of Points	Location	Sub-section	Chainage
1.	Drenovac – Start of the section	Drenovac - Cerovica	36+400.000
2.	Location Pušišta Intersection	Drenovac - Cerovica	35+000.000
3.	Location Kadića Dubrava	Drenovac - Cerovica	34+275.000
4.	Old School/Hunting lodge	Drenovac - Cerovica	34+825.000
5.	Location Gornji Bjelojevići	Drenovac - Cerovica	33+490.000
6.	Intersection /chapel	Drenovac - Cerovica	33+230.000
7.	Location Udora	Drenovac - Cerovica	32+800.000
8.	Border of Two Hunting Areas –Neum/Stolac	Drenovac - Cerovica	28+000.000
9.	Location Gornje Hrasno (at existing Popovi Intersection)	Drenovac - Cerovica	27+350.000
10.	Slopes of Hill Crnoglav	Drenovac - Cerovica	26+350.000
11.	Reservoir (Čatrnja) below Slopes of Hill Crnoglav	Drenovac - Cerovica	25+600.000
12.	Estate near Vivine Settlement	Drenovac - Cerovica	25+220.000
13.	Location Exit of Vivine Settlement	Drenovac - Cerovica	23+340.000
14.	Intersection for Neum	Broćanac-Hutovo-Cerovica	22+200.000
15.	Cerovica and Sanctuary of the Queen of Peace	Broćanac-Hutovo-Cerovica	21+400.000
16.	Road Near the Existing Train Planum	Broćanac-Hutovo-Cerovica	18+750.000
17.	Settlement Hutovo 2 – Exit of the Tunnel Žaba	Broćanac-Hutovo-Cerovica	16+730.000
18.	Settlement Hutovo 1	Broćanac-Hutovo-Cerovica	16+680.000
19.	Hadžibeys Old City	Broćanac-Hutovo-Cerovica	16+300.000
20.	Entrance to the tunnel Žaba	Broćanac-Hutovo-Cerovica	15+400.000
21.	Location Broćanac-Papratnica (Deviation of Road)	Broćanac-Hutovo-Cerovica	12+450.000
22.	Location Gradac Podžablje	Babin Do-Broćanac	8+850.000
23.	Location Moševići	Babin Do-Broćanac	5+450.000
24.	Location Babin Do-Broćanac (start of the section)	Babin Do-Broćanac	5+230.000
25.	Location Kiševo-Small Carst Field	Kiševo-Babin Do	2+210.000
26.	Landfill for Construction Material	Stari Neum -Kiševo	1+340.000
27.	Near source Blace	Stari Neum -Kiševo	1+000.000
28.	Intersection Vranjevo Village	Babin Do-Broćanac	0+720.000
29.	Location Stari Neum (start of the section)	Stari Neum -Kiševo	0+250.000

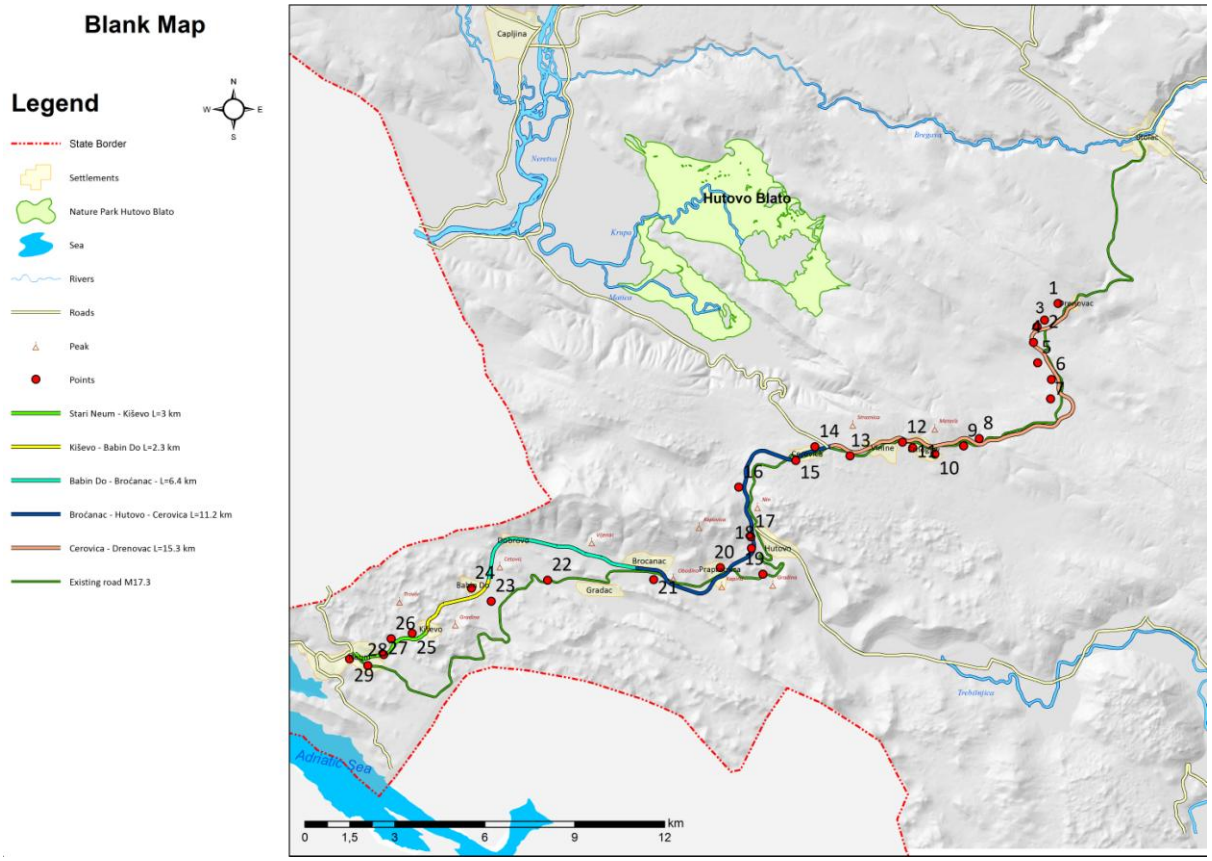


Figure 1: *Spatial Distribution of the Observation Points on Road Section Neum-Stolac (source: JV ENOVA & Zagrebinspekt)*

The road section Neum-Stolac was subjected to the survey of the site for any flora and fauna endemic or endangered species. The following methods were used: 'sit and wait' (relevant for fauna only), methods of visual observation, sampling, active search for e.g. animal shelter and sampling methods with the aim of further observations.

Baseline monitoring of air quality (10 samples), soil quality (32 samples), water quality (5 samples) and noise levels (10 samples) was also conducted and relevant standardized laboratory methods and analysis were used as elaborated in Chapter 4. This SS ESMP includes the baseline data from conducted monitoring.

The methodology of site-specific identification of cultural heritage involved the following steps/techniques:

- a literature review of all potential sources of data (particularly the legal status of cultural and historical heritage in the Project area)
- rapid field surveys and mapping undertaken in March 2017: the field surveys included field visits and screening of existing above-ground cultural and historical heritage along the road route. The screening belt included the width of the road (Project area) plus a 50 meters area on both sides of the road (area of influence). For distant locations (inaccessible locations), binoculars were used in order to screen the area (observations were carried out from higher altitudes)
- consultations with local experts (from the Institute for Protection of Cultural Heritage of HNC) to gain an overview of potential cultural heritage issues
- verification of data through interviews with users of the space, i.e. hunters, local population (random population encountered during the site visits).

Mitigation and monitoring plans follow a well-defined format as required by the World Bank guidelines.

The Consultant presented the cost estimate for the implementation of the SS ESMP as an integral part of the SS ESMP which reflects all associated cost whether related to human and other resources needed to monitor the Plan, needed capacity building and training, and/or any consultancy assignments which may be required to assist in the performance of specific and highly technical duties over the construction and also maintenance of the road segment.

2.2.3 Assumptions and Limitations

Since the field visit was conducted in March 2017, assumptions and limitations during the survey of the site for any endangered and endemic species are pertinent to the early vegetation stage of flora and dormant period for reptilian species. In order to overcome these obstacles, the Consultant also conducted the inspection of the animal shelters and consulted the local huntsmen. Additionally, the Consultant reviewed results of previously conducted biodiversity studies of the area of Mount Svitava and slopes of Mount Svitava and its wider area, which corresponds to the Project area.

Another limitation is pertinent to the inaccessibility of the terrain on the road section that corresponds to the tunnels Žaba and Oštrovac, as well as other parts of the road which are covered with dense shrubbery and thorns.

Regarding the sampling of water from the water source Blace, it is important to emphasize that the first water protection zone, which corresponds to the Water Source Blace, is completely inaccessible except for employees of the water management Company, PE Komunalno Neum Ltd. Neum and for employees of the laboratory that conducts regular analysis of water quality in accordance with *Rulebook on Drinking Water Health Safety* (Official Gazzette of FBIH, No. 40/10), respectively employees of the Institute for Public Health of FBiH, Mostar. The Consultant took the sample for analysis of water quality on the site closest to the water source Blace and its first water protection zone at pond which is hydrologically connected with water source Blace, and also gathered the relevant data on water quality conducted at the source Blace during 2012, 2015 and 2016 (Table 63).

2.3 Legal Framework

2.3.1 World Bank Policies

The objective of the World Bank's environmental and social safeguard policies is to help identify, avoid, and minimize harm to people and the environment in the development process.

A detailed description of the World Bank safeguard policies applicable to the Project is provided in the ESIA prepared for this Project, and a summary is provided in Table 2 below.

Table 2: *Summary of Triggered World Bank Safeguard Policies*

Safeguard Policy	Brief Description
OP/BP 4.01 on Environmental Assessment	Ensure the environmental and social soundness and sustainability of investment projects, as well as support integration of environmental and social aspects of projects in the decision-making process. The project is considered EA Category A.
OP/BP 4.04 on Natural Habitats	Promote environmentally sustainable development by supporting the protection, conservation, maintenance, and rehabilitation of natural habitats and their functions. The Bank supports, and expects borrowers to apply, a precautionary approach to natural resources management to ensure opportunities for environmentally sustainable development.

Safeguard Policy	Brief Description
OP/BP 4.11 Physical Cultural Resources	The Bank is sensitive about physical cultural properties that might potentially be impacted by project related activities or investments. Impacts produced over physical cultural resources should be avoided or mitigated.
OP/BP 4.12 on Involuntary Resettlement	Displaced people who lose their livelihood as a result of the project must be resettled, compensated for all of their losses and they must be provided with a situation that is at least as good as the one they had before the project, at least restoring their livelihoods and standards of living.
EHS Standards (IFC Standards)	The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP), as defined in IFC's *Performance Standard 3: Resource Efficiency and Pollution Prevention*. IFC uses the EHS Guidelines as a technical source of information during project appraisal activities. The EHS Guidelines contain information on cross-cutting environmental, health, and safety issues potentially applicable to all industry sectors, including the roads.

2.3.2 Overview of Environmental and Other Requirements in FBiH

A detailed description of the FBiH legislation applicable to the Project is provided in the ESIA prepared for this Project, and a summary is provided below.

FBiH Law	Brief Description
Law on Environmental Protection (Official Gazette of FBiH, No. 33/03 and 38/09)	Regulates the preservation, protection, restoration and improvement of the ecological quality and capacity of environment and of the quality of life; measures and conditions for managing, preserving and for rational use of natural resources; the framework for legal measures and institutions for the preservation, protection and improvement of environmental protection; financing environmental activities and voluntary measures; responsibilities and duties of public administration at different state levels. This Law also regulates EIA procedure and the issuance of Environmental Permit at entity level.
Law on Air Protection of FBiH (Official Gazette of FBiH, No. 33/03 and 4/10)	Lays down the technical conditions for the prevention or reduction of emissions into the air from human activities, planning of air quality protection, special emission sources, emission inventory, air quality, monitoring and sanctions for legal and private entities and natural persons. Limit values, target values and alert thresholds for pollutants and the date of their entry into force are defined by the by-laws to this Law.
Law on Nature Protection of FBiH (Official Gazette of FBiH, No. 66/13)	Regulates the competence of bodies for nature protection, general conservation measures, evaluation of operations in nature, habitats and ecologically important areas, species and subspecies, protection and conservation of biodiversity and ecosystems, the establishment of Natura 2000, measures to protect species and subspecies, transboundary movement of protected wild species and sub-species, and monitoring, access to information and public participation, a sign of nature protection, promotion of education in the protection of nature, awards and prizes for achievements in the nature protection, and financing for nature protection.
Law on Waste Management of FBiH (Official Gazette of FBiH, No. 33/03, 72/09 and 92/17)	Regulates waste management, planning and treatment, waste and hazardous waste cross-border transport with the objective to encourage and provide the basic conditions for the prevention of production, recycling and processing of waste for re-use; the extraction of secondary raw materials and possibly of energy thereof.
Law on Waters (Official Gazette of FBiH, No. 70/06)	Regulates water management and planning on the territory of FBiH. Water management includes water protection, water use, protection from harmful water effects and regulation of watercourses and other waters.
Law on Noise Protection	Regulates the permissible noise levels, noise protection measures, the way of measuring and

FBiH Law	Brief Description
of FBiH (Official Gazette of FBiH, No. 110/12)	recording noise, noise limits classified according to the atmosphere, land use and the time of day (day or night), in order to protect human health, working and living space, and the environment in general.
Law on Physical Planning and Land Use at the Level of FBiH (Official Gazette of FBiH, No. 2/06, 72/07, 32/08, 4/10, 13/10 and 45/10)	Regulates land use planning on the territory of FBiH through the preparation and adoption of plans and their implementation, the type and content of planning documents, land use at the entity level, supervision of the implementation of planning documents of importance to FBiH, supervision over the implementation of this law, as well as penalties for legal entities and individuals. This Law contains also the procedures for obtaining Urban Permit, Construction Permit and Use Permit.
Law on Roads (Official Gazette of FBiH, No. 12/10, 16/10 and 66/13)	Regulates the legal status of public roads on the territory of FBiH, closely defining the road management rules and requirements (physical planning and administrative provisions), construction, maintenance, additional management and public works regarding the construction of roads, the protection of roads and conditions for the provision of public and private road transport, financing of public roads, concessions on public roads, concrete technical rules for the implementation of the provisions of this Law.
Law on Basis of Road Traffic Safety in BiH (Official Gazette of FBiH, No 6/06, 75/06, 44/07, 84/09, 48/10 and 18/13)	Regulates basic principles for traffic participants behavior and other participants in the transport, the basic requirements to be met by roads in terms of road traffic safety, maintenance of the Central Registry of drivers and vehicles, road traffic rules, traffic signs system and signs given by authorized persons, duties in the event of traffic accidents, training of candidates for drivers, requirements for vehicles devices and equipment, dimensions, total weight, axial load, the basic conditions that need to be met by vehicle on traffic roads, as well as other issues related to road.
Law on Safety at Work (Official Gazette of SRBiH, No. 22/90)	Regulates measures to provide immediate safety of workers, measures in relation to working conditions, measures regarding the special protection of workers, rights, duties and responsibilities of the organization, employers and workers, and the other provisions regarding the health and safety at work.
Law on Protection against Fires and Protection of Fire-fighters (Official Gazette of FBiH, No. 64/09)	Regulates the organization and operation of fire protection and fire services, planning and implementation of fire protection measures, organization and functioning of the fire service and fire-fighting (fire intervention), professional training and development of employees and fire-fighters, financing and other issues of importance to the organization and functioning of fire protection and fire-fighting in FBiH.
Law on Agricultural Land (Official Gazette of FBiH, No. 52/09)	Contains definitions, basic principles, management, protection, use, planning, and records related to agricultural land. The aim of this Law is preservation, intended use, increase in production capacity and improvement of the agricultural land as a limited and non-renewable natural resource, as well as harmonization of interests of all stakeholders involved in the use of agricultural land in the economic and political development of the country.
Law on Expropriation of FBiH (Official Gazette of FBiH, No. 70/07, 36/10 and 25/12	Regulates the conditions and the procedure for expropriation of real property for construction of facilities in public interest and the compensation for expropriated property.
Law on Proprietary Rights (Official Gazette of FBiH, No. 66/13, 100/13	Regulates the issues of acquiring, using, disposing of, protecting and terminating ownership rights and other proprietary rights and possession rights, including the issues of restricting such rights, the right of servitude, co-ownership and joint ownership rights, the procedure for acquiring property rights over land and/or structures erected on someone else's land.
Law on Protection and Use of Cultural, Historical and Natural Heritage (Official Gazette of SR BiH, No. 20/85, 12/87 and 3/93)	Regulates the protection of cultural, historic and natural heritage.

2.4 Project Description

2.4.1 Project Location

The M17.3 begins at the settlement Buna, situated 11 km south from the City of Mostar, the regional centre of Herzegovina. From Mostar the road continues to the South-East through the City of Stolac towards the coast, respectively to the City of Neum.

Section Neum-Stolac is situated in Herzegovina-Neretva Canton, at the territory of Municipalities of Neum and Stolac. The suggested new road is part of the main road M17.3 Buna-Neum, which is a branch of the major road M17 Sarajevo-Mostar-Čapljina-Metković.[17] M17 connects north of BiH with the country's south and is 433 km long. The road M17 is a part of the European Route E73 that connects Central Europe, stretching from Hungary and eastern Croatia to BiH and the Adriatic Sea in the port of Ploče (Croatia).

2.4.2 Basic Information about the Project

Project includes 5 sub-sections from Stari Neum to Drenovac in two municipalities: Neum and Stolac. Project documentation for the section Neum-Stolac was prepared on the level of the Main Design. The future road alignment Neum-Stolac is divided into following sub-sections:

6. Sub-section Babin Do (Tunnel Oštrovac)-Broćanac (length = 6.4 km)
7. Sub-section Broćanac-Hutovo-Cerovica (length = 11.2 km), and
8. Sub-section Cerovica-Drenovac (length = 15.3 km).

Sub- sections Stari Neum – Kiševo (length = 3km) and Kiševo – Babin Do (length = 2.3 km), has already been constructed, missing only the final layer of asphalt. According to the Company representatives, these two sub-sections were constructed during 2005 in accordance with relevant local safety standards. Two sub-sections were financed by the PC Roads own funds and they were constructed in accordance with relevant local legislations at the time of construction[18] and Construction Permit No. UP.I-09-03-25-37/05 issued by the Ministry of Construction, Spatial Planning and Environmental Protection of Herzegovina-Neretva Canton during 2005 All necesary instruments and mitigation measures during construction had been applied.

The non-constructed road section begins from the settlement Babin Do in the municipality of Neum and passes near the settlements Broćanac, Hutovo and Cerovica and ends in Drenovac in the Municipality of Stolac. The total section of unconstructed road is 32.9 km long and consists of the dual carriageway, with the total of 1.5 km long line for slow vehicles, with 2 tunnels, 2 bridges, 18 passages and 8 deviations. The road does not pass through protected areas of natural heritage and passes nearby 13 settlements with total of 1108 population. There are no major industrial facilities along the route. The new road will be a single carriageway road, each lane 3.5 m wide with two hard shoulders of 1.5 m each, making a new road corridor with a width of 10.0 m.

During 2016 the *Preliminary Design of Disposal of Surplus Material* has been prepared. Total amount of 800,000 m^3 will be excavated and reused. Final disposal of around 50,000 m^3 construction material is planned

[17] In Republic of Croatia
[18] There was no Environmental Permit at the time of construction since the *Law on Environmental Protection* (Official Gazette of FBiH, No. 33/03 and 38/09) is first proclaimed during 2003, and the *Regulation on Facilities Subject to Obligatory Environmental Impact Assessment and Facilities Which May be Constructed and Operated Only with a Valid Environmental Permit* (Official Gazette of FBiH, No. 19/04) during 2004. Construction activities were conducted during 2005 in line with Construction Permit No. UP.I-09-03-25-37/05 issued by the Ministry of Construction, Spatial Planning and Environmental Protection of Herzegovina-Neretva Canton

at area of landfill of construction material at location Hutovo, land plots no.43/218 and 43/219 in accordance with the *Preliminary Design of Disposal of Surplus Material* and Waste Management Plan for Neum-Stolac (Ecoplan, 2016). Basic principles of waste disposal are given in Construction Permit No. UPI-03-23-2-264/12 MT, issued in January 2013 by the Federal Ministry of Spatial Planning. The Company has obtained the Consent No. 02-25-975/1-16 from the Local Community Neum to form the landfill of construction material at location Hutovo on land plots No. 43/218 and 43/219.

Quarries and borrow pits are not covered with the *Main Designs* or *Preliminary Design of Disposal of Surplus Material* since these locations are determined by the Contractor for construction works. The FBiH Roads ensures the monitoring of material sourcing from authorized sources and requires this term during the tendering procedure for sellection of Contractor for construction works. The Contractor also ensures the sourcing from authorized sources and decides on suppliers of construction material. The locations of suppliers of construction material will be detrmined during construction phase taking into consideration the authorization of resources, quality of construction material and proximity of the Project area to ensure economical efficiency.

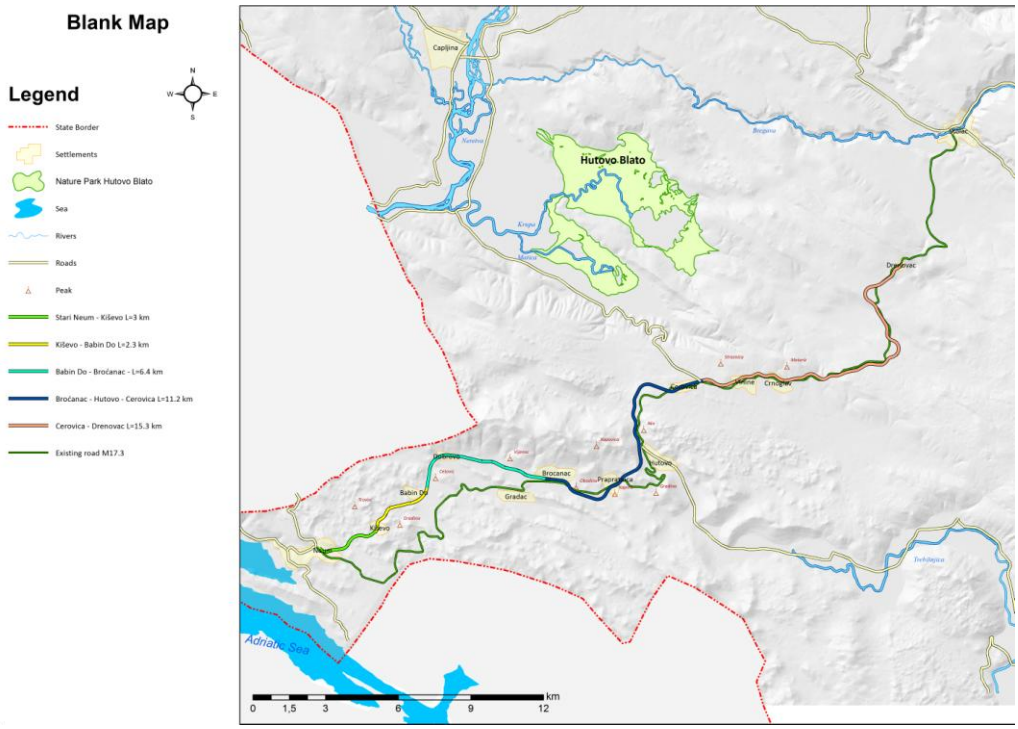


Figure 2: *Position of the Planned Road in Relation to the Settlements (source: JV ENOVA & Zagrebinspekt)*

2.4.3 Alternatives Considered

Different variants of connections of Neum with the interior of BiH were explored back in the 1970es during the original design development of the road. For the purpose of developing the Physical Plan of the Socialist Republic of BiH for the period 1981-2000, several possible alternatives were explored, and the corridor of 3 km width was identified as the most favourable one, also incorporated into the Physical Plan of the Municipality of Neum (1985-2000) as a corridor to be further considered. Recently, for the purpose of developing the Physical Plan of FBiH (development phase) and the Physical Plan of the Municipality of Neum (2010-2020), the identified corridors were re-examined, as well as several alternative routes within the corridors.

There were no specific alternatives that were based exclusively and solely on environmental impacts or environmental sensitive areas. However, five alternatives between Broćanac and Hutovo were analysed in

2013, of which one was the basis for the Preliminary Design. The alternative without the tunnel Žaba was also considered as a solution with significantly lower costs, but the alternative with the tunnel was selected at the insistence of Municipality of Neum in order to reflect the priorities of the local community. One of the reasons for choosing the alternative with the tunnel was also the vicinity of the cultural historical heritage site of Hutov grad (Hadzibegov grad). The road alignment in the alternative without the tunnel would pass very near this cultural historical site and would imply a large cut in the terrain in the close vicinity of the site which would affect the vissual value of the heritage. Other adjustments included by-passing olive groves along the sub-section Babin Do-Broćanac, including the intersection for the Papratnica settlement. In addition to that, in the area of the Queen of Peace Sanctuary, a request by the local community was accepted to place the route more to the north because of the unique features of the terrain and access to the Sanctuary, which was accepted by the investor and implemented into the final version of the Main Design.The other possible alternative is the 'do-nothing' option. The 'do-nothing' option is considered unfavourable, as it will lead to the unwanted 'status quo' of the current transportation system of the south of the FBiH. Namely, no improvements would be made to road safety as well and tourism potential will remain unused to the full potential.

2.5 Summary of Environmental and Social Baseline Conditions

2.5.1 Description of the Physical Environment

2.5.1.1 Topography, Geology and Geomorphology

Project area is mostly hilly and mountainous terrain, as shown in Figure 3. The major part of the route passes through hilly parts of the terrain (altitudes approx. 200-300 m aSl), while the central part around Prapratnica, Hutovo and Crnoglav have higher altitudes (approx. 300-500 m aSl). At the area of Hutovo, the road bypasses the mountain range Žaba (Mala Žaba) and is directed through the Tunnel Žaba (950 m).

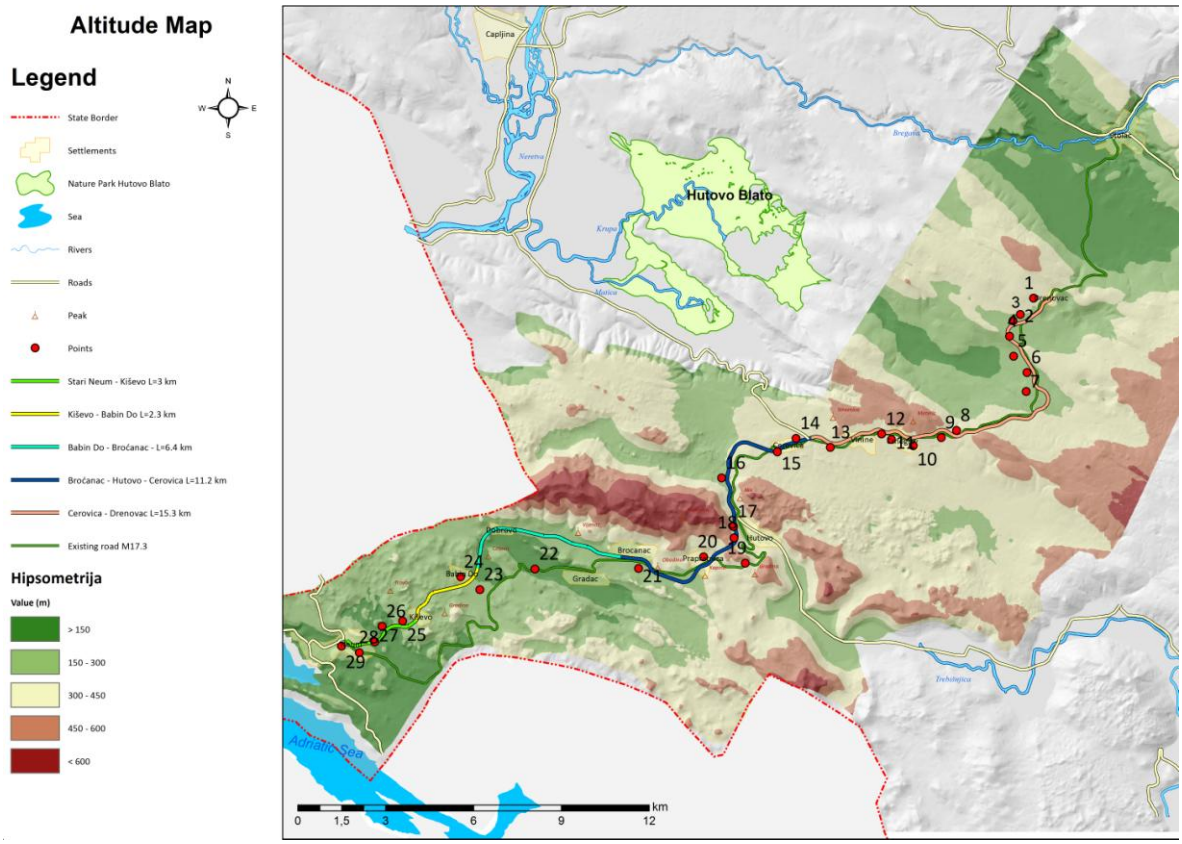


Figure 3: *Altitudes of the Terrain (source: JV ENOVA & Zagrebinspekt)*

Regarding the geological and geomorphological features of the terrain, road route passes through the area which consists of extremely karstic rocks, i.e. area of high karst with expressed occurrence of karst forms. Table 3 provides information on site specific geological features of the Project area.

Table 3: *Site Specific Information on Geological Features – Road Section Neum Stolac*

No.	Location	Sub-section	Chainage	Geological Features
1.	Drenovac – Start of the section	Drenovac - Cerovica	36+400.000	Limestone
2.	Location Pušišta Intersection	Drenovac - Cerovica	35+000.000	Limestone
3.	Location Kadića Dubrava	Drenovac - Cerovica	34+275.000	Limestone
4.	Old School/Hunting lodge	Drenovac - Cerovica	34+825.000	Limestone
5.	Location Gornji Bjelojevići	Drenovac - Cerovica	33+490.000	Limestone
6.	Intersection /chapel	Drenovac - Cerovica	33+230.000	Limestone
7.	Location Udora	Drenovac - Cerovica	32+800.000	Limestone
8.	Border of Two Hunting Areas –Neum/Stolac	Drenovac - Cerovica	28+000.000	Limestone
9.	Location Gornje Hrasno (at existing Popovi Intersection)	Drenovac - Cerovica	27+350.000	Limestone
10.	Slopes of Hill Crnoglav	Drenovac - Cerovica	26+350.000	Limestone
11.	Reservoir (Čatrnja) below Slopes of Hill Crnoglav	Drenovac - Cerovica	25+600.000	Limestone and dolomites
12.	Estate near Vivine Settlement	Drenovac - Cerovica	25+220.000	Limestone and dolomites
13.	Location Exit of Vivine Settlement	Drenovac - Cerovica	23+340.000	Limestone and dolomites
14.	Intersection for Neum	Broćanac-Hutovo-Cerovica	22+200.000	Limestone and dolomites
15.	Cerovica and Sanctuary of the Queen of Peace	Broćanac-Hutovo-Cerovica	21+400.000	Limestone and dolomites
16.	Road Near the Existing Train Planum	Broćanac-Hutovo-Cerovica	18+750.000	Limestone and dolomites
17.	Settlement Hutovo 2 – Exit of the Tunnel Žaba	Broćanac-Hutovo-Cerovica	16+730.000	Limestone and dolomites
18.	Settlement Hutovo 1	Broćanac-Hutovo-Cerovica	16+680.000	Limestone and dolomites
19.	Hadžibeys Old City	Broćanac-Hutovo-Cerovica	16+300.000	Limestone and dolomites
20.	Entrance to the tunnel Žaba	Broćanac-Hutovo-Cerovica	15+400.000	Limestone and dolomites
21.	Location Broćanac-Papratnica (Deviation of Road)	Broćanac-Hutovo-Cerovica	12+450.000	Limestone and dolomites
22.	Location Gradac Podžablje	Babin Do-Broćanac	8+850.000	Dolomites with inlays of limestone
23.	Location Moševići	Babin Do-Broćanac	5+450.000	Dolomites with inlays of limestone
24.	Location Babin Do-Broćanac (start of the section)	Babin Do-Broćanac	5+230.000	Dolomites with inlays of limestone
25.	Location Kiševo-Small Carst Field	Kiševo-Babin Do	2+210.000	Limestone and dolomites
26.	Landfill for Construction Material	Stari Neum -Kiševo	1+340.000	Limestone and dolomites
27.	Near source Blace	Stari Neum -Kiševo	1+000.000	Dolomites with inlays of limestone
28.	Intersection Vranjevo Village	Babin Do-Broćanac	0+720.000	Limestone and dolomites
29.	Location Stari Neum (start of the section)	Stari Neum -Kiševo	0+250.000	Limestone and dolomites

Table 4 below provides information on the areas that will be affected by the Project, with regard to the genetic type of the relief. Karstic relief comprises 94.09% of the area, fluvial accumulative relief comprises 4.80% of the area and fluvial karstic relief comprises 1.11% of the total area that will be directly affected by the road route.

Table 4: *Total Area that will be affected by the Project in Relation to the Genetic Type of the Relief*

Geomorphological genetic type of the relief	Project area – Direct impact (area in m^2)	Percent in genetic types	Percent in Total Area	Area of influence - Indirect impact (area in m^2)[19]	Percent in genetic types
Karstic	322,026.4 m^2	94.14%	88.53%	191,168.1 m^2	94.09%
Fluvial accumulative (Area of Hutovo Settlement)	16,257.32 m^2	4.75%	4.47%	9,754.42 m^2	4.80%
Fluvial karstic (Area south of the Peak Nin)	3,761.33 m^2	1.01%	1.03%	2,256.59 m^2	1.11%
Total Area	**342,045.1 m^2**			**203,179.1 m^2**	

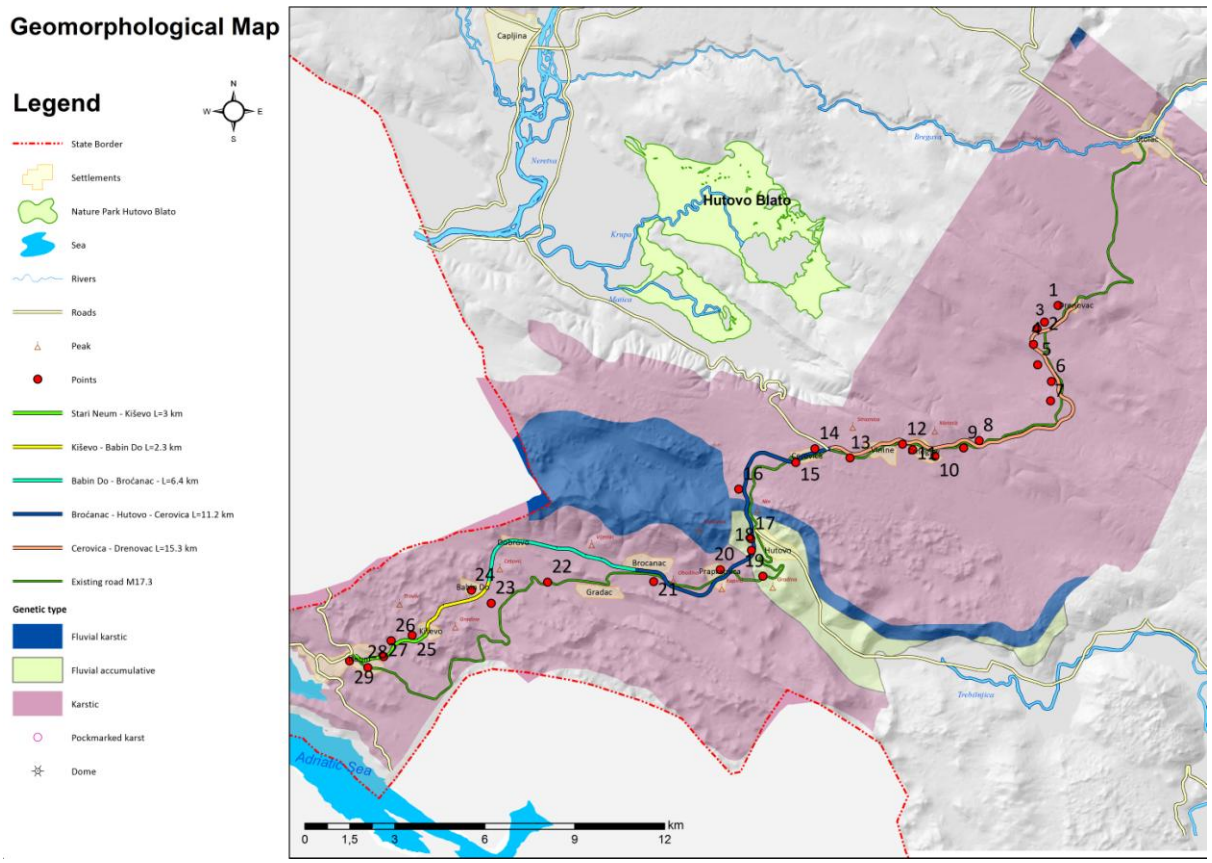


Figure 4: *Geomorphological Features of the Terrain (source: JV ENOVA & Zagrebinspekt)*

2.5.1.2 Soils

Different types of soils that have developed over limestone and dolomites can be found in Project area, as specified in Table 5. The soils are mostly shallow and undeveloped, and only luvisol and terra rosa are considered as valuable and fertile soils. Luvisol soils found in the area of Hutovo settlement represent only 0.69 % of the total area that will be directly under impact of the Project and 0.74% that will be indirectly under impact (Figure 5). Kalkokambisol and kalkomelanosol are represented with shallow soils on rocky supstrate with 50-70% of rockiness. Terra rosa is developed together with kalkomelanosol, kalkokambisol and regosol, which indicates that this type of soil is also shallow. The complex soils containing terra rosa represent 58.38 % of the total area that will be directly under impact of the Project and 46.69% that will be under indirect impact.

[19] Refers to the area along the road route (3 m on both sides of the road that may be under additional, unnecessary disturbance during construction phase)

Table 6 below provides information on total surface of the soil that will be affected by the project with regard to the soil type.

Table 5: *Site Specific Loss of Soil Designated by Soil Type*

	Polygons	Type of Soil	Project area - Direct impact (area in m^2)	Area of influence- Indirect impact [20] (area in m^2)
1	Drenovac - Pušišta	Kalkokambisol+Terra Rossa+Regosol	11453.7	6875,87
2	Pušišta – KadićaDubrava	Luvisol	830.4	502,275
		Kalkokambisol+Terra Rossa+Regosol	4194.6	2520,93
3	KadićaDubrava – Old School/Hunting lodge	Luvisol	1632.3	983,556
		Kalkokambisol+Terra Rossa+Regosol	3883.7	2330,7
4	Old School/Hunting lodge – GornjiBjelojevići	Kalkokambisol+Terra Rossa+Regosol	7571.2	4544,25
5	GornjBjelojevići – Intersection/chapel	Kalkokambisol+Terra Rossa+Regosol	7,734.7	4642,4
6	Intersection/chapel - Udora	Kalkokambisol+Terra Rossa+Regosol	8,857.4	5318,62
7	Udora – Border of Two Hunting Areas –Neum/Stolac	Kalkokambisol+Terra Rossa+Regosol	37,875.6	22725,5
8	Border of Two Hunting Areas – Neum/Stolac – GornjeHrasno	Kalkokambisol+Terra Rossa+Regosol	7,071.2	4243,3
9	GornjeHrasno – Slopes of Hill Crnoglava	Kalkokambisol+Terra Rossa+Regosol	9,526.3	5717,06
10	Slopes of Hill Crnoglav – Reservoir (Čatrnja) below Slopes of Hill Crnoglav	Kalkokambisol+Terra Rossa+Regosol	7,244.1	4351,64
11	Estate near Vivine Settlement - Reservoir (Čatrnja) below Slopes of Hill Crnoglav	Kalkokambisol+Terra Rossa+Regosol	3,611.5	2167,77
12	Estate near Vivine Settlement – Estate near Vivine Settlement	Kalkokambisol+Terra Rossa+Regosol	18,721.2	11234,6
13	Estate near Vivine Settlement – Intersection for Neum	Kalkokambisol+Terra Rossa	11,329.5	6798,7
		Kalkokambisol+Terra Rossa+Regosol	981.6	590,642
14	Intersection for Neum – Cerovica and Sanctuary of the Queen of Peace	Kalkokambisol+Terra Rossa	8,031.8	4824,63
15	Cerovica and Sanctuary of the Queen of Peace – Road Near the Existing Train Planum	Kalkomelanosol+Kalkokambisol	17,195.1	10320,7
		Kalkokambisol+Terra Rossa	3,109.4	1869,81
		Kalkokambisol+Regosol	5,724.8	3432,24
16	Road Near the Existing Train Planum – Settlement Hutovo 2/Exit of the Tunnel Žaba	Kalkomelanosol+Kalkokambisol	15,719	9432,32
		Kalkokambisol+Regosol	4,928.1	2958,4
17	Settlement Hutovo 2/Exit of the Tunnel Žaba - Settlement Hutovo 1	Kalkomelanosol+Kalkokambisol	15,719	9432,32
		Kalkokambisol+Regosol	4,928.1	2958,4
18	Settlement Hutovo 1 - Hadžibeys old City	Kalkomelanosol+Kalkokambisol	6,369.3	3825,14
19	Hadžibeys old City - Entrance to the tunnel Žaba	Kalkomelanosol+Kalkokambisol	6,831.9	4111,57
		Regosol	1,733.9	1040,38
20	Entrance to the tunnel Žaba - Broćanac/Papratnica	Kalkomelanosol+Kalkokambisol	3,180.5	1916,43
		Kalkokambisol	24,103.5	14466,22
		Regosol	674.4	404,65
21	Broćanac/Papratnica – GradacPodžablje	Kalkokambisol	38,732.6	23247,74
22	GradacPodžablje - Moševići	Kalkomelanosol, Kalkokambisol+Terra	6,801.1	3988,83

[20] Refers to the area along the road route (3 m on both sides of the road that may be under additional, unnecessary disturbance during construction phase)

	Polygons	Type of Soil	Project area - Direct impact (area in m^2)	Area of influence- Indirect impact [20] (area in m^2)
		Rossa		
		Litosol	49.9	146,347
23	Moševići - Babin Do/Broćanac	Kalkomelanosol, Kalkokambisol+Terra Rossa	23698	14225,6
		Regosol	2952.1	1777,8
24	Babin Do/Broćanac - Location Kiševo/Small Carst Field	Kalkomelanosol, Kalkokambisol+Terra Rossa	5907	3562
25	Location Kiševo/Small Carst Field - Landfill for Construction Material	Kalkokambisol+Terra Rossa	2818.4	1682,04
		Kalkomelanosol+Kalkokambisol+Terra Rossa	3059.5	1849,02
26	Landfill for Construction Material - Near Source Blace	Kalkokambisol+Terra Rossa	1238.7	755,262
		Kalkomelanosol, Kalkokambisol+Terra Rossa	4857.3	2914,87
27	Near Source Blace - Intersection Vranjevo Village Near Source Blace	Kalkokambisol+Terra Rossa	1238.7	755,262
		Kalkomelanosol, Kalkokambisol+Terra Rossa	4857.3	2914,87
28	Intersection Vranjevo Village - Location Stari Neum	Kalkokambisol+Terra Rossa	3866.5	2328,22

Table 6: *Total Surface of the Soil that will be affected by the Project with regard to the Soil Type*

Type of Soil	Project area – Direct impact (area in m^2)	Percent in Soil	Area of influence - Indirect impact[21] (area in m^2)	Percent in Soil
Kalkokambisol, Terra Rossa and Regosol	**131,597.9 m^2**	**36.18%**	**78.819.2 m^2**	**36.11%**
Luvisol	**2,512.5 m^2**	**0.69%**	**1,632.2 m^2**	**0.74%**
Kalkokambisol and Terra Rossa	**31,633.1 m^2**	**8.69%**	**19,013.9 m^2**	**0.087%**
Kalkomelanosol and Kalkokambisol	65,014.9 m^2	17.87%	39,038.4 m^2	17.88%
Kalkokambisol and Regosol	15,580.9 m^2	4.28%	9,349.1 m^2	4.28%
Kalkokambisol	62,836.1 m^2	17.27%	37,713.9 m^2	17.28%
Regosol	5,360.3 m^2	1.47%	3,222.8 m^2	1.47%
Kalkomelanosol, Kalkokambisol and Terra Rossa	**49,180.1 m^2**	**13.52%**	**29,455.2 m^2**	**13.49%**
Total Project Area	**363,716 m^2**		**218,244.8 m^2**	

[21] Refers to the area along the road route (3 m on both sides of the road that may be under additional, unnecessary disturbance during construction phase)

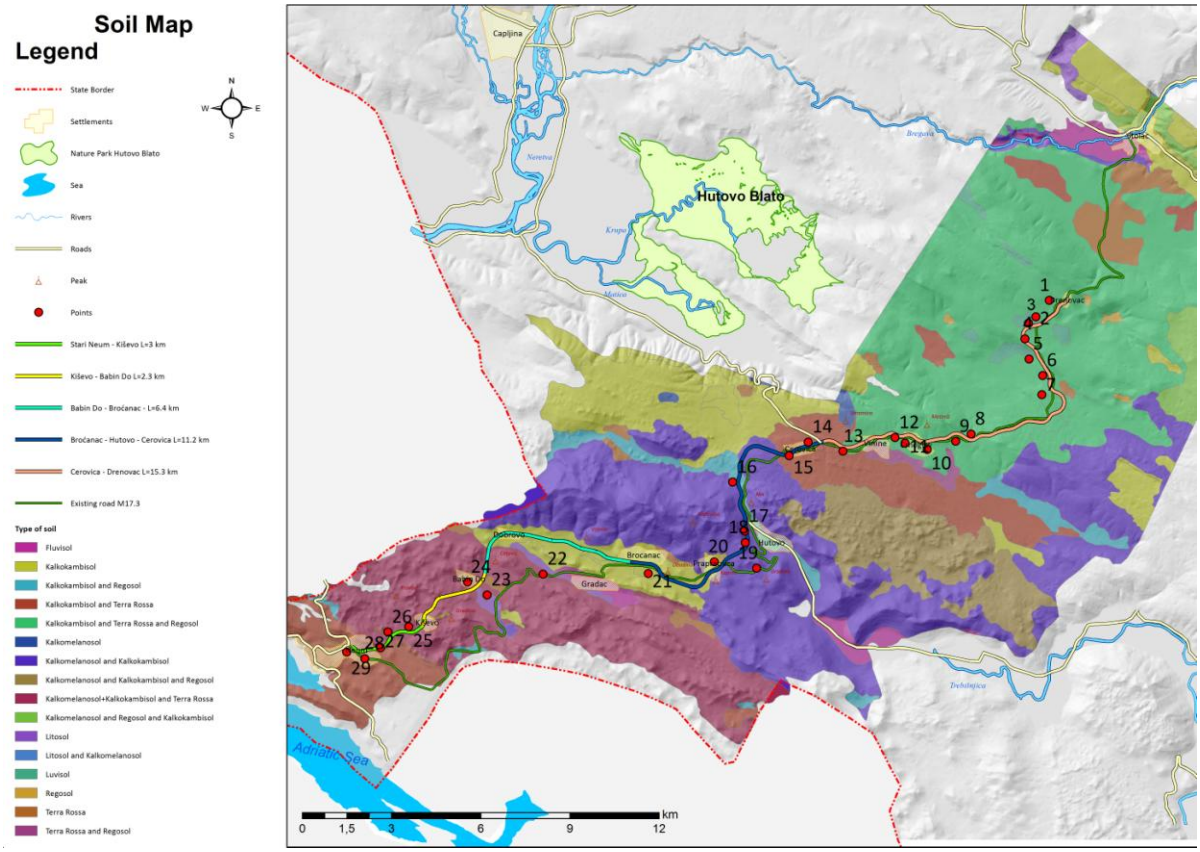


Figure 5: *Soil Types (source: JV ENOVA & Zagrebinspekt)*

In order to determine the baseline condition the Consultant[22] performed the monitoring of soil quality along the road route. Sampling was performed in period on 09-10 March 2017 when thirty-two (32) samples were taken at the locations where the most contamination during the construction is expected (Table 30 in Chapter 4.1). Samples are taken from the depth of up to 20 cm and analyzed in laboratory to determine pH value and heavy metals content (cadmium, lead). Site specific monitoring results on soil quality are available in Chapter 4.1.

Figure 6: *Soil sampling along the planned Road Neum-Stolac (source: JV ENOVA & Zagrebinspekt)*

[22] Refers to the Joint Venture ENOVA Ltd. Sarajevo & Zagrebinspekt Ltd. Mostar

2.5.1.3 Climate and Meteorology

The Project area belongs to the Mediterranean climate. Such area is characterized by moderately warm, rainy climate with dry summers. The wider coastal area has an average of 215 sunny days a year with 2.623 sunny hours. Annual mean value of air temperature is 15.6 °C; the lowest monthly mean value of the air temperature is in January (8.2 °C), while the highest mean value is in July (24.1°C). Annual allocation of precipitation is typical Adriatic. In total there is a proportionally high quantity of precipitation per year of 1,122.4 mm. There are about 110 days with precipitation in average per year.

According to the Köppen classification of climate, two types of climates are present (border between Csa and Cfsa is approximately at the direction Moševići – Vidonje):

- Csa – area in close vicinity to the Adriatic coast (moderate warm rainy climate with dry summers), and
- Cfsa – hilly – inlands with hills and mountains, encompassing the largest part of this area (winters of Csa climate are mild and rainy, and the summers are warm and dry), as shown in Figure 7 below.

The area is under the impact of two basic air circulations: dominant northern and less dominant southern winds. During winter strong bursts of north-eastern wind appears in a form of a bursting, strong and dry wind, but the southern wind is also common appearing as a constant, humid and less strong wind than the north-eastern wind which brings precipitation.

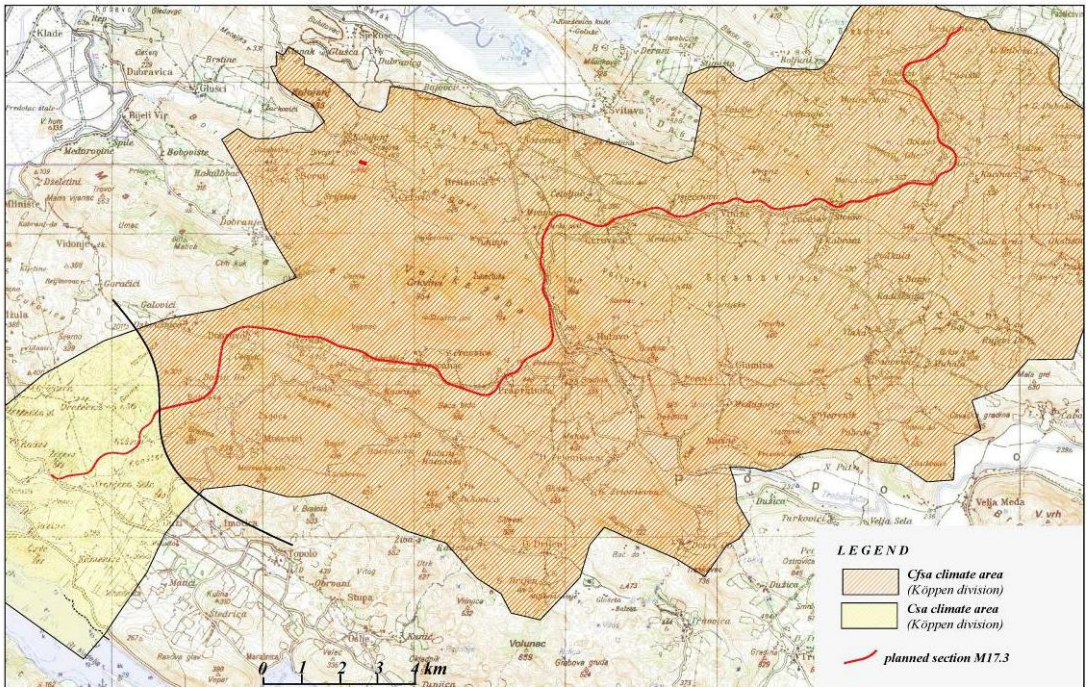


Figure 7: *Köppen Climate Zones (source: ESIA, 2016)*

2.5.1.4 Air Quality and Existing Sources of Air Emissions

In order to determine the baseline air quality conditions in the project area, the Consultant performed baseline monitoring of air quality parameters on ten locations along the planned road section, as shown in Table 7. Sampling period was performed from 8:00 10 March 2017 to 08:00 11 March 2017. Site specific monitoring results are available in Chapter 4.2. Table 7 provides information on the nearest sensitive receptors in proximity to the air sampling locations. The measurements provided are to the nearest residential subjects. There are no sensitive receptors such as schools, hospitals, daycare, old people home etc. The Project area is remote area with sporadic settlements with several residential facilities 30-500 m distant from the planned road route.

Table 7: *Measurement Points of Air Quality*

Measurement point	A closer toponym	Chainage	Coordinates	The position in relation to planned road	The nearest sensitive receptor
1	Road to populated place Mahića Mahala	33+225,000	43º 00' 52.62'' 17º 54'58.80''	Right	Settlement Mahića Mahala located approx. 500 m from sampling location
2	Populated place Udora	32+25,000	43º00'13.50' 17º55'18.24''	Left	One residential facility located approx. 25 m in Udora settlement from sampling location
3	Populated place Crnoglav	26+000,000	42º59'19.62'' 17º51'56.22''	Right	Settlement Crnoglav located approx. 120 m from sampling location
4	Populated place Vinine	25+50,000	42°59'27.98" 17°51'12.99"	Left	Settlement Vinine located approx. 300 m from sampling location and graveyard located approx. 50 m from sampling location
5	Populated place Cerovica	21+900,000	42°59'13.25" 17°49'6.72"	Right	Settlement Cerovica located approx. 150 m from sampling location
6	Populated place Hutovo	17+500,000	42°57'57.31" 17°47'38.87"	Right	Settlement Hutovo located approx. 130 m from sampling location
7	Populated place Prapratnica	14+950,000	42°56'58.19" 17°46'43.45"	Right	Residential facility located approx. 30 m from sampling location in settlement Papratnica
8	Populated place Broćanac	12+50,000	42°57'12.77" 17°45'1.46"	Left	Two residential facilities located approx. 30-40 m from sampling location in settlement Broćanac
9	Populated place Kiševo	3+000,000	42°56'13.25" 17°40'20.41"	Right	Residential facilities located approx. 500 m from sampling location in settlement Kiševo
10	Water spring Blace	0+300,000	42°55'21.83" 17°38'14.54"	Right	Residential facilities located approx. 30-60 m from sampling location in settlement Stari Neum in direction to Water spring Blace

There are no industrial air pollutants in the Project area. Existing sources of air emissions are represented by rare traffic on the existing main road 17.3 and individual heating units during the winter season from the settlements located along the route (Crnoglav, Vininie, Cerovica, Hutovo, Papratnica, Broćanac, Dobrovo, Babin Do, Kiševo and Stari Neum).

Figure 8: *Automatic Air Quality Station (source: JV ENOVA & Zagrebinspekt)*

2.5.1.5 Surface and Ground Water Resources and Existing Water Pollution Discharges and Receiving Water Quality

Crucial features of almost all karsts forms on terrain surface are lack of surface water and karst collector features with deep levels of groundwater. Infiltration of surface water (rainwater) is very high with an estimated very high infiltration coefficient of about 0.8.[23] There are no available data on groundwater quality since the monitoring of groundwater is not conducted on a regular basis.[24]

Table 8: *Site Specific Information on Hydro-geological Features*

No.	Location	Sub-section	Chainage	Hydro geological Features
1.	Drenovac – Start of the section	Drenovac - Cerovica	36+400.000	Well permeable rocks
2.	Location Pušišta Intersection	Drenovac - Cerovica	35+000.000	Well permeable rocks
3.	Location Kadića Dubrava	Drenovac - Cerovica	34+275.000	Well permeable rocks
4.	Old School/Hunting lodge	Drenovac - Cerovica	34+825.000	Well permeable rocks
5.	Location Gornji Bjelojevići	Drenovac - Cerovica	33+490.000	Well permeable rocks
6.	Intersection /chapel	Drenovac - Cerovica	33+230.000	Well permeable rocks
7.	Location Udora	Drenovac - Cerovica	32+800.000	Well permeable rocks
8.	Border of Two Hunting Areas – Neum/Stolac	Drenovac - Cerovica	28+000.000	Well permeable rocks
9.	Location Gornje Hrasno (at existing Popovi Intersection)	Drenovac - Cerovica	27+350.000	Well permeable rocks
10.	Slopes of Hill Crnoglav	Drenovac - Cerovica	26+350.000	Low permeable to impermeable rocks
11.	Reservoir (Čatrnja) below Slopes of Hill Crnoglav	Drenovac - Cerovica	25+600.000	Low permeable to impermeable rocks
12.	Estate near Vivine Settlement	Drenovac - Cerovica	25+220.000	Low permeable to impermeable rocks
13.	Location Exit of Vivine Settlement	Drenovac - Cerovica	23+340.000	Well permeable rocks
14.	Intersection for Neum	Broćanac-Hutovo-Cerovica	22+200.000	Well permeable rocks

[23] FBiH Roads (Ecoplan), ESIA, 2016
[24] Federal Ministry of Water Management, Agriculture and Forestry, Strategy on Water Management 2010-2022, 2010

No.	Location	Sub-section	Chainage	Hydro geological Features
15.	Cerovica and Sanctuary of the Queen of Peace	Broćanac-Hutovo-Cerovica	21+400.000	Well permeable rocks
16.	Road Near the Existing Train Planum	Broćanac-Hutovo-Cerovica	18+750.000	Well permeable rocks
17.	Settlement Hutovo 2 – Exit of the Tunnel Žaba	Broćanac-Hutovo-Cerovica	16+730.000	Well permeable rocks
18.	Settlement Hutovo 1	Broćanac-Hutovo-Cerovica	16+680.000	Well permeable rocks
19.	Hadžibeys Old City	Broćanac-Hutovo-Cerovica	16+300.000	Well permeable rocks
20.	Entrance to the tunnel Žaba	Broćanac-Hutovo-Cerovica	15+400.000	Well permeable rocks
21.	Location Broćanac-Papratnica (Deviation of Road)	Broćanac-Hutovo-Cerovica	12+450.000	Well permeable rocks
22.	Location Gradac Podžablje	Babin Do-Broćanac	8+850.000	Low permeable to impermeable rocks
23.	Location Moševići	Babin Do-Broćanac	5+450.000	Well permeable rocks
24.	Location Babin Do-Broćanac (start of the section)	Babin Do-Broćanac	5+230.000	Well permeable rocks
25.	Location Kiševo-Small Carst Field	Kiševo-Babin Do	2+210.000	Well permeable rocks
26.	Landfill for Construction Material	Stari Neum -Kiševo	1+340.000	Well permeable rocks
27.	Near source Blace	Stari Neum -Kiševo	1+000.000	Well permeable rocks
28.	Intersection Vranjevo Village	Babin Do-Broćanac	0+720.000	Well permeable rocks
29.	Location Stari Neum (start of the section)	Stari Neum -Kiševo	0+250.000	Well permeable rocks

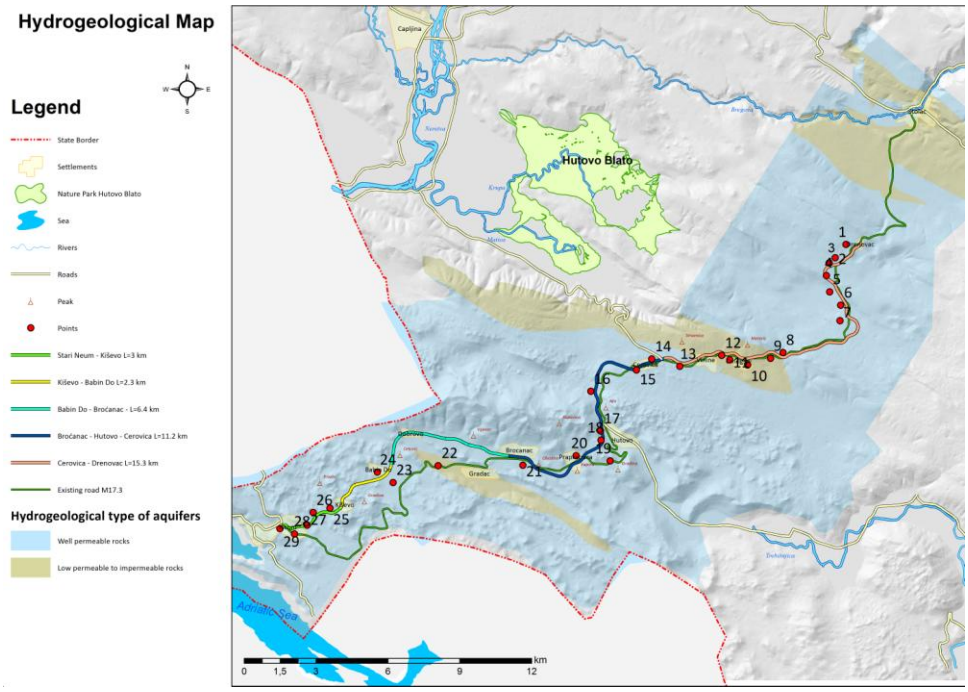


Figure 9: *Hydrogeological Features of the Terrain (source: JV ENOVA & Zagrebinspekt)*

There are no surface watercourses in the area of the road route. However, several water resources were identified along the road route, some of them being occasional (e.g. pond on location Kiševo near the road route at approx. 5-10 m). Wells comprising the Water Source Blace are located approx. 280-450 m from the constructed sub-section Stari Neum-Kiševo (missing only the final asphalt layer). Since the karst area is

represented with high water permeability, the Water Source Blace falls under the Project area of influence. The surface water of Hutovo Blato Nature Park is located at the smallest distance of 2.5 km from the planned road corridor.

In order to determine the baseline quality of water resources prior to the start of construction works, the analysis of surface and groundwater was carried at the following locations:

- MP1 – Pond on location Kiševo(U-1-III/17) – chainage 2+210.000
- MP2 - Water source Blace (U-2-III/17) – chainage 1+000.000
- MP3 – The waterwell on location Crnoglav (U-3-III/17) – chainage 25+600.000
- MP4 – Hutovo blato – southwards (U-4-III/17) – chainage not applicable
- MP5 – Hutovo blato – northwards (U-5-III/17) - chainage not applicable.

Pond on location Kiševo
42°56'00.1"
17°39'38.6"

Pond at Water source Blace
44°55'34.3"
17°39'02.3"

The water pit on location Crnoglav
43°59'21.0"
17°51'54.4"

Hutovo blato - southwards
43°00'53.5"
17°48'03.3"

Hutovo blato – northwards
43°01'59.8"
17°44'12.9"

Figure 10: *Sampling Locations for Baseline Monitoring of Water Resources (source: JV ENOVA & Zagrebinspekt)*

Site specific monitoring results are available in Chapter 4.3.

Additionally, for water Source Blace the Consultant requested monitoring results from the company PE Komunalno Neum ltd. Neum, which manages the water source and conducts water supply service in Municipality of Neum. The available results from the most recent sampling and testing showed that the parameter turbidity (on July 17, 2012 and April 23, 2015) and bacteriological status (July 17, 2012) of water were above the limit values set by the *Rulebook on Drinking Water Health Safety* (Official Gazzette of BiH, No. 40/10). These data are available in Table 59 (refer to Chapter 4.3.).

There are no industrial water discharges in the area of the road. Existing water discharges include sewage waters from the settlements located along the road route (Crnoglav, Vininie, Cerovica, Hutovo, Papratnica, Broćanac, Dobrovo, Babin Do, Kiševo and Stari Neum). There are no data on sewage water quality.

2.5.1.6 Noise Levels

In order to determine the baseline noise levels, measurement of noise levels was carried out near the residential areas at ten locations as shown in Table 7 of the Chapter 2.5.1.4. Table 7 also provides information on the nearest sensitive receptors in proximity to the noise sampling locations. The measurements provided are to the nearest residential subjects. As aforementioned, the Project area is remote area with sporadic settlements with several residential facilities 30-500 m distant from the planned road route. There are no sensitive receptors such as schools, hospitals, daycare, old people home etc. Site specific monitoring results are available in Chapter 4.4.

2.5.2 Description of the Biological Environment

2.5.2.1 Flora and Rare or Endangered Species of Flora

According to the ESIA (2016) there is a possibility that endangered or rare plant species may be found on the area that corresponds to the type of natural ecosystems represented in the areas from Stolac to Neum: *Petteria ramentace* (dalmatian laburnum), *Helleborus hercegovinus* (lenten rose), *Satureja subspicata Vis. subsp. subspicata* (savory), *Anthyllis illyrica* (downy flower), *Centaurea glaberrima* (centaury), *Inula viscosa* (strong-smelling inula), *Iris pseudopallida* (Southern Adriatic iris), *Aristolochia rotunda* (smearwort) etc.

According to the Red List of Flora of Federation Bosnia and Herzegovina (2013), the woody shrub *Petteria ramentace* (dalmatian laburnum, categorised as Near Threatened) can be found on peninsula Klek[25] which is not envisaged by any activity pertinent to the implementation of the Project and at location of settlement Hutovo that is envisaged by the Project area. Peninsula Klek is located south-south west from the Project area and is approx. 2 km distant from the closest point of the road section Neum-Stolac, which is the end point of the sub-section Stari Neum-Kiševo), and settlement Hutovo is one of the Project related settlements.

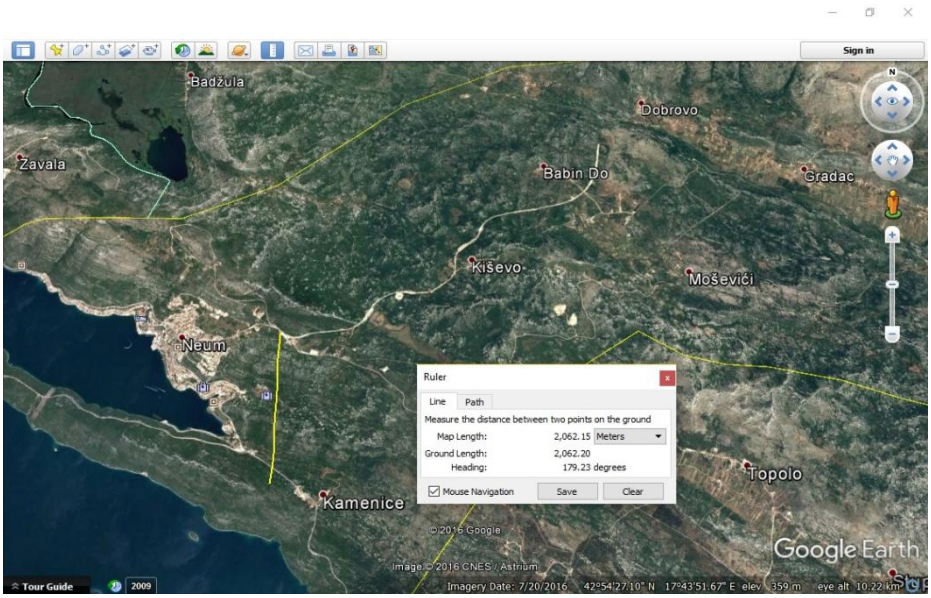


Figure 11: *Proximity of the Peninsula Klek with regard to the End of the Sub-section Stari Neum-Kiševo*[26]

Table 66 (refer to Chapter 4.5) provides site specific information regarding the found flora species. Status of vulnerability was also assessed for all the found species in line with the Red List of FBiH[27], EU Habitat Directive[28], and IUCN Red List Categories and Criteria.[29] One critically endangered species was identified according to the Red List of FBiH (*Crocus biflorus* – crocus) and six species are identified that are classified as least concerned according to the IUCN Red List (*Punica granatum* – pomegranate, *Juniperus oxycedrus* - prickly juniper, *Hedra helix* – ivy, *Avena fatua* - Common wild oat, *Vitis vinifera* - common grape vine and *Pistacia terebinthus* - turpentine tree. Crocus *(Crocus biflorus)* has been found sporadically at 3 out of 29 locations and only few plants were present due to the lack of soil substrate (kalkokambisol, terra rossa and regosol). During the site visits, *Petteria ramentace* wasn't found on site of the road route. Therefore, this area is **not classified as critical habitat** of significant importance to Critically Endangered (CR) and/or Endangered (EN) species in line with the World Bank OP 4.04 on Natural Habitats, and as such it represents the **natural habitat in line with the World Bank OP 4.04**. Specific mitigation measures will be suggested.

Regarding the area designated for tunneling activities, this area is also clasified as natural area in accordance with the World Bank OP 4.04. The Project will lead to change in land only at the entrance and exit of the

[25] According to: Red List of Flora of Federation Bosnia and Herzegovina (2013). EU „GreenWay“ and Faculty of Science, University of Sarajevo, Sarajevo.
[26] According to the Google Earth computer programme
[27] Red List of Endangered Wild Species and Subspecies of Fauna, Flora and Fungi of FBiH (Official Gazette of FBiH, No. 7/14)
[28] Council Directive 92/43/Eec of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:31992L0043 accessed on March 14, 2017)
[29] IUCN Red List Categories and Criteria, Version 3.1, 2001 (the IUCN Council adopted this latest version http://www.iucnredlist.org/static/categories_criteria_3_1 accessed on March 17, 2017)

tunnels Žaba and Oštrovac. Mining and tunneling activities will not lead to the change of water use since there are no surface watercources, and the ground water is deep in karstic areas.

2.5.2.2 Fauna and Rare or Endangered Species of Fauna

According to ESIA, (Ecoplan, 2016) there is a possibility that the following endangered or rare fauna species may be found on the area that corresponds to the type of natural ecosystems represented in the areas from Stolac to Neum: hedgehog (*Erinaceus* sp.), european pine marten (*Martes martes*), fox (*Vulpes vulpes*), rabbit (*Lepus europaeus*), wild boar (*Sus scrofa*), squirrel (*Sciurus vulgaris*), least weasel (*Mustela vulgaris*) from the group of Mammals. Most of the mediterranean birds live on coastal area, and very small number of them live only in one vegetation belt. The most common bird species which can be found on this area are: rock partridge (*Alectoris graeca*), black-eared wheatear (*Oenanthe hispanica*), western orphean warbler (*Sylvia hortensis*), black-headed bunting (*Emberiza melanocephala*), sombre tit (*Parus lugubris*), european turtle dove (*Streptopelia turtur*), barn swallow (*Hirundo rustica*), house sparrow (*Passer domesticus*), the european green woodpecker (*Picus viridis*), nightingale (*Luscinia megarhynchos*), jack snipe (*Lymnocryptes minimus*), buteo (*Buteo buteo*), the eurasian sparrowhawk (*Accipiter nisus*), the mistle thrush (*Turdus viscivorus*), fieldfare (*Turdus pilaris*), song thrush (*Turdus philomelos*), common blackbird (*Turdus merula*). These bird species live in winter season in vegetation belt of mediterranean forest, woodlands and scrub. The representatives of coastal bird species is the genus *Larus* (gull, seabird). The representative species from reptiles are: horned viper (*Vipera ammodytes*), European legless lizard (*Ophisaurus apodus*), European green lizard (*Lacerta viridis*), and the mediterranean house gecko (*Haemidactylus turcicus*). There are also many species present which belong to classes Insecta (insects), Aranea (spiders) and Myriapoda (centipedes). (ESIA, Ecoplan, 2016)

According to the Red List of Federation of Bosnia and Herzegovina following species belong to the Least Concern category: European pine marten (*Martes martes*), fox (*Vulpes vulpes*), rabbit (*Lepus europaeus*), wild boar (*Sus scrofa*), squirrel (*Sciurus vulgaris*), horned viper (*Vipera ammodytes*), European green lizard (*Lacerta viridis*), *Larus* sp. (gull, seabird), black-eared wheatear (*Oenanthe hispanica*), European turtle dove (*Streptopelia turtur*), barn swallow (*Hirundo rustica*), house sparrow (*Passer domesticus*), the European green woodpecker (*Picus viridis*), buteo (*Buteo buteo*), the Eurasian sparrowhawk (*Accipiter nisus*), the mistle thrush (*Turdus viscivorus*), song thrush (*Turdus philomelos*), common blackbird (*Turdus merula*). Specie Erinaceus sp. is categoriesd as Endangered. Species rock partridge (*Alectoris graeca*) and jack snipe (*Lymnocryptes minimus*) are categorised as Data Deficient. Species black-headed bunting (*Emberiza melanocephala*) and nightingale (*Luscinia megarhynchos*) are categorised as Near Threatend. The fieldfare (*Turdus pilaris*) is categorized as Critically Endangered according to the Red List of Fauna of Federation Bosnia and Herzegovina (2013).

Table 67 (refer to Chapter 4.5) provides site specific information regarding the fauna species determined *in situ*. Since the field visit was conducted in March 2017 during the dormancy of the most reptiles, so the Consultant also presumed the existence of certain fauna species based on the its biodiversity experience and previous surveys of the wider area of Svitava, appearance of animal shelter and based on the information given by the local huntsmen, as given in Table 68 (refer to Chapter 4.5). Status of vulnerability was also assessed for all the found species in line with the Red List of FBiH[30], EU Habitat Directive[31], EU Birds Directive[32] and IUCN Red List Categories and Criteria.[33] From the site specific fauna species determined *in situ*, two species from the Annex 1 EU Birds Directive were identified (*Ciconia ciconia* - white storck and *Larus sp.* – seabird were identified) that are also classified as endangered and least concern, respectively, as well as two

[30] Red List of Endangered Wild Species and Subspecies of Fauna, Flora and Fungi of FBiH (Official Gazette of FBiH, No. 7/14)
[31] Council Directive 92/43/Eec of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:31992L0043 accessed on March 14, 2017)
[32] Directive 2009/147/Ec of the European Parliament and of the Council of 30 November 2009 on the Conservation of Wild Birds (codified version) (http://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32009L0147, accessed on March 14, 2017)
[33] IUCN Red List Categories and Criteria, Version 3.1, 2001 (the IUCN Council adopted this latest version http://www.iucnredlist.org/static/categories_criteria_3_1 accessed on March 17, 2017)

species (*Ophisaurus apodus* - European legless lizard and *Lacerta viridis* - European green lizard) from the Annex IV of the EU Habitat Directive. European green lizard is also classified as least concern according to Red List of FBiH and IUCN Red List Categories and Criteria. White stork *(Ciconia ciconia)* has been identified at one out of 29 locations - the pond near the Water Source Blace, which is approx. 100-700 meters distant from the sub-section Stari Neum-Kiševo. However, this sub-section has been coonstructed in 2005 and missing only the final layer of asphalt. This area is **not classified as critical habitat** of significant importance to Critically Endangered (CR) and/or Endangered (EN) species since it is not supporting significant global concentrations of migratory species and/or congregatory species and it is therefore classified **as the natural habitat in line with the World Bank OP 4.04 on Natural Habitats**. Regarding the endangered hedgehog species *Erinaceus* sp., two locations where the presence of this specie is indirectly identified are not assessed as habitats of significant importance to *Erinaceus* sp.

2.5.2.3 Species with Potential to Become a Public Health Nuisance or a Vector-Transmitted Diseases

Zoonoses are infectious diseases of animals (usually vertebrates) that can naturally be transmitted to humans. When classifying a biological agent it should be assigned to one of the following hazard groups according to its level of risk of infection to humans: [34]

- group 1 - unlikely to cause human disease
- group 2 - can cause human disease and may be a hazard to employees; it is unlikely to spread to the community and there is usually effective prophylaxis or treatment available
- group 3 - can cause severe human disease and may be a serious hazard to employees; it may spread to the community, but there is usually effective prophylaxis or treatment available
- group 4 - causes severe human disease and is a serious hazard to employees; it is likely to spread to the community and there is usually no effective prophylaxis or treatment available

Table 9 provides information on the most usual zoonoses including the hazard assessment. The observed site specific animals in the area Neum – Stolac which have the potential to spread the vector-transmitted diseases are marked (*) and bold.

Table 9: *Zoonoses and the Hazard Assessment*[35]

Animal who can transfer the microoorganism	Microorganism	Disease	Group of hazard
Poultry, cattle, pigs, sheep and ostriches	Campylobacter	Campilobacteriosis	2
Birds*	**Chlamidophilia psittaci**	**Avian Chlamydiosis**	**3**
Rat	Hantaan virus	Korean hemorrhagic fever	3
Mouse	LCM virus	Lymphocytic choriomeningitis	3
Rat	Leptospira	Leptospirosis	2
Several species of rodent	Microsporum and Trichophyton	Microsporidiosis and Trichofitosis	2
Mouse and rat	Streptobacilus moniliformis	Rat bite fever	2
Cat*	**Toxoplasma gondii**	**Toxoplasmosis**	**3**

2.5.2.4 Migration Routes of Wild Game

During the site visit conducted in March 2017, no visible migration routes (e.g. animal corridors on the ground) of wild game were observed along the road route nor does the planned road intersect any visible migration routes.

[34] Health and Safety Executive (2013). The Approved List of biological agents
[35] Reuter J.D., Suckow M.A.: Laboratory Animal medicine and Management, International Veterinary Information Service (www.ivis.org) Ithaca, New York, USA

At the location Old School/Hunting Lodge (point 4, chainage 34+825.000) the Consultant held consultative meeting with local huntsmen from Pušišta who provided information that the area of Puštišta is known for the following wild game: wild boar, rabbit and roe deer. At the Border of two hunting areas Neum/Stolac (point 8, chainage 28+000.000), the Consultant also conducted analysis of the possible migration routes of wild game, however, no visible migration routes of wild game were observed.

2.5.2.5 Sensitive Habitats Including Parks and Preserves

There are no protected areas, parks and preserves on the the Project area. The nearest protected area is the Nature Park Hutovo Blato, at the smallest distance of 2.5 km from the road corridor at locations Crnoglav, Vivine, Cerovica. Hutovo Blato, as the largest bird reservation is an extremely valuable area, not just for bird fauna, but also for other groups of living organisms, such as reptiles, amphibians and insects, which are considered the most numerous group of organisms in the world. Hutovo Blato Nature Park was declared a protected area in 1995.

2.5.2.6 Significant Natural Sites

Significant natural sites (current or potential Natura 2000 sites) are not found in the Project area (Figure 12).

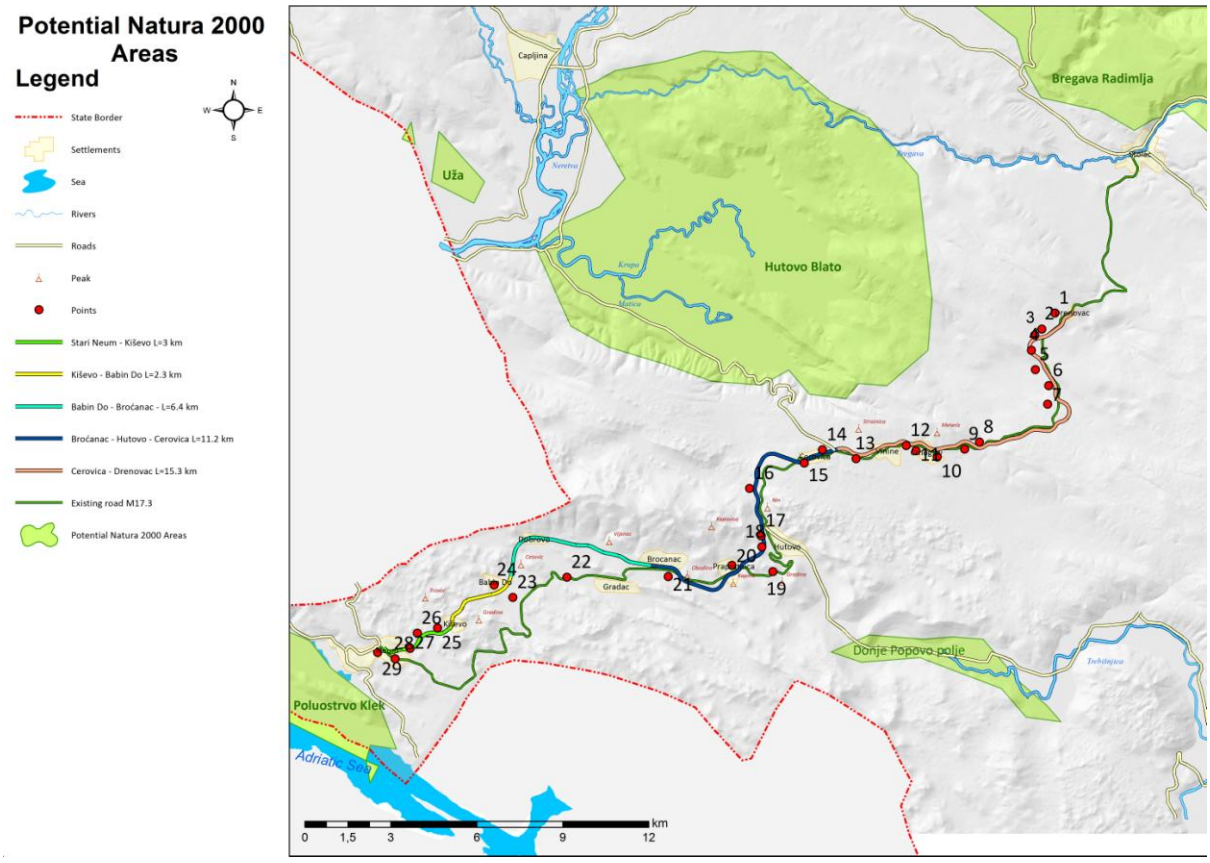


Figure 12: *Spatial Distribution of Potential Natura 2000 Sites in Relation to the Road Section Neum-Stolac (source: JV ENOVA & Zagrebinspekt)*

2.5.2.7 Forest and Forest Land

Regarding the forest ecosystems, the following plant communities are predominantly present in the area of the road section Neum-Stolac: all the Mediterranean forests dominated by holm oak (*Quercionilicis*), submediterranean forests of oriental hornbeam and pubescent oak (*Querco-Carpinetum orientalis*). Of the ecosystem of the rocky pastures and dry meadows, the *Scorzonero – Chrysopogonetalia* plant community is present, which is characterized by plants *Chrysopogon gryllus* and *Artemisia dracunculus*. In the surrounding

areas of nature park „Hutovo blato“the most common forms of vegetation are: *Querco – Carpinetum orientalis*, *Quercetum trojanae* and *Phillyreo – Carpinetumorientalis* (ESIA, Ecoplan, 2016).

Table 69 provides site specific information regarding the forest ecosystems, determined *in situ* during the site visit in March 2017. 72,40% of the forest vegetation area is represented by the Submediterranean forests of oriental hornbeam and pubescent oak and only 27,60% is represented by the Eumediterranean zone of evergreen vegetation (macchia and garrigue) of holm oak which mostly corresponds to the area of already constructed sub-sections from Stari Neum to Kiševo and Babin Do. Additionally, Submediterranean forests of oriental hornbeam and pubescent oak covers the area of 27.60% that will/may be affected by the Project (directly by the road or indirectly during the construction works, respectively) of the total Project area, and Eumediterranean zone of evergreen vegetation (macchia and garrigue) of holm oak covers the area of 11.13% of the total Project area, that will/may be affected by the Project (directly by the road or indirectly, respectively), as shown in Table 11.

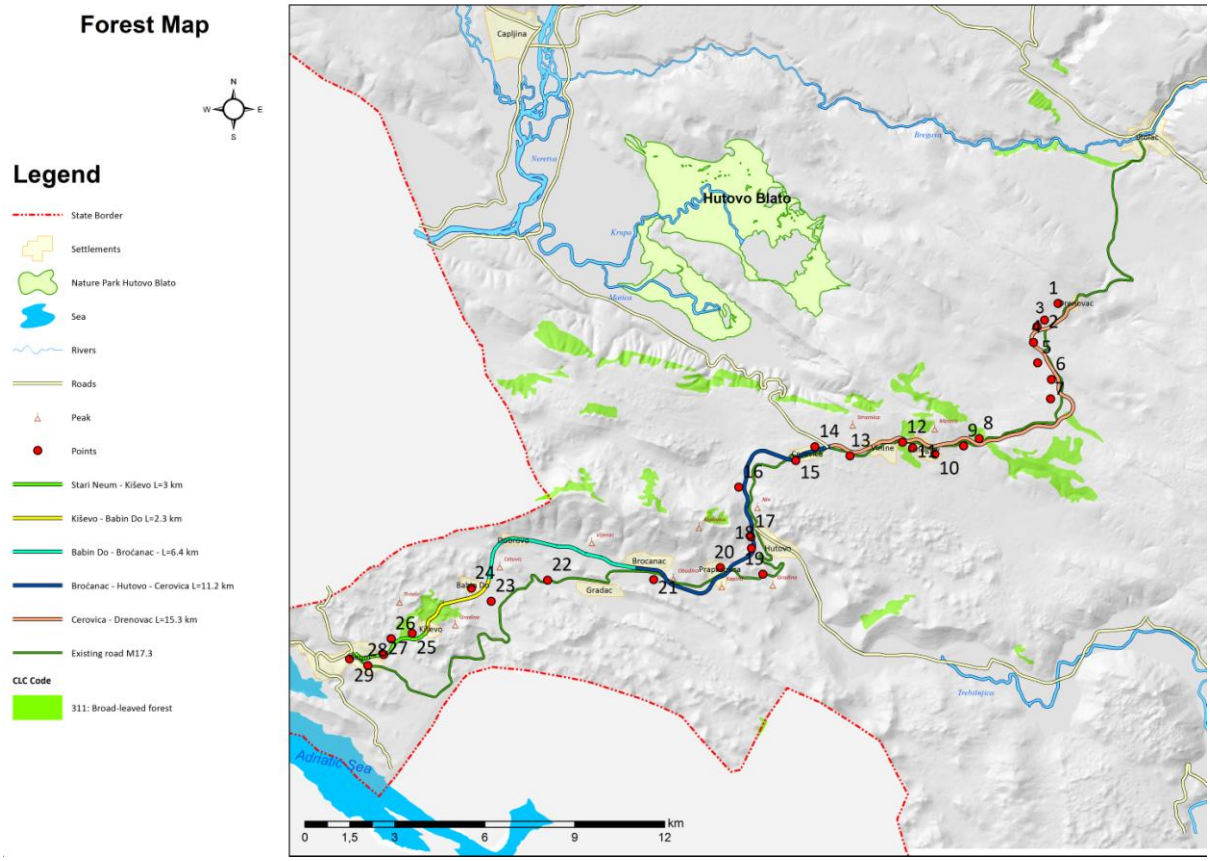


Figure 13: *Spatial Distribution of the Broad Leaved Forests in Relation to the Road Section Neum-Stolac (source: JV ENOVA & Zagrebinspekt)*

Table 10: *Area of Forest Vegetation that will be affected by the Project*

	Real Forest Vegetation	Type of Real Forest Vegetation	Project area – Direct impact (area in m^2)[36]	Area of influence – Indirect impact (area in m^2)[37]
1	Drenovac - Pušišta	Submediterranean forests of oriental hornbeam and pubescent oak	9,823.84	5,896.39
2	Pušišta – Kadića Dubrava	-	-	-
3	KadićaDubrava – Old School/Hunting lodge	-	-	-
4	Old School/Hunting lodge – GornjiBjelojevići	-	-	-
5	GornjBjelojevići – Intersection/chapel	Submediterranean forests of oriental hornbeam and pubescent oak	3,989.62	2,394.36
6	Intersection/chapel - Udora	Submediterranean forests of oriental hornbeam and pubescent oak	4,902.27	2,945.34
7	Udora – Border of Two Hunting Areas – Neum/Stolac	-	-	-
8	Border of Two Hunting Areas – Neum/Stolac – GornjeHrasno	-	-	-
9	GornjeHrasno – Slopes of Hill Crnoglava	-	-	-
10	Slopes of Hill Crnoglav – Reservoir (Čatrnja) below Slopes of Hill Crnoglav	Submediterranean forests of oriental hornbeam and pubescent oak	1,149.74	694.283
11	Estate near Vivine Settlement - Reservoir (Čatrnja) below Slopes of Hill Crnoglav	Submediterranean forests of oriental hornbeam and pubescent oak	3,611.5	2,167.77
12	Estate near Vivine Settlement – Estate near Vivine Settlement	Submediterranean forests of oriental hornbeam and pubescent oak	16,658.7	10,003.4
13	Estate near Vivine Settlement – Intersection for Neum	-	-	-
14	Intersection for Neum – Cerovica and Sanctuary of the Queen of Peace	-	-	-
15	Cerovica and Sanctuary of the Queen of Peace – Road Near the Existing Train Planum	-	-	-
16	Road Near the Existing Train Planum – Settlement Hutovo 2/Exit of the Tunnel Žaba	Submediterranean forests of oriental hornbeam and pubescent oak	2,766.99	1,660.095
17	Settlement Hutovo 2/Exit of the Tunnel Žaba - Settlement Hutovo 1	Submediterranean forests of oriental hornbeam and pubescent oak	2,766.99	1,660.095
18	Settlement Hutovo 1 - Hadžibeys old City	Submediterranean forests of oriental hornbeam and pubescent oak	5180	3,111.14
19	Hadžibeys old City - Entrance to the tunnel Žaba	Submediterranean forests of oriental hornbeam and pubescent oak	8,565.89	5,151.95
20	Entrance to the tunnel Žaba - Broćanac/Papratnica	Submediterranean forests of oriental hornbeam and pubescent oak	27,958.4	14,547.6
21	Broćanac/Papratnica – GradacPodžablje	Submediterranean forests of oriental hornbeam and pubescent oak	22,460.5	13,476.2
22	GradacPodžablje - Moševići	-	-	-
23	Moševići - Babin Do/Broćanac	-	-	-
24	Babin Do/Broćanac - Location Kiševo/Small Carst Field	Eumediterranean zone of evergreen vegetation (*macchia and garrigue)* of holm oak	18,646.4	11,194.1
25	Location Kiševo/Small Carst Field - Landfill for Construction Material	Eumediterranean zone of evergreen vegetation (*macchia and garrigue)* of holm oak	5907	3,562
26	Landfill for Construction Material - Near	Eumediterranean zone of evergreen	5,878.01	3,531.06

[36] Refers to the width of the new road of 10 meters
[37] Refers to the width of the zones of 3 m on both sides along the new road that may be affected by the Project

	Real Forest Vegetation	Type of Real Forest Vegetation	Project area – Direct impact (area in m^2)[36]	Area of influence – Indirect impact (area in m^2)[37]
	Source Blace	vegetation (*macchia and garrigue)* of holm oak		
27	Near Source Blace - Intersection Vranjevo Village Near Source Blace	Eumediterranean zone of evergreen vegetation (*macchia and garrigue)* of holm oak	6,095.95	3,670.13
28	Intersection Vranjevo Village - Location StariNeum	Eumediterranean zone of evergreen vegetation (*macchia and garrigue)* of holm oak	3,866.48	2,328.22

Table 11: *Total Area of Forest Vegetation that will be affected by the Project*

Type of Real Forest Vegetation	Project area - Direct impact (area in m^2)	Percent in Forest Vegetation	Percent in Total Area	Area of influence – Indirect impact (area in m^2)	Percent in Forest Vegetation	Percent in Total Area
Submediterranean forests of oriental hornbeam and pubescent oak	109,834.4 m^2	73,11%	30,20%	63,708.62 m^2	72,40%	27,60%
Eumediterranean zone of evergreen vegetation (*macchia and garrigue)* of holm oak	40,393.84 m^2	26,89%	11,10%	24,285.51 m^2	27,60%	11,13%
Total Area of Forest Vegetation	**150,228.3 m^2**			**87,994.13 m^2**		
Total Project Area	**363,716 m^2**			**218,244.8 m^2**		

2.5.2.8 Species of Commercial Importance

Forest resources in the area around the corridors have limited options in terms of their development, due to natural (climate, geology) and anthropological constraints in the past. In recent years, frequent fires were recorded in the Mediterranean and sub-Mediterranean area. Most of the corridor is dominated by deforested areas and has characteristics of rocky karst. In most of these areas shrubs, bushes and under-bush are identified without any economic importance (Figure 13). Forest systems are characterized by fragmentation and mosaic mode of representation in a wide range of regression. Vegetation and trees in these areas have little economic value, mainly due to limited size and the degradation phase, but do serve a number of environmental functions that are valuable to the karst area. These include mitigation of climate extremes, in particular when it comes to wind effects and insolation, land protection and prevention of its erosion, filtration of precipitation waters, absorption of carbon dioxide and oxygen releasing, air purification, preservation of biological diversity, biological and environmental balance of eco-system, aesthetic and landscape colours of karst zones, etc. (ESIA,2016).

Site specific medicinal herbs are listed in Table 70 (refer to Chapter 4.7).

Figure 14: *Typical Appearance of the Forests along the Road Section Neum-Stolac (source: JV ENOVA & Zagrebinspekt)*

2.5.3 Description of the Socio-economic Environment

2.5.3.1 Institutional, Historical and Political Context

Both Neum and Stolac municipalities belong to the Herzegovina-Neretva Canton (HNC) - one of the ten cantons in the Federation of Bosnia and Herzegovina (FBiH). The Washington Agreement, signed on 29th of February, 1994, established FBiH as an entity with ten cantons, underlying the political, territorial and administrative organization of FBiH. The Constituent Assembly of FBiH held in March 1994 adopted the Constitution of FBiH. The legal and political aspects of the process of creating FBiH were completed in 1995 in Dayton (United States) and Paris, by the signing of the General Framework Agreement for Peace in BiH.

HNC covers an area of 4,401.0 km^2 and, as such, is the second largest canton in FBiH. HNC makes 16.86% of the total area of FBiH and 8.6% of the total area of BiH. HNC consists of nine municipalities, with its headquarters in Mostar. It occupies the southern and southwestern part of BiH.

The highest executive body in both municipalities is the Municipal Mayor, whereas the legislative authority is the Municipal Council which consists of 17 members.

2.5.3.2 Local Organization and Settlements

The new main road connects the two towns (also namesake municipalities) Neum and Stolac.
Table 12 below provides basic information about the two project affected municipalities, Neum and Stolac, with site-specific information where available. Both municipalities have approximately the same surface area and the same number of settlements, while Stolac has almost 3 times a larger population. In both municipalities, the majority of the population is Croats, while in Stolac there is a significantly larger share of Bosniaks (38%) than in Neum (1%).

Table 12: *Basic Data on the Municipalities of Neum and Stolac, with Site-Specific Data*

Basic information		Neum	Stolac	Site-specific
Area in square km[38]		225.0	286.0	Area of settlements in Project area/area of influence: 97.63
Number of settlements[39]		27	27	11 in total (7 - Project area, 4 - Area of influence)
Population[40]		4,335	12,898	4,186 (950 without Neum)
Population density (inhabitants/square km)[41]		19.3	45.1	Sparsely populated
Nationality[42]	Bosniaks	63	5,544	No available data.
	Croats	4,543	8,486	
	Serbs	21	279	
	Others	26	193	

The new main road Stolac-Neum will pass through mostly rural areas in these two municipalities, with the exception of the area of Old Neum, which is much more urbanized (Figure 15). It will pass through the following 7 settlements in the municipality of Neum: Crnoglav, Vinine, Cerovica, Prapratnica, Dobrovo, Kiševo and Neum (Project area), and close to two settlements: Broćanac and Babin Do (area of influence). The settlements Gradac and Hutovo (municipality of Neum) are closer to the existing road than the new main road (area of influence). There are no settlements in the project area or the area of influence in the municipality of Stolac. Other settlements that are at a greater distance (>2 km) from the road are: Hotanj, Hutovski, Moševići, Brštanica, Dubravica, Glumina, Gornje Hrasno, Dobri do, Donji Zelenikovac, Rabrani, Duži, Previš, Cerovo, Žukovica, Borut, Donji Drijen and Brestica in the Municipality of Neum, and three settlements in the Municipality of Stolac: Burmazi, Bjelojevići and Stolac center.

[38] Federal Development Planning Institution (2015). Macroeconomic Indicators for Municipalities in FBiH for 2014. Sarajevo.
[39] Ibid.
[40] Census 2013 data. Available at: http://www.statistika.ba/ (accessed at March 22, 2017)
[41] Ibid.
[42] Ibid.

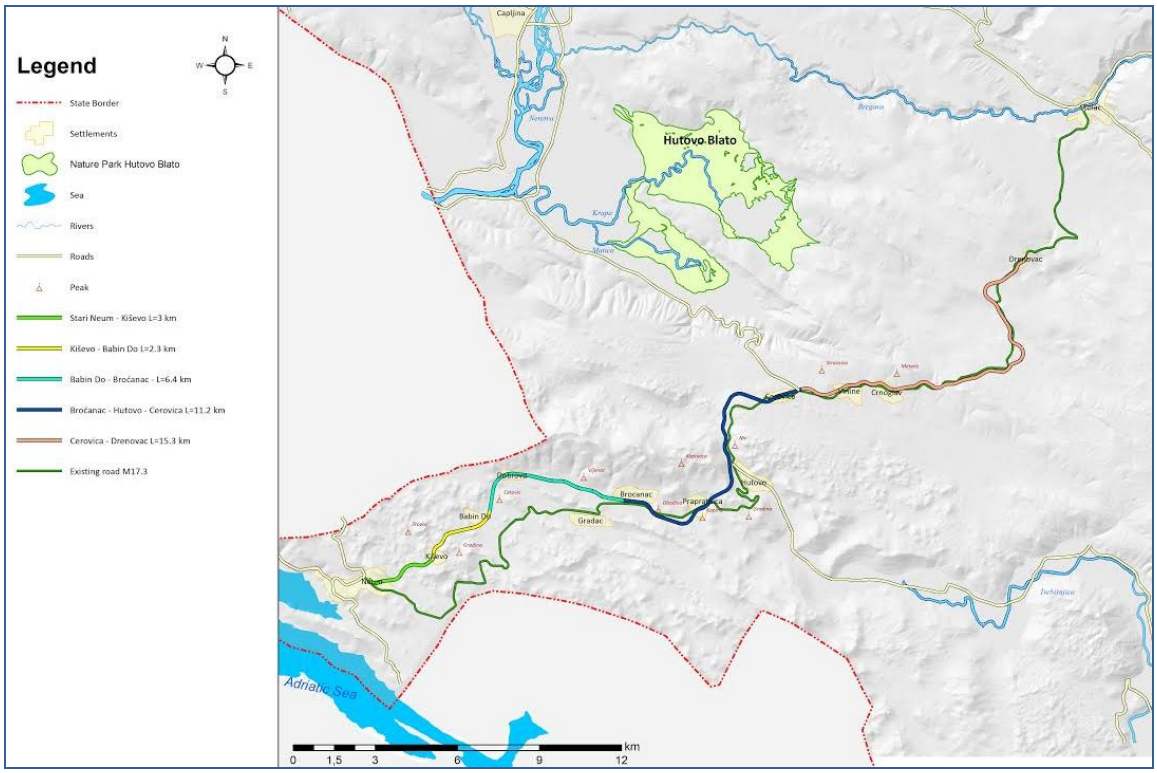


Figure 15: *Map of Settlements along the Route (source: JV ENOVA & Zagrebinspekt)*

Table 13 below provides basic data on the settlements in the Project area and the area of influence of the new main road. Other specific data (i.e. demography data, socio-economic data of population) per settlement are not available.

Table 13: *Basic Data on Settlements in the Project area and Area of Influence of the New Main Road*[43]

Area	Settlement	Municipality	Population	Population density (inhabitants/square km)	Area of settlement in square km
Project area	Crnoglav	Neum	24	5.56	4.32
	Vinine		49	5.16	9.50
	Cerovica		91	12.20	7.46
	Prapratnica		53	5.44	9.75
	Dobrovo		118	12.37	9.54
	Kiševo		12	1.80	6.67
	Neum		3,236	235.69	13.73
Area of influence	Broćanac		76	16.89	4.50
	Babin Do		66	30.00	2.20
	Gradac		237	20.34	11.65
	Hutovo		224	12.23	18.31
			Total: 4,186	**Average: 42.8**	**Total: 97.63**

[43] Census 2013. Official web page of Federal Institute for statistics, available at: http://www.px-web.fzs.gov.ba (accessed on March 22, 2017)

2.5.3.3 Demography

Full results of the population census by settlements which would provide a clearer insight into population structure with all socio-economic components have not been published yet. Census data that are available for municipal level include gender, age and average age of population, whereas data on mortality, health, growth, etc. have been taken from other official statistics as referenced below. Site-specific information on education levels and household size is taken from the results of a socio-economic survey of the land owners/users affected by land acquisition presented in the Resettlement Action Plan Neum-Stolac (March 2016) prepared for this Project.

Table 14 provides demographic data on the municipalities of Neum and Stolac with site-specific information where applicable. According to the data available, both municipalities have a similar gender ratio, age structure of the population and mortality rate. Natural growth in both Municipalities is in decline, although the decline is somewhat slower in Stolac.

Table 14: *Demography Data on Municipalities with Site-Specific Information*[44]

Indicator		Neum	Stolac	Site specific population affected by land aquisition)[45]
Gender[46]		50.7:49.3 in favor of women	51.5:48.5 in favor of women	n/a
Age[47]	<15	15.6	15.4	n/a
	15-65	31.3	30.1	
	>65	16.7	15.7	
Average age of population[48]		41.1	40	
Health - leading causes of death (Cantonal level)[49]		Cardiac arrest (26.5 %), stroke (6.8), acute myocardial infarction (6%), malignant lung neoplasm (4.9)		
Mortality rate[50]		40 in 2014 9.2 (out of 1,000) in a population	128 in 2014 9.9 (out of 1,000) in a population	n/a
Mortality rate of infants (Cantonal level) in 1,000[51]			14.1	
Natural growth[52]		-32	-39	n/a
Natural growth[53] per thousand inhabitants		-7.38	-3.02	n/a
Primary school education[54]	No. of primary schools	3	8	0
	No. of pupils	349	935	
	No. of pupils per 1000 inhabitants	81	72	
Secondary school education[55]	No. of secondary schools	1	1	0
	No. of pupils	76	427	

[44] Census 2013. Official web page of Federal Institute for statistics, available at: http://www.px-web.fzs.gov.ba (accessed at March 22, 2017)
[45] JP Ceste FBiH (2016). Resettlement Action Plan Neum-Stolac. Sarajevo
[46] JP Ceste FBiH (2016). Environmental and Social Impact Assessment. Sarajevo
[47] Ibid.
[48] Census 2013. Official web page of Federal Institute for statistics, available at: http://www.px-web.fzs.gov.ba (accessed at March 22, 2017)
[49] Federal Institute of Public Health (2016). Status of health and health care in FBiH in 2015. Sarajevo
[50] Federal Development Planning Institution (2015). Macroeconomic Indicators for Municipalities in FBiH for 2014. Sarajevo.
[51] Federal Institute of Public Health (2016). Status of health and health care in FBiH in 2015. Sarajevo
[52] Ibid.
[53] Ibid.
[54] Ibid.
[55] Ibid.

Indicator		Neum	Stolac	Site specific population affected by land aquisition)[45]
	No. of pupils per 1000 inhabitants	23	33	
Education (%)[56]	University degree	6.5	7.4	29
	Post-secondary education	5.2	2.9	0
	Vocational education	42.2	35.9	12
	Secondary school education	28.6	27.9	49
	Primary education	17.5	25.9	10
Household size[57]		3.3	3.7	4.2

2.5.3.4 Economy and Employment

According to the available data presented in Table 15 below and the index of development, the Municipality of Neum is significantly more developed than the Municipality of Stolac. Although the trade balance is much more favorable in Stolac, the economy of Neum is more developed due to tourism. According to the Table 15, Stolac has a higher number of enterprises overall. However, the number of enterprises per 1,000 inhabitants is twice as high in Neum than in Stolac. The employment rate is higher in Neum primarily due to the tourist industry. In Stolac, largest portion of the population is employed in the public sector and in the sector of small and medium enterprises (manufacturing and construction). The average salaries are similar in both municipalities.

Table 15: *Economy and Employment Indicators for Municipalities of Neum and Stolac, with Site-Specific Data*[58]

Indicator		Neum	Stolac
Index of development[59]		131.6	70.9
Rang among total 79 municipalities in FBiH		9	52
Import (in 1,000 BAM)		3,520 (1,946.26 USD)	4,184 (2,313.39 USD)
Export (in 1,000 BAM/USD)		316 (175.62 USD)	4,887 (2,715.98 USD)
Export-import ratio (%)		8,98	116,80
Trade balance in BAM/USD		-3,204 (-1,780.64 USD)	703 (390.70 USD)
Number of enterprises		519	757
Number of enterprises per 1,000 inhabitants		119.7	58.7
Working age population		3,067 (70.7%)	9,015 (69.9%)
Active population		1,425	3,016
Number of people employed		1,051	1,006
Employment rate (%)	in the total population	24.2	7.8
	in the working age population	34.3	11.2
	in active population	73.8	33.4
The average net salary (BAM/USD)		776 (431.27 USD)	775 (430.71 USD)
In relation to the average of FBiH (%)		93.5%	93.4%

[56] JP Ceste FBiH (2016). Environmental and Social Impact Assesment. Sarajevo
[57] Census 2013. Official web page of Federal Institute for statistics, available at: http://www.px-web.fzs.gov.ba (accessed at March 22, 2017)
[58] Federal Development Planning Institution (2015).Macroeconomic Indicators for Municipalities in FBiH for 2014. Sarajevo.
[59] Aggregated Index of development of municipalities in FBiH was obtained taking into account different indicators, as follows: (i) the employment rate of the population, (ii) the unemployment rate of the population, (iii) the number of pupils/students in primary and secondary schools per 1,000 inhabitants, (iv) the estimated gross domestic product (GDP) by municipality per capita, and (v) absent population in comparison to the Census from 1991.

2.5.3.5 Land and Livelihoods

Land use and agriculture

According to the ESIA prepared for this Project, the Municipality of Neum had a decrease in agricultural production in the period 2010-2016, mostly because of the following reasons:

- the interest of people in agricultural activities has been decreasing due to the development of tourism and trade in the municipal center in the previous years
- due to poor traffic connections, the population has been migrating to the municipal center where tourism can currently provide better living conditions
- the current condition of the overall road network is partially responsible for difficulties in transport of agricultural goods to the potential markets
- land fragmentation – a large number of small land plots is mainly appropriate only for household consumption rather than commercial agriculture.

The majority of agricultural production in the Municipality of Stolac takes place in the northern part of the Municipality, not in the area of the planned construction of the new main road. The reason for the poor development of agriculture in the southern part of the Municipality is scarcity of water, as water supply infrastructure does not exist in this part, so the rural population mostly pursues cattle breeding as their main source of income. The population has access to water only through their own wells which are filled with rainwater or by bringing water in cisterns during the summer months.

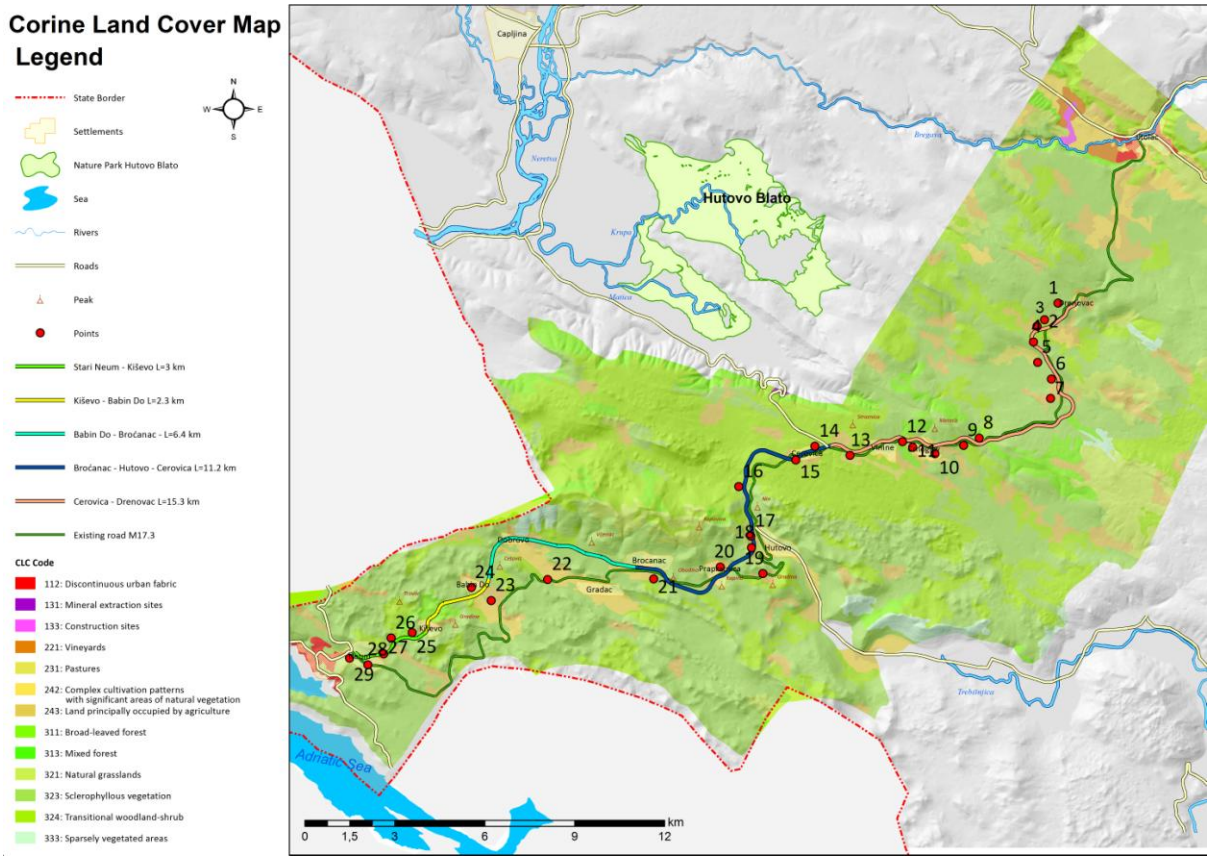


Figure 16: *Map of the Project Area Based on the CORINE Land Cover (2012) (source: JV ENOVA & Zagrebinspekt)*

Agriculture along the new main road is not developed in either municipality; there are a few small plots of plowed/sown land and permanent plantations (olives).

Table 16: *Site-Specific Land Use – Road Section Neum-Stolac*

No.	Location	Sub-section	Chainage	Land use (agriculture)
1.	Drenovac – start of the section	Drenovac - Cerovica	36+400.000	No.
2.	Pušišta Intersection	Drenovac - Cerovica	35+000.000	Yes.
3.	Kadića Dubrava	Drenovac - Cerovica	34+275.000	No.
4.	Old school/hunting lodge	Drenovac - Cerovica	34+825.000	No.
5.	Gornji Bjelojevići	Drenovac - Cerovica	33+490.000	No.
6.	Intersection /chapel	Drenovac - Cerovica	33+230.000	No.
7.	Udora	Drenovac - Cerovica	32+800.000	Yes.
8.	Border of two hunting areas –Neum/Stolac	Drenovac - Cerovica	28+000.000	No.
9.	Gornje Hrasno (at existing Popovi Intersection)	Drenovac - Cerovica	27+350.000	Yes.
10.	Slopes of Crnoglav hill	Drenovac - Cerovica	26+350.000	Yes.
11.	Reservoir (Čatrnja) below slopes of Crnoglav hill	Drenovac - Cerovica	25+600.000	Yes.
12.	Estate near Vivine settlement	Drenovac - Cerovica	25+220.000	Yes.
13.	Exit of Vivine settlement	Drenovac - Cerovica	23+340.000	Yes.
14.	Intersection for Neum	Drenovac - Cerovica	22+200.000	Yes.
15.	Cerovica and Sanctuary of the Queen of Peace	Drenovac - Cerovica	21+400.000	Yes.
16.	Road near the existing train Planum	Drenovac - Cerovica	18+750.000	Yes.
17.	Settlement Hutovo 2 – exit of the Tunnel Žaba	Broćanac-Hutovo-Cerovica	16+730.000	Yes.
18.	Settlement Hutovo 1	Broćanac-Hutovo-Cerovica	16+680.000	Yes.
19.	Hadžibeys Old City	Broćanac-Hutovo-Cerovica	16+300.000	No.
20.	Entrance to the tunnel Žaba	Broćanac-Hutovo-Cerovica	15+400.000	Yes.
21.	Broćanac-Papratnica (deviation of road)	Broćanac-Hutovo-Cerovica	12+450.000	Yes.
22.	Gradac Podžablje	Babin Do-Broćanac	8+850.000	Yes.
23.	Moševići	Babin Do-Broćanac	5+450.000	Yes.
24.	Babin Do-Broćanac	Babin Do-Broćanac	5+230.000	Yes.
25.	Kiševo-Small Carst Field	Kiševo-Babin Do	2+210.000	No.
26.	Landfill for construction material	Stari Neum -Kiševo	1+340.000	No.
27.	Proximity of the water source Blace	Stari Neum -Kiševo	1+000.000	Yes.
28.	Intersection Vranjevo Village	Babin Do-Broćanac	0+720.000	Yes.
29.	Stari Neum	Stari Neum -Kiševo	0+250.000	No.

According to Table 17 below, there are 83,480 square meters (8.3 ha) of agricultural land in the Project area, which is app. 3% of all land in the Project area.

Table 17: *Land Use According to the CORINE Land Cover – Site-Specific (2012)*[60]

Type of land	Project area - width of the road (in m^2)	Project area - 3 m from both sides of the road (in m^2)
Natural grasslands	8,673.0	5,276.3
Complex cultivation patterns	16,301.7	9,791.7
Broad-leaved forest	17,781.7	10,699.2
Land mainly occupied by agriculture, with significant areas of natural vegetation	53,871.7	3,5179.0
Transitional woodland-shrub	82,545.1	40,982.3
Sclerophyllous vegetation	18,1025.1	120,043.5

[60] European Environmental Agency (2017) CLC database.

Type of land	Project area - width of the road (in m^2)	Project area - 3 m from both sides of the road (in m^2)
Total	**360,198.4**	**2,201,972.1**

According to the results of the survey of a sample of land owners/users affected by land acquisition in the framework of the Project[61], the majority of respondents (51%) reported that they do not use the affected land plots. 12 respondents (22.6 %) reported that they use land plots for farming (i.e. farm land) and 14 respondents (26.4 %) reported that they use the land plots for livestock grazing (i.e. pasture).

Livelihoods

According to the survey a sample of land owners/users affected by land acquisition[62], 15 respondents (28%) reported growing crops for their own needs, whereas only 10 respondents (4%) reported commercial activities related to agricultural production. The minimum profit from sale of agricultural products reported is 2,000 BAM (1,111.51 USD) per year and the maximum profit reported is 25,000 BAM (13,893.91 USD) per year in the sample. In average, households that grow corps generate a profit of 7,062 BAM (3,924.75 USD) in annual sales. 4 families (7%) reported that agricultural production contributes to their livelihoods, of which 2 families (4%) have no other source of income (depend entirely on agricultural production), whereas the other two families have salaries as primary source of income (agricultural production is secondary source of income). The Ressetlement Action Plan Neum-Stolac (2016) specifies the measures to be taken for restoring the livelihoods of families reliant on agriculture.

2.5.3.6 Poverty and Vulnerability

There are no data available on poverty of population at lower administration levels (cantons, municipalities).

According to the survey a sample of land owners/users affected by land acquisition, 22 households (41%) reported having less than 500 BAM (277.88 USD) of monthly income, 18 households (34%) have income in the range of 500 to 1000 BAM (277.88 – 555.76 USD), and 11 households (21%) reported income higher than 1000 BAM (555.76 USD). Taking into consideration that the relative poverty line in FBiH was 416.40 BAM (231.42 USD) a month per equivalent adult in 2011[63], every third household in the sample is considered as poor.

According to the ESIA, vulnerable groups are recorded and supported in both municipalities if they meet the criteria for social benefits, at the request of the vulnerable person themselves. Such systems may overlook persons who do not ask for help.

The Municipality of Neum has 55, and the Municipality of Stolac has 176 beneficiaries of social welfare.[64] The majority of vulnerable people belong to the category of old and frail living in the remote villages of the municipalities. Such persons are disconnected from municipal services and rely on their relatives and close friends to provide them with supplies and medicines from municipal centers.

Vulnerable groups in the Project area are[65]:

- people who live in poverty: there has been no research on poverty per each municipality, but it may be assumed that all unemployed people or those living on retirement as the main source of income live or are on the edge of the poverty line

[61] JP Ceste FBiH (2016). Ressetlement Action Plan Neum-Stolac. Sarajevo
[62] Ibid.
[63] Institute for Statistics of FBiH (2012). First Release, No. 21.3. Sarajevo. *The Agency for Statistics of BiH publishes a core set of indicators of poverty, in compliance with EU standards, in the Household Budget Report. The last report was published in 2011*.
[64] JP Ceste FBiH (2016). Environmental and Social Impact Assesment. Sarajevo
[65] Ibid.

- single parents: there are 5 single parents in the area of the two municipalities; as there are no available data specifically on self-supporting parents in municipalities, data on pupils living with one parent only from schools were used to identify this vulnerable group
- disabled persons: there are a large number of disabled persons due to war events between 1992 and 1995. These persons are expected to have direct benefits from the development of commerce in this area and a higher possibility of employment
- children: since the full census results have not been published yet, there are no exact statistics about the number of children in the municipalities. The number of children in the 0-14 age group (based on the estimate of the population number for 2014) is 1,343 in Stolac and 443 in Neum
- ethnic minorities: in Neum there is one Roma family which occasionally visits the local waste area, which is near the existing route (not in the aea of influence), but does not live in the Municipality. Its basic activity of collecting secondary raw materials in the waste area will not be endangered by project activities. In Stolac, there are four Roma families which are inhabited near Radimlja. The Roma population in both municipalities is not situated near the project route and will not be subject to resettlement.

2.5.3.7 Community Characteristics

Number of Displaced Persons

According to data provided by the statistical report of the Federal Ministry of Displaced Persons and Refugees of December 31, 2014, there were a total of 89 internally displaced persons[66] (24 households) living in Stolac, and there were no displaced persons in Neum. Such persons mainly live in urban areas as these typically provided better protections from war events in the form of proximity to army, civil government protection and health services.[67]

2.5.3.8 Infrastructure Including Health Care Services, Electricity, Water

Health Care Services

Primary health services: Health services (emergency, primary and secondary services) to citizens of Neum are provided by the Health Center in the City of Neum. In addition, there are five outreach clinics which are opened once a week. In sparsely populated rural areas where communities have to travel long distances to the nearest clinic, accessing basic health services can be difficult. As a result, outreach services, where medical staff provide basic medical care directly in the communities, are vital for helping community members stay healthy. Emergency medical service is available 24 hours a day and is provided by the Neum Health Center. There is one doctor per 450 citizens in Neum, which is significantly higher than the average in BiH (one doctor per 700 citizens). Besides providing services in the Health Centre Neum, visiting nurses performed 5,400 house calls in 2014. In the same year, there was one home birth, and three births were performed at the Health Centre Neum. In 2014, 40 women from Neum gave birth in hospitals in Mostar in FBiH and Dubrovnik and Metković in the neighboring Republic of Croatia. The main problem in providing health care is the large population dispersion and distance of settlements in the Municipality of up to 40 km. During the high tourist season, the number of health care assistance demands increases three times more than the regular demand. This deteriorates the quality of service due to staff deficiency and outdated technical equipment.

Primary health services for Stolac and the settlements Bjelojevići and Burmazi is provided by the Stolac Health Care Centre. It is the regional center for physical therapy and mental health care for Stolac, Neum, Čapljina and Ravno municipalities.

[66] An internally displaced person (IDP) is someone who is forced to flee his or her home but who remains within his or her country's borders. They are often referred to as refugees, although they do not fall within the current legal definition of a refugee.
[67] JP Ceste FBiH (2016). Environmental and Social Impact Assesment. Sarajevo

Secondary health care*:* Secondary health care (specialist doctors) is considered insufficient in Neum, and Neum has no hospital. The nearest hospital is in Mostar or in the neighboring Republic Croatia, i.e. in Dubrovnik and Metković. During 2014, 320 ambulance transports to Mostar were recorded. Travelling time to Mostar is 2 hours, while in the peak season, due to large traffic jams on border crossings, it can increase to over 3 hours. Costs for medical treatment in Dubrovnik and Metković are significantly higher.[68]

For secondary health services as well as surgeries, Stolac has to rely to the closest hospitals in Mostar and Sarajevo.[69]

Elderly nursing homes

Neum has one elderly nursing home "Mirna luka", with a capacity of 30 persons providing accommodation, care and basic health care services.

Stolac has several privately owned elderly nursing homes and one public nursing home for elderly and disabled persons, with a capacity of 250 persons.

Figure 17 shows the social structure in both municipalities including Project area.

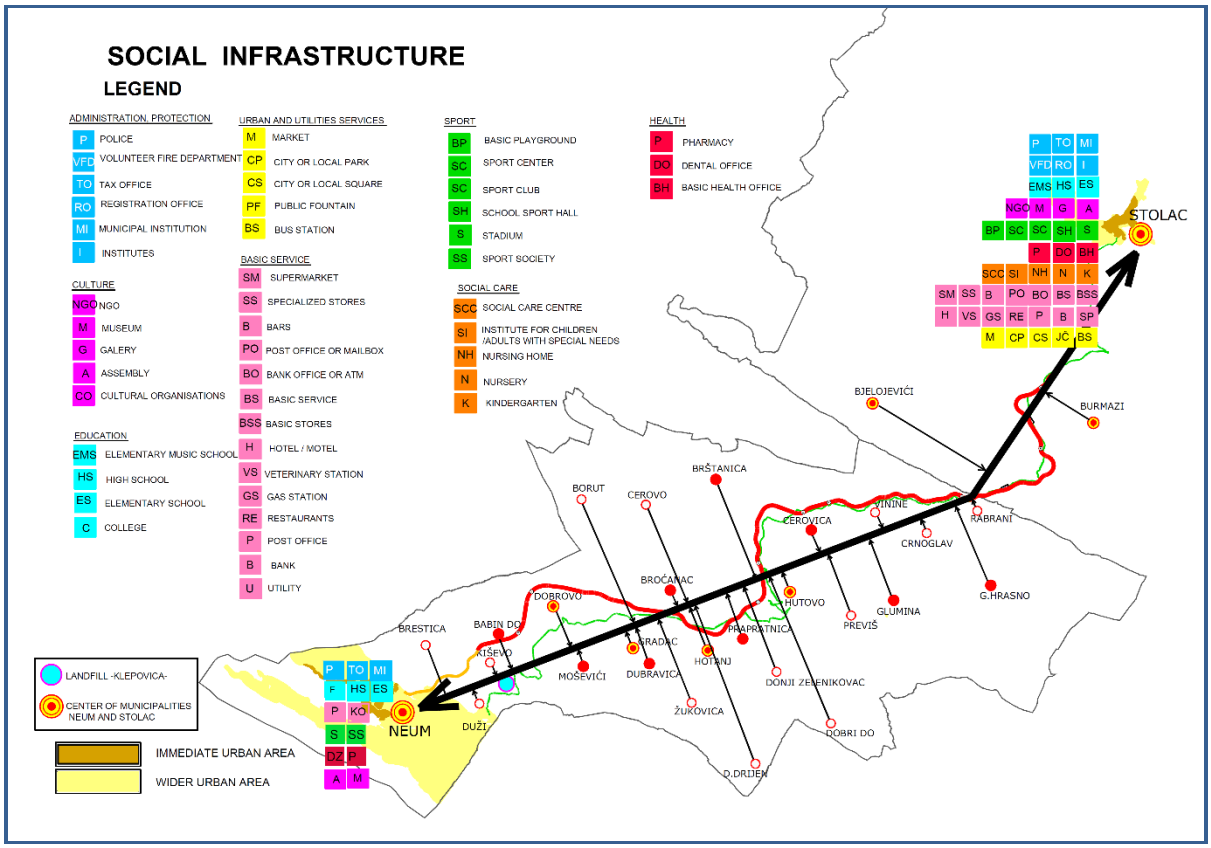


Figure 17: *Social Structure in Stolac and Neum Municipalities[70] (Source: ESIA, Ecoplan)*

[68]Interview with the director of Health Care, and Integral Strategy of the Development of the Municipality of Neum (2014 – 2024), Neum 2015 and Physical Plan of the Municipality of Neum for the period 2010 – 2020, Neum 2015
[69] Key informant interview, Stolac Health Centre Employee, held over the phone on January 5, 2015
[70] JP Ceste FBiH (2016). Environmental and Social Impact Assessment. Sarajevo

Power

In several locations along its course, the alignment is in collision with overhead transmission towers of the electrical network set on wooden or concrete posts, so it will be necessary to relocate some of the towers bearing in mind the need to have a free profile of the new road.

Table 18: *Site Specific Power Collision – Road Section Neum Stolac*

No.	Location	Sub-section	Chainage	Power collision
30.	Drenovac – start of the section	Drenovac - Cerovica	36+400.000	No.
31.	Pušišta Intersection	Drenovac - Cerovica	35+000.000	No.
32.	Kadića Dubrava	Drenovac - Cerovica	34+275.000	No.
33.	Old school/hunting lodge	Drenovac - Cerovica	34+825.000	10kV trunks (chainage: 34+800.00) at Drenovac
34.	Gornji Bjelojevići	Drenovac - Cerovica	33+490.000	10kV trunks (chainage: 33+300.00-33+750.00)
35.	Intersection /chapel	Drenovac - Cerovica	33+230.000	
36.	Udora	Drenovac - Cerovica	32+800.000	10kV trunks (chainage: 32+500.00) in Udor settlement
37.	Border of two hunting areas – Neum/Stolac	Drenovac - Cerovica	28+000.000	10kV trunks (chainage: 28+000.00 and 31+800.00)
38.	Gornje Hrasno (at existing Popovi intersection)	Drenovac - Cerovica	27+350.000	No.
39.	Slopes of hill Crnoglav	Drenovac - Cerovica	26+350.000	No.
40.	Reservoir (Čatrnja) below slopes of hill Crnoglav	Drenovac - Cerovica	25+600.000	No.
41.	Estate near Vivine settlement	Drenovac - Cerovica	25+220.000	No.
42.	Exit of Vivine settlement	Drenovac - Cerovica	23+340.000	10kV trunks (chainage: 24+550.00) at Vinine settlement
43.	Intersection for Neum	Drenovac - Cerovica	22+200.000	No.
44.	Cerovica and Sanctuary of the Queen of Peace	Drenovac - Cerovica	21+400.000	10kV trunks (chainage: 21+500.00-22+700.00) at Cerovica settlement
45.	Road near the existing train Planum	Drenovac - Cerovica	18+750.000	No.
46.	Settlement Hutovo 2 – exit of the Tunnel Žaba	Broćanac-Hutovo-Cerovica	16+730.000	No.
47.	Settlement Hutovo 1	Broćanac-Hutovo-Cerovica	16+680.000	No.
48.	Hadžibeys Old City	Broćanac-Hutovo-Cerovica	16+300.000	No.
49.	Entrance to the Tunnel Žaba	Broćanac-Hutovo-Cerovica	15+400.000	10kV trunks (chainage: 15+200.00-15+550.00) at Papratnica
50.	Broćanac-Papratnica (deviation of road)	Broćanac-Hutovo-Cerovica	12+450.000	10kV trunks (chainage:12+075.00, 12+900.00-13+500.00)
51.	Gradac Podžablje	Babin Do-Broćanac	8+850.000	No.
52.	Mošević	Babin Do-Broćanac	5+450.000	Underground 10kV line for Babin Do settlement (chainage: 5+309.50) 10kV line for the Oskrušnica settlement (chainage:6+950.00)
53.	Babin Do-Broćanac	Babin Do-Broćanac	5+230.000	No.
54.	Kiševo-small karst field	Kiševo-Babin Do	2+210.000	No.
55.	Landfill for construction material	Stari Neum -Kiševo	1+340.000	No.
56.	Proximity of the water source Blace	Stari Neum -Kiševo	1+000.000	No.

No.	Location	Sub-section	Chainage	Power collision
57.	Intersection Vranjevo Village	Babin Do-Broćanac	0+720.000	No.
58.	Stari Neum	Stari Neum -Kiševo	0+250.000	No.

Water

According to the ESIA, water for the settlements in the Municipality of Neum is supplied from two water sources. One of them is in the settlement Gabela in the Municipality of Čapljina (a water supply system built in 1982). The second water source, Blace, was reactivated in 2004 and is completely gravitational. The capacity of its main water supply duct is 27 l/s, with the possibility of capacity enhancement by another 60 l/s. The Public Company "Komunalno" Neum manages the water supply system. 3,000 inhabitants[71] in Neum are connected to the water supply system, in the following settlements: Brštanik, Hutovo, Prapratnica, Broćanac, Gradac, Mošević, Babin Do, Oskrušnica, Duži, Vranjevo selo and Neum. The population of all other settlements in Neum have water supply from family cisterns (water wells) in which rainwater or water from tank trucks is collected. About 11% of households still use such water wells.

The water supply system in Stolac relies on the river of Bregava well. Today, only 48% of population is supplied by this system and the rest is still supplied by water from cisterns (water wells) in which rainwater is collected. It should be noted that the southern part of the Municipality is at a higher altitude than Bregava well, disabling supply through the Stolac supply system.

Table 19: *Site-specific Water Supply Pipelines Collision – Road Section Neum Stolac*

No.	Location	Sub-section	Chainage	Water supply collision
1.	Drenovac – start of the section	Drenovac - Cerovica	36+400.000	No.
2.	Pušišta Intersection	Drenovac - Cerovica	35+000.000	No.
3.	Kadića Dubrava	Drenovac - Cerovica	34+275.000	No.
4.	Old school/hunting lodge	Drenovac - Cerovica	34+825.000	No.
5.	Gornji Bjelojevići	Drenovac - Cerovica	33+490.000	No.
6.	Intersection /chapel	Drenovac - Cerovica	33+230.000	No.
7.	Udora	Drenovac - Cerovica	32+800.000	No.
8.	Border of two hunting areas – Neum/Stolac	Drenovac - Cerovica	28+000.000	No.
9.	Gornje Hrasno (at existing Popovi intersection)	Drenovac - Cerovica	27+350.000	No.
10.	Slopes of hill Crnoglav	Drenovac - Cerovica	26+350.000	No.
11.	Reservoir (Čatrnja) below slopes of hill Crnoglav	Drenovac - Cerovica	25+600.000	No.
12.	Estate near Vivine settlement	Drenovac - Cerovica	25+220.000	No.
13.	Exit of Vivine settlement	Drenovac - Cerovica	23+340.000	No.
14.	Intersection for Neum	Drenovac - Cerovica	22+200.000	No.
15.	Cerovica and Sanctuary of the Queen of Peace	Drenovac - Cerovica	21+400.000	No.
16.	Road near the existing train Planum	Drenovac - Cerovica	18+750.000	- at km 21+170, in Cerovica, the road intersects the reversible

[71]Source: Spatial Plan of the Municipality of Neum for the Period 2010-2020, Neum, 2015

No.	Location	Sub-section	Chainage	Water supply collision
				tunnel of Čapljina Hydroelectric Power Station.
17.	Settlement Hutovo 2 – exit of the Tunnel Žaba	Broćanac – Hutovo - Cerovica	16+730.000	- at km 18+120, in Mramor, the planned road intersects the pipeline of the Gabela-Neum Regional water supply, the diameter of DN 500 mm;
18.	Settlement Hutovo 1	Broćanac – Hutovo - Cerovica	16+680.000	- at km 15+500 to the left of grade level of the alignment there is the "Prapratnica" reservoir (V=150 m^3) with bottom elevation of 367.70 m above sea level; - from km 14+900 to 16+500, the alignment passes by the tunnel of the existing Gabela-Neum regional water supply, diameter of the pipe DN 500 and in that stretch intersection of the alignment of the road may occur (which at km 16+570 chainage mark enters the "Žaba" tunnel of 975 m in length) with the pipeline tunnel of 773.5 m in length, with the bottom elevation of 370 m above sea level. The pipeline tunnel is constructed without a concrete base and blasting during the construction of the trunk road tunnel could cause the collapse and backfilling of the existing tunnel, thus damaging the water supply pipeline; - at km 16+250, in Hutovo, to the right of the grade level of the trunk road in the tunnel, at the exit of the pipeline tunnel, there is the Hutovo reservoir (V=2x500 m^3) at a distance of about 120 m, with the bottom elevation of 364 m above sea level.
19.	Hadžibeys Old City	Broćanac – Hutovo - Cerovica	16+300.000	
20.	Entrance to the Tunnel Žaba	Broćanac – Hutovo - Cerovica	15+400.000	
21.	Broćanac-Papratnica (deviation of road)	Broćanac – Hutovo - Cerovica	12+450.000	- at km 13+300, the planned alignment touches the pipeline of Gabela-Neum regional water supply, diameter of DN 350 mm; - at km 13+480 the alignment intersects the existing local pipeline for water supply of the Praovice settlement.
22.	Gradac Podžablje	Babin Do - Broćanac	8+850.000	- at km 12+060 the alignment is in collision with the water supply pipeline for the Broćanac settlement, in the location of the planned intersection. To the left of the grade level of the trunk road above the settlement, in the distance of approx. 300 m to the north, there is the Broćanac reservoir (V=100 m) with the bottom elevation of 300 m above sea level.
23.	Moševići	Babin Do - Broćanac	5+450.000	No.
24.	Babin Do-Broćanac	Babin Do - Broćanac	5+230.000	- at km 5+309, the alignment is in

No.	Location	Sub-section	Chainage	Water supply collision
				collision with the water supply pipeline for the Babin Do settlement. In this location the pipeline runs underneath the planned bridge.
25.	Kiševo - small karst field	Kiševo - Babin Do	2+210.000	No.
26.	Landfill for construction material	Stari Neum - Kiševo	1+340.000	No.
27.	Proximity of the water source Blace	Stari Neum - Kiševo	1+000.000	No.
28.	Intersection Vranjevo Village	Babin Do - Broćanac	0+720.000	No.
29.	Stari Neum	Stari Neum - Kiševo	0+250.000	No.

2.5.3.9 Cultural Heritage Sites and Sites of Cultural Heritage Interest

According to the ESIA, the area of the Municipalities of Stolac and Neum has been inhabited since the historic times, as evidenced by numerous archaeological sites found in this area. The road M17.3 is planned in the vicinity of known artifacts and sites from historic times, but will not directly affect those. [72]

The cultural heritage sites may be categorized in terms of cultural and historical protection of the assets as follows[73]**:**

- First category: assets proclaimed by the Commission for National Monument Protection of BiH as national monuments, i.e. six assets in the Municipality of Neum and thirty assets in the Municipality of Stolac. The new main road does not affect any of these monuments, but it passes in the immediate vicinity of two monuments: (i) Hutovo town (the Hajji bey fort), historical area (proclamation published in the Official Gazette of BiH, no. 84/09), - the town is situated about 900 m from the Tunnel Žaba, (ii) Saint Ana Catholic Church in Neumski Gradac, historical structure (proclamation published in the Official Gazette of BiH, no. 78/05) – the church is located at a distance of 700 m from the route
- Second category: monuments and cultural assets of regional importance
- Third category: all other recorded sites and cultural and historical monuments within the territory of the municipalities as defined by the regional plans.

ESIA provides a full list of cultural assets in the wider Project area.

Based on the field visits to the route and field observations, it has been determined that there are no protected cultural and historic assets at the Project area (new main road route or its access roads or planned crossroads). However, in the area of influence there are following visible assets (chance finds are possible and mitigation measures are provided in Table 24):

- 13 recorded tumuli on a planned route of the new main road. The stone tumuli as the archaeological site will not have any material and monumental value after the excavations, but the moveable artifacts can be stored at museums and presented to the public

- the narrow-gauge railway which was protected according to the regional plan together with other structures within the railway (in the area of the Municipality of Neum). According to the main design, the new main road crosses the railway by the overpass.

[72] JP Ceste FBiH (2016). Environmental and Social Impact Assessment. Sarajevo
[73] Ibid.

Figure 18 shows cultural heritage sites along the new main road. Note: even though a certain point on the map appears as if on the route itself (due to small-scale of the map), these sites in reality at least 100 m away from the route.

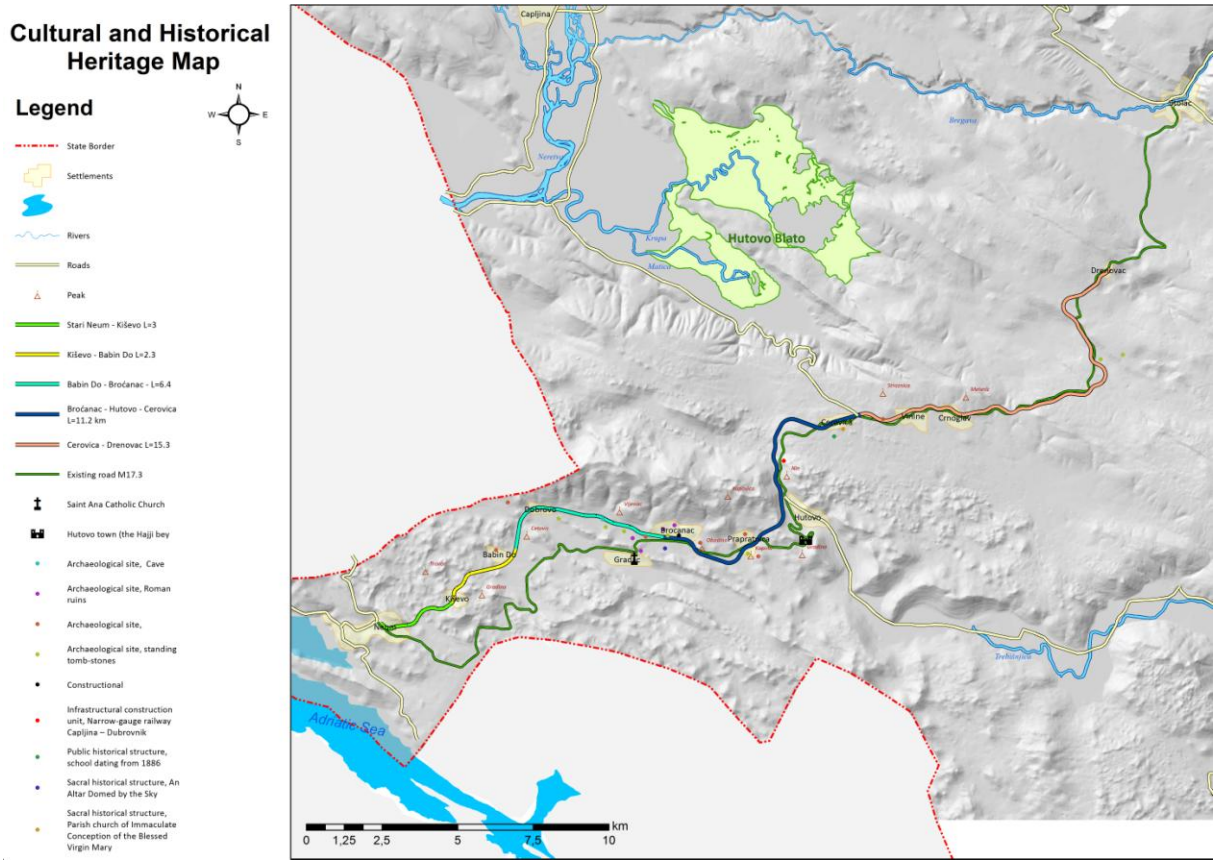


Figure 18: *Map of Cultural Heritage Sites along the New Main Road (source: JV ENOVA & Zagrebinspekt)*

This analysis did not include the sites where some moveable artifacts were found in the past, which was not a rare case. There is also a consistent number of recorded Roman settlements, and future excavations of certain tools, weapons and similar objects from the classical period are probable.

Table 20 below provides site-specific information on cultural heritage.

Table 20: *Site-specific Cultural Heritage – Road Section Neum-Stolac*

No.	Location	Sub-section	Chainage	Cultural heritage	
				Project area	Area of influence
1.	Drenovac – start of the section	Drenovac - Cerovica	36+400.000	None.	None.
2.	Pušišta intersection	Drenovac - Cerovica	35+000.000	None.	None.
3.	Kadića Dubrava	Drenovac - Cerovica	34+275.000	None.	None.
4.	Old school/hunting lodge	Drenovac - Cerovica	34+825.000	None.	None.
5.	Gornji Bjelojevići	Drenovac - Cerovica	33+490.000	None.	None.
6.	Intersection /chapel	Drenovac - Cerovica	33+230.000	None.	None.

No.	Location	Sub-section	Chainage	Cultural heritage	
				Project area	Area of influence
7.	Udora	Drenovac - Cerovica	32+800.000	None.	1 tumulus (chainage: 32+000.00-2+500.00)
8.	Border of two hunting areas –Neum/Stolac	Drenovac - Cerovica	28+000.000	None.	None.
9.	Gornje Hrasno (at existing Popovi Intersection)	Drenovac - Cerovica	27+350.000	None.	None.
10.	Slopes of hill Crnoglav	Drenovac - Cerovica	26+350.000	None.	None.
11.	Reservoir (Čatrnja) below slopes of hill Crnoglav	Drenovac - Cerovica	25+600.000	None.	None.
12.	Estate near Vivine settlement	Drenovac - Cerovica	25+220.000	None.	None.
13.	Exit of Vivine settlement	Drenovac - Cerovica	23+340.000	None.	1 tumulus (chainage:23+500.00)
14.	Intersection for Neum	Drenovac - Cerovica	22+200.000	None.	None.
15.	Cerovica and Sanctuary of the Queen of Peace	Drenovac - Cerovica	21+400.000	None.	None.
16.	Road near the existing train Planum	Drenovac - Cerovica	18+750.000	None.	None.
17.	Settlement Hutovo 2 – exit of the Tunnel Žaba	Broćanac-Hutovo-Cerovica	16+730.000	None.	None.
18.	Settlement Hutovo 1	Broćanac-Hutovo-Cerovica	16+680.000	None.	None.
19.	Hadžibeys Old City	Broćanac-Hutovo-Cerovica	16+300.000	None.	None.
20.	Entrance to the Tunnel Žaba	Broćanac-Hutovo-Cerovica	15+400.000	None.	None.
21.	Location Broćanac-Papratnica (deviation of road)	Broćanac-Hutovo-Cerovica	12+450.000	None.	3 tumuli (chainage: 13+500.00, 14+500.00 and 15+000.00)
22.	Gradac Podžablje	Babin Do-Broćanac	8+850.000	None.	4 tumuli (chainage: 8+000.00, 8+500.00 and 9+000.00)
23.	Moševići	Babin Do-Broćanac	5+450.000	None.	2 tumuli (chainage: 6+500.00)
24.	Babin Do-Broćanac	Babin Do-Broćanac	5+230.000	None.	None.
25.	Kiševo - small karst field	Kiševo-Babin Do	2+210.000	None.	None.
26.	Landfill for construction material	Stari Neum - Kiševo	1+340.000	None.	None.
27.	Proximity of the water source Blace	Stari Neum - Kiševo	1+000.000	None.	None.
28.	Intersection Vranjevo Village	Babin Do-Broćanac	0+720.000	None.	None.
29.	Stari Neum	Stari Neum - Kiševo	0+250.000	None.	None.

2.5.3.10 Stakeholder Identification and Analysis

Stakeholders that need to be informed and consulted in connection with Project activities throughout the project cycle include persons or groups which are:

- directly and/or indirectly affected by the project activities
- have certain interest connected with the project or its activities

- have the ability to influence the Project itself or its final outcome.

Stakeholders must be informed and consulted about the project activities during the entire project cycle. Vulnerable categories must be kept informed and consulted in appropriate ways, and engagement activities have to be adjusted to their needs.

Table 21: *Overview of Stakeholders for the Project with Levels of Interest and Influence*

Identified stakeholders in the Project	Detailed description of stakeholders	Level of interest	Level of influence
Project Affected Person(s) Land owners/users who will be directly affected by land acquisition	Persons and households identified in the expropriation studies and RAP	High	Medium
Local population in the area of influence of the project Local communities located in the proximity of the planned construction/reconstruction works which may experience access restrictions and/or disturbances	Population affected by the construction and limitations of the access to road	High	Low
Affected vulnerable groups Vulnerable groups including individuals or groups that are greatly affected by the Project and have limited power to influence the Project.	Elderly people Poor and unemployed people Single parents Children Disabled persons Members of minority ethnic groups	Medium	Low
Municipalities and local community boards Interest groups with the special interest for the project, which have the power to influence the final outcome of the Project	Municipality of Neum Municipality of Stolac All relevant committees of local communities	High	High
Relevant government authorities Interest groups with special interest in the project with power to influence the final outcome of the Project	Ministry of Transportation and Communications of HNC and the Government of FBIH Federal Ministry of Environment and Tourism Federal Ministry of Culture and Sport- Institute for Protection of Monuments Federal Ministry of Agriculture, Water-Management and Forestry Ministry of Trade, Tourism and Environmental Protection of HNC Ministry of Agriculture, Forestry and Water Management of HNC Ministry of Construction and Spatial Planning of HNC Institute for Protection of Cultural and Historical Heritage HNC	Medium	High

Identified stakeholders in the Project	Detailed description of stakeholders	Level of interest	Level of influence
Interested NGOs (including beneficiaries of space)[74] NGOs in different spheres of action, environmental NGOs and other organizations of the civil society that expressed the interest in the project and/or may influence the Project	Hunters Bee keepers Olive growers Livestock breeders Farmers	Medium	Medium
Employers and workers Interest groups of high importance for the success of the Project which are directly or indirectly in charge with design and implementation of the Project	Employees of PE FBiH Roads Construction and temporary workers Contractors and their workers Companies in charge with supervision and control of the works	High	High

2.6 Environmental and Social Impacts

2.6.1 Potential Impacts and Opportunities during Pre-Construction and Construction Phase

Environmental impacts associated with pre-construction phase are pertinent to inadequate organisation of construction site, which may reflect to disruption of natural environment outside of the area envisaged by the Project. This is possible in cases when the construction area is not organised in the manner of good construction practices or good environmental practices, as well in cases when the Construction Waste Management Plan (CWMP) and Construction Site Organization Plan (CSOP) which the Contractor is obliged to design are not developed or implemented. Another impact pertinent to the pre-construction phase is potential conflict with illegal construction of other facilities along the road.

Environmental impacts in construction phase are mainly adverse and can be listed as follows:

Land:

- conversion of the total area of 363,716 m^2 of the present natural state that will be directly affected by the road / possible disruption of additional 218,244.8 m^2 that have the potential to be indirectly affected by the road
- physical loss of fertile soil due to construction of the road, accompanying facilities and access roads
- physical loss of forest land due to construction of the road, accompanying facilities and access roads (total area of 109,834.4 m^2 of the Submediterranean forests of oriental hornbeam and pubescent oak and 40,393.84 m^2 of Eumediterranean zone of evergreen vegetation (*macchia and garrigue)* of holm oak will be directly affected by the road, accompanying facilities and access roads/ possible disruption of additional 63,708.62 m^2 of the Submediterranean forests of oriental hornbeam and pubescent oak and possible disruption of additional 24,285.51 m^2 of Eumediterranean zone of evergreen vegetation (*macchia and garrigue)* of holm oak that have the potential to be indirectly affected by the road. Submediterranean forests of oriental hornbeam and pubescent oak covers the area of 30.20% of the total Project area that will directly be affected by the road and 27.60% of the area that have the potential to be indirectly affected during the construction works. Eumediterranean zone of evergreen vegetation (macchia and garrigue) of holm oak covers the area of 11.10% of the total Project area, and 11.13% that have the potential to be indirectly affected during the construction works). However,

[74] As defined under local legislation: associations or organizations entitled to use and manage certain space based on an approval by the relevant government authorities.

the forest land and vegetation is classified as natural habitat since it does not represent the highly threatened and/or unique ecosystems or area associated with key evolutionary processes, as shown in Figure 14

- land destruction and creation of erosive surfaces
- possible soil contamination due to dissipation of solid material such as asphalt, which contains VOC and PAH
- possible soil contamination due to accidental leakage of oil, lubricants and fuel from means of transport or demolition machinery
- soil disturbance due to the temporary disposal of construction waste (generation of construction waste (topsoil, rocky and earth material and excavated material from the tunnelling activities) and other types of waste, both hazardous and non-hazardous, as well as inadequate management of waste)

Water:

- possible groundwater contamination (e.g. water source Blace) due to accidental leakage of oil, lubricants and fuel from means of transport or construction machinery
- generation of sanitary wastewater
- degradation of water quality due to inadequate management of hazardous waste
- possible groundwater contamination due to dissipation of solid material such as asphalt, which contains VOC and PAH

Air:

- air emission due to traffic and work of transport and construction vehicles (polluters such as sulphur dioxide (SO_2), carbon dioxide (CO_2), carbon monoxide (CO), nitrogen oxides[75] (NO_x), volatile organic compound (VOC) may be expected
- dust generation as a result of site preparation activities (excavation of earth material, trenching, blasting and tunnelling), due to movement of machinery and transport vehicles and during construction of cut and infill and during manipulation of construction materials (i.e. fine granulated construction materials)
- emission of volatile organic compounds (VOC) containing polycyclic aromatic hydrocarbons (PAH) in the phase of placing asphalt mass on road route
- disruption of landscape and visual values.

Flora and fauna:

- physical loss of vegetation and fauna species in the phase of works on preparation of construction site and possible disruption of additional areas of natural environment due to performance of construction works
- fragmentation of habitat and increase of edge effect
- disturbance of fauna species due to increased level of noise and vibration in the zone of construction works (especially during blasting activities)

Noise:

- noise and vibration emission from the constuction activities (use and movement of construction machinery, tunneling, use of working equipment, offloading of construction material

[75] NOx is a generic term for the mono-nitrogen oxides (NO) and nitrogen dioxide (NO_2). They are produced from the reaction of nitrogen and oxygen gases in the air during combustion, particularly at high temperatures

- noice emission from the everyday traffic related to supply of construction materials and construction activities. The most nearest sensitive receptors are given in Table 7

Socio-economic impacts

- permanent land acquisition and livelihood impact for families identified in the Resettlement Action Plan prepared for this Project (only during the pre-construction phase)
- possible temporary land acquisition for placing of equipment and mechanization
- disrupted traffic and traffic congestions due to increase in local traffic (including heavy machinery and trucks)
- possible and temporary disruptions in the present functional organization of space (i.e. access to agricultural land and pastures in several cases referring to people crossing the road to reach their remote farms and pastures)
- impacts on living conditions of local communities during construction works - negative impacts refer to disturbances to surrounding communities related to increased noise and dust, disruptions to water and electricity supply due to construction works etc.
- labor influx –the maximum expected number of workers that will be hired per one construction site is approx. 70. The demand for local staff will very likely occur for administrative personnel, qualified, semi-qualified and unskilled persons. According to the experience of the Company in similar projects in the country, it is most likely that workers will be selected among the local population, but probably not all of them will instantly (at the beginning of construction) be part of the contractor's team (excluding key personnel). Given that the new main road is positioned between two towns (one is a major tourist destination), there is high absorption capacity for temporary workers, especially off season. Worker accommodation will most likely be found in the private leasing market as the cheapest option, so labour camps will not be required. Negative impacts due to influx of workers could be expected to a lesser extent, i.e. conflicts with the local population.
- increased dust concentration due to movement of work machines and transport vehicles which might cause adverse consequences on population and workers
- possible minimal impacts on existing cultural assets below and above ground level in terms of vibration and potential damage to new archaeological findings
- possible physical damage to structures such as fences due to construction works (vibrations, material disposal, forming access roads) etc.

The implementation of the Project will contribute to socio-economic improvement and will have positive impacts on the life quality of local communities. Possible socio-economic benefits and opportunities during the pre-construction and construction phase are as follows:

- direct employment and service opportunities: in line with the requirements of the *World Bank procurement guidelines*, the tender will be of the international character and for that reason it is difficult to anticipate the origin of the company to be selected as Constructor; however, practice in the construction industry in BiH indicates that local laborers are expected to be hired for the construction works
- construction works are expected to trigger the “multiplier effect” of the industry - employment of cooks, waiters and waitresses etc. in nearby services oriented business (restaurants and supplies industry).

2.6.2 Potential Impacts and Opportunities during Operation Phase and Decommissioning Phase

Environmental impacts associated with operation phase are as follows:

- air emission from the vehicles comprising the everyday traffic (polluters such as sulphur dioxide (SO_2), carbon dioxide (CO_2), carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compound (VOC) may be expected[76]
- noise emission from the everyday traffic
- fatalities of terriastric fauna species during attempt to cross roads and possible fatalities of avio fauna during low flyover of the road
- possible soil contamination due to deposition of products from the vehicle exhaust on the surrounding soil
- possible groundwater contamination due to deposition of combustion products on the surrounding soil
- inadequate maintenance of the system for drainage and inadequate maintenance of the system for treatment of run-off rainwater
- generation of waste during the maintenance of the road and inadequate management of both non-hazardous and hazardous waste
- possible migration of timid fauna species due to edge effect and noise from everyday traffic
- potential conflict with illegal construction of other facilities along the road.

Environmental impacts associated with decommissioning phase are similar to the ones identified during construction phase including significant impact from generation of demolition waste (old asphalt and earth material).

Socio-economic

Potential socio-economic impacts that could be expected during the operation phase are as follows:

- risk of direct contact (accidents) or physical damage to facilities in close vicinity of the road
- potential risks to illegal construction of structures along the road
- possible road safety issues due to increased number of vehicles and increased vehicle speed on the new road.

Socio-economic impacts during the decommissioning phase are:

- disrupted traffic and traffic congestion
- increased dust concentration due to movement of work machines and transport vehicles which might cause adverse consequences on population and workers
- possible physical damage to structures and objects due to decommissioning works (vibrations, material disposal) etc.
- disruption of landscape and visual values.

Possible socio-economic benefits and opportunities during the operation phase are as follows:

[76] The modeling of air emission and dispersion of air pollution can not be done due to the lack of official climatology data regarding the wind directions, wind speed and wind direction frequency for Project area. The most nearest available data are available for Meteorological Station "Mostar", which is aprox. 35-50 km distant from the Project area. However, the applicability of the data from Meteorological Station "Mostar" is questionable due to different geomorphological features of the terrain (Mostar is located in the valley surrounded by high karst hills) , difference in elevation values of approx. 50-300 m and position of the terrain

- the Project will improve connections between municipalities at national and regional level, and stimulate the socioeconomic development of the areas
- more efficient and safe road transport system through reduced travel times, vehicle operating and maintenance costs and transportation costs for goods. Due to the increase of speed and the expected number of vehicles on the new road, an increase in the absolute number of accidents is possible, but due to the increase of AADT the relative number of accidents should be lower, and the outcome of accidents should be less severe.
- faster and better transport connections and accessibility to the Nature Park Hutovo Blato as well as other cultural and historical assets and locations in both municipalities
- improved transport system, accessibility and communication - road improvement in terms of surfacing and sloping (protection and stabilization); tunnel improvement in terms of illumination, establishment of drainage system; bridge improvement in terms of bridge stabilization, all enhancing road safety
- reduction of erosion rate (improved road drainage system and reconstruction of bridges) in relation to community security through improvement of the road safety. The beneficiaries of the Project are road users and communities neighboring the selected sub-sections
- developed road infrastructure with improved access to and within settlements in the Project area,
- enhancement of quality of life of the community in general (better access to key facilities: healthcare, education, employment, etc.)
- benefits to vehicle travelers and users of public transportation means due to improved traffic connections and road capacity
- benefits for the industrial sector and development of industrial activity due to improved connections with the international highway network, and the cost savings and reliability associated with a decrease in congestion.

Socio-economic benefits and opportunities during the decommissioning phase are related to direct employment only.

2.6.3 Potential Impacts in Case of Emergency Circumstances

Environmental impacts in case of emergency circumstances are relevant for **construction, operation and decommissioning phase.** Emergency circumstances include occurrences of fire, explosions, earthquakes, traffic accidents and similar large-scale activities. Even though the possibility of occurrence of exceptional circumstances is mostly low and in function of several factors, consequences are significant and serious**.** During all three phases of the Project implementation, the following impacts in case of emergency circumstances may be expected:

- damage of constructed road and facilities in case of earthquake and explosion
- possible soil contamination due to accidental leakage of oil, lubricants and fuel from means of transport or machinery
- possible groundwater contamination due to accidental leakage of oil, lubricants and fuel from means of transport or machinery.

Socio-economic

In case of emergency circumstances, the following possible socio-economic impacts could be expected:

- impacts on workers (endangering the health and safety of workers through potential risks and injuries) in possible accidents caused by human factor or force majeure (thunder strike, extremely unfavorable weather conditions)

- endangering community safety through potential risks, injuries and material damage in case of fire/explosion
- impacts on local population health by possible soil and water contamination
- possible physical damage to structures and objects (in case of fire/explosion)
- disrupted traffic and traffic congestions (disabled approach for ambulance in some parts).

3 ENVIRONMENTAL AND SOCIAL MANAGEMENT, MITIGATION AND MONITORING PLAN

3.1 Environmental and Social Management and Mitigation

This SS ESMP includes management and mitigation measures that have been developed on the basis of the principles of a mitigation hierarchy, i.e. measures have been developed to avoid creating impacts from the outset of development activities, and where this is not possible, to implement additional measures that would minimize, mitigate and, as a last resort, offset and/or compensate any potential residual adverse impacts.

During the design phase, the PE FBiH Roads ensured that engineering designs drafted for the Project are in line with the following by-laws:

- *Regulation on Type and Content of Projects for Construction and Reconstruction of Public Roads* (Official Gazette of FBiH, No. 69/10)
- *Decree on Construction Site Organization, Mandatory Documentation on Construction Site and Construction Work Participants* (Official Gazette of FBiH, No. 48/09, 75/09 and 93/12)
- *Decree on Type, Content, Marking and Keeping, Control and Verification of Investment and Technical Documentation* (Official Gazette of FBiH, No. 33/10 and 99/14).

Mitigation measures are incorporated as part of the standard design and, as such, their costs are included in the construction costs.

For the purpose of preparation of construction works, several management plans need to be developed and implemented in order to ensure the adequate implementation of the Project, in line with national legislation (according to the *Decree on Construction Site, Mandatory Documentation on the Site and Participants in Construction*[77]) during the pre-construction phase as shown in Table 22:

Table 22: *Management Plans to be implemented prior to Construction Phase*

Name of plan/sub-plan	Required content of plan/sub-plan		Responsibility
1) Construction Site Organization Plan (CSOP)[78] defines: - the organization of preliminary works - organization of sites during construction - organization of sites after construction and the project scheme. CSOP should consist of: 1a) Construction	**1a) Construction Environmental Management Plan (CEMP)**	To be developed prior to construction All mitigation measures regarding environmental protection given in this SS ESMP shall be incorporated in the CEMP during the development of the said document, as part of the Construction Site Organization Plan in line with the *Decree on Construction Site, Mandatory Documentation on the Site and Participants in Construction*	The Contractor selected for implementation of construction works
	1b) Fire and Explosion Management Plan (FEMP)	To be developed prior to construction All mitigation measures regarding fire-fighting activities in case of fires, plans for alerting fire-	The Contractor selected for implementation of construction works

[77]Required by the *Decree on Construction Site, Mandatory Documentation on the Site and Participants in Construction*- Official Gazette of FBiH, No. 48/09, 75/09, 93/12, 74/13, 89/14, 99/14, 53/15 and 101/15
[78]Required by the *Decree on Construction Site, Mandatory Documentation on the Site and Participants in Construction*- Official Gazette of FBiH, No. 48/09, 75/09, 93/12, 74/13, 89/14, 99/14, 53/15 and 101/15

Name of plan/sub-plan	Required content of plan/sub-plan		Responsibility
Environmental Management Plan (CEMP) 1b) Fire and Explosion Management Plan 1c) Occupational Health and Safety Management Plan		fighting services and contains procedures for identifying and safe handling of unexploded ordnance (UXOs) in case of finding the UXOs[79] given in this SS ESMP shall be incorporated in the FEMP during the development of the said document, as part of the Construction Site Organization Plan in line with the *Decree on Construction Site, Mandatory Documentation on the Site and Participants in Construction*	
	1c) Occupational Health and Safety Management Plan (OHSMP)	To be developed prior to construction All mitigation measures regarding mandatory equipment for OHS, preliminary medical assistance and plan for alerting the official medical assistance authorities given in this SS ESMP shall be incorporated in the OHSMP during the development of the said document, as part of the Construction Site Organization Plan in line with the *Decree on Construction Site, Mandatory Documentation on the Site and Participants in Construction*	The Contractor selected for implementation of construction works
Construction Waste Management Plan (CWMP)	To be developed prior to construction in accordance with the *Decree on Construction Site, Mandatory Documentation on the Site and Participants in Construction*[80] and *Law on Waste Management*[81] with special emphasis on management of hazardous waste (if any).		The Contractor selected for implementation of construction works

The PE FBiH Roads is responsible for monitoring that the SS ESMP requirements are incorporated into the CSOP.

During the construction phase, Contractors will be required to allocate the responsibility of overseeing day-to-day compliance with the SS ESMP to a senior member of staff. Contractors will be responsible for the implementation of all measures included in the SS ESMP for all activities undertaken in terms of the construction contract (including work undertaken by subcontractors). Compliance of Contractors with these measures will be assessed by the Construction Supervisor appointed by the PE FBiH Roads, in line with the *Decree on Construction Site Organisation, Mandatory Documentation on Construction Site and Construction Work Participants*.

Compliance reviews will be submitted by the Contractor to the PE FBiH Roads on a monthly basis. Non-conformances, incidents and deviations from the action plan will be communicated to the PE FBiH Roads as soon as possible within 24 hours form the time of occurrence.

Additionally, Construction Site Organization includes also the following:

- The Contractor will be responsible for avoidance/ management of traffic disturbance – e.g. during tourist season

[79] Possible due to the last war
[80] Required by the *Decree on Construction Site, Mandatory Documentation on the Site and Participants in Construction*- Official Gazette of FBiH, No. 48/09, 75/09, 93/12, 74/13, 89/14, 99/14, 53/15 and 101/15
[81] Official Gazette of FBiH, No. 33/03, 72/09 and 92/17

- The Contractor will be responsible for appointing a Health, Safety and Environment Coordinator who will be responsible for ensuring compliance with the provisions of national legislation, WB requirements and EU standards regarding environmental protection, occupational safety and fire protection at the construction site, as well as for the implementation of CSOP.
- The Contractor will be responsible for ensuring that order, discipline and professional responsibility of all employees on the construction sites are maintained at all times. Work must be restricted exclusively to the construction site and damage to private property, land and crops must be avoided and if can not be avoided all private owners should be compensated as stated RAP.
- The timing of construction activities should, if possible, be planned to day time only and it is recommended that machines only operate in the period 07-20 h[82] in all sub-sections of the route that passes through settlements.
- The Contractor is responsible for establishing temporary disposal sites for construction materials, area for washing and cleaning of machinery (on site or off-site) and vehicles in line with CSOP. Temporary disposal sites for excavation material (rocky material and topsoil) are to be reduced to maximum 2 m height, in order to prevent compaction caused by weight of the temporary disposed material.
- The Contractor is responsible for ensuring that all construction equipment is licensed and approved in accordance with local regulations, and certified in compliance with EU standards. This includes use of modern machines and vehicles that fulfil environmental standards in terms of emission of harmful gases (complete combustion) and those that have enclosed sources of noise (engines, exhaust system).
- The Contractor is responsible for ensuring that machines and vehicles parking are located on designated area and that not affect presumed endangered fauna.
- The Contractor is obliged to reinstate the construction areas in accordance with the planned land use and to supplement by adequate material if needed.

In the operation phase, PE FBiH Roads is required to adhere to the following measures:

- Regular inspection of road integrity and on-going maintenance of road, including road other facilities in line with *Regulation on Maintenance of Public Roads*[83]
- Regular maintenance of vegetation along road to ensure adequate visibility and passability of the road
- Adding appropriate traffic signs
- Cleaning of road (removal of wastes, debris caused by erosion, snow (if any), etc.) and road signage
- Ensuring all absorption substances used for absorption of spills on road are treated as hazardous waste and handed over to authorized operators of hazardous waste.

The Company PE FBiH Roads will engage a Contractor for Maintenance Works, whose obligations include maintenance of Road Inspection Logs, Road Maintenance Logs and Log of Construction Works in line with the *Guidelines for the Design, Construction, Maintenance and Supervision*[84].

[82]Due to the lack of national legislation defining permissible working hours for noisy construction activities, the Consultant has proposed working hours for operation of machines in line with international standards, guidelines and regulations as described in Granneman, J. (2013). Construction noise: overview of regulations of different countries, *INTER-NOISE 2013* (pp. 3106 - 3115). Innsbruck, Austrian Noise Abatement Association.
[83] Official Gazette of FBiH, no. 48/03
[84] FBiH Roads, 2010

3.1.1 Site Specific Environmental Management Plan

This SS ESMP consists of **mitigation measures** and institutional measures which are to be taken during pre-construction, construction, operation and decommissioning of the facilities in order to remove, neutralize or diminish adverse environmental and social impacts to an acceptable level. SS ESMP identifies feasible and cost-effective measures which can reduce potentially negative impacts on the environment and society to an acceptable level. If mitigation measures are not possible, profitable or sufficient, compensation is included as the last measure.

Specifically, the mitigation section of the SS ESMP:

i. identified and summarized all anticipated significant adverse social and environmental impacts
ii. described--with technical details--each mitigation measure, including the type of impact to which it relates and the conditions under which it is required (e.g., continuously or in the event of contingencies), together with designs, equipment descriptions, and operating procedures, as appropriate
iii. estimated any potential environmental impacts of these measures, and
iv. provided linkage with any other mitigation plans (e.g., for involuntary resettlement, or cultural property) required for the project.

Table 23: *Site Specific Environmental Management Plan for Road Section Neum-Stolac*

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
Pre-construction	Inadequate organization of construction site which may reflect to disruption on natural environment outside of the area envisaged by the Project	• Development of Construction Site Organization Plan (CSOP). **Construction Site Organization Plan (CSOP)**[85] defines: - the organization of preliminary works - organization of sites during construction - organization of sites after construction and the project scheme. • The necessary documentation and management plans are to be developed once, after the selection of the Contractor. The necessary documentation is to be developed in line with the legislation described in Table 22 • Construction Site Organization Plan (CSOP) includes: - **Construction Environmental Management Plan (CEMP)** - all mitigation measures regarding environmental protection given in this SS ESMP shall be incorporated in the CEMP during the development of the said document. - **Fire and Explosion Management Plan (FEMP)–** all mitigation measures regarding fire-fighting activities in case of fires, plans for alerting fire-fighting services and contains procedures for identifying and safe handling of unexploded ordnance (UXOs) in case of finding the UXOs given in this SS ESMP shall be incorporated in the FEMP during the development of the said document. - **Occupational Health and Safety**	Included in the bid price	-	The Contractor[86]	PE FBiH Roads	n/a

[85]Required by the *Decree on Construction Site, Mandatory Documentation on the Site and Participants in Construction*- Official Gazette of FBiH, No. 48/09, 75/09, 93/12, 74/13, 89/14, 99/14, 53/15 and 101/15
[86] Refers to the sellected Contractor for implementation of construction works

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		Management Plan (OHSMP) - all mitigation measures regarding mandatory equipment for OHS, preliminary medical assistance and plan for alerting the official medical assistance authorities given in this SS ESMP shall be incorporated in the OHSMP during the development of the said document • **Construction Waste Management Plan (CWMP)** – to be developed in accordance with the *Decree on Construction Site, Mandatory Documentation on the Site and Participants in Construction* and *Law on Waste Management* with special emphasis on management of hazardous waste. All mitigation measures regarding adequate waste management shall be incorporated in the CWMP during the development of the said document					
Pre-construction	Potential conflict with illeagal construction of other facilities along the road	• Communication with Department of Spatial Planning of Municipalities Neum and Stolac in order to prohibit construction in area of protective zone of the main road of 20 m on each side of the main road in accordance with the Article 58 of the *Law on FBiH Roads* (Official Gazette of FBiH, No, 12/10, 16/10) • Conduct regular inspection in order to identify any illegal constructed facilities	-[87]	-	PE FBiH Roads	Municipality Neum Municipality Stolac – Inspectorate Department and Department of Spatial Planning	n/a
Construction	Conversion of the total area of 363,716 m^2 of the present natural state that will be directly affected by the Project / possible disruption of additional 218,244.8 m^2 that have the potential to be indirectly affected by the road	• The land determined to be used by the Project, including temporary storage of building material, parking of the heavy machinery, disposal of construction waste at planned landfill of construction waste (4,500 m^2 at location Hutovo) etc., can only be used for the construction activities and no additional land is available for these activities in terms of preventing of additional disturbance of 218,244	-	-	The Contractor	PE FBiH Roads	n/a

[87] The proposed mitigation measure does not include any cost

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		m^2 that have the potential to be directly affected by the road • Conduct regular everyday inspection in order to identify any unnecessary land disruption and prohibit any unnecessary land disruption • Restoration of disturbed areas upon completion of construction activitiesRe-vegetation with autochthonous species and cultivar species upon completion of construction activities in accordance with the *Main Designs – Chapter Landscape* • Measures are to be implemented along the whole road section Neum-Stolac and during the implementation of all construction activities[88]					
Construction	Physical loss of fertile soil due to construction of the road, accompanying facilities and access roads and due to installation of temporary facilities, formation of disposal sites or borrow pits	• The land determined to be used by the Project, including temporary storage of building material, parking of the heavy machinery, disposal of construction waste at planned landfill of construction waste (4,500 m^2 at location Hutovo) etc., can only be used for the construction activities and no additional area land is available for these activities in terms of preventing the compaction of soil that may be indirectly affected by the road • Conduct regular everyday inspection in order to identify any unnecessary occupation of fertile soil and prohibit any unnecessary disruption of fertile soil at settlements Kiševo, Babin Do, Dobrovo, Papratnica, Hutovo, Cerovica, Vinine and Crnoglav • Physical barriers should be placed in zones of agricultural areas of Kiševo, Babin Do, Dobrovo, Papratnica, Hutovo, Cerovica, Vinine and Crnoglav	-	-	The Contractor	PE FBiH Roads	n/a

[88] All proposed mitigation measures shall be incorporated in the CEMP during the development of the CEMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		• All excavated humus material shall be disposed of on planned sites (covered storage), so it could be used later for the purpose of planting greenery • Slope stabilization measures should be conducted (installation of gabions, protective nets, supporting walls and biological measures such as hydro-seeding), especially on notch road parts • Installation of runoff and drainage structures should be conducted (collecting channels, drainage slopes and drainage wells), in accordance with the *Main designs* • Above listed measures are to be implemented along the road at settlements Kiševo, Babin Do, Dobrovo, Papratnica, Hutovo, Cerovica, Vinine and Crnoglav and during the implementation of all construction activities • Reinstatement to pre-works conditions of areas such as disposal sites or borrow pits, as well as areas envisaged by the installation of temporary facilities[89]					
Construction	Physical loss of forest land due to construction of the road, accompanying facilities and access roads	• The land determined to be used by the Project, including temporary storage of building material, parking of the heavy machinery, disposal of construction waste at planned landfill of construction waste (4,500 m^2 at location Hutovo) etc., can only be used for the construction activities and no additional area is available for these activities in terms of preventing the additional loss of forest that may be indirectly affected by the road • Especially avoid forested areas for placing of the auxiliary and support facilities	-	-	The Contractor	PE FBiH Roads	n/a

[89] All proposed mitigation measures shall be incorporated in the CEMP during the development of the CEMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		• Conduct regular everyday inspection in order to identify any unnecessary loss of forest and prohibit any unnecessary disruption of forest at areas along the both sides of the road, in particularly at: Pušišta Intersection (35+000.000), Kadića Dubrava (34+275.000), Border of Two Hunting Areas Neum/Stolac (28+000.000), Gornje Hrasno (27+350.000), Slopes of Hill Crnoglav (26+350.000, 25+600.000), Cerovica and Sanctuary of the Quen of Peace (21+400.000), Babin Do (5+320.000) and Kiševo (1+000.000) • Take precautionary measures in order to prevent the outbreak of fires (e.g. flammable materials to be handled with care, to prohibit smoking during construction activities except in designated areas during work breaks) along the whole section Neum-Stolac • Restoration of disturbed forest areas upon completion of construction activities • Re-vegetation of disturbed forest areas with autochthonous tree species upon completion of construction activities in accordance with the *Main Designs – Chapter Landscape* • Compensation for forest loss should be conducted (cut trees should be given to the local population for firewoods, plantation of autochthonous trees should be conducted in Submediterranean forests of oriental hornbeam and pubescent oak and Eumediterranean zone of evergreen vegetation of holm. Alternative solution is to finance forestation and conduct these activities in cooperation with PE Forests of					

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		Herzegovina-Neretva Canton) • Above listed measures are to be implemented during the implementation of all construction activities[90]					
Construction	Generation of sanitary wastewater	• Temporary installation of portable toilets for workers as part of the regular organisation of construction site (e.g. foam-enveloped toilets using foam instead of water, to block waste odours. As a result, the foam-enveloped toilet uses considerably less water (less than 50 ml), preserving water and reducing disposal costs) • Measures are to be implemented during the implementation of all construction activities along the whole section Neum-Stolac[91]	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a
Construction	Generation of construction waste (topsoil, rocky and earth material and excavated material from the tunnelling activities) and other types of waste, both hazardous and non-hazardous, as well as inadequate management of waste	• Reuse of rocky and bulk earthy material (e.g. from tunneling of the Tunnel Žaba) to construct infills at sub-sections Babin Do-Broćanac, Broćanac-Hutovo-Cerovica and Cerovica-Drenovac in total amount of 800,000 m^3 in accordance with the *Preliminary Design of Disposal of Surplus Material* • Final disposal of around 50,000 m^3 construction material at planned area of landfill of construction material at location Hutovo, land plots no.43/218 and 43/219 in accordance with the *Preliminary Design of Disposal of Surplus Material* • In case of generation of construction material at sub-sections Stari Neum-Kiševo and Kiševo – Babin Do, reuse of construction waste should be conducted at the nearest infills of the sub-section Babin Do-Broćanac or the construction waste should be disposed at the existing landfill	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a

[90] All proposed mitigation measures shall be incorporated in the CEMP during the development of the CEMP
[91] All proposed mitigation measures shall be incorporated in the CEMP during the development of the CEMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		of construction material at chainage 1+340.000 • All other types of waste, both hazardous and non-hazardous should be finally disposed by engaging the authorized company in accordance with the *Law on Waste Management* (Official Gazette of FBiH, No. 33/03, 72/09 and 92/17) • Separation of different types of waste, both hazardous and non-hazardous in accordance with the CWMP, respectively in accordance with the *Law on Waste Management* (Official Gazette of FBiH, No. 33/03, 72/09 and 92/17) is needed • Reinstatement to pre-works conditions of areas such as disposal sites. Landfill of construction material Hutovo (4,500 m^2) should be closed in environmentally acceptable manner upon completion of construction works • Above listed measures are to be implemented during the implementation of all construction activities along the whole section Neum-Stolac[92]					
Construction	Supply of materials to be used in the roads, placement and impacts of asphalt plants, transport of construction materials, and pressures exerted on supply of raw materials	• Supply of raw material needs to be from controlled and licensed sources • The land determined to be used by the Project, including temporary storage of building material, parking of the heavy machinery, disposal of construction waste at planned landfill of construction waste (4,500 m^2 at location Hutovo) etc., can only be used for the construction activities and no additional land is available for these activities in terms of preventing of additional disturbance of 218,244 m^2 that have the potential to be directly affected by the road • Conduct regular everyday inspection in order to identify any unnecessary land disruption and	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a

[92] All proposed mitigation measures shall be incorporated in the CWMP during the development of the CWMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		prohibit any unnecessary land disruption • Measures are to be implemented along the whole road section Neum-Stolac and during the implementation of all construction activities, especially during the placement of auxiliary plants and facilities, as well as during offloading of construction materials[93]					
Construction	Fragmentation of habitats and increase of the edge effect (may cause the decrease of the population of timid species, such as roe deer and rabbit) due to construction of the new road	• Mitigation measures are not applicable since the construction of the planned road leads to fragmentation of habitat due to the facts the road is the linear facility. The only possible measure is the implementation of 'do nothing' alternative	n/a	n/a	n/a	n/a	n/a
Construction	Disturbance of fauna species, physical loss of vegetation and possible disruption of additional areas of natural environment due to performance of construction works	• The areas determined to be used by the Project, including temporary storage of building material, parking of the heavy machinery, disposal of construction waste at planned landfill of construction waste (4,500 m^2 at location Hutovo) etc., can only be used for the construction activities and no additional land is available for these activities in terms of preventing of additional disturbance of 218,244 m^2 that have the potential to be directly affected by the road, to ensure minimization of habitat loss • Construction works on locations where the crocus has been identified (Drenovac – Start of the section, Location Pušišta Intersection and Location Kadića Dubrava) should start in early spring to ensure detection of crocus species. Upon detection, the Contractor should dig the soil and re-plant the crocus at location >200 m distance to eliminate any negative effect from the Project area	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a

[93] All proposed mitigation measures shall be incorporated in the CEMP during the development of the CEMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		• Restoration of disturbed natural habitats upon completion of construction activities • In case of the need for removal of *Petteria ramentace*, the Contractor should compensate for the loss of this plant by planting at least the same amount of the affected area covered with *Petteria ramentace*, in cooperation with the local Beekeeping Association Neum • Re-vegetation of disturbed areas with autochtonus species upon completion of construction activities in accordance with the *Main Designs – Chapter Landscape* • Conduct regular everyday inspection in order to identify any unnecessary disruption and prohibit any unnecessary disruption *of additional natural environmen*t • Above listed measures are to be implemented along the whole road section Neum-Stolac and during the implementation of all construction activities • Three open underpasses for animals should be constructed at sub-section Babin Do-Broćanac, as defined in the Main Design for this section • On other sub-sections, drainage channels and culverts should be constructed (DN 100 cm) on locations defined in the Main Designs, which may also represent the open corridors for animals • Fencing of the construction site to prevent the fatalities of endangered fauna species (refer to the Table 67 and Table 68)[94]					
Construction	Increased level of noise and vibration in the zone of construction works (especially during	• Minimise the duration of clearance works	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a

[94] All proposed mitigation measures shall be incorporated in the CEMP during the development of the CEMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
	blasting activities) will have adverse impacts on living world	• Tunneling activities should be performed by using the milling machines such as 'moles' • Blasting works should be minimized as far as possible • In case of blasting, the type of explosive and amount of explosive which makes the least harm to the environment should be used. Special technique of millisecond activation of blasting charge with directed blasting action should be used • Equipment and machinery need to be shut down when not in use • Simultaneous use of machines that generate noise over 70 dB needs to be limited • Machines and vehicles to be used in construction activities must have use/operation permits • Restriction of construction works to day - time only (07:00-20:00[95]) • Conduct regular everyday inspection in order to identify any unnecessary disruption and prohibit any unnecessary disruption of additional natural environment • Above listed measures are to be implemented along the whole road section Neum-Stolac and during the implementation of all construction activities • Conduct monitoring of noise levels during construction activities at 10 locations (refer to Chapter 3.2.1)[96]	except for monitoring cost. For monitoring price please refer to Chapter 3.2.1, Table 25 Table 23				

[95] Due to the lack of national legislation defining permissible working hours for noisy construction activities, the Consultant has proposed working hours for operation of machines in line with international standards, guidelines and regulations as described in Granneman, J. (2013). Construction noise: overview of regulations of different countries, *INTER-NOISE 2013* (pp. 3106 - 3115). Innsbruck, Austrian Noise Abatement Association.

[96] All proposed mitigation measures regarding the noise and vibration management shall be incorporated in the CEMP during the development of the CEMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
Construction	Air emission due to traffic and work of construction vehicles (polluters such as sulphur dioxide (SO_2), carbon dioxide (CO_2), carbon monoxide (CO), nitrogen oxides[97] (NO_x), volatile organic compound (VOC) may be expected; dust will be generated as a result of site preparation activities (excavation of earth material, trenching, blasting and tunnelling), due to movement of machinery and transport vehicles and during construction of cut and infill and during unloading of construction materials (i.e. fine granulated construction materials); placing asphalt mass on road route leading to emission of volatile organic compound (VOC) with polycyclic aromatic hydrocarbons (PAH)	• Sand and gravel materials need to be transported in covered trucks • Machines and vehicles must have installed filters to reduce soot emission. If applicable, vehicles with at least EURO 4 emission standard should be used • During the creation of blasting boreholes, the machines with dust collection should be used • High quality fossil fuels (with low percentage of sulphur and lead) need to be used as motor fuel for machinery and equipment • Vehicles need to be regularly maintained • The equipment and machinery need to be shut down when not in use • Machines and vehicles to be used in construction activities must have use/operation permits • Measures are to be implemented along the whole road section Neum-Stolac and during the implementation of all construction activities • Conduct monitoring of air quality during construction activities at 10 locations (refer to Chapter 3.2.1)[98]	Included in the bid price except for monitoring cost. For monitoring price please refer to Chapter 3.2.1, Table 25	-	The Contractor	PE FBiH Roads	n/a
Construction	Possible soil and groundwater contamination due to dissipation of solid material such as asphalt which contains VOC and PAH, accidental leakage of oil, lubricants and fuel from means of transport or construction machinery	• Asphalt need to be transported in covered trucks • Repair of machinery, change of oil and car batteries at construction sites should be prohibited • If needed, tanking the heavy machinery with fuel should be conducted with special	Included in the bid price except for monitoring cost. For monitoring price please	-	The Contractor	PE FBiH Roads	n/a

[97] NOx is a generic term for the mono-nitrogen oxides (NO) and nitrogen dioxide (NO_2). They are produced from the reaction of nitrogen and oxygen gases in the air during combustion, particularly at high temperatures
[98] All proposed mitigation measures regarding the preservation of air quality shall be incorporated in the CEMP during the development of the CEMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		precaution measures to prevent spill, and by conduction these activities on water tight areas, such as nylon. Reservoirs of fuel should be water tight and secured with bunds with the same or bigger volume • Vehicles and machines need to be regularly maintained to prevent leakage of oil • Internal traffic should be defined and traffic signs should be placed to prevent collision during internal traffic and indirectly prevent situations that may lead to soil contamination • At least 90 oil separators with coalescing units in accordance with EN 858-1 and EN 858-2 should be installed, and at least 38 drainage wells should be constructed; the locations and the volume of the oil separators are defined in the Main Designs • Drainage channels and culverts should be constructed on locations defined in the Main Designs • Develop and implement spill response plan, including the procurement and use of spill cleanup kits for accidental releases/spills • Above listed measures are to be implemented along the whole road section Neum-Stolac • Conduct monitoring of soil quality during construction activities at 32 locations (refer to Chapter 3.2.1)[99] • Conduct monitoring of water quality during construction activities at 5 locations (refer to Chapter 3.2.1) [100]	refer to Chapter 3.2.1, Table 25				

[99] All proposed mitigation measures regarding the hazardous materials management, spill response management (e.g. procurement of adsorbent material, use of adsorbent material in case of spills and adequate disposal of used adsorbent material) and traffic management shall be incorporated in the CEMP during the development of the CEMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
Construction	Disruption of landscape and visual values	• Recultivation of Project area should be conducted as foreseen in *Main Designs – Chapter Landscape* • Chance finds procedure should be developed and implemented	Included in the bid price– approx. 5,000	-	The Contractor	PE FBiH Roads	n/a
Construction	Physical damage to local roads and access roads	• Contractor should bear the cost of repairs and compensation of any damages	10,000 (please refer to cost given in Table 24 below)	-	The Contractor	PE FBiH Roads	n/a
Construction	Damage of constructed road and facilities in case of earthquake and explosion	• Mitigation measures in cases of earthquake are not applicable • Internal traffic should be defined and traffic signs should be placed to prevent collision during internal traffic and indirectly prevent situations that may lead to explosions • Above listed measures are to be implemented along the whole road section Neum-Stolac[101]	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a
Operation/ Maintenance	Air emission from the vehicles comprising the everyday traffic (polluters such as sulphur dioxide (SO_2), carbon dioxide (CO_2), carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compound (VOC) may be expected	• Machines and vehicles to be used in maintenance activities must have use/operation permits • Machines and vehicles to be used in maintenance activities must have installed filters to reduce soot emission • High quality fossil fuels (with low percentage of sulphur and lead) need to be used as motor fuel for machinery and equipment • Conduct monitoring of air quality during operation phase of the road at 10 locations (refer to Chapter 3.2.1)	Included in the bid price except for monitoring cost. For monitoring price please refer to Chapter 3.2.1, Table 25	-	The Contractor (Refers to the selected Contractor for implementation of monitoring and maintenance of the road)	PE FBiH Roads	n/a

[100] All proposed mitigation measures regarding the hazardous materials management, spill response management (e.g. procurement of adsorbent material, use of adsorbent material in case of spills and adequate disposal of used adsorbent material) and traffic management shall be incorporated in the CEMP during the development of the CEMP
[101] All proposed mitigation measures shall be incorporated in the CEMP during the development of the CEMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		• Upon known official data on wind for area between Stolac and Neum, conduct air mobile source emissions modeling, utilizing the data on air quality and traffic forecast	-[102]	-	PE FBiH Roads	PE FBiH Roads	n/a
Operation/ Maintenance	Noise emission from everyday traffic	• Plantation and maintenance of protective green belt along the road that passes through residential areas such as settlements: Kiševo, Babin Do, Dobrovo, Papratnica, Hutovo, Cerovica, Vinine and Crnoglav • Conduct monitoring of air quality during operation phase of the road at 10 locations (refer to Chapter 3.2.1)	Included in the bid price except for monitoring cost. For monitoring price please refer to Chapter 3.2.1, Table 25	-	The Contractor	PE FBiH Roads	n/a
Operation/ Maintenance	Possible soil contamination due to deposition of combustion products on the surrounding soil and accidental leakage of oil, lubricants and fuel from means of transport	• Conduct monitoring of soil quality during operation phase of the road at 32 locations (refer to Chapter 3.2.1) • Regular cleaning of oil separators should be conducted, at least once a year • Inspection of functional work of oil separators should be conducted at least every three months • Traffic road is to be equipped with appropriate horizontal and vertical signalization, which includes necessary prohibitions and notifications • Develop and implement spill response plan, including the procurement of spill cleanup kits for accidental releases/spills • In case of pollution, urgent rehabilitation shall be implemented in line with Regulation on procedures and measures in cases of accidents on water and coastal water terrain, Official	Included in the bid price except for monitoring cost. For monitoring price please refer to Chapter 3.2.1, Table 25	-	The Contractor	PE FBiH Roads	n/a

[102] Unknown cost due to uncertainties regarding the timeframe of wind data collection, market and equipment to be used for air quality modeling

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		Gazette of FBiH no. 71/09. • In case of leakage of hazardous substances they must be diluted, neutralized and absorbed. Cleaning must be performed by an expert using all necessary prescribed protection resources.					
Operation/ Maintenance	Possible groundwater contamination due to deposition of combustion products on the surrounding soil and accidental leakage of oil, lubricants and fuel from means of transport	• Conduct monitoring of water quality during operation phase of the road at 5 locations (refer to Chapter 3.2.1) • Regular cleaning of oil separators should be conducted, at least once a year • Inspection of functional work of oil separators should be conducted at least every three months • Traffic road is to be equipped with appropriate horizontal and vertical signalization, which includes necessary prohibitions and notifications • Develop and implement spill response plan, including the procurement of spill cleanup kits for accidental releases/spills • In case of pollution, urgent rehabilitation shall be implemented in line with *Regulation on procedures and measures in cases of accidents on water and coastal water terrain,* Official Gazette of FBH no. 71/09. • In case of leakage of hazardous substances they must be diluted, neutralized and absorbed. Cleaning must be performed by an expert using all necessary prescribed protection resources	Included in the bid price except for monitoring cost. For monitoring price please refer to Chapter 3.2.1, Table 25	-	The Contractor	PE FBiH Roads	n/a
Operation/ Maintenance	Inadequate maintenance of the system for drainage and inadequate maintenance of the system for treatment of run-off rainwater	• Regular cleaning of drainage channels and the drainage system should be conducted as part of the regular maintenance of the road and cleaning of the 1 m along each side of the main road, in accordance with the *Law on FBiH Roads* (Official Gazette of FBiH, No, 12/10, 16/10) • Regular cleaning of oil separators should be	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		conducted, at least once a year • Inspection of functional work of oil separators should be conducted at least every three months • Waste from the cleaning of drainage system and system for treatment of run-off rainwater (oil separators) should be finally disposed by engaging the authorized company in accordance with the *Law on Waste Management* (Official Gazette of FBiH, No. 33/03, 72/09 and 92/17) for both hazardous and non-hazardous waste • Separation of different types of waste, both hazardous and non-hazardous in accordance with the *Law on Waste Management* (Official Gazette of FBiH, No. 33/03, 72/09 and 92/17) is needed					
Operation/ Maintenance	Generation of waste during maintenance of the road	• All types of waste both hazardous and non-hazardous waste should be finally disposed by engaging the authorized company in accordance with the *Law on Waste Management* (Official Gazette of FBiH, No. 33/03, 72/09 and 92/17) for both hazardous and non-hazardous waste • Separation of different types of waste, both hazardous and non-hazardous in accordance with the *Law on Waste Management* (Official Gazette of FBiH, No. 33/03, 72/09 and 92/17) is needed • Any operational related maintenance waste management is part of the works contract • Day to day waste that may appear along the road shall be collected and disposed as part of the regular activities of the local municipal services in Neum and Stolac	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a
Operation/ Maintenance	Fatalities of fauna species	• As part of the regular inspection and monitoring of the road regarding the inspection of ongoing maintenance of road (including road and other facilities in line with *Regulation on Maintenance*	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		of Public Roads[103]*),* monitoring of fatalities of fauna species should also be conducted • Take record of fatalities of animals with an aim of taking additional measures of protection, such as marking the places where animals cross the road with appropriate signs • At areas: Pušišta (chainage 35+000.000 to 34+825.000) and border between two hunting areas Stolac/Neum (chainage 28+000.000) protective fence should be places along both sides of the road to prevent fatalities of wild game • Additionally, if the monitoring of fatalities of animals show that the endangered species are injured (refer to the Table 67 and Table 68), fencing of the site to prevent the fatalities of endangered fauna species should be conducted at areas of frequent animal injuries					
Operation/ Maintenance	Migration of timid fauna species due to edge effect and noise from traffic (may cause the decrease of the population of timid species, such as roe deer and rabbit)	• Mitigation measures are not applicable since the operation phase of the road will inevitably lead to migration of timid fauna species due to the edge effect and noise from traffic, respectively, due to the nature of specific animal species	n/a	n/a	n/a	n/a	n/a
Operation/ Maintenance	Increased danger from fire and destruction of forest land and vegetation along the road	• Warning signs must be placed along the road, regarding prohibition of throwing cigarette buds and glass packaging, which is the most common cause of fire in summer months	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a
Operation/ Maintenance	Potential conflict with illegal construction of other facilities along the road	• Communication with Department of Spatial Planning of Municipalities Neum and Stolac in order to prohibit construction in area of protective zone of the main road of 20 m on each side of the main road in accordance with the Article 58 of the *Law on FBiH Roads* (Official Gazette of FBiH, No, 12/10, 16/10)	-	-	PE FBiH Roads	Municipality Neum Municipality Stolac – Inspectorate Department and	n/a

[103] Official Gazette of FBiH, no. 48/03

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		• Conduct regular inspection in order to identify any illegal constructed facilities				Department of Spatial Planning	
Decommissioning	Generation of demolition waste	• All types of waste both hazardous and non-hazardous waste should be finally disposed by engaging the authorized company in accordance with the *Law on Waste Management* (Official Gazette of FBiH, No. 33/03, 72/09 and 92/17) for both hazardous and non-hazardous waste • Separation of different types of waste, both hazardous and non-hazardous waste in accordance with the *Law on Waste Management* (Official Gazette of FBiH, No. 33/03, 72/09 and 92/17) is needed • Above listed measures are to be implemented along the whole road section Neum-Stolac and during the implementation of all decommissioning activities	Included in the bid price	-	The Contractor[104]	PE FBiH Roads	n/a
Decommissioning	Air emission due to traffic and work of demolition vehicles (polluters such as sulphur dioxide (SO_2), carbon dioxide (CO_2), carbon monoxide (CO), nitrogen oxides[105] (NO_x), volatile organic compound (VOC) may be expected; dust will be generated as a result of demolition and due to movement of machinery and transport vehicles	• Sand and gravel materials need to be transported in covered trucks • Machines and vehicles must have installed filters to reduce soot emission. If applicable, vehicles with at least EURO 4 emission standard should be used • High quality fossil fuels (with low percentage of sulphur and lead) need to be used as motor fuel for machinery and equipment • Vehicles need to be regularly maintained • The equipment and machinery need to be shut down when not in use • Machines and vehicles to be used in construction activities must have use/operation	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a

[104] Refers to the selected Contractor for implementation of demolition of the road
[105] NO_x is a generic term for the mono-nitrogen oxides (NO) and nitrogen dioxide (NO_2). They are produced from the reaction of nitrogen and oxygen gases in the air during combustion, particularly at high temperatures

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		permits • Measures are to be implemented along the whole road section Neum-Stolac and during the implementation of all decommissioning activities					
Decommissioning	Increased noise levels	• Minimise the duration of clearance works • Equipment and machinery need to be shut down when not in use • Simultaneous use of machines that generate noise over 70 dB needs to be limited • Machines and vehicles to be used in construction activities must have use/operation permits • Restriction of construction works to day - time only (07:00-20:00[106]) • Measures are to be implemented along the whole road section Neum-Stolac and during the implementation of all decommissioning activities	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a
Decommissioning	Possible soil contamination due to accidental leakage of oil, lubricants and fuel from means of transport	• Repair of machinery, change of oil and car batteries at construction sites should be prohibited • If needed, tanking the heavy machinery with fuel should be conducted with special precaution measures to prevent spill, and by conduction these activities on water tight areas, such as nylon. Reservoirs of fuel should be water tight and secured with bunds with the same or bigger volume • Vehicles and machines need to be regularly	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a

[106]Due to the lack of national legislation defining permissible working hours for noisy construction activities, the Consultant has proposed working hours for operation of machines in line with international standards, guidelines and regulations as described in Granneman, J. (2013). Construction noise: overview of regulations of different countries, *INTER-NOISE 2013* (pp. 3106 - 3115). Innsbruck, Austrian Noise Abatement Association.

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		maintained to prevent leakage of oil • Internal traffic should be defined and traffic signs should be placed to prevent collision during internal traffic and indirectly prevent situations that may lead to soil contamination					
Decommissioning	Possible groundwater contamination due to accidental leakage of oil, lubricants and fuel from means of transport	• Repair of machinery, change of oil and car batteries at construction sites should be prohibited • If needed, tanking the heavy machinery with fuel should be conducted with special precaution measures to prevent spill, and by conduction these activities on water tight areas, such as nylon. Reservoirs of fuel should be water tight and secured with bunds with the same or bigger volume • Vehicles and machines need to be regularly maintained to prevent leakage of oil • Internal traffic should be defined and traffic signs should be placed to prevent collision during internal traffic and indirectly prevent situations that may lead to soil contamination	Included in the bid price	-	The Contractor	PE FBiH Roads	n/a

LEGEND:

	Negative impact
	Mitigation measures given in this SS ESMP shall be incorporated in the CEMP during the development of the CEMP
	Mitigation measures given in this SS ESMP shall be incorporated in the CWMP during the development of the CWMP

3.1.2 Site Specific Social Management Plan

Table 24: *Site Specific Social Management Plan for Road Section Neum-Stolac*

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
Pre-construction	Local familiarity/perception and community support	• In order to consult the communities and enhance stakeholder support, the Project should be presented and all issues/questions should be addressed. The presentation should contain the following information: design, the financing method, the land acquisition process and similar details which shall account to the readiness of government and PC Roads to complete this infrastructure project	-	Included in the bid price	PE FBiH Roads	Contractor[107]	n/a
Pre-construction	Access to water and sanitation, electricity and telecommunications	• Use adequate and up-to-date utility mapping standards including but not limited to: Existing records Surface features, Electromagnetic/Radio Frequency Locators, Ground Penetrating Radar, Vacuum Excavations • Develop a Utility Conflict/Collision Matrix to provide management tool to deal with conflicts, organize relevant information on conflicts and alternatives and allow tracking of conflict resolution progress • Obtain necessary approvals from competent authorities and public utility companies, responsible for transport, communications and infrastructure	-	Included in the bid price	PE FBiH Roads	Contractor	n/a
Pre-construction	Dominant sectors	During pre-Bid meetings, PE FBiH Roads will inform the potential bidders about type of works and related equipment and machinery likely to be engaged in construction activities by publicizing and notification on planned activities on its website. This will continue to boost economy in the construction sector • Inform potential investors about opportunities and potential of this area in relation to the new main road construction and its potential impact on tourism	-	Included in the bid price	PE FBiH Roads	Contractor	n/a
Pre-construction	Land acquisition / involuntary resettlement	• Implement the Resettlement Action Plan (RAP) as a resettlement instrument guiding the required land acquisition/resettlement and compensation process in compliance with national legislation and OP 4.12.	Included in RAP (1,100,000.00 EUR) 1,033,106.38 USD	Included in RAP	PE FBiH Roads Municipalities	The Company Municipalities Supervision constultant	n/a The Company Municipalities

[107] Refers to the selected Contractor for implementation of works during the pre-construction phase

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		• Implement the grievance mechanism as defined in RAP					
Pre-construction	Cultural Heritage	• Implement measures included in the Expert Opinions obtained from the Federal Institute for the Protection of Monuments - develop expert studies on executed preventive archaeological research for subsections: Broćanac-Hutovo-Cerovica (probe works), Cerovica-Drenovac (sporadic archaeological research) and Kiševo-Broćanac (sporadic archaeological research), according to the Expert Opinions obtained from the Federal Institute for the Protection of Monuments • Implement detailed archaeological research and conservatory inspection of recorded sites along the route; recording the present state of objects and sites (tumuli, stone walls, tombstones, etc.) or other requirements specified in the opinion(s). Submit results from research to relevant institutions	60,000	-	PE FBiH Roads	Contractor	n/a
Pre-construction	Gender	• Prior the construction work, Contractor will prepare a staff engagement plan to foresee where and when possible to engage men and women equally, depending on the specific position. • Contractor will whenever possible employ women, depending on available trained and skilled laborers.	In the framework of construction works (to be included in the contract with Contractor)	-	PE FBiH Roads	Contractor[108]	n/a
Construction	The influx of workers	• The contractor is obliged to arrange suitable worker accommodation for non-local workers. Taking into consideration the fact that the road will be built between two urban settlements (one of which is Neum as a tourist center with high lodging availability), it is envisioned that the contractor will lease worker accommodation from the local private market. Renting of suitable worker accommodation should be done prior to beginning of construction works. In advance of the civil works, the affected Municipalities should communicate to the local communities the upcoming demand for worker lodging and encourage private owners to early advertise lodging vacancies thus promoting leasing arrangements for vacancies that can accommodate construction workers.	In the framework of construction works (to be included in the contract with Contractor)	-	PE FBiH Roads Municipalities/Contractor	PE FBiH Roads Municipalities	- Boosting local economy

[108] Refers to the sellected Contractor for implementation of construction works

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		• Managing public expectations by regular dissemination of information about temporary worker in-migration by PE FBiH Roads (at local level). • Negative impacts due to influx of workers could be expected to a lesser extent i.e. conflicts with the local population. Code of conduct for the workers should be developed and distributed					
Construction	Danger from mines (endangerment of community safety and works safety) in the case of earth movements	• Works in the field should not start before the MAC BH verify that the field does not have suspected areas and mine risks • Contractor is required to arrange the execution of construction works upon the Company receives the approval/verification that the field does not have suspected areas and mine risks, in order to obtain maximum safety level • Additionally, although the area near the road is proclaimed safe from mines, special attention is needed during the earth moving works and blasting works. In case of any doubt, works must be stopped and MAC BH has to be notified and contacted for consultations and further instructions • Chance finds procedure should be developed and implemented, and should take into consideration procedures for finding and safe management of UXOs	In the framework of construction works (to be included in the contract with Contractor)	-	PE FBiH Roads	Contractor MAC BH	n/a
Construction	Employment	• Hiring guidelines for recruitment will be in place to promote transparency of the recruitment process • Equal opportunities and non-discrimination will be guaranteed in the recruiting process • There will be no distinction, exclusion or preference in the recruitment made on the basis of "race, color, gender, religion, political opinion, marital status, national extraction or social origin, disability, age, sexual orientation, and/or HIV status" • Selection criteria will include minimum age and skills requirements • All job vacancies will be listed clearly with skills and experience required to fill the position, as well as the duration of the employment contract • Clear information on the recruiting process and the selection criteria will be publically available and easy to access to promote transparency of the process	In the framework of construction works (to be included in the contract with Contractor)	-	Contractor	PE FBiH Roads	n/a

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		• All contractors will be required to implement the hiring guidelines					
Construction	Access to water and sanitation, electricity and telecommunications	• Ensure emergency and prompt reaction in case of disruption • Use adequate and up-to-date utility mapping standards including but not limited to: Existing records Surface features, Electromagnetic/Radio Frequency Locators, Ground Penetrating Radar, Vacuum Excavations • Develop a Utility Conflict Matrix to provide management tool to deal with conflicts, organize relevant information on conflicts and alternatives and allow tracking of conflict resolution progress	2,000$ / disruption max. 40,000$	-	Contractor	Supervisory body/authority	n/a
Construction	Health and safety risk for workers	• Contractor is required to implement all OHS measures foreseen by the Occupational Health and Safety Management Plan (OHSMP) as part of the Construction Site Organization Plan (CSOP) that will be developed for the Project, in particular: • Controlling the hazard at its source through use of engineering controls. Examples include local exhaust ventilation, isolation rooms, machine guarding, acoustic insulating, etc. • Minimizing the hazard through design of safe work systems and administrative or institutional control measures. Examples include job rotation, training safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration • Regarding the blasting works/works with explosives, the contractor must have certificates that prove the competence or qualifications for these activities, according to the Mining Act of the FBiH (Official Gazette of the FBIH 27/10). Specific measures are: (i) the Contractor is obliged to deliver drilling and blasting parameters with a blasting field sketch at minimum one week prior to the implementation of these works, (ii) blasting field and the distance to the endangered objects and mechanization needs to be presented in a blasting field sketch, (iii) during the blasting ignition it is not permitted for anyone to be present in the area of the stone scattering zone, (iv) before the blasting works a security needs to be placed at all possible access points to contain people and vehicles outside of the	In the framework of construction works (to be included in the contract with Contractor)	-	Contractor	Supervisory body/Inspection	n/a

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		endangered zone, (v) the beginning and the end of the blasting works needs to be announced with audio signals, (vi) in case of any losses of cleaning air by drilling no further drilling or blasting works shall be carried out at that point, (vii) drilling and blasting works need to be coordinated with seismical measurements in nearby settlements according to the law, (viii) the blasting works need to be announced in advance to: Ministry of Internal Affairs of the HNC, police stations in Neum and/or Stolac, and local population (one day in advance and at the day of the blasting works via local media, especially local radio stations) • The contractor is obliged to undertake all the necessary safety measures in line with the local legislation and shall be liable for non-performance to the investor and competent inspection authorities: (i) provide appropriate personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE, (ii) OHS training • The Contractor shall at all times maintain the health and safety of its personnel, in collaboration with local health authorities • The Contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the site and at any accommodation for Contractor's and PE FBiH Roads's personnel as well as ensure that all suitable arrangements are made in line with necessary welfare and hygiene requirements enabling prevention of epidemics • The Contractor shall appoint an accident prevention officer at the site, responsible for maintaining safety and protection against accidents • The Contractor shall throughout the contract (including the DNP) conduct Information, Education and Communication (IEC) campaigns on the workers' code of conduct vis-a-vis the local community, at least every second month, addressed to all the Site staff and laborers (including all the Contractor's employees, all Subcontractors and any other Contractor's or Employer's personnel, and all truck drivers and crew making deliveries to Site for construction activities)					

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		• The Contractor shall conduct an HIV-AIDS awareness programme via an approved service provider, and shall undertake such other measures to reduce the risk of the transfer of the HIV virus between and among the Contractor's Personnel and the local community, to promote early diagnosis and to assist affected individuals. • The Contractor shall throughout the contract (including the Defects NotificationPeriod): • (i) conduct Information, Education and Communication (IEC) campaigns on the workers' code of conduct vis-a-vis the local community, at least every other month, addressed to all the Site staff and labour (including all the Contractor's employees, all Subcontractors and any other Contractor's or Employer's personnel, and all truck drivers and crew making deliveries to Site for construction activities) • (ii) provide male or female condoms for all Site staff and labour as appropriate; and • (iii) provide education/awareness raising activities in form of online presentation and brochure for STI and HIV/AIDS on screening, diagnosis, counseling and referral to a dedicated national STI and HIV/AIDS programme, (unless otherwise agreed) of all Site staff and labour.[109] • The Contractor will adopt, communicate to all employees and implement an effective grievance mechanism for workers to raise workplace concerns. The mechanism should also allow for confidential complaints to be raised and addressed. The mechanism will not impede access to other judicial or administrative remedies that might be available under law or through existing arbitration or mediation procedures, nor substitute for grievance mechanisms provided through workers unions or collective agreements. The grievance mechanism will be based on a formalised procedure for dealing with workers' grievances, and will include, as a minimum, a					

[109] All proposed mitigation measures shall be incorporated in the OHSMP during the development of the OHSMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		responsible person/unit for organizing the resolution of grievances and for keeping a database of grievances, a timeframe for acknowledging the receipt of grievances and resolving the grievances, and arrangements for maintaining confidentiality, reviewing and resolving grievances.					
Construction	Community health and safety risk	• Provide information (at least weekly) to the public about the scope and schedule of construction activities and expected disruptions and access restrictions. Report these acitivities in mouthly progress report to PE FBiH Roads. • Prepare an emergency response plan in case of emergency transportation to allow transport without delay to the intended destination • The contractor shall immediate local communities, concerning the risks, dangers and impact, and appropriate avoidance behaviour with respect to, of Sexually Transmitted Diseases (STD) - or Sexually Transmitted Infections (STI) in general and HIV/AIDS in particular	In the framework of construction works (to be included in the contract with Contractor)	-	Contractor	Supervisory body/Inspection	n/a
Construction	Local transport system	• Develop and implement the Traffic Safety Management Plan in frame of the Construction Environmental Management Plan (CEMP)[110]	In the framework of construction works (to be included in the contract with Contractor)	-	PE FBiH Roads	PE FBiH Roads	n/a
Construction	Transportation of children to school and back to their homes	• The transportation of construction material should be aligned to the school timeline i.e. avoid the time when children go to school or returning from school to transport materials • Provide timely information of work sequencing • Develop and implement Traffic Safety Management Plan in conjunction with road authorities to manage all temporary accesses, delivery of material and machinery • Provide information to the public about the scope and	In the framework of construction works (to be included in the contract with Contractor)	-	Contractor Schools	Supervisory body/Inspection	n/a

[110] Proposed mitigation measure shall be incorporated in the CEMP during the development of the CEMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		schedule of construction activities and expected disruptions and access restrictions					
Construction	Physical damage to structures and objects	• Contractor should bear the cost of repairs and compensation of any damages to any physical and legal entities • Continue raising awareness about the established grievance mechanism	10,000	-	Contractor	PE FBiH Roads	n/a
Construction	Local economy /income level/poverty	• Contractors should be encouraged to source local crops, meat and fish locally produced to feed themselves and their staff, use local services such as food preparation, cleaning facilities and laundry • The contractor should liaison with local suppliers to identify and quantify their potential and increase of capacity balanced with his demands. Activities required from contractor include, but not limited to publishing types of goods and services (food, beverage, cleaning services, repair shop services, etc) which contractor will procure in local media • Advertise job opportunities related to the construction works well in advance • Contractors should be encouraged to procure locally equipment and vehicles, goods services and similar that will be required during construction phase	In the framework of construction works (to be included in the contract with Contractor)	-	Contractor	PE FBiH Roads	n/a
Construction	Employment	• Develop guidelines for recruitment of construction site personnel will be in place to promote transparency of the recruitment process • Equal opportunities and non-discrimination will be guaranteed in the recruiting process • There will be no distinction, exclusion or preference in the recruitment made on the basis of "race, color, gender, religion, political opinion, marital status, national extraction or social origin, disability, age, sexual orientation, and/or HIV status" • Selection criteria will include minimum age and skills requirements • All contractors will be required to implement the hiring guidelines • All job vacancies will be listed clearly with skills and experience required to fill the position, as well as the duration of the employment contract • Clear information on the recruiting process and the	-	-	PE FBiH Roads	PE FBiH Roads	n/a

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		selection criteria will be publically available and easy to access to promote transparency of the process • Prior to civil works, the PE FBiH Roads shall release an announcement to indicate commencement of the Project indicating what vocations and skills shall most likely be required during construction and backstopping activities and encourage vocational training					
Construction	Access to agricultural plots (farms / fields, pastures and meadows (including honey bee hives)	• Farmers and cattlemen should be allowed to pass with their mechanization and livestock to their farms twice a day, when they go to their farms/pastures and return back to home • Cattleman to be encouraged to go on pastures as far as possible from the construction site • Contractor is obligated to sprinkle water on construction site to limit dust expansion on surrounding agriculture land	In the framework of construction works (to be included in the contract with Contractor)	-	Contractor	Supervisory body	n/a
Construction	Tourism	• Tourist agencies that offer arrangements to Neum should be noticed about traffic disruptions in order to avoid their customers' inconveniences during their vacations	In the framework of construction works (to be included in the contract with Contractor)	-	Contractor	Supervisory body	n/a
Construction	Cultural heritage	• Best practice and any further mitigation identified as part of the further survey will be included in the CEMP. In addition, a chance finds procedure will be developed and included within the CEMP • Mandatory suspension of all works and informing the competent authority for the protection of cultural heritage/monuments in case of discovery of cultural / archaeological findings • The Contractor is required to inform the competent authority for cultural heritage in case that construction works might have influence on any of 13 tumuli that are recorded to be in direct area of influence or any other new discover assets • The Contractor is required to develop and implement a physical cultural resources management plan, as provided in World Bank's OP 4.11. The objective of the plan is to prevent any inadvertent loss of physical and cultural resources during project construction and	20,000	-	Contractor	Supervisory body	n/a

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		operation. The contractor is required to incorporate in the Plan the Expert Opinions and archeological research that are proposed to be relied on. The plan must be in place before the beginning of construction works. • Periodic monitoring of facilities in the area of influence is required in order to determine possible physical damage to the structures. This monitoring will be in the line to the work dynamic[111]					
Operation	Possible road safety issues due to increased number of vehicles and increased vehicle speed on the new road	• Install road safety measures / signage (the road is to be equipped with appropriate horizontal and vertical signalization, which includes necessary prohibitions and notifications, such as speed limits, curve ahead)	-	-	Contractor	PE FBiH Roads	n/a
Operation	Access to agricultural plots (farms / fields, pastures and meadows (including honey bee hives)	• Minimize the possibility that the newly built main road disable approach/access of farmers / pastors (and their machines and livestock) to their agricultural parcels (farms / fields, pastures and meadows (including honey bee hives)) • In case that newly built main road disable approach/access of farmers/pastors (and their machines and livestock) to their agricultural parcels or prolongs the time /way to approach the same (double the mileage or time interval) it is neccesary to provide compensations for these farmers/pastors.	-	-	Contractor	PE FBiH Roads	n/a
Operation	Migration and population change	• Municipalities should promote all positive aspects of new main road by presentation of improved access to public services and the coast for the revitalization of this area on a long term basis	-	-	Municipalities of Neum and Stolac		n/a
Operation	Demographics/local economy and living standards	• Municipalities should develop different policies that including measures on improving and promoting transport accessibility, supporting entrepreneurship (especially SMEs), stronger local job creation, gender equality improvement, poverty reduction, immigration encouragement, youth, adult and elderly skills development along the route of the new main roads	-	-	Municipalities of Neum and Stolac		n/a

[111] All proposed mitigation measures shall be incorporated in the CEMP during the development of the CEMP

Phase	Issue/Impact	Mitigation Measure	Estimated Cost (US$)		Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Operate	Install	Operate	
		(Project area)					
Operation	Health services	• Publicly announce completion of construction and reduced time for travel to larger medical centers in BiH especially those in Mostar and Sarajevo	-	-	PE FBiH Roads	PE FBiH Roads	n/a
Operation	Schools	• Publicly announce completion of construction and reduced time for travel. This would promote the option of choosing larger number of different schools to attend (especially secondary school students)	-	-	PE FBiH Roads	PE FBiH Roads	n/a
Decommissioning	Disrupted traffic and traffic congestion	• Implement Traffic Safety Management Plan and its measures developed in the frame of the CEMP	-	--	PE FBiH Roads	PE FBiH Roads	n/a
Decommissioning	Increased dust concentration (OHS and Community safety)	• Contractor is required to implement all OHS measures foreseen by OHSMP in frame of the Construction Site Organization Plan (CSOP) that will be developed for the Project • Provide information (at least weekly) to the public about the scope and schedule of construction activities and expected disruptions and access restrictions • Prepare an emergency response plan in case of emergency transportation to allow transport without delay to the intended destination • Maintenance all mitigation measures proposed in the CEMP			Contractor	Supervisory body	n/a
Decommissioning	Physical damages to existing cultural assets	• The Contractor is obligated to inform the supervisory body for cultural heritage in case that works might have influence on any of 13 tumuli that are recorded to be in direct area of influence or those that might be discovered • Periodic monitoring of objects in the indirect area of influence is required in order to determine possible physical damage to the structures. This monitoring will be in the line to the work dynamic	20,000	-	Contractor	Supervisory body	n/a
Decommissioning	Physical damages to structures and objects	• Contractor should bear the cost of repairs and compensation of any damages that could be applied to other physical and legal entities	10,000	-	Contractor	PE FBiH Roads	n/a

LEGEND:

	Negative impact
	Positive impact
	Mitigation measures given in this SS ESMP shall be incorporated in the CEMP during the development of the CEMP
	Mitigation measures given in this SS ESMP shall be incorporated in the OHSMP during the development of the OHSMP

3.2 Environmental and Social Monitoring Plan

Monitoring during Project implementation provides information on the key environmental and social aspects of the project, particularly on the environmental and social aspects of the project and effectiveness of the mitigation measures. Such information enables the borrower and the Bank to evaluate the success of mitigation as part of project supervision, and allows corrective action to be taken when needed. Therefore, the SS ESMP identifies monitoring objectives and specifies the type of monitoring, with linkages to the impacts assessed in the ESIA report and the mitigation measures described in the SS ESMP.

The main components of the monitoring plan include:

- parameters that will be monitored
- location of monitoring of parameters with focus on specific chainage
- in what way the monitoring will be performed
- when will the monitoring be performed
- rationale of the monitoring to be performed
- cost of the monitoring activities
- responsibility to perform monitoring.

The Contractors are required to develop Environmental Monitoring Plans in accordance with the requirements of the table below and this SS ESMP, which will, incorporate the monitoring requirements, described below, but shall not be limited to these requirements. Monitoring of the water quality, soil quality, air quality and measurement of noise levels will be conducted based on provisions of the Environmental Permit (analysis of 5 samples of water resources, analysis of 32 soil samples, especially near the agricultural areas, analysis of air quality at 10 locations near the settlements and measurement of noise levels at 10 locations near the settlements).

PE FBiH Roads will be responsible for reviewing the Environmental Monitoring Plans prepared by the Contractors and for ensuring that the monitoring programmes provided are consistent with this document.

A field-monitoring checklist will be prepared based on this SS ESMP. The field-monitoring checklist will be used by the PE FBiH Roads's Supervising Engineers (monitoring of implementation of the measures proposed by the SS ESMP the PE FBiH Roads contracts with the Supervising Engineer). The signed checklists will be provided to the Company that will be responsible for the follow-up and compliance reporting.

3.2.1 Site Specific Environmental Monitoring Plan

Table 25: *Site Specific Environmental Monitoring Plan for Road Section Neum-Stolac*

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
BASELINE/INITIAL STATE[112]								
Water (surface and groundwater) quality: • Chemical analysis (Temperature, pH, Smell, Colour, Fuzziness, Dissolved oxygen, Conductivity, Permangate index, Ammonia, Nitrates – NO_3, Total nitrogen –N, Total phosphorus- P, Chloride) • Microbiological analysis (Total coliforms, Fecal coliforms *(Escherichia coli,* Fecal streptococcus *(Enterococcus faecalis))*	Water source Blace[113], two locations at Hutovo Blato Nature Park and two occasional standing waters (precise locations with coordinates are given in Figure 10) Total of 5 sampling locations	Sampling and laboratory testing at least once a year. Given the fact the whole area envisaged by the Project is karstic and water impermeable substrate, the sampling and analysis of the quality of water resources should be conducted during the period of the year with more rainfall, such as early spring, late fall and winter Methods and laboratory standards are defined in Chapter 4.3. Development of reports of monitoring results	Monitoring of baseline parameters for water quality is already conducted as part of this assignment. For results of monitoring please refer to Chapter 4.3	Defined zero state prior to the beginning of construction of the road in order monitor any possible changes and adverse impacts that might appear during construction, operation and decommissioning of the road.	-	100 $ for one sample x 5 samples = 500 $ for chemical analysis 70 $ for one sample x 5 samples = 350 $ for microbiological analysis	Consultant engaged for development of SS ESMP Authorized laboratory	PE FBiH Roads
Air quality:	Along road route near settlements	Sampling and laboratory testing at least once a	Monitoring of baseline parameters for air quality is already	Same as above	-	400 $ for one sample x 10 locations = 4,000	Consultant engaged for development	PE FBiH Roads

[112] Monitoring of baseline parameters for soil quality, water quality, air quality and measurement of noise levels are already conducted as part of this assignment. For results of monitoring please refer to Chapter 4
[113] The first water protection zone, which corresponds to the Water Source Blace, is completely inaccessible except for employees of the water management company, PE Komunalno Neum Ltd. Neum and for employees of the laboratory that conducts regular analysis of water quality in accordance with *Rulebook on Drinking Water Health Safety* (Official Gazzette of FBIH, No. 40/10), respectively employees of the Institute for Public Health of FBiH, Mostar. The Consultant took the sample for analysis of water quality on the site closest to the water source Blace and its first water protection zone at pond which is hydrologically connected with water source Blace

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
• Air quality parameters (SO_2, NO_2, black smoke index), analysis of total sediment matter (TSM) and analysis of the concentration of lead (Pb) in TSM[114] • Meteorological conditions in the moment of air quality testing (wind direction, pressure, temperature, humidity)	(precise locations with coordinates are given in Table 7) Total of 10 sampling locations	year. Methods and laboratory standards are defined in Chapter 4.2 Development of reports of monitoring results	conducted as part of this assignment. For results of monitoring please refer to Chapter 4.2			$ for air quality analysis	of SS ESMP Authorized laboratory	
Soil quality: • pH value • Heavy metals (cadmium, lead)	Along road route (right or left side of the road), especially near settlements and agricultural land (precise locations with coordinates are given in Table 30) Total of 32 sampling locations	Sampling and laboratory testing at least once a year. Methods and laboratory standards are defined in Chapter 4.1 Development of reports of monitoring results	Monitoring of baseline parameters for soil quality is already conducted as part of this assignment. For results of monitoring please refer to Chapter 4.1	Same as above	-	60 $ for one sample x 32 locations = 1,000 $ for air soil quality analysis	Consultant engaged for development of SS ESMP Authorized laboratory	PE FBiH Roads
Noise levels: • L_{rezid} – measured levels of residual noise • L_{eq} – measured equivalent noise level • L1%-noise that is	Along road route near the settlements (precise locations with coordinates are given in Table	Measurement at least once a year. Methods and analysers are defined in Chapter 4.4	Monitoring of baseline parameters for noise levels near settlements is already conducted as part of this assignment. For results of	Same as above	-	70 $ for one sample x 10 locations = 700 $ for measurement of noise levels	Consultant engaged for development of SS ESMP Authorized	PE FBiH Roads

[114] PM10, PM2.5 and O_3 were not analized for baseline/initial state

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
exceeded 1% of time)	64) Total of 10 measurement locations	Development of reports of monitoring results	monitoring please refer to Chapter 4.4				laboratory	
Survey of the site for any endemic or endangered species	In the zone of corridors of direct and indirect impacts (refer to Table 66, Table 67 and Table 68)	Field recording and incorporation of the findings in the SS ESMP	Monitoring of the site for any endemic or endangered species is already conducted as part as part of this assignment (refer to Table 66, Table 67 and Table 68)	Same as above	-	1,500 $	Consultant engaged for development of SS ESMP	PE FBiH Roads
Forest and forest land: frequency and type of forest systems, character of forest communities and their commercial categories, zones of sensitivity to harmful impacts from mechanical damage and damage caused by contamination	In the zone of corridors of direct and indirect impacts (refer to Table 69)	Field recording and incorporation of the findings in the SS ESMP	Monitoring of the site for forest and forest land (frequency and type of forest systems, character of forest communities and their commercial categories, zones of sensitivity to harmful impacts) is already conducted as part as part of this assignment (refer to Table 69)	Same as above	-	1,500 $	Consultant engaged for development of SS ESMP	PE FBiH Roads
Migration routes of large and small wild game	In the zone of corridors of direct and indirect impacts (refer to Chapter 2.5.2.4)	Field recording and incorporation of the findings in the SS ESMP	Monitoring of the site Migration routes of large and small wild game is already conducted as part as part of this assignment. (refer to Chapter 2.5.2.4)	Same as above	-	1,500 $	Consultant engaged for development of SS ESMP	PE FBiH Roads
CONSTRUCTION PHASE								

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
Inadequate organization of construction site which may reflect to disruption of natural environment outside of the area envisaged by the Project	At construction site	Recording during regular daily reports of Head of the Construction Site	Every day during the construction activities	To prevent disruption of natural environment outside of the area envisaged by the Project	-	-	The Contractor for construction activities	PE FBiH Roads
Implementation of all suggested mitigation measures for construction phase regarding the environmental protection	At construction site (locations specified in Table 23)	Recording during regular daily reports of Head of the Construction Site	Every day during the construction activities	In order to be fulfil the obligations from SS ESMP and to prevent disruption of natural environment to the greatest extent possible	-	-	The Contractor for construction activities	PE FBiH Roads
Water (surface and groundwater) quality: • Chemical analysis (Temperature, pH, Smell, Colour, Fuzziness, Dissolved oxygen, Conductivity, Permangate index, Ammonia, Nitrates – NO_3, Total nitrogen –N, Total phosphorus- P, Chloride, Total Suspended Solids and Oil and Grease) • Microbiological analysis (Total coliforms, Fecal coliforms *(Escherichia coli,* Fecal streptococcus *(Enterococcus faecalis))*	Water source Blace, two locations at Hutovo Blato Nature Park and two occasional standing waters (precise locations with coordinates are given in Figure 10 Total of 5 sampling locations	Sampling and laboratory testing at least once a year. Given the fact the whole area envisaged by the Project is karstic and water impermeable substrate, the sampling and analysis of the quality of water resources should be conducted during the period of the year with more rainfall, such as early spring, late fall and winter Methods and laboratory standards are defined in Chapter 4.3 Development of reports of monitoring results	Monitoring of water quality should be conducted during construction works	In order to track any possible changes of water quality parameters and adverse impacts that might appear during construction of the road	100 $ for one sample x 5 samples = 500 $ for chemical analysis 70 $ for one sample x 5 samples = 350 $ for microbiological analysis	-	Authorized laboratory	PE FBiH Roads
Air quality: • Air quality parameters (SO_2, NO_2, black smoke	Along road route near settlements (precise locations	Sampling and laboratory testing at least four times in a year.	Monitoring of air quality should be conducted during construction works	In order to track any possible changes of air quality parameters and	400 $ for one sample x 10 locations = 4,000 $ for air quality	-	Authorized laboratory	PE FBiH Roads

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
index), analysis of total sediment matter (TSM), PM10 and PM2.5, O_3 and analysis of the concentration of lead (Pb) in TSM • Meteorological conditions in the moment of air quality testing (wind direction, pressure, temperature, humidity)	with coordinates are given in Table 7) Total of 10 sampling locations	Methods and laboratory standards are defined in Chapter 4.2 Development of reports of monitoring results		adverse impacts that might appear during construction of the road	analysis in one course of the measurement			
Soil quality: • pH value • Heavy metals (cadmium, lead)	Along road route (right or left side of the road), especially near settlements and agricultural land (precise locations with coordinates are given in Table 30) Total of 32 sampling locations	Sampling and laboratory testing at least once a year. Methods and laboratory standards are defined in Chapter 4.1 Development of reports of monitoring results	Monitoring of soil quality should be conducted during construction works	In order to track any possible changes of soil quality and adverse impacts that might appear during construction of the road	60 $ for one sample x 32 locations = 1,000 $ for air soil quality analysis	-	Authorized laboratory	PE FBiH Roads
Noise levels: • L_{rezid} – measured levels of residual noise • L_{eq} – measured equivalent noise level • L1%-noise that is exceeded 1% of time)	Along road route near the settlements (precise locations with coordinates are given in Table 64) Total of 10 measurement	Measurement at once a year and upon complaints. Methods and analyzers are defined in Chapter 4.4 Development of reports of monitoring results	Measurement of noise levels should be conducted during construction works	In order to track any possible disturbance from the increased noise during construction of the road	70 $ for one sample x 10 locations = 700 $ for measurement of noise levels in one course of the measurement	-	Authorized laboratory	PE FBiH Roads

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
	locations							
OPERATIONAL PHASE								
Implementation of all suggested mitigation measures for operation phase regarding the environmental protection	At locations specified in Table 23	Recording during regular reports for maintenance of the road	Every day during the construction activities	In order to be fulfill the obligations from SS ESMP and to prevent disruption of natural environment to the greatest extent possible	-	-	The Contractor for maintenance of the road	PE FBiH Roads
Water (surface and groundwater) quality: • Chemical analysis (Temperature, pH, Smell, Colour, Fuzziness, Dissolved oxygen, Conductivity, Permangate index, Ammonia, Nitrates – NO_3, Total nitrogen –N, Total phosphorus- P, Chloride, Total Suspended Solids and Oil and Grease) • Microbiological analysis (Total coliforms, Fecal coliforms *(Escherichia coli,* Fecal streptococcus *(Enterococcus faecalis))*	Water source Blace, two locations at Hutovo Blato Nature Park and two occasional standing waters (precise locations with coordinates are given in Figure 10 Total of 5 sampling locations	Sampling and laboratory testing at least once a year. Given the fact the whole area envisaged by the Project is karstic and water impermeable substrate, the sampling and analysis of the quality of water resources should be conducted during the period of the year with more rainfall, such as early spring, late fall and winter If the monitoring shows that the tested parameters are below permissible values, sampling and testing should be conducted once in three years Methods and laboratory standards are defined in Chapter 4.3. or even better methods and laboratory standards should be used	Monitoring of water quality should be conducted during operation phase of the road (e.g. next 70 years)	In order to track any possible changes of water quality parameters and adverse impacts that might appear during operation phase of the road	100 $ for one sample x 5 samples = 500 $ for chemical analysis 70 $ for one sample x 5 samples = 350 $ for microbiological analysis	-	Authorized laboratory	PE FBiH Roads

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
		Development of reports of monitoring results						
Contaminated stormwater discharged to surface waters: • Flow, Temperature, pH, Dissolved oxygen, COD, BOD_5, Suspended mater after 0,5 h settlement, Total suspended matter, Colour, Conductivity, Ammonia (NH_4-N), Total phosphorus (P), Toxicological bio-experiment Daphnia magna Straus, 48hEC50 (% of diluted wastewater), Mineral oils	Oil separator - exit pipe of the oil separator	Sampling and laboratory testing at least once a year after heavy rainfall Development of reports of monitoring results	During operation phase	In order to track the quality of effluent and oil separator efficiency	50$ for one sample x 90 locations = 4,500 $ for effluent quality analysis in one year	-	Authorized laboratory	PE FBiH Roads
Air quality: • Air quality parameters (SO_2, NO_2, black smoke index), analysis of total sediment matter (TSM), PM10 and PM2.5, O_3 and analysis of the concentration of lead (Pb) in TSM • Meteorological conditions in the moment of air quality testing (wind direction, pressure, temperature, humidity)	Along road route near settlements (precise locations with coordinates are given in Table 7) Total of 10 sampling locations	Sampling and laboratory testing at least once a year Methods and laboratory standards are defined in Chapter 4.2 or even better methods and laboratory standards should be used If the monitoring shows that the tested parameters are below permissible values, sampling and testing should be conducted once in three years Development of reports of	Monitoring of air quality should be conducted during operation phase of the road (e.g. next 70 years)	In order to track any possible changes of air quality parameters and adverse impacts that might appear during operation phase of the road	400 $ for one sample x 10 locations = 4,000 $ for air quality analysis in one course of the measurement	-	Authorized laboratory	PE FBiH Roads

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
		monitoring results						
Soil quality: • pH value • Heavy metals (cadmium, lead)	Along road route (right or left side of the road), especially near settlements and agricultural land (precise locations with coordinates are given in Table 30) Total of 32 sampling locations	Sampling and laboratory testing at least once a year. Methods and laboratory standards are defined in Chapter 4.1 or even better methods and laboratory standards should be used If the monitoring shows that the tested parameters are below permissible values, sampling and testing should be conducted once in three years Development of reports of monitoring results	Monitoring of soil quality should be conducted during operation phase of the road (e.g. next 70 years)	In order to track any possible changes of soil quality and adverse impacts that might appear during operation phase of the road	60 $ for one sample x 32 locations = 1,000 $ for air soil quality analysis	-	Authorized laboratory	PE FBiH Roads
Noise levels: • L_{rezid} – measured levels of residual noise • L_{eq} – measured equivalent noise level • L1%-noise that is exceeded 1% of time)	Along road route near the settlements (precise locations with coordinates are given in Table 64) Total of 10 measurement locations	Measurement at least once a year Methods and analyzers are defined in Chapter 4.4 or even better methods and laboratory standards should be used If the monitoring shows that the tested parameters are below permissible values, sampling and testing should be conducted once in three	Measurement of noise levels should be conducted during operation phase of the road (e.g. next 70 years)	In order to track any possible disturbance from the increased noise that might appear during operation phase of the road	70 $ for one sample x 10 locations = 700 $ for measurement of noise levels in one course of the measurement	-	Authorized laboratory	PE FBiH Roads

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
		years Development of reports of monitoring results						
DECOMMISSIONING PHASE								
Implementation of all suggested mitigation measures for decommissioning phase regarding the environmental protection as defined in Table 23	At demolition site (locations specified in Table 23)	Recording during regular daily reports of Head of the Demolition Site	Every day during demolition activities	In order to fulfil the obligations from SS ESMP and to prevent disruption of natural environment to the greatest extent possible	-	-	The Contractor for demolition activities	PE FBiH Roads
Water (surface and groundwater) quality: • Chemical analysis (Temperature, pH, Smell, Colour, Fuzziness, Dissolved oxygen, Conductivity, Permanganate index, Ammonia, Nitrates – NO_3, Total nitrogen –N, Total phosphorus- P, Chloride) • Microbiological analysis (Total coliforms, Fecal coliforms *(Escherichia coli,* Fecal streptococcus *(Enterococcus faecalis))*	Water source Blace, two locations at Hutovo Blato Nature Park and two occasional standing waters (precise locations with coordinates are given in Figure 10 Total of 5 sampling locations	Sampling and laboratory testing once during demolition activities. Given the fact the whole area envisaged by the Project is karstic and water impermeable substrate, the sampling and analysis of the quality of water resources should be conducted during the period of the year with more rainfall, such as early spring, late fall and winter Methods and laboratory standards are defined in Chapter 4.3 or even better methods and laboratory standards should be used Development of reports of monitoring results	Monitoring of water quality should be conducted during demolition activities	In order to track any possible changes of water quality parameters and adverse impacts that might appear during demolition of the road	100 $ for one sample x 5 samples = 500 $ for chemical analysis 70 $ for one sample x 5 samples = 350 $ for microbiological analysis	-	Authorized laboratory	PE FBiH Roads
Air quality:	Along road route near settlements	Sampling and laboratory testing once during	Monitoring of air quality should be	In order to track any possible changes of air	400 $ for one sample x 10	-	Authorized laboratory	PE FBiH Roads

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
• Air quality parameters (SO_2, NO_2, black smoke index), analysis of total sediment matter (TSM), PM10 and PM2.5, O_3 and analysis of the concentration of lead (Pb) in TSM • Meteorological conditions in the moment of air quality testing (wind direction, pressure, temperature, humidity)	(precise locations with coordinates are given in Table 7) Total of 10 sampling locations	demolition activities Methods and laboratory standards are defined in Chapter 4.2 or even better methods and laboratory standards should be used Development of reports of monitoring results	conducted during demolition activities	quality parameters and adverse impacts that might appear during demolition of the road	locations = 4,000 $ for air quality analysis in one course of the measurement			
Soil quality: • pH value • Heavy metals (cadmium, lead)	Along road route (right or left side of the road), especially near settlements and agricultural land (precise locations with coordinates are given in Table 30) Total of 32 sampling locations	Sampling and laboratory testing once a year during demolition activities. Methods and laboratory standards are defined in Chapter 4.1 or even better methods and laboratory standards should be used Development of reports of monitoring results	Monitoring of soil quality should be conducted during demolition activities	In order to track any possible changes of soil quality and adverse impacts that might appear during demolition of the road	60 $ for one sample x 32 locations = 1,000 $ for air soil quality analysis	-	Authorized laboratory	PE FBiH Roads
Noise levels: • L_{rezid} – measured levels of residual noise • L_{eq} – measured equivalent noise level • L1%-noise that is exceeded 1% of time)	Along road route near the settlements (precise locations with coordinates are given in Table 64) Total of 10	Measurement once a year during demolition activities. Methods and analyzers are defined in Chapter 4.4 or even better methods and laboratory standards should be used	Measurement of noise levels should be conducted during demolition activities	In order to track any possible disturbance from the increased noise during demolition of the road	70 $ for one sample x 10 locations = 700 $ for measurement of noise levels in one course of the measurement	-	Authorized laboratory	PE FBiH Roads

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Install	Operate	Install	Operate
	measurement locations	Development of reports of monitoring results						

3.2.2 Site Specific Social Monitoring Plan

Table 26: *Site Specific Social Monitoring Plan for Road Section Neum-Stolac*

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
CONSTRUCTION PHASE								
• Number of grievances submitted and % of grievance and comments addressed within the announced time-	Central Feedback Desk (CFD), Beneficiary Feedback Commission (BFC)	CFD Log	Monthly	Monitoring construction impacts on local community, identified/addressed adverse effects and PAPs satisfaction with the grievance mechanism	-	-	PE FBiH Roads The Beneficiary Feedback Commission as a grievance mechanism in the affected municipalites of Neum and Stolac	The Company

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
frame								
• Number of jobs created for men and women during project planning and construction • Duration of employment (number of man-months)	Contractor employment report Municipalities Economics Department	Data collected by contractors and municipalities	Quarterly	Monitoring project influence on local economy	-	-	PE FBiH Roads	Municipalities and Contractor
• Lost time injury frequency rate	At site	Constant measuring, calculated as: Number of lost time accidents x 1,000,000 hours / total man-hours worked = injuries per million hours worked	Daily	OHS: Lost workdays are the number of workdays (consecutive or not) beyond the date of injury or onset of illness that the employee was away from work or limited to restricted work activity because of an occupational injury or illness.	-	-	Contractor	Contractor
• Number of chance	At site of chance finds	Data collected by contractors Survey results of	Quarterly	Protection of the cultural heritage			Contractor	Contractor

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
finds • Number of notifications to the competent authority for the protection of the cultural heritage		competent authority for the protection of the cultural heritage						
• State of cultural heritage	At locations/chainages provided in Table 20 and any other locations according to the results of preliminary archaeological researches	Field verification Three times during construction works at specific location	In line with the work dynamic. At the beginning, in the middle and in the end of construction works at specific location (implies plus / minus 5 km of the specific chainage)	Protection of the cultural heritage.	10,000	-	Contractor	Contractor
OPERATIONAL PHASE								
• Number of traffic accidents per annual average daily traffic	At PE FBiH Road offices	Annual bulletin of the Ministry of the Interior on traffic accidents on the roads in BiH	Annually during operation phase	The new main road shall improve safety	-	-	PE FBiH Roads	PE FBiH Roads

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
(AADT) • The number of killed in accidents per AADT • The number of severely injured per AADT • The number of slightly injured per AADT								
• The price of fuels at gas stations in Neum and comparable gas stations in the	At Neum gas stations	Field verification	Once within two years after commissioning	Currently the prices of fuel are higher in Neum than in the rest of the FBiH. Energy sources equalization with rest of the country	-	-	PE FBiH Roads	PE FBiH Roads

Which parameter is to be monitored?	Where will the monitoring be performed?	How will the monitoring be performed – frequency or constant measuring?	When will the monitoring be performed?	Why will the monitoring be performed?	Cost assessment (US$)		Responsibility	
					Implementation	Operative	Implementation	Operative
region								
• Travel time	From beginning to the end of the new main road compared with the old road (from Stari Neum to Drenovac)	Field verification	Once after all construction works are finished	Time travel in general shall be decreased and accessibility to targeted destinations (jobs, services, social infrastructure) shall be improved.	50	-	PE FBiH Roads	PE FBiH Roads

3.3 Cost for Implementation of the SS ESMP

Table 27 provides the indicative cost for implementation of the SS ESMP.

Table 27: *Costs for implementation of the SS ESMP*

	Heading	Cost Estimate in US$
1.	Environmental Mitigation Measures	(Environmental Mitigation Measures are part of the Main Designs and are included in the bid price (e.g. 5,000), except for monitoring of air quality, water quality, soil quality and noise levels)
1.	Social Mitigation Measures	1,193,106,38
2.	Environmental Monitoring Programme	34,500
3.	Social Monitoring Programme	10,050
4.	Capacity Building and Training	5.000
5.	Environmental Sub Total	44,500
6.	Social Sub Total	1,203,156.38
7.	Contingency (5 % of the Sub Total (6+7))	62,382.82
	Total (6+7+8)	**1,310,039.20**

3.4 Implementation and Reporting

3.4.1 Organizational Commitment

The Company PE FBiH Roads is the implementing agency for the Project and will be responsible for the implementation of and compliance with this ESMP. Day-to-day implementation and compliance will be the task of the Company PE FBiH Roads. Implementation of all identified environmental and social mitigation (E&S) measures and monitoring activities should be ensured. The Contractors will be responsible for the implementation of E&S mitigation measures during construction and shall employ an environmental specialist who will supervise the implementation of the Contractors' E&S responsibilities and coordinate with the PE FBiH Roads and the Federal Ministry of Physical Planning (FMoPP). The PIU has set-up a grievance commission to address any complaints during Project implementation. During Project implementation, the PE FBiH Roads shall monitor the compliance of the Contractor with the ESMP provisions.

Upon Project completion, the PE FBiH Roads will be in charge of the operation and maintenance of the Project. Monitoring will be undertaken as scheduled in the monitoring plan.

3.4.2 Contractual Conditions

The ESMP will be an integral part of the procurement documentation according to the *World Bank procurement guidelines* and the Contract for Execution of Works. It is the Contractor's obligation to cost the implementation of E&S mitigation measures in its overall cost. The Contractor will be required to provide a short statement that confirms that:

- the ESMP conditions have been estimated and included into the bid price
- the Contractor has a qualified and experienced person on its team who will be responsible for the environmental and social compliance requirements of the ESMP
- the Contractor will comply with applicable BiH and FBiH laws, EU standards and WB requirements.

The following contractual conditions will apply to Contractors to be engaged by the PE FBiH Roads:

- failure to provide a formal commitment to comply with the requirements of this ESMP within the submitted bid will render the bidder ineligible to be commissioned for the contract
- the Contractor will be required to prepare a site-specific CSOP in accordance with the requirements of local legislation and this ESMP. All CSOPs will be formally reviewed by the PE FBiH Roads prior to agreement and sign-off. All plans must be agreed and signed-off by the PE FBiH Roads within a 3 month period of signing the compliance form
- the Contractor will provide formal written reports to the PE FBiH Roads in accordance with requirements set out in the *Environmental and Social Monitoring Plan* which is a part of this document
- the PE FBiH Roads is responsible to instruct all contractors, subcontractors and personnel working on the Project on the contents of this ESMP and any penalties arising from non-compliance
- the Contractor is responsible for notifying the PE FBiH Roads of any complaints or grievances received and of any corrective actions identified and implemented
- the Contractor will develop the CSOP in accordance with the provisions of local legislation and WB requirements with regards to labor and worker accommodation.

The Contractor will be required to provide regular reports on its management and monitoring of the working conditions of direct and indirect employees on the work site and ensure that systems are in place to monitor compliance with labor and health and safety standards.

As a minimum, the Contractor shall:

- ensure that all workers are required to comply with all local legislation on labor and health and safety and World Bank EHS standards including the reporting requirements therein
- exchange information and request any plans from subcontractors which deals with significant health and safety hazards and risks created by or associated with their work activities, and
- maintain regular effective two-way communication with all workers, sharing information and assisting in dealing with any unforeseen problems promptly.

The recommendations and proposed mitigation measures will be attached to the public procurement documentation and subsequently the contract with the Contractor. The ESMP is a part of the work program and as such it must be addressed by the Contractor and carried out as required.

3.4.3 Capacity Building, Development and Training

The PE FBiH Roads and the Contractors are required to comply with the requirements laid down by the *Law on Safety at Work*[115] and the *Law on the Protection against Fires and Protection of Fire-fighters*[116], which stipulate that trainings on health and safety at work and on fire protection are mandatory both for the PE FBiH Roads employees of the PE FBiH Roads and Contractor's employees. Through such training, workers need to be introduced to the relevant risks and hazards on construction sites.

Article 17 of the PE FBiH Roads internal *Regulation on Health and Safety at Work*[117] requires employees to undergo obligatory training related to safety at work. According to Article 18 of the aforementioned Regulation, the training program needs to cover the following topics:

- basics of safety at work

[115] Official Gazette of SR BiH, No. 22/90
[116] Official Gazette of FBiH, No. 64/09
[117] PE Roads of FBiH, August 2010

- rights, duties and responsibilities of employees related to safety at work
- dangers that threaten the safety of employees at work
- procedure during the rescue of employees in the event of natural disasters
- first aid.

According to the *Decree on Construction Site Organization, Mandatory Documentation on Construction Site and Construction Work Participants*, the Contractor needs to implement measures regarding induction and training of construction site workers contained in the PE FBiH Roads *Guidelines for the Design, Construction, Maintenance and Supervision, Volume II: Construction, Part 1: General Technical Requirements, Section 2.1.13: Construction Site Arrangement*[118] and in line with the *Regulation on Safety at Work in Construction Industry*[119]. Such training should also cover topics relevant to the proper implementation of WB requirements set out in this ESMP as well. This means that the Contractor should induct all workers on the following:

- Hiring procedures
- Site induction
- Company health and safety policy
- Code of conduct
- Accident reporting procedures/first aid
- Fire procedures and precautions
- Site specific risks
- Handling of equipment and specific machinery
- Contractors workers' grievance mechanism
- Chance find procedure
- Safety procedures and site safety rules
- Stakeholder engagement
- Grievance management.

In addition to training, all workers should be provided with relevant health and safety information in order to:

- ensure that workers are not injured or made ill by the work they do
- develop a positive health and safety culture, where safe and healthy working becomes second nature to everyone;
- allow workers to understand how they could manage health and safety better, and
- meet the national legal requirements.

All workers should sign a declaration stating that they have received and understood the induction-training program. These records should be kept available on construction site for review by the Federal or Cantonal Inspection Authorities and the PE FBiH Roads.

Due to the fact that operation phase of the road will lead to air emissions, mitigation measure regarding mobile source modeling was suggested, utilizing the air quality data that will be obtained during suggested monitoring of air quality, traffic forecast and wind data. Since there are no official data on wind directions, wind speed and wind direction frequency for the Project area, this measure is to be implemented upon availability of the official wind data. PE FBiH Roads should train their personnel regarding the air quality assessment and air emissions modeling. Through such training, workers need to be introduced to the limit values on air quality parameters and air emissions modeling.

[118] Faculty of Civil and Geodetic Engineering of the University of Ljubljana and DDC Consulting & Engineering Ltd, 2005
[119] Official Gazette of SFRY, No. 42/68 and 45/68

3.4.4 Reporting Process

A) Contractor to the Company PE FBiH Roads

The Contractor shall immediately inform PE FBiH Roads for any grievances received directly in the field, which should be logged in the central log in the PE FBiH Roads. All grievances received directly in the field should be addressed to:

Attention: Head of CFD/ Head of BFC
PE FBiH Roads
Address: Terezija 54, 71 000 Sarajevo
T:+387 33 250 370, F:+387 33 250 400
E: zalbena@jpcfbih.ba

The Contractor shall prepare a compliance report in respect to this ESMP as a monthly progress report and submit it to the PE FBiH Roads, in both local B/H/S and English language, in hard copy and electronic versions. These reports will include a list and description of all undertaken activities at the site, as well as recommendations for future activities and protection measures.

If any type of accident or endangerment to the environment or local communities occurs, reporting will be immediate. Contractor is obliged to inform the PIU and the local authorities about any accidents immediately after occurrence. In case the head of PIU is not available, the Contractor is obliged to inform the PE FBiH Roads about any incident:

T: +387 33 250 370

E: info@jpcfbih.ba

B) Supervising Engineer/PIU to the Company PE FBiH Roads's

The findings of the regular monitoring activities, including activities specified in the ESMP carried out by the Contractor will be included in the quarterly progress reports of the PIU.

If any type of accident or endangerment to the environment or local communities occurs, reporting will be immediate.

C) The Company PE FBiH Roads to the FMoPP and WB

Annual Monitoring Reports on the environmental and social performance of the Project will be prepared by the PE FBiH Roads and submitted for WB's review.

The PE FBiH Roads shall also submit reports to the FMoPP in line with the requirements of the local legislation, i.e., the Law on Physical Planning of FBiH.

In case of fatalities or major incidents on site the PE FBiH Roads will immediately report to the WB.

3.5 Public Discussion and Information Disclosure

For the new main road section covered by this ESMP, a set of consultations with the local communities for the previous Environmental Impact Study has already been carried out - two sets of consultations for the ESIA and multiple consultations for RAPs (Table 28).

The first public consultations for the Project's ESIA were held in Hutovo in November 2015. During the presentation of the project, participants were informed about previous and future project activities. Representatives of PE FBiH Roads informed the participants about earlier consultations held in Neum for the main project design, during which the road alignment was changed to satisfy local community requirements. Furthermore, the detailed road plans, maps, placement of tunnels, road intersections, etc. were presented.

The second public consultations on the ESIA draft were organized after the WB and PE FBiH Roads approved the draft document. ESIA was made available to the public in local language on the website of PE FBiH Roads in February 2016, and the public was provided with 14 days to submit their comments in order to identify issues of concern and possible solutions. The public consultations were held in March 2016 in Hutovo and included a discussion about the possible positive and negative impacts of the planned road on the environment and community.

Public consultations were also organized for the draft Resettlement Action Plan (RAP) for the Neum-Stolac road. The draft RAP was disclosed in February 2016 on the website of PE FBiH Roads and public consultative meetings were organized by the PIU in the Municipality of Neum and Municipality of Stolac in February 2016.

In order to complement the secondary data and allow for the full range of relevant baseline to be presented, public surveys, public consultations, community meetings - focus groups and key informant interviews were conducted to gather qualitative data (baseline conditions of relevance to the environmental characteristics and socio-economic environment of the Neum and Stolac area of influence) during the ESIA development (November and December, 2015). Surveys and public consultations were conducted for the purposes of RAP too (December 2015-February 2016).

Table 28: *Summary of consultations on the Project*

Consultation	Date	Place	Issues consultated
Preliminary meetings and consultations	n/a	Neum and Hutovo	Presentation of main project design (Presentation of alignment Broćanac-Hutovo-Cerovica and detailed presentation of Broćanac – Hutovo – Cerovica alignment) Several public consultations were held to disclose information about the alignment of the Project, tentative implementation arrangements were disseminated and comments and concerns and views on the planned activities collected.
Consultation on previous Environmental Impact Study	July and August 2013	Neum and Hutovo	Previous Environmental Impact Study (emphasis on environmental impacts)
First public consultations on ESIA	November 11, 2015	Hutovo	ESIA - future project activities and land acquisition process suspension due WB requests in order to harmonize this process with Banks Operational Policies presented detailed road plans, maps, placement of tunnels, road intersections detailed road plans, maps, placement of tunnels, road intersections
Second public consultations on ESIA	March 2, 2016	Hutovo	Draft of ESIA (emphasis on possible positive and negative impacts of this road on environment and community)
First public consultations (two meetings)	February 2016	Municipality of Neum and Municipality of Stolac	Consultations with the stakeholders, especially PAPs, related to the document as well as additional socio-economic surveying of PAPs not surveyed to date. The presentation included the key principles of the land acquisition process, the entitlements matrix, the timeline for RAP implementation, with information about the cut-off date, and the grievance mechanism. Discussion on the draft RAP (presentation on road sections included in the RAP, the Project area with graphics -maps and cadastral maps, the current status of the expropriation process with the next steps, the legal framework for land acquisition, the prepared documents within

Consultation	Date	Place	Issues consultated
			the Project and the purpose of these documents, the process, purpose and results of the Census and Socioeconomic survey).

The draft ESMP has been disclosed on the website of PE FBiH Roads (http://www.jpdcFBiH.ba/ba/) and on the web sites of Municipalities Neum and Stolac in local language, and on the website of the WB in English. Public consultation regarding the draft ESMP has been organized by PE FBiH Roads at location of Hutovo Municipality of Neum during February 2018. Public consultations were attended by 24 interested parties. In order to ensure an adequate and timely consultation process, the PE FBiH Roads has established a PIU, consisting of representatives from the PE FBiH Roads that will be responsible for the communication with Local Community Offices, PAPs, representatives of government authorities and all other stakeholders.

The PE FBiH Roads has developed a system for regular and direct communication with stakeholders, including the following channels of communication and information disclosure:

- Official websites of the PE FBiH Roads and BIHAMK (http://www.jpcfbih.ba/ba/ and http://bihamk.ba/)
- Disclosure of information through the Local Community Offices (LCOs)
- Telephone, mail, fax or e-mail inquiries and online question forms
- Public announcements communicated to the media (local radio and television stations, daily newspapers).

In addition, a Project-specific grievance mechanism has been established.

A Beneficiary Feedback Commission (BFC) has been established as a forum for grievances and comments in relation to expropriation in the Municipalities of Neum and Stolac. The BFC consists of five members, two of whom are representatives of PAPs (at least one female), two are officials from the respective municipality[120] (at least one female) and one is the representative of PC Roads FBiH not directly involved in the process of expropriation to ensure full impartiality. The municipalities will make sure the PAPs elect their representatives to represent the affected persons most adequately. The BFC will meet as necessary, depending on the range and nature of grievances. The BFC is responsible for receiving and responding to grievances/comments of the following two groups: (i) Persons directly affected by the Project including land acquisition impacts, (ii) Residents living in the Project area who are interested in and/or affected by the Project

The BFC is supported by the Central Feedback Desk (CFD) at the level of PC Roads FBiH, which is tasked with keeping comments/grievances received through the BFC through a Central Grievance Log.

Any comments or concerns can be brought to the attention of the BFC or the Contractor verbally (personally or by telephone) or in writing by filling in the grievance form (by post, fax or personal delivery to the addresses/numbers given below or by e-mail to zalbena@jpcfbih.ba), without any costs incurred to the complainant. Grievances can also be submitted anonymously.

More information on grievance mechanism is available in RAP.

Any request for information or complaint can be addressed to:

Attention: Head of CFD/ Head of BFC

[120]In both municipalities, a municipal official is in charge of receiving the grievances, acknowledging receipt, recording the grievances and forwarding them to the BFC.

PE FBiH Roads
Address: Terezija 54, 71 000 Sarajevo
T:+387 33 250 370, F:+387 33 250 400
E: zalbena@jpcfbih.ba

The grievance form is available in Annex 2 of this ESMP. During the construction works, the Contractor will submit monthly information to the PE FBiH Roads regarding the progress of works, which will be disclosed on the website of both the PE FBiH Roads and BIHAMK. The schedule of works and potential amendments to the schedule of works will also be submitted approximately 2 weeks prior to the commencement of construction works to LCOs, as well as local newspapers, radio and television stations for publishing. The schedules will provide information on the commencement and finalization of the works, which may impact the affected groups (such as changes in the transport/ water/ electricity supply regime, and access, noise and dust due to construction works).

4 MONITORING RESULTS AND FINDINGS[121]

4.1 Monitoring Results of Soil Quality[122]

Analytical methods of specified parameters are defined by standard methods listed in Table 29

Table 29: *Parameters and Methods of Soil Quality Analysis*

Parameter	Description of method	Method	Apparatus
pH	Electrometry	ISO 10390	pH meter
Heavy metals	AAS	BAS ISO 11466:2000 BAS ISO 11047:2000	AAS

Table 30: *Sampling Locations for Soil Quality Monitoring*

Measurement point	Chainage	Coordinates	Position in relation to future motorway	Closer toponym
1	36+400.000	43°01'56.1'' 17°55'29.5''	Left	Grdijevići
2	35+450.000	43°01'38.2'' 17°55'08.6''	Right	Intersection R4
3	35+125.000	43°01'30.5'' 17°54'56.6''	Right	Kadića Dubrava
4	33+650.000	43°01'06.3'' 17°54'53.4''	Right	Pušišta
5	33+400.000	43°00'53.2'' 17°54'57.8''	Left	Turn to the road for Matića Mahala
6	31+950.000	43°00'14.0'' 17°55'18.5''	Left	Udora
7	30+0.000	42°59'46.6'' 17°54'48.6''	Left	Varda
8	29+100.000	42°59'34.7'' 17°53'56.0''	Left	Trnovski brijeg
9	28+0.000	42°59'22.9'' 17°53'12.8''	Left	Intersection R2
10	25+600.000	42°59'19.8'' 17°51'56.3''	Right	Intersection R1
11	25+0.000	42°59'23.0'' 17°50'52.1''	Right	Passage 3
12	24+400.000	42°59'15.2'' 17°50'29.2''	Right	Vinine
13	24+0.000	42°59'11.9'' 17°50'24.7''	Right	Passage 2
14	23+500.000	42°59'11.8'' 17°50'10.2''	Right	Meduljice
15	23+0.000	42°59'11.8'' 17°50'10.2''	Right	Osječenica
16	22+450.000	42°59'19.6'' 17°49'26.6''	Right	Intersection Cerovica

[121] Monitoring results and findings are presented separatelly from baseline information in order to obtain simplicity and clearer presentation of information in Chapter 2.5.1

[122] Results of heavy metal analysis are presented against national standards for allowable quantities of hazardous and noxious substances in the soil, since there are no applicable values for contaminated land (International Finance Corporation, General EHS Guidelines: Environmental, Contaminated Land, April 30, 2007)

Measurement point	Chainage	Coordinates	Position in relation to future motorway	Closer toponym
17	21+475.000	42°59'08.8'' 17°48'51.1''	Right	Shrine of Queen of Peace
18	21+75.000	42°59'07.6'' 17°48'32.9''	Right	Overpass
19	19+700.000	42°58'59.9'' 17°47'57.4''	Right	LIsina
20	18+800.000	42°58'37.1'' 17°47'38.5''	Right	Petrov dol
21	17+850.000	42°58'07.9'' 17°47'37.3''	Right	Intersection „Hutovo“
22	17+525.000	42°57'29.5'' 17°47'59.0''	Right	Košare
23	16+600.000	42°57'23.8'' 17°47'48.5''	Right	Hutovo
24	15+600.000	42°57'00.4'' 17°47'22.7''	Right	Underpass 2
25	14+600.000	42°56'52.2'' 17°46'25.0''	Left	Intersection Prapratnica
26	11+900.000	42°57'01.6'' 17°45'15.8''	Right	Intersection Broćanac (agricultural surface)
27	10+900.000	42°57'02.2'' 17°44'04.0''	Right	Broćanac
28	9+500.000	42°56'54.8'' 17°42'53.5''	Right	Gradac (agricultural surface)
29	4+0.000	42°56'47.2'' 17°42'04.9''	Right	Moševići
30	0+500.000	42°55'30.3'' 17°38'02.9''	Right	Vranjevo Selo
31	6+0.000	42°56'67.6'' 17°41'11.5	Right	Babin do
32	3+0.000	42°55'58.3'' 17°39'36.9''	Right	Kiševo (agricultural surface)

Measurement points 26, 28 and 32 were located on agricultural land, so the results of the analysis are compared with the limit values for agricultural land in accordance with the *Regulation on determining allowable quantities of hazardous and noxious substances in the soil and methods of their analysis* (FBiH Official Gazette of FBiH, No. 72/09). The results of conducted laboratory analysis showed that:

- in accordance with the above mentioned Regulation, the **soil sample on “measurement point 28”** does not comply with the limit values for the tested metals: cadmium and lead. Soil samples were taken at an agricultural area in Gradac with no visible traces of contamination and no visible traces of contamination sources;
- since the tested soil samples indicate a mild alkaline reaction, it may be concluded that heavy metals in these soil samples are in an inactive form;
- comparing the content of total forms of heavy metals in soil sample with limit values, it was determined that concentrations of heavy metals (lead and cadmium) at remaining measurement points do not exceed the limits defined for agricultural land (clay soil) in the mentioned Regulation.

Table 31: *pH Values of the Soil Samples*

No.	Sample of soil (km)	Results:		Analysis performed by
		pH in H_2O	pH in 1 M KCl	
1.	36+400.000	7,83	6,88	Zagrebinspekt Ltd. Mostar
2.	35+450.000	7,36	6,07	
3.	35+125.000	7,86	7,05	
4.	33+650.000	7,52	6,41	
5.	33+400.000	7,66	6,64	
6.	31+950.000	7,33	6,48	
7.	30+0.000	7,59	6,39	
8.	29+100.000	7,28	6,34	
9.	28+0.000	7,27	6,25	
10.	25+600.000	7,69	6,78	
11.	25+0.000	7,51	6,46	
12.	24+400.000	8,38	7,40	
13.	24+0.000	8,04	7,01	
14.	23+500.000	7,68	6,38	
15.	23+0.000	8,21	7,25	
16.	22+450.000	7,76	6,85	
17	21+475.000	8,00	6,78	
18.	21+75.000	7,70	6,70	
19.	19+700.000	8,07	7,07	
20.	18+800.000	8,04	6,94	
21.	17+850.000	7,97	6,80	
22.	17+525.000	7,96	7,13	
23.	16+600.000	7,96	7,09	
24.	15+600.000	7,92	6,92	
25.	14+600.000	7,71	6,39	
26.	11+900.000	6,15	4,81	
27.	10+900.000	7,88	7,11	
28.	9+500.000	7,88	6,85	
29.	4+0.000	7,69	6,81	
30.	0+500.000	8,25	6,98	
31.	6+0.000	8,37	7,26	
32.	3+0.000	7,76	6,56	

Date of analysis: 13.03.2017.

Table 32: *Results of Heavy Metals Analysis*

No.	Soil sample (km)	Results:		Analysis performed by
		Cadmium, Cd (mg/kg)	Lead, Pb (mg/kg)	
1.	36+400.000	<3,88	87,50	Zagrebinspekt Ltd. Mostar
2.	35+450.000	7,76	<37,50	
3.	35+125.000	12,94	50,00	
4.	33+650.000	11,64	<37,50	
5.	33+400.000	<3,88	<37,50	
6.	31+950.000	11,64	150,00	
7.	30+0.000	6,47	<37,50	
8.	29+100.000	19,41	75,00	
9.	28+0.000	10,35	<37,50	
10.	25+600.000	9,06	<37,50	
11.	25+0.000	16,82	<37,50	
12.	24+400.000	9,06	<37,50	
13.	24+0.000	<3,88	<37,50	
14.	23+500.000	9,06	<37,50	
15.	23+0.000	7,76	<37,50	
16.	22+450.000	<3,88	50,00	
17	21+475.000	14,23	<37,50	
18.	21+75.000	12,94	50,00	
19.	19+700.000	12,94	<37,50	
20.	18+800.000	11,64	<37,50	
21.	17+850.000	<3,88	75,00	
22.	17+525.000	<3,88	<37,50	
23.	16+600.000	<3,88	125,00	
24.	15+600.000	<3,88	<37,50	
25.	14+600.000	5,17	87,50	
26.	11+900.000	<3,88	<37,50	
27.	10+900.000	<3,88	87,50	
28.	9+500.000	**6,47**	**75,00**	
29.	4+0.000	<3,88	62,50	
30.	0+500.000	9,06	50,00	
31.	6+0.000	<3,88	50,00	
32.	3+0.000	<3,88	<37,50	

Date of analysis: 16.03.2017.

4.2 Monitoring Results of Air Quality

Monitoring methods for air quality are in accordance with *Rulebook on the Manner of Air Quality Monitoring and Defining the Types Of Pollutants, Limit Values and Other Standards – Annex V: Reference methods of measuring the concentration of sulfur dioxide, nitrogen dioxide and nitrogen oxides, suspended particles (PM_{10}, $PM_{2,5}$), lead, benzene, carbon monoxide and ground-level ozone* (Official Gazette of FBH, No. 01/12).

Monitoring of nitrous oxides (NOX, NO i NO_2) concentration was performed with gas analyzer for NO_x, NO and NO_2 monitoring, model T200 (Chemiluminescence NO/NO_2/NO_x Analyzer). For determining of NO_x, NO and NO_2 concentrations, method of chemiluminiscence is used with measurement range 0-2000 ppb. There is a BAS EN 14211 Standard for monitoring of nitrous oxides.

Figure 19: *NO_x Analyzer T200 (source: JV ENOVA & Zagrebinspekt)*

Basic technical characteristics of analyzer:

- measurement range from 0-50 to 2000 ppb concentration
- average sample time needed 10-300 seconds
- flow coefficient 0,5 l/min
- temperatures range 5-40 °C.

The principle of operation of this analyzer is based on the reaction between NO and O_3 that causes a characteristic chemiluminescence of its intensity linearly proportional to the concentration of NO. Luminescence (from Latin word lumen, luminis=light) represents the occurrence of cold light radiation (photons). These occurrences are not caused by increase in temperature, but by many other causes, so there are several forms of luminescence. This form of radiation is different from thermal radiation by way of formation, characteristics and duration. Chemical luminescence is a direct transformation of chemical energy to energy of radiation, without heat release.

Monitoring of sulphur dioxide SO_2 concentration was performed with SO_2 analyzer, model T 100 (UV Fluorescence SO_2 Analyzer) and the method of UV fluorescence, with measurement range 0-20 ppm. There is a BAS EN 14212 Standard for this method.

Figure 20: *SO_2 Analyzer T100 (source: JV ENOVA & Zagrebinspekt)*

Measurement of the concentration of lead (Pb) in total sediment matter

Analysis of total sediment matter (TSM) - Standard method of sampling and analysis: Bergerhoff instrument.

Analysis of the concentration of lead (Pb) in TSM - Method of measurement AAS

Measurement of black smoke index - black smoke represents strongly light-absorbing particulate matter. Determination of black smoke index is based on the staining effect of particles which is produced when a sample of air is drawn through a filter paper and index is determined by the reflectometer. The method is intended for the measurement of a smoke index in the range 6 to 375 in the ambient atmosphere.

Other measurements along with the Air Quality Monitoring

Meteorological parameters were measured during automatic monitoring:

- speed and direction of wind 0-75 m/s, 0-360 0
- temperature and relative humidity (-50)°C-600°C, 0-100 %
- pressure 300-1200 hPa.

According to the results of air quality monitoring along the planned road section Neum-Stolac, analysed parameters were within the limitations required by the *Regulation on the Manner of Air Quality Monitoring and Defining the Types Of Pollutants, Limit Values and Other Standards* (Official Gazette of the Federation of BH No. 01/12) for all tested parameters (SO_2, NO_2, black smoke index, total sediment matter (TSM) and lead (Pb) in TSM). PM10, PM 2.5 and O_3 were not analized. During the monitoring period at all measurement points concentrations of SO_2 and NO_2 were not exceeding hourly or daily limit values.

Table 33: *Results of Air Quality Monitoring at MM1*

Sampling period from 8:00 10.03. 2017. to 08:00- 11.03.2017.	Limit Value according to National Legislation			Limit Value according to World Bank Standards			Measued Values		
	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index
1-year	50	40	50	-	40	-			
24 - hour	125	85	125	20	-	-	16.76	4.88	<6.20
1- hour	350	200	-	-	200	-	Min 14.01 Max 23.94	Min 2.01 Max 5.97	
10-min	-	-	-	500	-	-	-	-	

Table 34: *Results of Air Quality Monitoring at MM2*

Sampling period from 8:00 10.03. 2017. to 08:00- 11.03.2017.	Limit Value according to National Legislation			Limit Value according to World Bank Standards			Measued Values		
	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index
1-year	50	40	50	-	40	-			
24 - hour	125	85	125	20	-	-	15.91	4.95	<6.20
1- hour	350	200	-	-	200	-	Min 14.22 Max 22.65	Min 2.01 Max 6.11	
10-min	-	-	-	500	-	-	-	-	

Table 35: *Results of Air Quality Monitoring at MM3*

Sampling period from 8:00 10.03. 2017. to 08:00- 11.03.2017.	Limit Value according to National Legislation			Limit Value according to World Bank Standards			Measued Values		
	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index
1-year	50	40	50	-	40	-			
24 - hour	125	85	125	20	-	-	16.14	4.97	<6.20
1- hour	350	200	-	-	200	-	Min 14.55 Max 24.24	Min 2.03 Max 6.08	
10-min	-	-	-	500	-	-	-	-	

Table 36: *Results of Air Quality Monitoring at MM4*

Sampling period from 8:00 10.03. 2017. to 08:00- 11.03.2017.	Limit Value according to National Legislation			Limit Value according to World Bank Standards			Measued Values		
	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index
1-year	50	40	50	-	40	-			
24 - hour	125	85	125	20	-	-	14.75	4.78	<6.20
1- hour	350	200	-	-	200	-	Min 13.10 Max 23.87	Min 2.15 Max 6.00	

10-min	-	-	-	500	-	-	-	-	

Table 37: *Results of Air Quality Monitoring at MM5*

Sampling period from 8:00 10.03. 2017. to 08:00- 11.03.2017.	Limit Value according to National Legislation			Limit Value according to World Bank Standards			Measued Values		
	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index
1-year	50	40	50	-	40	-			
24 - hour	125	85	125	20	-	-	14.54	4.90	<6.20
1- hour	350	200	-	-	200	-	Min 13.23 Max 24.51	Min 1.99 Max 4.95	
10-min	-	-	-	500	-	-	-	-	

Table 38: *Results of Air Quality Monitoring at MM6*

Sampling period from 8:00 10.03. 2017. to 08:00- 11.03.2017.	Limit Value according to National Legislation			Limit Value according to World Bank Standards			Measued Values		
	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index
1-year	50	40	50	-	40	-			
24 - hour	125	85	125	20	-	-	15.77	5.14	<6.20
1- hour	350	200	-	-	200	-	Min 13.79 Max 23.76	Min 2.02 Max 5.80	
10-min	-	-	-	500	-	-	-	-	

Table 39: *Results of Air Quality Monitoring at MM7*

Sampling period from 8:00 10.03. 2017. to 08:00- 11.03.2017.	Limit Value according to National Legislation			Limit Value according to World Bank Standards			Measued Values		
	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index
1-year	50	40	50	-	40	-			
24 - hour	125	85	125	20	-	-	16.01	5.14	<6.20
1- hour	350	200	-	-	200	-	Min 14.13 Max 24.40	Min 2.51 Max 5.59	
10-min	-	-	-	500	-	-	-	-	

Table 40: *Results of Air Quality Monitoring at MM8*

Sampling period from 8:00 10.03. 2017. to 08:00- 11.03.2017.	Limit Value according to National Legislation			Limit Value according to World Bank Standards			Measued Values		
	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index
1-year	50	40	50	-	40	-			
24 - hour	125	85	125	20	-	-	15.77	4.28	<6.20
1- hour	350	200	-	-	200	-	Min 13.95 Max 24.02	Min 1.80 Max 4.73	
10-min	-	-	-	500	-	-	-	-	

Table 41: *Results of Air Quality Monitoring at MM9*

Sampling period from 8:00 10.03. 2017. to 08:00- 11.03.2017.	Limit Value according to National Legislation			Limit Value according to World Bank Standards			Measued Values		
	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index
1-year	50	40	50	-	40	-			
24 - hour	125	85	125	20	-	-	14.88	4.64	<6.20
1- hour	350	200	-	-	200	-	Min 13.57 Max 24.29	Min 2.10 Max 4.38	
10-min	-	-	-	500	-	-	-	-	

Table 42: *Results of Air Quality Monitoring at MM10*

Sampling period from 8:00 10.03. 2017. to 08:00- 11.03.2017.	Limit Value according to National Legislation			Limit Value according to World Bank Standards			Measued Values		
	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index	SO_2 ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	Black smoke index
1-year	50	40	50	-	40	-			
24 - hour	125	85	125	20	-	-	15.45	5.03	<6.20
1- hour	350	200	-	-	200	-	Min 14.30 Max 24.81	Min 2.11 Max 5.94	
10-min	-	-	-	500	-	-	-	-	

Table 43: *Results of Measurement and Analysis of the Concentration of Lead (Pb) in Sediment - location MP1*

No.	ANALYSIS	Unit	Result	Unit	Final value	Limit value according to World Bank Standard	Limit value according to National Legislation (Annex XV)
						LV	LV[123]
1	Total sediment matter (TSM)	(mg)	6,12	($mgm^{-2}d^{-1}$)	179,303879	-	200
2	Pb in TSM	(mg/kg)	48	($\mu gm^{-2}d^{-1}$)	8,60658619	-	100

Table 44: *Results of Measurement and Analysis of the Concentration of Lead (Pb) in Sediment - location MP2*

No.	ANALYSIS	Unit	Result	Unit	Final value	Limit value according to World Bank Standard	Limit value according to National Legislation (Annex XV)
						LV	LV
1	Total sediment matter (TSM)	(mg)	5,94	($mgm^{-2}d^{-1}$)	174,030236	-	200
2	Pb in TSM	(mg/kg)	54	($\mu gm^{-2}d^{-1}$)	9,39763272	-	100

Table 45: *Results of Measurement and Analysis of the Concentration of Lead (Pb) in Sediment - location MP3*

No.	ANALYSIS	Unit	Result	Unit	Final value	Limit value according to World Bank Standard	Limit value according to National Legislation (Annex XV)
						LV	**LV**
1	Total sediment matter (TSM)	(mg)	5,79	($mgm^{-2}d^{-1}$)	169,635533	-	200
2	Pb in TSM	(mg/kg)	49	($\mu gm^{-2}d^{-1}$)	8,3121411	-	100

Table 46: *Results of Measurement and Analysis of the Concentration of Lead (Pb) in Sediment - location MP4*

No.	ANALYSIS	Unit	Result	Unit	Final value	Limit value according to World Bank Standard	Limit value according to National Legislation (Annex XV)
						LV	**LV**
1	Total sediment matter (TSM)	(mg)	6,03	($mgm^{-2}d^{-1}$)	176,667057	-	200
2	Pb in TSM	(mg/kg)	47	($\mu gm^{-2}d^{-1}$)	8,30335169	-	100

[123] Refers to the limit value

Table 47 : *Results of Measurement and Analysis of the Concentration of Lead (Pb) in Sediment - location MP5*

No.	ANALYSIS	Unit	Result	Unit	Final value	Limit value according to World Bank Standard	Limit value according to National Legislation (Annex XV)
						LV	**LV**
1	Total sediment matter (TSM)	(mg)	6,10	($mgm^{-2}d^{-1}$)	178,717919	-	200
2	Pb in TSM	(mg/kg)	49	($\mu gm^{-2}d^{-1}$)	8,75717801	-	100

Table 48: *Results of Measurement and Analysis of the Concentration of Lead (Pb) in Sediment - location MP6*

No.	ANALYSIS	Unit	Result	Unit	Final value	Limit value according to World Bank Standard	Limit value according to National Legislation (Annex XV)
						LV	**LV**
1	Total sediment matter (TSM)	(mg)	5,91	($mgm^{-2}d^{-1}$)	173,151295	-	200
2	Pb in TSM	(mg/kg)	55	($\mu gm^{-2}d^{-1}$)	9,52332122	-	100

Table 49: *Results of Measurement and Analysis of the Concentration of Lead (Pb) in Sediment - location MP7*

No.	ANALYSIS	Unit	Result	Unit	Final value	Limit value according to World Bank Standard	Limit value according to National Legislation (Annex XV)
						LV	**LV**
1	Total sediment matter (TSM)	(mg)	5,92	($mgm^{-2}d^{-1}$)	173,444275	-	200
2	Pb in TSM	(mg/kg)	51	($\mu gm^{-2}d^{-1}$)	8,84565803	-	100

Table 50: *Results of Measurement and Analysis of the Concentration of Lead (Pb) in Sediment - location MP8*

No.	ANALYSIS	Unit	Result	Unit	Final value	Limit value according to World Bank Standard	Limit value according to National Legislation (Annex XV)
						LV	**LV**
1	Total sediment matter (TSM)	(mg)	6,35	($mgm^{-2}d^{-1}$)	186,042424	-	200
2	Pb in TSM	(mg/kg)	52	($\mu gm^{-2}d^{-1}$)	9,67420602	-	100

Table 51: *Results of Measurement and Analysis of the Concentration of Lead (Pb) in Sediment - location MP9*

No.	ANALYSIS	Unit	Result	Unit	Final value	Limit value according to World Bank Standard	Limit value according to National Legislation (Annex XV)
						LV	**LV**
1	Total sediment matter (TSM)	(mg)	5,83	($mgm^{-2}d^{-1}$)	170,807453	-	200
2	Pb in TSM	(mg/kg)	47	($\mu gm^{-2}d^{-1}$)	8,02795031	-	100

Table 52: *Results of Measurement and Analysis of the Concentration of Lead (Pb) in Sediment - location MP10*

No.	ANALYSIS	Unit	Result	Unit	Final value	Limit value according to World Bank Standard	Limit value according to National Legislation (Annex XV)
						LV	**LV**
1	Total sediment matter (TSM)	(mg)	6,08	($mgm^{-2}d^{-1}$)	178,131958	-	200
2	Pb in TSM	(mg/kg)	60	($\mu gm^{-2}d^{-1}$)	10,6879175	-	100

4.3 Monitoring Results of Surface Water Quality[124]

The conducted laboratory testing showed that:

- based on the results of physical andchemical analysis of surface waters, all tested parameters were in the acceptable range prescribed by *Decree on Hazardous and Noxious Substances in Water* (Official Gazette of FBH, No. 43/07)
- the water source Blace and Hutovo blato match in I-II class of surface waters, while the pond on location Kiševo and a water pit on location Crnoglav belong in III-IV class of surface water in accordance with the *Decree on classification of Waters and Coastal Sea of Yugoslavia within the Borders of the SR of BiH* (Official Gazette of SR BH, No. 19/80).

Table 53: *Results of Physical and Chemical Analysis – Pond on Location Kiševo*

Sample number:	**U-1-III/17**						
	Unit	**Result**	**Method**	**Analyst**	**Date**	**Limit value**	
						I - II CLASS Surface water	**III - IV CLASS Surface water**
Sampling	-	-	BAS ISO 5667-1:2008,3:2014,10:2000	Branimir Drinovac	10.03. 2017.	-	-
Parameters							
Temperature	°C	10,8	Standard Methods 2550 B izd. APHA-AWWA-WEF 2012.	Branimir Drinovac	10.03. 2017.	-	-
pH		7,7	BAS EN ISO 10523:2013	Branimir Drinovac	10.03. 2017.	6,8-8,5/5,8-8,5	6,0-9,0/6,0-9,0
Smell		without	-	Branimir Drinovac	10.03. 2017.	without / without	slightly noticeable /-
Colour		without	ISO 7887 (A)	Branimir Drinovac	10.03. 2017.	without / without	slightly noticeable /-
Fuzziness	NTU/FTU	13,1	BAS EN ISO 7027:2002*	Branimir Drinovac	10.03. 2017.		

[124] Results of physical and chemical analysis are presented against national standards for surface water quality since there are no applicable values for surface water quality in Table 1.3.1 - Indicative Values for Treated Sanitary Sewage Discharges (International Finance Corporation, General EHS Guidelines: Environmental, Environmental Wastewater and ambient Water Quality, April 30, 2007)

Sample number:	U-1-III/17						
	Unit	Result	Method	Analyst	Date	Limit value	
						I - II CLASS Surface water	III - IV CLASS Surface water
Dissolved oxygen	mg/l	9,0	BAS EN ISO 5814:2014	Branimir Drinovac	10.03. 2017.	8/6	4/3
Conductivity	µS/cm	264	BS EN 27888:1993	Branimir Drinovac	10.03. 2017.	-	-
Permangate index	mg/l O_2	11,52	BAS EN ISO 8467	Public HealthInstitute of FBiH	14. 03. 2017.	-	-
Ammonia	mg/l N	<0,050	BAS ISO 7150-1:2002	Branimir Drinovac	13. 03. 2017.	100-250	250-1500
Nitrates – NO_3	mg/l N	0,055	BAS ISO 7890-3:2002	Branimir Drinovac	14. 03. 2017.	500-1500	1500-10000
Total nitrogen, N	mg/l N	<0,5	Internal method*	Tomislav Leko	13. 03. 2017.	-	-
Total phosporus, P	mg/l	0,034	BAS EN ISO 6878:2006	Tomislav Leko	13. 03. 2017	0,1-0,25	0,25-1,5
Chloride	mg/l	7	BAS ISO 9297:2002	Tomislav Leko	13.03. 2017.	-	-

* Method is not accredited.

Table 54: *Results of Physical and Chemical Analysis – Water Source Blace*

Sample number:	U-2-III/17						
	Unit	Result	Method	Analyst	Date	Limit value	
						I - II CLASS Surface water	III - IV CLASS Surface water
Sampling	-	-	BAS ISO 5667-1:2008,3:2014,10:2000	Branimir Drinovac	10.03. 2017.	-	-
Parameters							

Sample number:	U-2-III/17						
	Unit	Result	Method	Analyst	Date	Limit value	
						I - II CLASS Surface water	III - IV CLASS Surface water
Temperature	°C	13,3	Standard Methods 2550 B izd. APHA-AWWA-WEF 2012.	Branimir Drinovac	10.03. 2017.	-	-
pH		8,0	BAS EN ISO 10523:2013	Branimir Drinovac	10.03. 2017.	6,8-8,5/5,8-8,5	6,0-9,0/6,0-9,0
Smell		without	-	Branimir Drinovac	10.03. 2017.	without / without	slightly noticeable /-
Colour		without	ISO 7887 (A)	Branimir Drinovac	10.03. 2017.	without / without	slightly noticeable /-
Fuzziness	NTU/FTU	10,3	BAS EN ISO 7027:2002*	Branimir Drinovac	10.03. 2017.		
Dissolved oxygen	mg/l	10,3	BAS EN ISO 5814:2014	Branimir Drinovac	10.03. 2017.	8/6	4/3
Conductivity	µS/cm	427	BS EN 27888:1993	Branimir Drinovac	10.03. 2017.	-	-
Permangate index	mg/l O_2	2,56	BAS EN ISO 8467	Public Health Institute of FBiH	14.03. 2017.	-	-
Ammonia	mg/l N	<0,050	BAS ISO 7150-1:2002	Branimir Drinovac	13. 03. 2017.	100-250	250-1500
Nitrates – NO_3	mg/l N	<0,040	BAS ISO 7890-3:2002	Branimir Drinovac	14. 03. 2017.	500-1500	1500-10000
Total nitrogen, N	mg/l N	<0,5	Internal method*	Tomislav Leko	13. 03. 2017.	-	-
Total phosporus, P	mg/l	<0,025	BAS EN ISO 6878:2006	Tomislav Leko	13. 03. 2017	0,1-0,25	0,25-1,5
Chloride	mg/l	<5	BAS ISO 9297:2002	Tomislav Leko	13.03. 2017.	-	-

* Method is not accredited.

Table 55: *Results of Physical and Chemical Analysis – The Water Well on Location Crnoglav*

Sample number:	**U-3-III/17**						
	Unit	**Result**	**Method**	**Analyst**	**Date**	**Limit value**	
						I - II CLASS Surface water	**III - IV CLASS Surface water**
Sampling	-	-	BAS ISO 5667-1:2008,3:2014,10:2000	Branimir Drinovac	10.03. 2017.	-	-
Parameters							
Temperature	°C	12,9	Standard Methods 2550 B izd. APHA-AWWA-WEF 2012.	Branimir Drinovac	10.03. 2017.	-	-
pH		8,0	BAS EN ISO 10523:2013	Branimir Drinovac	10.03. 2017.	6,8-8,5/5,8-8,5	6,0-9,0/6,0-9,0
Smell		without	-	Branimir Drinovac	10.03. 2017.	without / without	slightly noticeable /-
Colour		without	ISO 7887 (A)	Branimir Drinovac	10.03. 2017.	without / without	slightly noticeable /-
Fuzziness	NTU/FTU	13,8	BAS EN ISO 7027:2002*	Branimir Drinovac	10.03. 2017.		
Dissolved oxygen	mg/l	8,2	BAS EN ISO 5814:2014	Branimir Drinovac	10.03. 2017.	8/6	4/3
Conductivity	µS/cm	125	BS EN 27888:1993	Branimir Drinovac	10.03. 2017.	-	-
Permangate index	mg/l O_2	1,15	BAS EN ISO 8467	Public Health Institute of FBiH	14.03. 2017.	-	-
Ammonia	mg/l N	<0,050	BAS ISO 7150-1:2002	Branimir Drinovac	13. 03. 2017.	100-250	250-1500
Nitrates – NO_3	mg/l N	0,43	BAS ISO 7890-3:2002	Branimir Drinovac	14. 03. 2017.	500-1500	1500-10000
Total nitrogen, N	mg/l N	0,9	Internal method*	Tomislav Leko	13. 03. 2017.	-	-

Sample number:	U-3-III/17						
	Unit	Result	Method	Analyst	Date	Limit value	
						I - II CLASS Surface water	III - IV CLASS Surface water
Total phosporus, P	mg/l	0,049	BAS EN ISO 6878:2006	Tomislav Leko	13. 03. 2017	0,1-0,25	0,25-1,5
Chloride	mg/l	6	BAS ISO 9297:2002	Tomislav Leko	13.03. 2017.	-	-

* Method is not accredited.

Table 56: *Results of Physical and Chemical Analysis – Hutovo Blato – Southwards*

Sample number:	U-4-III/17						
	Unit	Result	Method	Analyst	Date	Limit value	
						I - II CLASS Surface water	III - IV CLASS Surface water
Sampling	-	-	BAS ISO 5667-1:2008,3:2014,10:2000	Branimir Drinovac	10.03. 2017.	-	-
Parameters							
Temperature	°C	11,9	Standard Methods 2550 B izd. APHA-AWWA-WEF 2012.	Branimir Drinovac	10.03. 2017.	-	-
pH		8,2	BAS EN ISO 10523:2013	Branimir Drinovac	10.03. 2017.	6,8-8,5/5,8-8,5	6,0-9,0/6,0-9,0
Smell		without	-	Branimir Drinovac	10.03. 2017.	without / without	slightly noticeable /-
Colour		pale yellow	ISO 7887 (A)	Branimir Drinovac	10.03. 2017.	without / without	slightly noticeable /-
Fuzziness	NTU/FTU	25,4	BAS EN ISO 7027:2002*	Branimir Drinovac	10.03. 2017.		
Dissolved oxygen	mg/l	10,4	BAS EN ISO 5814:2014	Branimir Drinovac	10.03. 2017.	8/6	4/3
Conductivity	µS/cm	285	BS EN 27888:1993	Branimir Drinovac	10.03. 2017.	-	-

Sample number:	U-4-III/17						
	Unit	Result	Method	Analyst	Date	Limit value	
						I - II CLASS Surface water	III - IV CLASS Surface water
Permangate index	mg/l O_2	4,09	BAS EN ISO 8467	Public Health Institute of FBiH	14.03. 2017.	-	-
Ammonia	mg/l N	<0,050	BAS ISO 7150-1:2002	Branimir Drinovac	13. 03. 2017.	100-250	250-1500
Nitrates – NO_3	mg/l N	0,14	BAS ISO 7890-3:2002	Branimir Drinovac	14. 03. 2017.	500-1500	1500-10000
Total nitrogen, N	mg/l N	0,8	Internal method*	Tomislav Leko	13. 03. 2017.	-	-
Total phosporus, P	mg/l	0,031	BAS EN ISO 6878:2006	Tomislav Leko	13. 03. 2017	0,1-0,25	0,25-1,5
Chloride	mg/l	<5	BAS ISO 9297:2002	Tomislav Leko	13.03. 2017.	-	-

* Method is not accredited.

Table 57: *Results of Physical and Chemical Analysis – Hutovo Blato – Northwards*

Sample number:	U-5-III/17						
	Unit	Result	Method	Analyst	Date	Limit value	
						I - II CLASS Surface water	III - IV CLASS Surface water
Sampling	-	-	BAS ISO 5667-1:2008,3:2014,10:2000	Branimir Drinovac	10.03. 2017.	-	-
Parameters							
Temperature	°C	13,2	Standard Methods 2550 B izd. APHA-AWWA-WEF 2012.	Branimir Drinovac	10.03. 2017.	-	-
pH		7,6	BAS EN ISO 10523:2013	Branimir Drinovac	10.03. 2017.	6,8-8,5/5,8-8,5	6,0-9,0/6,0-9,0
Smell		without	-	Branimir Drinovac	10.03. 2017.	without / without	slightly noticeable /-

Sample number:	U-5-III/17						
	Unit	Result	Method	Analyst	Date	Limit value	
						I - II CLASS Surface water	III - IV CLASS Surface water
Colour		without	ISO 7887 (A)	Branimir Drinovac	10.03. 2017.	without / without	slightly noticeable /-
Fuzziness	NTU/FTU	10,7	BAS EN ISO 7027:2002*	Branimir Drinovac	10.03. 2017.		
Dissolved oxygen	mg/l	10,1	BAS EN ISO 5814:2014	Branimir Drinovac	10.03. 2017.	8/6	4/3
Conductivity	µS/cm	400	BS EN 27888:1993	Branimir Drinovac	10.03. 2017.	-	-
Permangate index	mg/l O_2	0,51	BAS EN ISO 8467	Public Health Institute of FBiH	14.03. 2017.	-	-
Ammonia	mg/l N	0,11	BAS ISO 7150-1:2002	Branimir Drinovac	13. 03. 2017.	100-250	250-1500
Nitrates – NO_3	mg/l N	0,19	BAS ISO 7890-3:2002	Branimir Drinovac	13. 03. 2017.	500-1500	1500-10000
Total nitrogen, N	mg/l N	0,5	Internal method*	Tomislav Leko	13. 03. 2017.	-	-
Total phosporus, P	mg/l	0,14	BAS EN ISO 6878:2006	Tomislav Leko	13. 03. 2017	0,1-0,25	0,25-1,5
Chloride	mg/l	11	BAS ISO 9297:2002	Tomislav Leko	13.03. 2017.	-	-

* Method is not accredited.

Table 58: *Results of the Microbiological Analysis – Pond on Location Kiševo*

Sample number: U-1-III/17							
Parameters	Unit	Result	Method	Analyst	Date	Limit value	
Total coliforms	100 ml	3,5 x 10^4	BAS EN ISO 9308-1:2015*	Institute of Public Health FBiH	16. 03. 2017	-	-
Fecal coliforms *(Escherichia coli)*	100 ml	3 x 10^2	BAS EN ISO 9308-1:2015*		16. 03. 2017	-	-
Fecal streptococcus (*Enterococcus faecalis*)	100 ml	10	BAS EN ISO 7899-2:2003		16. 03. 2017	-	-

Table 59: *Results of the Microbiological Analysis – Water Source Blace*

Sample number: U-2-III/17							
Parameters	**Unit**	**Result**	**Method**	**Analyst**	**Date**	**Limit value**	
Total coliforms	100 ml	$3,6 \times 10^4$	BAS EN ISO 9308-1:2015*	Institute of Public Health FBiH	16. 03. 2017	-	-
Fecal coliforms *(Escherichia coli)*	100 ml	10	BAS EN ISO 9308-1:2015*		16. 03. 2017	-	-
Fecal streptococcus (*Enterococcus faecalis*)	100 ml	7	BAS EN ISO 7899-2:2003		16. 03. 2017	-	-

Table 60: *Results of the Microbiological Analysis – The Water Well on Location Crnoglav*

Sample number: U-3-III/17							
Parameters	**Unit**	**Result**	**Method**	**Analyst**	**Date**	**Limit value**	
Total coliforms	100 ml	8×10^3	BAS EN ISO 9308-1:2015*	Institute of Public Health FBiH	16. 03. 2017	-	-
Fecal coliforms *(Escherichia coli)*	100 ml	Not isolated	BAS EN ISO 9308-1:2015*		16. 03. 2017	-	-
Fecal streptococcus (*Enterococcus faecalis*)	100 ml	Not isolated	BAS EN ISO 7899-2:2003		16. 03. 2017	-	-

Table 61: *Results of the Microbiological Analysis – Hutovo Blato - Southwards*

Sample number: U-4-III/17							
Parameters	**Unit**	**Result**	**Method**	**Analyst**	**Date**	**Limit value**	
Total coliforms	100 ml	$1,5 \times 10^4$	BAS EN ISO 9308-1:2015*	Institute of Public Health FBiH	16. 03. 2017	-	-
Fecal coliforms *(Escherichia coli)*	100 ml	Not isolated	BAS EN ISO 9308-1:2015*		16. 03. 2017	-	-
Fecal streptococcus (*Enterococcus faecalis*)	100 ml	Not isolated	BAS EN ISO 7899-2:2003		16. 03. 2017	-	-

Table 62: *Results of the Microbiological Analysis – Hutovo Blato – Northwards*

Sample number: U-5-III/17							
Parameters	**Unit**	**Result**	**Method**	**Analyst**	**Date**	**Limit value**	
Total coliforms	100 ml	4,5 x 10^3	BAS EN ISO 9308-1:2015*	Institute of Public Health FBiH	16. 03. 2017	-	-
Fecal coliforms *(Escherichia coli)*	100 ml	10	BAS EN ISO 9308-1:2015*		16. 03. 2017	-	-
Fecal streptococcus (*Enterococcus faecalis*)	100 ml	Not isolated	BAS EN ISO 7899-2:2003		16. 03. 2017	-	-

Table 63: *Results of Physical, Chemical and Microbiological Analysis of Water at Water Source Blace - Well 3*[125]

No.	Parameter	Result					Unit	Rulebook[126] (Annex I and II)
		17.07.2012	23.04.2015	29.09.2015	21.04.2016	08.09.2016		LV
Phisical and Chemical Analysis								
1.	Turbidity	**1.67**	**1.20**	<0,1	<0,01	<0,01	NTU	**1.00**
2.	Colour	without	without	without	without	without	-	**-**
3.	Smell	without	without	without	without	without	-	**-**
4.	Taste	without	without	without	without	without	-	**-**
5.	Electro Conductivity	487	464	469	517	488	μScm^{-1} at 20°C	**2,500**
6.	pH	7.8	7.5	7.4	7.3	7.3	pH value	**6.5-9.5**
7.	Residual Chlorine	-	-	-	-	-	mg/l	**0.5**
8.	Consumption of KMnO4	0.89	0.89	0.26	0.64	0.38	0_2 mg/l	**5.0**
9.	Ammonia	0.00	<0,005	<0,005	<0,005	<0,005	NH_4^+ mg/l	**0.50**
10.	Nitrates	1.76	0.160	0.483	0.240	0.377	NO_3^- mg/l	**50**
11.	Nitrites	0.02	-	-	-	-	NO_2^- mg/l	**0.50**
12.	Sulphates	12.19	4.420	6.670	4.510	3.370	SO_4^- mg/l	**250**
13.	TOC	2.31	-	-	-	-	mg/l C	**-**
14.	Chlorides	9.5	10.5	9.80	11.2	9.8	Cl^- mg/l	**250**
15.	Arsenic (As)	0.00	-	-	-	-	µg/l As	**10**

[125] Well 1 and well 2 were not in a use at the time of analysis
[126] Rulebook on Drinking Water Health Safety (Official Gazzette of FBIH, No. 40/10)

No.	Parameter	Result					Unit	Rulebook[126] (Annex I and II)
		17.07.2012	23.04.2015	29.09.2015	21.04.2016	08.09.2016		LV
16.	Aluminium	23.13	-	-	-	-	µg/l Al	**200**
17.	Antimony	0.06	-	-	-	-	µg/l Sb	**5.0**
18.	Copper	1.37	-	-	-	-	µg/l Cu	**2.0**
19.	Cadmium	0.00	<0,05	<0,05	<0,05	<0,05	µg/l Cd	**5.0**
20.	Chrome	0.69	0.69	0.77	2.88	2.03	µg/l Cr	**5.0**
21.	Manganese	1.16	-	-	-	-	µg/l Mn	**50**
22.	Sodium	5.38	3.32	11.64	11.58	5.89	mg/l Na	**200**
23.	Nickel	0.44	-	-	-	-	µg/l Ni	**20**
24.	Lead	0.14	0.30	0.17	1.33	0.90	µg/l Pb	**10**
25.	Iron	50.6	51.20	49.90	86.70	48.60	µg/l Fe	**200**
26.	Mercury	0.00	0.01	0.05	0.03	<0,01	µg/l Hg	**1.0**
27.	Anionic Detergents	0.67	4.88	8.95	8.66	8.60	µg/l	**200**
28.	Mineral Oil	0.00	-	-	-	-	µg/l	**20.0**
Microbiological Analysis								
1.	Coliform bacteria	230	0	0	0	0	100 ml	**0,00**
2.	*Escherichia colli*	4	0	0	0	0	100 ml	**0,00**
3.	*Enterococcus faecalis*	46	0	0	0	0	100 ml	**0,00**
4.	*Clostridium prefigens*	0	-	-	-	-	100 ml	**0,00**
5.	Number of colonies at 37°C	**290**	-	-	-	-	1 ml	**20**
6.	Number of colonies at 22°C	**360**	-	-	-	-	1 ml	**100**

4.4 Monitoring Results of Noise Levels

Measurement and evaluation of noise levels is carried out according to international standards ISO 1996/1 and 1996/2.

Based on the collected and analysed data from the field it may be concluded that the results of measurements correspond to the acoustic requirements of the client, as well as the acoustic requirements defined by the *Law on Noise Protection* (Official Gazette of the FBiH, No. 110/12).

Table 64: *Locations of the Measurement of Noise Levels*

Measurement point	Chainage	Coordinates		The position in relation to planned road	A closer toponym
		X	Y		
1	33+225,000	43º00'52.62''	17º54'58.80'	Right	Road to populated place Matića Mahala
2	32+25,000	43º00'13.50'	17º55''18.24''	Left	Populated place Udora
3	26+000,000	42º59'19.62''	017º51'56.22''	Right	Populated place Crnoglav
4	25+50,000	42°59'27.98"	17°51'12.99"	Left	Populated place Vinine
5	21+900,000	42°59'13.25"	17°49'6.72"	Right	Populated place Cerovica
6	17+500,000	42°57'57.31"	17°47'38.87"	Right	Populated place Hutovo
7	14+950,000	42°56'58.19"	17°46'43.45"	Right	Populated place Prapratnica
8	12+50,000	42°57'12.77"	17°45'1.46"	Left	Populated place Broćanac
9	3+000,000	42°56'2.46"	17°39'42.64"	Right	Populated place Kiševo
10	0+300,000	42°55'29.83"	17°38'7.47"	Right	Water spring Blace

Table 65: *Results of the Measurement of Noise Levels*

MEASURING POINT	DESCRIPTION OF MEASURING AND WORKING CONDITIONS										
1	Measurement point is located at the chainage 33+225,000 km on the right side of the planned road at the distance of 40 m.*										
	NOISE LEVEL AND THE ADJUSTEMENT IN dB(A)										
	ENERGY AVARAGE VALUE			**ADJUSTMENT**		**RATING LEVEL**		**DAYTIME LIMIT VALUE ACCORDING TO NATIONALN LEGISLATION**		**DAYTIME LIMIT VALUE ACCORDING TO WORLD BANK STANDARDS**	
	L_{rezid}	L_{eq}	$L_{1\%}$	K_T	K_I	L_{Req}	$L_{R1\%}$	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas
	-	34,3	44,6	-	-	34,3	44,6	70	55	70	55
2	Measurement point is located at the chainage 32+25,000 km on the left side of the planned road at the distance of 30 m.*										
	NOISE LEVEL AND THE ADJUSTEMENT IN dB(A)										
	ENERGY AVARAGE VALUE			**ADJUSTMENT**		**RATING LEVEL**		**DAYTIME LIMIT VALUE ACCORDING TO NATIONAL LEGISLATION**		**DAYTIME LIMIT VALUE ACCORDING TO WORLD BANK STANDARDS**	

MEASURING POINT	DESCRIPTION OF MEASURING AND WORKING CONDITIONS										
	L_{rezid}	L_{eq}	$L_{1\%}$	K_T	K_I	L_{Req}	$L_{R1\%}$	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas
	-	40,5	42,5	-	-	40,5	42,5	70	55	70	55
3	Measurement point is located at the chainage 26+000,000 km on the right side of the planned road at the distance of 35 m.*										
	NOISE LEVEL AND THE ADJUSTEMENT IN dB(A)										
	ENERGY AVARAGE VALUE			**ADJUSTMENT**		**RATING LEVEL**		**DAYTIME LIMIT VALUE ACCORDING TO NATIONALN LEGISLATION**		**DAYTIME LIMIT VALUE ACCORDING TO WORLD BANK STANDARDS**	
	L_{rezid}	L_{eq}	$L_{1\%}$	K_T	K_I	L_{Req}	$L_{R1\%}$	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas
	-	42,6	49,5	-	-	42,6	49,5	70	55	70	55
4	Measurement point is located at the chainage 25+50,000 km on the left side of the planned road at the distance of 35 m.*										
	NOISE LEVEL AND THE ADJUSTEMENT IN dB(A)										
	ENERGY AVARAGE VALUE			**ADJUSTMENT**		**RATING LEVEL**		**DAYTIME LIMIT VALUE ACCORDING TO NATIONALN LEGISLATION**		**DAYTIME LIMIT VALUE ACCORDING TO WORLD BANK STANDARDS**	
	L_{rezid}	L_{eq}	$L_{1\%}$	K_T	K_I	L_{Req}	$L_{R1\%}$	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas
	-	41,8	45,6	-	-	41,8	45,6	70	55	70	55
5	Measurement point is located at the chainage 21+900,000 km on the right side of the planned road at the distance of 30 m.*										
	NOISE LEVEL AND THE ADJUSTEMENT IN dB(A)										
	ENERGY AVARAGE VALUE			**ADJUSTMENT**		**RATING LEVEL**		**DAYTIME LIMIT VALUE ACCORDING TO NATIONALN LEGISLATION**		**DAYTIME LIMIT VALUE ACCORDING TO WORLD BANK STANDARDS**	
	L_{rezid}	L_{eq}	$L_{1\%}$	K_T	K_I	L_{Req}	$L_{R1\%}$	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas
	-	37,4	44,9	-	-	37,4	44,9	70	55	70	55

MEASURING POINT	DESCRIPTION OF MEASURING AND WORKING CONDITIONS										
6	Measurement point is located at the chainage 17+500,000 km on the right side of the planned road at the distance of 30 m.*										
	NOISE LEVEL AND THE ADJUSTEMENT IN dB(A)										
	ENERGY AVARAGE VALUE			**ADJUSTMENT**		**RATING LEVEL**		**DAYTIME LIMIT VALUE ACCORDING TO NATIONALN LEGISLATION**		**DAYTIME LIMIT VALUE ACCORDING TO WORLD BANK STANDARDS**	
	L_{rezid}	L_{eq}	$L_{1\%}$	K_T	K_I	L_{Req}	$L_{R1\%}$	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas
	-	40,4	50,4	-	-	40,4	50,4	70	55	70	55
7	Measurement point is located at the chainage 14+950,000 km on the right side of the planned road at the distance of 35 m.*										
	NOISE LEVEL AND THE ADJUSTEMENT IN dB(A)										
	ENERGY AVARAGE VALUE			**ADJUSTMENT**		**RATING LEVEL**		**DAYTIME LIMIT VALUE ACCORDING TO NATIONALN LEGISLATION**		**DAYTIME LIMIT VALUE ACCORDING TO WORLD BANK STANDARDS**	
	L_{rezid}	L_{eq}	$L_{1\%}$	K_T	K_I	L_{Req}	$L_{R1\%}$	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas
	-	41,1	47,2	-	-	41,1	47,2	70	55	70	55
8	Measurement point is located at the chainage 12+50,000 km on the left side of the planned road at the distance of 30 m.*										
	NOISE LEVEL AND THE ADJUSTEMENT IN dB(A)										
	ENERGY AVARAGE VALUE			**ADJUSTMENT**		**RATING LEVEL**		**DAYTIME LIMIT VALUE ACCORDING TO NATIONALN LEGISLATION**		**DAYTIME LIMIT VALUE ACCORDING TO WORLD BANK STANDARDS**	
	L_{rezid}	L_{eq}	$L_{1\%}$	K_T	K_I	L_{Req}	$L_{R1\%}$	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas
	-	38,3	43,9	-	-	38,3	43,9	70,0	85,0	70	55
9	Measurement point is located at the chainage 3+000,000 km on the right side of the planned road at the distance of 30 m.*										
	NOISE LEVEL AND THE ADJUSTEMENT IN dB(A)										
	ENERGY AVARAGE VALUE			**ADJUSTMENT**		**RATING LEVEL**		**DAYTIME LIMIT VALUE ACCORDING TO NATIONALN LEGISLATION**		**DAYTIME LIMIT VALUE ACCORDING TO WORLD BANK STANDARDS**	

MEASURING POINT	DESCRIPTION OF MEASURING AND WORKING CONDITIONS										
	L_{rezid}	L_{eq}	$L_{1\%}$	K_T	K_I	L_{Req}	$L_{R1\%}$	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas
	-	43,7	48,1	-	-	43,7	48,1	70	55	70	55
10	Measurement point is located at the chainage 0+300,000 km on the right side of the planned road at the distance of 35 m.*										
	NOISE LEVEL AND THE ADJUSTEMENT IN dB(A)										
	ENERGY AVARAGE VALUE			**ADJUSTMENT**		**RATING LEVEL**		**DAYTIME LIMIT VALUE ACCORDING TO NATIONALN LEGISLATION**		**DAYTIME LIMIT VALUE ACCORDING TO WORLD BANK STANDARDS**	
	L_{rezid}	L_{eq}	$L_{1\%}$	K_T	K_I	L_{Req}	$L_{R1\%}$	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas	L_{Req} - industrial and commercial areas	L_{Req} - residential and educational areas
	-	39,4	45,7	-	-	39,4	45,7	70	55	70	55

*outside the scope of accreditation

Legend: L_{rezid} – measured levels of residual noise, L_{eq} – measured equivalent noise level, K_T i K_I – adjuctments to tonality and impulsiveness noise, L_{Req} – rating level of noise, L1%-noise that is exceeded 1% of time

4.5 Results of Survey of the Site for any Endangered and Endemic Species

Table 66: *Site Specific Flora Species – Road Section Neum Stolac*

No.	Location	Sub-Section	Chainage	Identified Flora species		Status of Vulnerability		
				Latin name[127]	English name	Red List FBiH	EU Habitat Directive	IUCN Status
1	Drenovac – Start of the section	Drenovac - Cerovica	36+400.000	*Arctium lappa* (Asteraceae)	Greater burdock	-	-	-
				Poaceae	Grasses	-	-	-
				***Crocus biflorus* (Iridaceae)**	**Crocus**	**Critically Endangered**	**-**	**-**
				***Punica granatum* (Lythraceae)**	**Pomegranate**	**-**	**-**	**Least concern**
				Primulina eburnea (Gesneriaceae)	African violets	-	-	-
				Forsythia europaea (Oleaceae)	*Forsythia*	-	-	-
				***Juniperus oxycedrus* (Cupressaceae)**	**Prickly juniper**	**-**	**-**	**Least concern**

[127] Radovan, 1984

No.	Location	Sub-Section	Chainage	Identified Flora species		Status of Vulnerability		
				Latin name[127]	English name	Red List FBiH	EU Habitat Directive	IUCN Status
2	Location Pušišta Intersection	Drenovac - Cerovica	35+000.000	*Juniperus oxycedrus* (Cupressaceae)	Prickly juniper	-	-	Least concern
				Poaceae	Grasses	-	-	-
				Crocus biflorus (Iridaceae	Croci	Criticaly Endangered	-	-
3.	Location Kadića Dubrava	Drenovac - Cerovica	34+275.000	*Juniperus oxycedrus* (Cupressaceae)	Prickly juniper	-	-	Least concern
				Poaceae	Grasses	-	-	-
				Crocus biflorus (Iridaceae)	Croci	Criticaly endangered	-	-
4.	Old School/Hunting lodge	Drenovac – Cerovica	34+825.000	*Cornus mas* (Cornaceae)	Cornelian cherry		-	-
				Cupressus sempervirens (Cupressaceae)	Mediterranean cypress	-	-	-
5.	Location Gornji Bjelojevići	Drenovac – Cerovica	33+490.000	*Juniperus macrocarpa* (Cupressaceae)	Large-fruited juniper	-	-	-
				Quercus pubescens (Fagaceae)	Downy oak	-	-	-
6.	Intersection /chapel	Drenovac – Cerovica	33+230.000	see above	-	-	-	-
7.	Location Udora	Drenovac – Cerovica	32+800.000	*Paliurus spina-christi* (Rhamnaceae)	Christ's thorn	-	-	-
				***Hedra helix* (Hederaceae)**	**Ivy**	**-**	**-**	**Least concern**
				Punica granatum (Lythraceae	Pomegranate	-	-	Least concern
8.	Border of Two Hunting Areas – Neum/Stolac	Drenovac - Cerovica	28+000.000	*Punica granatum* (Lythraceae)	Pomegranate	-	-	Least concern
9.	Location Gornje Hrasno (at existing Popovi intersection)	Drenovac - Cerovica	27+350.000	*Quercus pubescens* (Fagaceae)	Downy oak	-	-	-
10.	Slopes of Hill Crnoglav	Drenovac - Cerovica	26+350.000	*Punica granatum* (Lythraceae)	Pomegranate	-	-	Least concern
11.	Reservoir (Čatrnja) below Slopes of Hill Crnoglav	Drenovac - Cerovica	25+600.000	*Punica granatum* (Lythraceae)	Pomegranate	-	-	Least concern
				Juniperus macrocarpa (Cupressaceae)	Large-fruited juniper	-	-	-
				Quercus pubescens (Fagaceae)	Downy oak	-	-	-
12.	Estate near Vivine Settlement	Drenovac - Cerovica	25+220.000	*Juniperus macrocarpa* (Cupressaceae)	Large-fruited juniper	-	-	-
13.	Location Exit of Vivine Settlement	Drenovac - Cerovica	23+340.000	see above	-	-	-	-
14.	Intersection for Neum	Broćanac – Hutovo - Cerovica	22+200.000	*Juniperus macrocarpa* (Cupressaceae)	Large-fruited juniper	-	-	-
15.	Cerovica and Sanctuary of the Queen of Peace	Broćanac-Hutovo-Cerovica	21+400.000	*Forsythia europaea* (Oleaceae)	*Forsythia*	-	-	-
16	Road Near the Existing Train Planum	Broćanac-Hutovo-	18+750.000	-	-	-	-	-

No.	Location	Sub-Section	Chainage	Identified Flora species		Status of Vulnerability		
				Latin name[127]	English name	Red List FBiH	EU Habitat Directive	IUCN Status
		Cerovica						
17.	Settlement Hutovo 2-Exit of the Tunnel Žaba	Broćanac-Hutovo-Cerovica	16+730.000	*Paliurus spina-christi* (Rhamnaceae)	Christ's thorn	-	-	-
				Clematis flammula (Ranunculaceae)	Fragrant virgin's bower	-	-	-
				Tamus communis (Dioscoreaceae)	Lady's-seal	-	-	-
				***Avena fatua* (Poaceae)**	**Common wild oat**	**-**	**-**	**Least concern**
				Punica granatum (Lythrace ae)	Pomegranate	-	-	-
18.	Settlement Hutovo 1	Broćanac-Hutovo-Cerovica	16+680.000	*Juniperus oxycedrus* (Cupressaceae)	Prickly juniper	-	-	Least concern
				Quercus pubescens (Fagaceae)	Downy oak	-	-	-
19	Hadžibeys Old city	Broćanac-Hutovo-Cerovica	16+300.000	*Cornus mas* (Cornaceae)	Cornelian cherry	-	-	-
				Tamus communis (Dioscoreaceae)	Lady's-seal	-	-	-
				Clematis flammula (Ranunculaceae)	Fragrant virgin's bower	-	-	-
				Forsythia europaea (Oleaceae)	*Forsythia*	-	-	-
				Viola adriatica (Violaceae)	Viola	-	-	-
				Hedra helix (Hederaceae)	Ivy	-	-	Least concern
20.	Entrance to the tunnel Žaba	Broćanac-Hutovo-Cerovica	15+400.000	*Juniperus macrocarpa* (Cupressaceae)	Large-fruited juniper	-	-	-
21.	Location Broćanac – Papratnica (Deviation of Road)	Broćanac-Hutovo-Cerovica	12+450.000	*Hedra helix* (Hederaceae)	Ivy	-	-	Least concern
				Spartium junceum (Fabaceae)	Spanish broom	-	-	-
				Olea europaea (Oleaceae)	Olive	-	-	-
				Helichrysum arenarium (Asteraceae)	Immortelle	-	-	-
22.	Location Gradac Podžablje	Babin Do-Broćanac	8+850.000	***Vitis vinifera* (Vitaceae)**	**Common grape vine**	**-**	**-**	**Least concern**
23.	Location Mošević	Babin Do-Broćanac	5+450.000	Poaceae	Grass	-	-	-
24.	Location Babin Do-Broćanac	Babin Do-Broćanac	5+230.000	*Juniperus macrocarpa* (Cupressaceae)	Large-fruited juniper	-	-	-

No.	Location	Sub-Section	Chainage	Identified Flora species		Status of Vulnerability		
				Latin name[127]	English name	Red List FBiH	EU Habitat Directive	IUCN Status
	(start of the section)			*Spartium junceum* (Fabaceae)	Spanish broom	-	-	-
				Sedum acre (Crassulaceae)	Goldmoss stonecrop	-	-	-
				Clematis flammula (Ranunculaceae)	Fragrant virgin's bower	-	-	-
				Ambrosia artemisiifolia (Asteraceae)	Commo n ragweed	-	-	-
25	Location Kiševo –Small Carts Field	Kiševo-Babin Do	2+210.000	*Viola adriatica* (Violaceae)	Violas	-	-	-
				***Pistacia terebinthus* (Anacardiaceae)**	**Turpentine tree**	**-**	**-**	**Least concern**
				Laurus nobilis (Lauraceae)	Grecian laurel	-	-	-
26	Landfill for Construction material	Stari Neum - Kiševo	1+340.000	-	-	-	-	-
27.	Near source Blace	Stari Neum - Kiševo	1+000.000	*Poaceae*	Grass	-	-	-
				Trifolium repens (Fabaceae)	Clover	-	-	-
28.	Intersection Vranjevo selo	Babin Do-Broćanac	0+720.000	*Juniperus macrocarpa* (Cupressaceae)	Large-fruited juniper	-	-	-
				Tamus communis (Dioscoreaceae)	Lady's-seal	-	-	-
29	Location Stari Neum – Kiševo (start of the section)	Stari Neum - Kiševo	0+250.000	*Spartium junceum* (Fabaceae)	Spanish broom	-	-	-
				Sedum acre (Crassulaceae)	Goldmoss stonecrop	-	-	-

Table 67: *Directly Identified Fauna Species*

No.	Location	Sub-Section	Chainage	Identified Fauna		Status of vulnerability			
				Latin name[128]	English name	Red list FBiH	EU Habitat Directive	EU Birds Directive	IUCN Status
3.	Location Blavor	Drenovac - Cerovica	34+275+000	***Ophisaurus apodus*** **(Anguidae)**	**European legless lizard**	**-**	**Annex IV**	**-**	**-**
13.	Location Vivine	Drenovac - Cerovica	23+340.000	***Lacerta viridis*** **(Lacertidae)**	**European green lizard**	**Least concern**	**Annex IV**	**-**	**Least concern**
20.	Near source Blace	Stari Neum - Kiševo	15+400.000	***Ciconia ciconia*** **(Ciconiidae)**	**White storck**	**Endangered**	**-**	**Annex 1**	**-**
				Larus sp. **(Laridae)**	**Seabird**	**Least concern**	**-**	**Annex 1**	**-**
				Sus scrofa **(Suidae)**	**Wild boar**	**Least concern**	**-**	**-**	**Least concern**

Table 68: *Fauna Species whose Presence is Indirectly Determined*

No.	Location	Sub-Section	Chainage	Identified Fauna		Status of vulnerability			
				Latin name[129]	English name	Red list FBiH	EU Habitat Directive	EU Birds Directive	IUCN Status
1.	Drenovac – Start of the section	Drenovac - Cerovica	36+400.000	*Erinaceus* sp. (Erinaceidae)	Hedghog	Endangered	Annex IV	-	Least concern
				Lepus europaeus (Leporidae)	Rabbit	Least concern	-	-	Least concern
2.	Location Pušišta Intersection	Drenovac - Cerovica	35+000.000	*Passer domesticus* (Passeridae)	house sparrow	Least concern	-	-	Least concern
3.	Location Kadića Dubrava	Drenovac - Cerovica	34+275.000	*Ophisaurus apodus* (Anguidae)	european legless lizard	-	Annex IV	-	-
4.	Old School/Hunting lodge	Drenovac – Cerovica	34+825.000	*Sus scrofa* (Suidae)	Wild boar	Least concern	-	-	Least concern

[128] Lelo,2011; Lelo, 2012; Lelo, Kotrošan & Kašić-Lelo, 2014
[129] Lelo,2011; Lelo, 2012; Lelo, Kotrošan & Kašić-Lelo, 2014

No.	Location	Sub-Section	Chainage	Identified Fauna		Status of vulnerability			
				Latin name[129]	English name	Red list FBiH	EU Habitat Directive	EU Birds Directive	IUCN Status
				Lepus europaeus (Leporidae)	Rabbit	Least concern	-	-	Least concern
				Vipera ammodytes (Viperidae)	Horned viper	Least concern	Annex IV	-	Least concern
5.	Location Gornji Bjelojevići	Drenovac – Cerovica	33+490.000	*Vipera ammodytes* (Viperidae)	Horned viper	Least concern	Annex IV	-	Least concern
6.	Intersection /chapel	Drenovac – Cerovica	33+230.000	-	-	-	-	-	-
7.	Location Udora	Drenovac – Cerovica	32+800.000	*Vipera ammodytes* (Viperidae)	Horned viper	Least concern	Annex IV	-	Least concern
8.	Border if Two Hunting Areas - Neum/Stolac	Drenovac - Cerovica	28+000.000	*Lepus europaeus* (Leporidae)	Rabbit	Least concern	-	-	Least concern
9.	Location Gornje Hrasno (at existing Popovi intersection)	Drenovac - Cerovica	27+350.000	*Erinaceus* sp. (Erinaceidae)	Hedghog	Endangere	Annex IV	-	Least concern
10.	Slopes of Hill Crnoglav	Drenovac - Cerovica	26+350.000	-	-	-	-	-	-
11.	Reservoir (Čatrnja) below Slopes of Hill Crnoglav	Drenovac - Cerovica	25+600.000	-	-	-	-	-	-
12.	Estate near Vivine Settlement	Drenovac - Cerovica	25+220.000	-	-	-	-	-	-
13.	Location Exit of Vivine Settlement	Drenovac - Cerovica	23+340.000	*Haemidactylus turcicus* (Gekkonidae)	mediterranean house gecko	-	-	-	-
				Lacerta viridis (Lacertidae)	european green lizard	Least concern	Annex IV	-	Least concern
14.	Intersection for Neum	Broćanac-Hutovo - Cerovica	22+220.000	-	-	-	-	-	-
15.	Cerovica and Sanctuary of the Queen of Peace	Broćanac-Hutovo - Cerovica	21+400.000	-	-	-	-	-	-
16	Road near the Existing Train Planum	Broćanac-Hutovo - Cerovica	18+750.000	*Alectoris graeca* (Phasianidae)	Rock partridge	Data deficient	-	Annex II	Near Threatened

No.	Location	Sub-Section	Chainage	Identified Fauna		Status of vulnerability			
				Latin name[129]	English name	Red list FBiH	EU Habitat Directive	EU Birds Directive	IUCN Status
17.	Settlement Hutovo 2- Exit of the Tunnel Žaba	Broćanac-Hutovo-Cerovica	16+730.000	-	-	-	-	-	-
18.	Settlement Hutovo 1	Broćanac-Hutovo-Cerovica	16+680.000	-	-	-	-	-	-
19	Hadžibeys Old City	Broćanac-Hutovo-Cerovica	16+300.000	*Vipera ammodytes* (Viperidae)	Horned viper	Least concern	Annex IV	-	Least concern
20.	Entrance to the tunnel Žaba	Broćanac-Hutovo-Cerovica	15+400.000	-	-	-	-	-	-
21.	Location Broćanac-Papratnica (Deviation of the road)	Broćanac-Hutovo-Cerovica	12+450.000	-	-	-	-	-	-
22.	Location Gradac Podžablje	Babin Do-Broćanac	8+850.000	*Buteo buteo* (Accipitridae)	Buteo	Least concern	-	-	-
23.	Location Moševići	Babin Do-Broćanac	5+450.000	-	-	-	-	-	-
24.	Location Babin Do-Broćanac (start of the section)	Babin Do-Broćanac	5+230.000	*Vipera ammodytes* (Viperidae)	Horned viper	Least concern	Annex IV	-	Least concern
				Accipiter nisus (Accipitridae)	eurasian sparrowhawk	Least concern	-	Annex I	Least concern
25.	Location Kiševo –Small Carts Field	Kiševo-Babin Do	2+210.000	*Martes martes* (Mustelidae)	european pine marten	Least concern	Annex V	-	-
				Vipera ammodytes (Viperidae)	Horned viper	Least concern	Annex IV	-	Least concern
26.	Landfill for Construction Material	Stari Neum -Kiševo	1+340.000	-	-	-	-	-	-
27.	Near source Blace	Stari Neum -Kiševo	1+000.000	*Ciconia ciconia* (Ciconiidae)	White storck	Endangered	-	Annex 1	-
				Larus sp. (Laridae)	Seabird	Least concern	-	Annex 1	-
				Sus scrofa (Suidae)	Wild boar	Least concern	-	-	Least concern

No.	Location	Sub-Section	Chainage	Identified Fauna		Status of vulnerability			
				Latin name[129]	English name	Red list FBiH	EU Habitat Directive	EU Birds Directive	IUCN Status
28.	Intersection Vranjevo Village	Babin Do-Broćanac	0+720.000	-	-	-	-	-	-
29	Location Stari Neum –(start of the section)	Stari Neum -Kiševo	0+250.000	-	-	-	-	-	-

4.6 Results of Survey of the Site for Forest Types

Table 69: *Site Specific Forest Ecosystem – Road Section Neum Stolac*

No.	Location	Sub-Section	Chainage	Identified Forest Ecosystem	
				Latin name	English name
1.	Drenovac – Start of the section	Drenovac - Cerovica	36+400.000	-	-
2.	Location Pušišta Intersection	Drenovac - Cerovica	35+000.000	-	-
3.	Location Kadića Dubrava	Drenovac - Cerovica	34+275.000	-	-
4.	Old School/Hunting lodge	Drenovac - Cerovica	34+825.000	-	-
5.	Location Gornji Bjelojevići	Drenovac - Cerovica	33+490.000	*Querco pubescentis-Carpientum orientalis*	Submediterranean forests of oriental hornbeam and pubescent oak
6.	Intersection /chapel	Drenovac - Cerovica	33+230.000	-	-
7.	Location Udora	Drenovac - Cerovica	32+800.000	-	-
8.	Border of Two Hunting Areas - Neum/Stolac	Drenovac - Cerovica	28+000.000	-	-
9.	Location Gornje Hrasno (at existing Popovi intersection)	Drenovac - Cerovica	27+350.000	*Querco pubescentis-Carpientum orientalis*	Submediterranean forests of oriental hornbeam and pubescent oak
10.	Slopes of Hill Crnoglav	Drenovac - Cerovica	26+350.000	-	-
11.	Reservoir (Čatrnja) below Slopes of Hill Crnoglav	Drenovac - Cerovica	25+600.000	*Querco pubescentis-Carpientum orientalis*	Submediterranean forests of oriental hornbeam and pubescent oak
12.	Estate near Vivine Settlement	Drenovac - Cerovica	25+220.000	-	-
13.	Location Exit of Vivine Settlement	Drenovac - Cerovica	23+340.000	-	-
14.	Intersection for Neum	Broćanac-Hutovo-Cerovica	22+200.000	-	-
15.	Cerovica and Sanctuary of the Queen of Peace	Broćanac-Hutovo-Cerovica	21+400.000	-	-
16.	Road Near the Existing Train Planum	Broćanac-Hutovo-	18+750.00	-	-

No.	Location	Sub-Section	Chainage	Identified Forest Ecosystem	
				Latin name	English name
		Cerovica			
17.	Settlement Hutovo 2- Exit of the Tunnel Žaba	Broćanac-Hutovo-Cerovica	16+730.000	-	-
18.	Settlement Hutovo 1	Broćanac-Hutovo-Cerovica	16+680.000	*Querco pubescentis-Carpientum orientalis*	Submediterranean forests of oriental hornbeam and pubescent oak
19.	Hadžibeys Old city	Broćanac-Hutovo-Cerovica	16+300.000	*Querco pubescentis-Carpientum orientalis*	Submediterranean forests of oriental hornbeam and pubescent oak
20.	Entrance to the tunnel Žaba	Broćanac-Hutovo-Cerovica	15+400.000	*Querco pubescentis-Carpientum orientalis*	Submediterranean forests of oriental hornbeam and pubescent oak
21.	Location Broćanac-Papratnica (Deviation of the Road)	Broćanac-Hutovo-Cerovica	12+450.000	-	-
22.	Location Gradac Podžablje	Babin Do-Broćanac	8+850.000	-	-
23.	Location Moševići	Babin Do-Broćanac	5+450.000	-	-
24.	Location Babin Do-Broćanac (start of the section)	Babin Do-Broćanac	5+230.000	*Quercion ilicis et Cisto - Ericion*	Eumediterranean zone of evergreen vegetation (*macchia and garrigue)* of holm oak
25.	Location Kiševo –Small Carts Field	Kiševo-Babin Do	2+210.000	*Quercion ilicis et Cisto - Ericion*	Eumediterranean zone of evergreen vegetation (*macchia and garrigue)* of holm oak
26.	Landfill for Construction Material	Stari Neum - Kiševo	1+340.000	*Quercion ilicis et Cisto - Ericion*	Eumediterranean zone of evergreen vegetation (*macchia and garrigue)* of holm oak
27.	Near source Blace	Stari Neum - Kiševo	1+000.000	*Quercion ilicis et Cisto - Ericion*	Eumediterranean zone of evergreen vegetation (*macchia and garrigue)* of holm oak
28.	Intersection Vranjevo Village	Babin Do-Broćanac	0+720.000	*Quercus ilicis et Cisto - Ericion*	Eumediterranean zone of evergreen vegetation (*macchia and garrigue)* of holm oak
29.	Location Stari Neum – (start of the section)	Stari Neum - Kiševo	0+250.000	-	-

4.7 Results of Survey of the Site for Medicinal Herbs

Table 70: *Site Specific Medicinal Herbs – Road Section Neum Stolac*[130]

No.	Location	Sub-Section	Chainage	Identified Herb species	
				Latin name[131]	English name
1	Drenovac – Start of the section	Drenovac - Cerovica	36+400.000	*Arctium lappa* (Asteraceae)	Greater burdock
				Crocus biflorus (Iridaceae)	Crocus
				Punica granatum (Lythraceae)	Pomegranate
				Juniperus oxycedrus (Cupressaceae)	Prickly juniper
2	Location Pušišta Intersection	Drenovac - Cerovica	35+000.000	*Juniperus oxycedrus* (Cupressaceae)	Prickly juniper
				Crocus biflorus (Iridaceae)	Croci
3.	Location Kadića Dubrava	Drenovac - Cerovica	34+275.000	*Juniperus oxycedrus* (Cupressaceae)	Prickly juniper
				Crocus biflorus (Iridaceae)	Croci
4.	Old School/Hunting lodge	Drenovac – Cerovica	34+825.000	*Cornus mas* (Cornaceae)	Cornelian cherry
				Cupressus sempervirens (Cupressaceae)	Mediterranean cypress
5.	Location Gornji Bjelojevići	Drenovac – Cerovica	33+490.000	*Juniperus macrocarpa* (Cupressaceae)	Large-fruited juniper
6.	Intersection /chapel	Drenovac – Cerovica	33+230.000	see above	-
7.	Location Udora	Drenovac – Cerovica	32+800.000	*Paliurus spina-christi* (Rhamnaceae)	Christ's thorn
				Hedera helix (Hederaceae)	Ivy
				Punica granatum (Lythraceae	Pomegranate
8.	Border of Two Hunting Areas – Neum/Stolac	Drenovac - Cerovica	28+000.000	*Punica granatum* (Lythraceae)	Pomegranate
9.	Location Gornje Hrasno (at existing Popovi intersection)	Drenovac - Cerovica	27+350.000	-	-
10.	Slopes of Hill Crnoglav	Drenovac - Cerovica	26+350.000	*Punica granatum* (Lythraceae)	Pomegranate
11.	Reservoir (Čatrnja) below Slopes of Hill Crnoglav	Drenovac - Cerovica	25+600.000	*Punica granatum* (Lythraceae)	Pomegranate
				Juniperus macrocarpa (Cupressaceae)	Large-fruited juniper
12.	Estate near Vivine Settlement	Drenovac - Cerovica	25+220.000	*Juniperus macrocarpa* (Cupressaceae)	Large-fruited juniper
13.	Location Exit of Vivine Settlement	Drenovac - Cerovica	23+340.000	see above	-
14.	Intersection for Neum	Broćanac – Hutovo - Cerovica	22+200.000	*Juniperus macrocarpa* (Cupressaceae)	Large-fruited juniper
15.	Cerovica and Sanctuary of the Queen of Peace	Broćanac-Hutovo-Cerovica	21+400.000	-	-
16	Road Near the Existing Train Planum	Broćanac-Hutovo-Cerovica	18+750.000	-	-
17.	Settlement Hutovo 2- Exit of the Tunnel Žaba	Broćanac-Hutovo-Cerovica	16+730.000	*Paliurus spina-christi* (Rhamnaceae)	Christ's thorn
				Tamus communis (Dioscoreaceae)	Lady's-seal
				Punica granatum (Lythrace ae)	Pomegranate
18.	Settlement Hutovo 1	Broćanac-Hutovo-Cerovica	16+680.000	*Juniperus oxycedrus* (Cupressaceae)	Prickly juniper
19	Hadžibeys Old city	Broćanac-Hutovo-Cerovica	16+300.000	*Cornus mas* (Cornaceae)	Cornelian cherry
				Tamus communis (Dioscoreaceae)	Lady's-seal
				Hedra helix (Hederaceae)	Ivy
20.	Entrance to the tunnel Žaba	Broćanac-Hutovo-Cerovica	15+400.000	*Juniperus macrocarpa* (Cupressaceae)	Large-fruited juniper
21.	Location Broćanac – Papratnica (Deviation of Road)	Broćanac-Hutovo-Cerovica	12+450.000	*Hedra helix* (Hederaceae)	Ivy
				Olea europaea (Oleaceae)	Olive
				Helichrysum arenarium (Asteraceae)	Immortelle
22.	Location Gradac Podžablje	Babin Do-Broćanac	8+850.000	*Vitis vinifera* (Vitaceae)	Common grape vine
23.	Location Moševići	Babin Do-Broćanac	5+450.000	-	-

[130] Šoljan, D. (2000). Cormofits as biological resources. University Book, Sarajevo.
[131] Šoljan, 2000

24.	Location Babin Do-Broćanac (start of the section)	Babin Do-Broćanac	5+230.000	*Juniperus macrocarpa* (Cupressaceae)	Large-fruited juniper
25	Location Kiševo –Small Carts Field	Kiševo-Babin Do	2+210.000	*Pistacia terebinthus* (Anacardiaceae)	Turpentine tree
				Laurus nobilis (Lauraceae)	Grecian laurel
26	Landfill for Construction material	Stari Neum -Kiševo	1+340.000	-	-
27.	Near source Blace	Stari Neum -Kiševo	1+000.000	-	-
28.	Intersection Vranjevo selo	Babin Do-Broćanac	0+720.000	*Juniperus macrocarpa* (Cupressaceae)	Large-fruited juniper
				Tamus communis (Dioscoreaceae)	Lady's-seal
29	Location Stari Neum –Kiševo (start of the section)	Stari Neum -Kiševo	0+250.000	-	-

5 BIBLIOGRAPHY

- Census 2013 data. Available at: http://www.statistika.ba/
- Census 2013. Official web page of Federal Institute for statistics, available at: http://www.px-web.fzs.gov.ba
- EP FBiH Roads(2016). Environmental and Social Impact Assesment. Sarajevo
- EP FBiH Roads(2016). Ressetlement Action Plan Neum-Stolac. Sarajevo
- European Environmental Agency (2017) CLC database.
- Faculty of Civil and Geodetic Engineering of the University of Ljubljana and DDC Consulting & Engineering Ltd, 2005
- Federal Development Planning Institution (2015).Macroeconomic Indicators for Municipalities in FBiH for 2014. Sarajevo.
- Federal Institute of Public Health (2016). Status of health and health care in FBiH in 2015. Sarajevo
- Health and Safety Executive. (2013). The Approved List of biological agents.
- Institute for Statistics of FBiH (2012). First Release, No. 21.3. Sarajevo.
- IUCN Official Web Site: http://www.iucnredlist.org/static/categories_criteria_3_1 (accessed on: 09-27 March, 2017)
- Lelo, S. (2011.). Zoology. Faculty of Science, University in Sarajevo, Sarajevo.
- Lelo, S. (2012.). Herpetology. Sarajevo.
- Lelo, S. Kotrošan, D. & Kašić-Lelo, M. (2014.). Ornitology. Faculty of Science, University in Sarajevo, Sarajevo.
- Municipality Neum Official Web Site: http://www.neum.ba/index.php/neum/razvojgospodarstva (accessed on: 12-20 March, 2017)
- Radovan, D. (1984.). Small Flora of Croatia and surrounding areas. School Book Zagreb.
- Red List of Fauna of Federation Bosnia and Herzegovina (2013). EU „GreenWay“ and Faculty of Science, University of Sarajevo, Sarajevo.
- Red List of Flora of Federation Bosnia and Herzegovina (2013). EU „GreenWay“ and Faculty of Science, University of Sarajevo, Sarajevo.
- Reuter J.D. & Suckow M.A. Laboratory Animal medicine and Management, International Veterinary Information Service (www.ivis.org) Ithaca, New York, USA.
- Šoljan, D. (2000). Cormofits as Biological Resources. University Book, Sarajevo
- Spatial Plan of the Municipality of Neum for the Period 2010-2020, Neum, 2015
- Updated Environmental and Social Impact Assessment for section Neum-Stolac. (2016.). Ecoplan, Mostar.
- Updated environmental and social impact assessment for section Neu-Stolac. (2016.). Ecoplan, Mostar.

6 ANNEXES

6.1 Annex 1 - Incident Report and Investigation Form

INCIDENT REF	
INCIDENT REPORT	

IN THE EVENT OF A FATALITY OR MORE THAN ONE SERIOUS INJURY REQUIRING HOSPITALISATION PLEASE COMPLETE THIS FORM WITHIN 24 HOURS AND EMAIL TO info@jpcfbih.ba

1. INCIDENT DETAILS

Contractor		**Date of incident**	
		Time of Incident	
Location of incident		**Type of Incident**	**Environmental** ☐
			Injury ☐

2. WHAT HAPPENED

3. INJURED WORKERS

Employee / Contractor	Male / Female	Age	Job Title / Description	Time with company	Cause	Injury Type (Major / Fatal)

4. ENVIRONMENTAL

Type (Spill / Gas Release)	Total Loss (Litres /KGs)	Cause	Damage

5. OTHER RELEVANT INFORMATION

Authorities informed?	**YES**	☐	**NO** ☐	**Person Completing Form**	
Media Attention?	**YES**	☐	**NO** ☐		
Any effects off site	**YES**	☐	**NO** ☐	**Position**	

6. INVESTIGATION FINDINGS

6.2 Annex 2 - Grievance Form

Reference number:	
Full name (*optional*)	
Contact information **Please mark how you wish to be contacted (mail, telephone, e-mail).**	☐ **By post: Please provide mailing address:** _____ _____ _____ ☐ **By telephone:** _____ ☐ **By e-mail:** _____
Preferred language of communication	☐ **Bosnian / Serbian / Croatian** ☐ **English (if possible)**

Description of incident for grievance	What happened? Where did it happen? Who did it happen to? What is the result of the problem?

Date of incident / grievance	
	☐ **One-time incident/grievance (date _____)** ☐ **Happened more than once (how many times? _____)** ☐ **On-going (currently experiencing problem)**

What would you like to see happen?	

Signature: _____
Date: _____

Please return this form to either of the following:
Please return this form to:
PE FBIH ROADS (JP CESTE FBIH)
Attention: Head of PIU
FBiH Roads Modernization Project
Address: Terezija 54, 71 000 Sarajevo
T: +387 33 250 370, F: +387 33 250 400
E: zalbena@jpcfbih.ba

6.3. Annex 3 - Report on public discussion

JP CESTE FEDERACIJE BIH

JP Ceste Federacije BiH d.o.o. Sarajevo poziva sve zainteresirane subjekte, nevladine organizacije i stanovnike općina i naselja koja gravitiraju području namjeravane izgradnje magistralnog puta M17.3 Neum - Stolac, da uzmu učešće u

JAVNOJ RASPRAVI

o Planu upravljanja okolišem i društvenim pitanjima specifičan za lokaciju, uključujući monitoring nultog stanja za dionicu Neum – Stolac

koja će se održati u Hutovu (općina Neum), **u prostorijama Osnovne škole u Hutovu 20.02.2018. godine u 15.00 sati**, s ciljem davanja prijedloga i sugestija javnosti i uključivanja relevantnih pitanja u finalnu verziju dokumenta. Dokument je izrađen za potrebu Programa modernizacije magistralnih cesta u FBiH prema politikama kreditora. Nacrt dokumenta može se pronaći na službenoj stranici JP Ceste FBiH na sljedećem linku: http://jpcfbih.ba/bs/aktivnosti/modernizacija-magistralnih-cesta/38

Svi zainteresirani subjekti koji nisu u mogućnosti da prisustvuju javnoj raspravi mogu svoje sugestije i komentare dostaviti do 20.02.2018. putem e-mail adrese: pimt@jpcfbih.ba.

Dnevni red:

1. Prezentacija Plana upravljanja okolišem i društvenim pitanjima specifičan za lokaciju, uključujući monitoring nultog stanja za dionicu Neum – Stolac
2. Pitanja, diskusija, odgovori i objašnjenja

31.01.2018.

Javno preduzeće Ceste Federacije BiH društvo sa ograničenom odgovornošću, Sarajevo • ul. Terezija 54, 71000 Sarajevo, Bosna i Hercegovina • Tel. +387(33)250-370 • Faks +387(33)250-400 • Reg. br. 065-0-Reg-11-000713 od 29.3.11., Općinski sud u Sarajevu • JIB 4200339240004 • Računi 1610000028440120 - Raiffeisen Bank d.d. BiH, 1540012000213884 - Intesa Sanpaolo Banka d.d. BiH

Announcement of Public discussion in the Local Newspaper „Večernji list" (02.02.2018.)

Rukomet

Burić izabran za All-star utakmicu

Benjamin Burić, vratar rukometne reprezentacije BiH i Wetzlara, nastupit će na All-star utakmici njemačke Bundeslige u kojoj će se sastati vrsta sastavljena od igrača iz cijelog svijeta i reprezentacija Njemačke. Ovogodišnja All-star utakmica na programu je danas u Leipzigu, a u timu svijeta Buriću će na golu društvo praviti srebrni s nedavno završenog Europskog prvenstva Švedanin Mikael Appelgren (Rhein-Neckar Loewen) i njegov zemljak, veteran Mattias Andersson (Flensburg), kojeg će bh. vratar iduće sezone naslijediti u timu s krajnjeg sjevera Njemačke. Burić je sjajnim igrama u Bundesligi stekao veliki ugled u najjačoj rukometnoj ligi svijeta. Svoju kvalitetu moći će potvrditi i na susretu u kojem će nastupiti rukometne veličine kao što su: Wolff, Weinhold, Groetzki, Gensheimer, Sigurdsson, Larsen... Utakmica počinje u 19.30 sati. ●

Rukomet

Efendić i Alibegović pojačanja za ostanak Sloge u društvu najboljih

Ekipa danas završava pripreme u Makarskoj, gdje su radili na podizanju tjelesne spreme momčadi, sad slijedi uigravanje

Darko Dragičević
bih@vecernji.net
BANJA LUKA

Rukometni klub Sloga dobio je velika pojačanja za drugi dio sezone u prvenstvu Bosne i Hercegovine.
Dobojlije su u svoje redove doveli vratara rukometne reprezentacije Bosne i Hercegovine Damira Efendića, koji je u zimskom prijelaznom roku raskinuo ugovor s turskim Selkasporom, dok je ranije klub potpisao ugovor s Tarikom Alibegovićem, nekadašnjim kapetanom sarajevske Bosne, koji može igrati jednako dobro na dvjema pozicijama. Tu je i mladi Luka Komnenović koji dolazi iz Mađarske.

Izboriti ostanak

S ovim pojačanjima u klubu Sloga nadaju se kako će uspjeti izboriti ostanak u društvu najboljih. Ekipa danas završava pripreme u Makarskoj, gdje su radili na podizanju tjelesne spreme momčadi i sad slijedi uigravanje za nastavak prvenstva.

Efendić je u zimskom prijelaznom roku raskinuo ugovor sa Selkasporom

Prihod s humanitarne utakmice protiv Slobode ide za liječenje Nine Bližnjaković

Danko Panić: Riječ je o iskusnim rukometašima koji će dobro doći našem timu

Pokazali humanost

- Zadovoljni smo odrađenim pripremama u Makarskoj. Ozlijede su nas, na svu sreću, ovaj put mimoišle i sad potpuno spremni krećemo s uigravanjem momčadi za nastavak natjecanja u prvenstvu. Imamo novih igrača, a sigurno da su Efendić i Alibegović prava pojačanja koja će nam donijeti dodatnu kvalitetu u borbi za ostanak u društvu najboljih. Riječ je o iskusnim rukometašima koji će dobro doći našem timu. Imamo i dobar raspored u drugom dijelu, tako da se nadamo najboljem i da ćemo ostvariti klupske ambicije, istaknuo je trener dobojske Sloge Danko Panić.
Sloga je pokazala i svoju humanost. Tako će 7. veljače organizirati humanitarnu utakmicu protiv Slobode iz Tuzle, čiji će sav prihod ići za liječenje sugrađanke Nine Bližnjaković koja boluje od leukemije. Osim ovog dvoboja, u dobojskom timu će odigrati još četiri kontrolne utakmice, a prva je protiv Vogošće na programu već u subotu. ●

Gdje je nestao fair play?

Košarkaški savez BiH traži od FIBA-e da bh. reprezentaciji plati čarter-let do Rusije

BiH 23. veljače u 20 sati igra utakmicu s Belgijom u Skenderiji, a Rusi su za 25. veljače u 15 sati u dalekom Permu zakazali dvoboj s BiH

R. L
bih@vecernji.net
MOSTAR

Košarkaški savez Bosne i Hercegovine (KS BiH) zatražio je od krovne svjetske košarkaške organizacije FIBA-e da sudjeluje u troškovima leta bosanskohercegovačke reprezentacije za ruski grad Perm.
Naime, izabranici izbornika Duška Vujoševića u petak 23. veljače u 20 sati igraju utakmicu s Belgijom u Skenderiji, a Rusi su za 25. veljače u 15 sati u dalekom Permu zakazali dvoboj s Bosnom i Hercegovinom.
Ne postoji, dakle, mogućnost da se komercijalnim letom otputuje do dalekog Perma i da se uopće u vremenskom intervalu manjem od 48 sati organizira takvo što.
Rusi su, očito, vrlo dobro znali što rade jer ako se FIBA ogluši o zahtjeve reprezentacije Bosne i Hercegovine, bh. nacionalni tim praktički će iz zrakoplova odmah ući u dvoranu, a posljedice mogu biti dalekosežne i za rezultat, ali i zdravlje košarkaša. Zbog toga se od FIBA-e traži da sudjeluje u refundiranju troškova organizacije čarter-leta do Perma ili da se termin utakmice pomjeri za ponedjeljak, 26. veljače 2018. godine.
U KS-u BiH, kako doznajemo, još uvijek čekaju odgovor FIBA-e, ali nema sumnje kako je bosanskohercegovački nacionalni tim doveden u neugodnu situaciju prije izuzetno značajne utakmice kvalifikacija za Svjetsko prvenstvo u košarci. ●

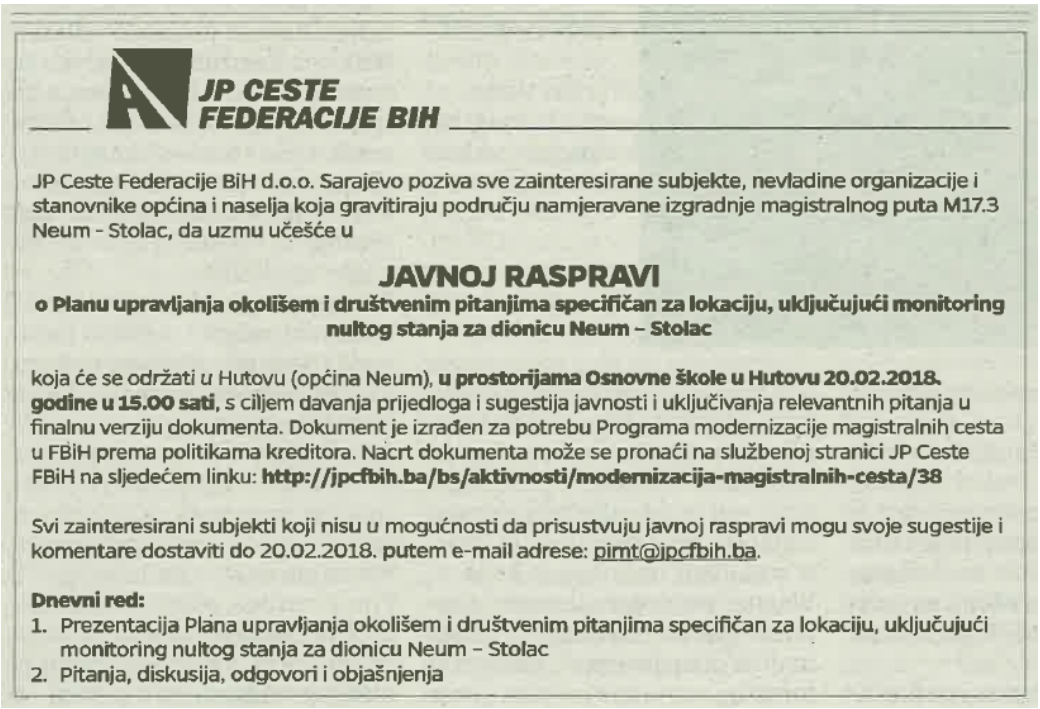
BiH je u posljednjem susretu slavila nad Rusijom

Odbojka (Ž)

Mostar danas u Banjoj Luci traži bod(ove) spasa za ostanak u ligi

Vodeće Jedinstvo i pratitelji Kula i Gacko favoriti su protiv Slobode, odnosno Modriče i Goražda. Jahorini stiže "fenjeraš" iz Višegrada

U 14. kolu prvenstva odbojkašica pred Mostarom je neugodno gostovanje u Banjoj Luci. Pogled na prvenstvenu ljestvicu govori da su Banjolučanke favoritkinje, međutim, činjenica je da "studentice" nemaju što izgubiti.
Domaćim porazom, odnosno osvojenim jednim bodom protiv Jahorine i pobjedom Goražda u trinaestom kolu, borba za ostanak se zaoštrila pa je Mostaru sada ostalo tražiti bodove ne samo protiv ekipa iz donje polovice ljestvice, nego i protiv jačih. U ostalim susretima 14. kola vodeće Jedinstvo i njegovi pratitelji Kula i Gacko izraziti su favoriti protiv Slobode, odnosno Modriče i Goražda, bez obzira što će igrati u gostima. Izraziti favorit je i Jahorina, kojoj u goste stiže "fenjeraš" iz Višegrada.
Parovi i satnica 14. kola: Banja Luka: BL Volley – Mostar (19 sati), 2. veljače, dok će se ostale utakmice igrati 3. veljače, a sastat će se: Pale: Jahorina – HE na Drini (17), Modriča: Modriča – Kula Gradačac (19), Gacko: Gacko – Goražde (18.30), Tuzla: Sloboda – Jedinstvo (15.30). **(dmu)** ●



JP CESTE FEDERACIJE BIH

JP Ceste Federacije BiH d.o.o. Sarajevo poziva sve zainteresirane subjekte, nevladine organizacije i stanovnike općina i naselja koja gravitiraju području namjeravane izgradnje magistralnog puta M17.3 Neum - Stolac, da uzmu učešće u

JAVNOJ RASPRAVI

o Planu upravljanja okolišem i društvenim pitanjima specifičan za lokaciju, uključujući monitoring nultog stanja za dionicu Neum – Stolac

koja će se održati u Hutovu (općina Neum), **u prostorijama Osnovne škole u Hutovu 20.02.2018. godine u 15.00 sati,** s ciljem davanja prijedloga i sugestija javnosti i uključivanja relevantnih pitanja u finalnu verziju dokumenta. Dokument je izrađen za potrebu Programa modernizacije magistralnih cesta u FBiH prema politikama kreditora. Nacrt dokumenta može se pronaći na službenoj stranici JP Ceste FBiH na sljedećem linku: **http://jpcfbih.ba/bs/aktivnosti/modernizacija-magistralnih-cesta/38**

Svi zainteresirani subjekti koji nisu u mogućnosti da prisustvuju javnoj raspravi mogu svoje sugestije i komentare dostaviti do 20.02.2018. putem e-mail adrese: pimt@jpcfbih.ba.

Dnevni red:
1. Prezentacija Plana upravljanja okolišem i društvenim pitanjima specifičan za lokaciju, uključujući monitoring nultog stanja za dionicu Neum – Stolac
2. Pitanja, diskusija, odgovori i objašnjenja

Web addresses containing the document and the Announcement of Public discussion with screenshots of the websites:

1. PC Roads of FBH website

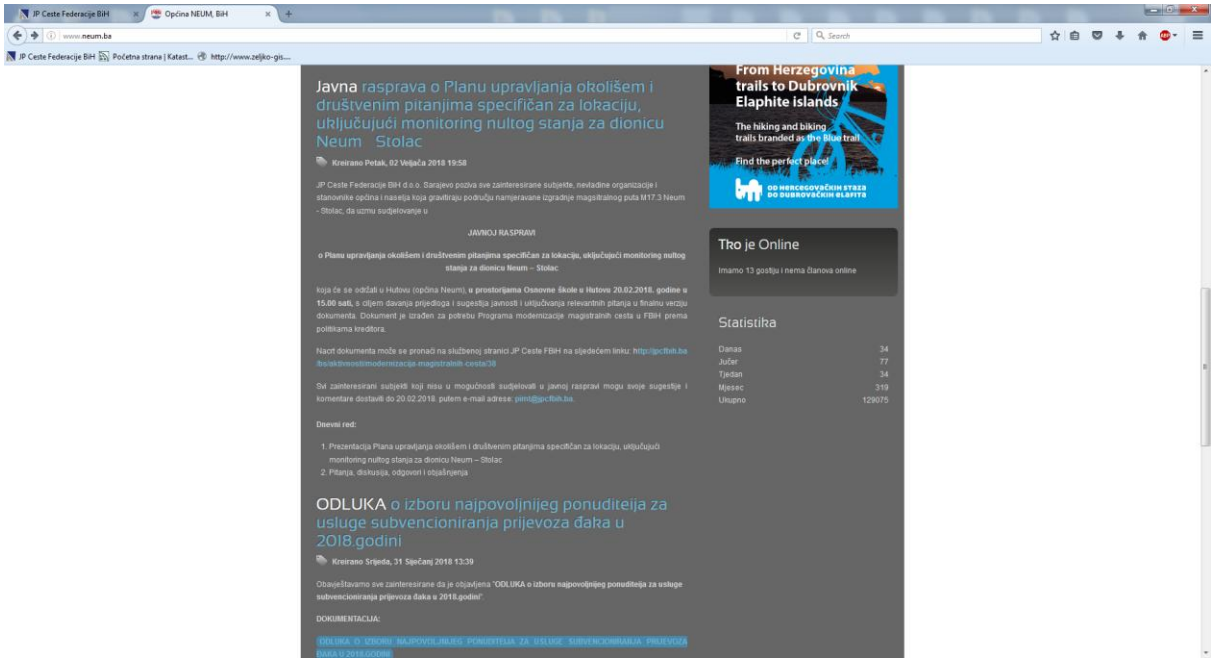
http://jpcfbih.ba/bs/novosti/javna-rasprava-o-planu-upravljanja-okolisem-i-drustvenim-pitanjima-specifican-za-lokaciju-ukljucujuci-monitoring-nultog-stanja-za-dionicu-neum-stolac/25 - Announcement of the Public discussion (B/H/S language), published on January 31, 2018

http://jpcfbih.ba/assets/upload/dokumenti-modernizacija/plan_upravljanja_okolisem_neum_s.pdf - Document (B/H/S language) august 2017.

http://jpcfbih.ba/assets/upload/dokumenti-modernizacija/envi_soci_management_plan_neum_s.pdf - Document (English language) august 2017.

2. Municipality of Neum – web page (published 02.02.2018.)

http://www.neum.ba/index.php/javni-oglasi-i-natjecaji-2/460-javna-rasprava-o-planu-upravljanja-okolisem-i-drustvenim-pitanjima-specifican-za-lokaciju-ukljucujuci-monitoring-nultog-stanja-za-dionicu-neum-stolac



3. Municipality of Stolac – web page (published 01.02.2018.)

http://www.stolac.gov.ba/index.php/1052-poziv-za-javnu-raspravu-o-planu-upravljanja-okolisem-i-drustvenim-pitanjima-specifican-za-lokaciju-ukljucujuci-monitoring-nultog-stanja-za-dionicu-neum-

stolac


OPĆINA STOLAC
SLUŽBENE STRANICE OPĆINE
Početna
Općinska uprava
LEAP
Ustanove
Turizam i kultura
Gospodarstvo
Dokumenti
Galerija
Javna rasprava o Planu upravljanja okolišem i društvenim pitanjima specifičan za lokaciju, uključujući monitoring nultog stanja za dionicu Neum – Stolac
Detalji
Objavljeno Četvrtak, 01 Veljača 2018 10:01
JP Ceste Federacije BH d.o.o. Sarajevo poziva sve zainteresirane subjekte, nevladine organizacije stanovnike općina i naselja koja gravitiraju području namjeravane izgradnje magistralnog puta M17.3 Neum - Stolac, da uzmu učešće u
JAVNOJ RASPRAVI
o Planu upravljanja okolišem i društvenim pitanjima specifičan za lokaciju, uključujući monitoring nultog stanja za dionicu Neum – Stolac koja će se održati u Hutovu (općina Neum), u prostorijama Osnovne škole u Hutovu 20.02.2018. godine u 15.00 sati, s ciljem davanja prijedloga i sugestija javnosti i uključivanja relevantnih pitanja u finalnu verziju dokumenta. Dokument je izrađen za potrebu Programa modernizacije magistralnih cesta u FBiH prema poštikama kreditora. Nacrt dokumenta može se pronaći na službenoj stranici JP Ceste FBiH na sljedećem linku: http://jpcfbih.ba/bs/aktivnosti/modernizacija-magistralnih-cesta/38
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1. Prezentacija Plana upravljanja okolišem i društvenim pitanjima specifičan za lokaciju, uključujući monitoring nultog stanja za dionicu Neum – Stolac
2. Pitanja, diskusija, odgovori i objašnjenja
Glavni izbornik
Početna
O nama
Dokumenti
Galerija
Poslovna zona Hodovo
O zoni
Natječaji i dokumenti
Regionalni informativni centar - Zona Hodovo
Kontakt info
Općina Stolac
Ulica kralja Tomislava b.b.
88360 Stolac BiH
Tel: 00387 36 853 101
Fax: 00387 36 853 229
e-mail: opcina@stolac.gov.ba
Login Form
Korisničko ime
Lozinka
Gospodarsko-poslovna zona HODOVO
Europe for Citizens
PROSTORNI PLAN OPĆINE STOLAC
J.U. "RADIMLJA" STOLAC
KOMUNALNO PODUZEĆE d.o.o. STOLAC
MDGF

MINUTES from the Public Discussion on the Draft Site Specific Environmental and Social Management Plan including the Zero State Monitoring for the Section NEUM - STOLAC

Held on February 20, 2018 in the premises of the Elementary School in Hutovo (Neum Municipality) at 3 pm

A public discussion on the draft of Site Specific Environmental and Social Management Plan, including the Zero State Monitoring for the Section Neum - Stolac section was held with the aim of notifying the public about the draft of the above document.

The public discussion was organized by the investor, PC Roads of the Federation of Bosnia and Herzegovina, and on behalf of the Investors participated: Munir Tojaga - project manager, Selma Ljubijankić - member of the PIT in charge of social aspects, and Haris Zejnić – PIT assistant for environmental monitoring of the Project.

On behalf of the consultancy firm, Enova d.o.o. Sarajevo, attended the discussion: Maja Jaćimovska and Ajla Mehmedović.

A list of all participants is enclosed to these minutes.

Presentation and Discussion:

- **Haris Zejnić,** on behalf of the Investor PC Roads of the Federation of BiH, greeted all participants and the present representatives of the Investor and the Consultant, gave a brief introduction on the Modernization Program and the document, and explained that all the relevant comments from the public discussion will be included in the final document. It was also emphasized that the document was revised by the World Bank team and, after the adoption, will become a binding document for the contracting parties in the implementation of the project itself.

- Enova doo member, **Maja Jaćimovska**, presented the document itself, and familiarised all the participants with the Site Specific Environmental and Social Management Plan, including the zero state monitoring for section Neum – Stolac, with the goals and methodology of design, project description, legal framework, zero state of environmental and social conditions, field research and the results of the zero state monitoring of the environment, environmental and social impact assessment, mitigation measures, monitoring plan, costs of implementation of the Plan, public discussions, disclosure of the information, and annexes within the document itself.

The public discussion on the document in question followed.

- **Zdravko Konjevod**, Association of beekeepers "Kadulja" Neum, comments that the source of Blace is the only drinking water source in Neum, and it is taken into consideration that water will be polluted in case the project is implemented. He considers that the occasional flow in Moševići, which runs for several months depending on the rain, will be cut off by the planned alignment. It states that the herbs of tilos and sage is the most populated on the planned alignment near the Žaba and Orlović areas, not as mentioned during the presentation, and considers that the planned alignment crosses the main beekeeping areas, which will have invaluable damages in beekeeping and gathering. He adds that the alignments are designed against the interests of the local community because they are bypassing the centres of the local communities. It highlights the need for the village to have an access road to the new main road, as well as the dissatisfaction of locals

who throughout history have always had main roads that passed through their village. He points out a number of positive impacts on society in the case of this connection and the importance of visiting the cultural and historical monument of the old town of Hutovo and the natural monument Vjetrenica. He also highlighted the environmental impacts on the cultivable land and olive plantations.

- **Munir Tojaga** (PC Roads of the FBiH): In cooperation with local people from Babin Dol, all problems were detected and all the water was collected, and all the sinks were adequately gathered. He pointed out that in the area of Blaca everything was rehabilitated, a separate drainage system was made, and the installation of a separate drainage system is planned along the entire alignment of the road Neum - Stolac. It was emphasized that three separators have been installed on Blaca.

- **Maja Jaćimovska**, adds that the installation of a total of 45 separators on the unplanned part of the alignment is foreseen. She points out that the Municipal Company Neum periodically performs water control from the Blace source and that only one sample did not satisfy the blurriness parameters at the time of the zero state survey.

- **Mirko Pavlović**, Councillor of the Municipal Council Neum: He is asking for an access road in the town of Gradac and the intersection in Babin Dol, the construction of which was promised but not fulfilled. He adds that at the last session of the Municipal Council of Neum, a unanimous conclusion was declared on this, sent to the PC Roads of the FBiH, and requested for the same answer. He further asks about the access road in Hutovo at the tunnel exit, connecting Hutovo and Ravno, related to the length of the access road. It adds that it was also asked and promised to collect all the rain and wastewater in Neum that should be dropped into the recipient in an adequate manner. He appeals for the plan to be completed in 2018.

- **Vinko Sentić**, chairman of the Municipality Council of Neum: He is referring to Mirko P. statement and adds that since the meeting in 2013, no information regarding the connections in Babin Dol, Broćanac and Cerovica has been received although promised.

- **Munir Tojaga** (PC Roads of the FBiH): At the request of the locals of the villages Dobrovo, Oskušnica, Hotonj, Žukovice, Radetići and Drijen, the Investor on the date of August 10, 2012 gave the consent to provide access to these villages in the Dobrovo settlement in front of the Oštrovac tunnel (responded by letter ref. 01-02.1-6771-1/12MT, August 10, 2012). Regarding the matter of Babin Dol, a letter was received from the local people that they were not with the underpass solution, and some other solution will have to be found, while there is an adequate solution for Broćanac.

  - **Ružica Krešić**, Municipality of Neum: comments that the letter was sent in which required to submit the project to the Municipality of Neum, and that on three meetings a connection to Gradac was required. She asks where the connection to Gradac is located, and Munir T. states that this connection is located in front of the Oštovac tunnel before the overpass.

  - **Živko Matuško**, Mayor of the Municipality of Neum: He points out that as far as the alignment is concerned it was not done according to the agreement, adding that the separators on Blace were not adequately made.

- **Munir Tojaga** states that part of the alignment in Blace was built in accordance with the Water Management Approval and the project of a separate drainage system on this part of the alignment.

- **Nikola Konjevod**, Hutovo: Asks about the way of connecting the villages of Hutovo and the municipality of Ravno. Points out the problems with the detouring of settlement in Hutovo with the new road. He wants to know the exact route of the Hutovo connection.

- *(The answer to the previous question is attached to this Minutes, and all information is shared with Neum Municipality, which authorized the auditor who gave the opinion that the connection could not be carried out.)*

- **Martin Matić**: Points out problems with the alignment through Broćanac and the passage through the olive trees, which will be affecting about 150 trees, at that point Zdravko Konjevod joined in.

- **Pero Marić**, Broćanac: Asks whether there are plans concerning the livestock, game, and precipitation waters.

- **Munir Tojaga** states that three underpasses 3x2, 5 m are planned from Broćanac to Oštrovac, plus adequate drains.

- **Zdravko Konjevod** points out that this planned road will cut the local road that goes to the apiary and that in the case of a newly built road it has to go around the road instead of the previous shorter route, and demands an alternative to use a shorter route. The biggest problem is that, according to the local population, the people never saw the project or obtained data on which height the road would be built and whether it would also disable access to agricultural parcels.

- **Munir Tojaga** states that access to the local road for Mramor is guaranteed by the underpass designed foreseen by the project.

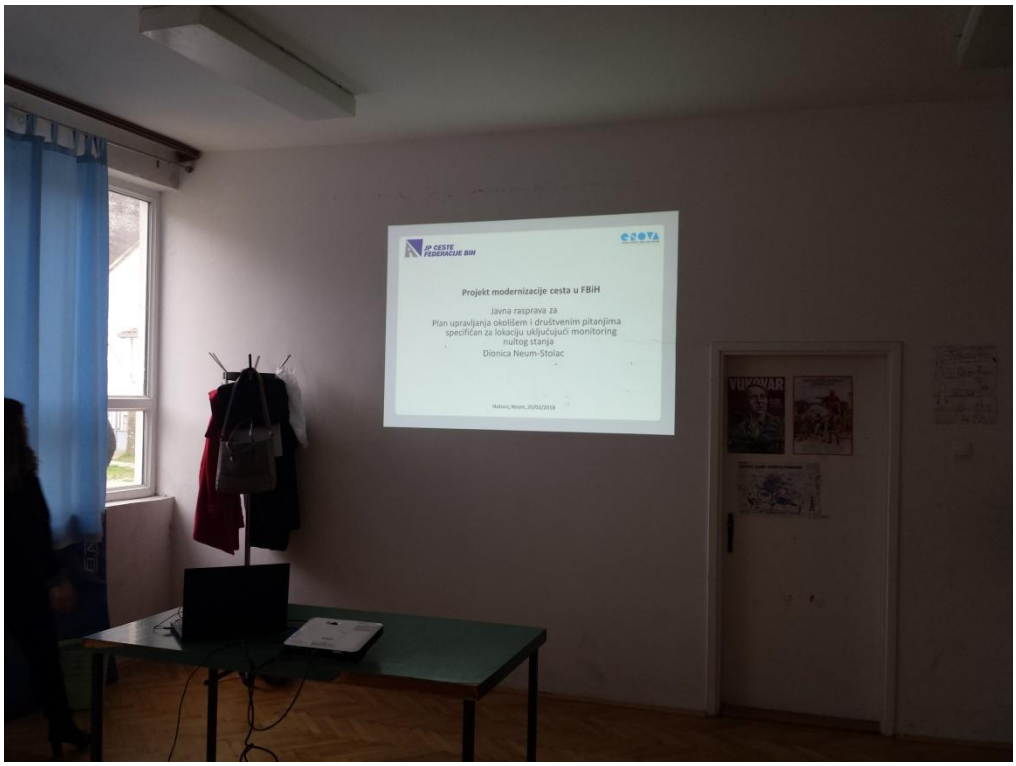
- **Selma Ljubijankić** emphasizes that it is a priority plan not to close the passages of the plots to anyone, and that everyone would have a way to access the plots.

- **Ajla Mehmedović**, who presented herself as a social affairs expert on behalf of the Consultant, states that the issue of access to agricultural land is recognized in the document in general, and asks everyone present who sees this as a potential problem to record the locations of their plots in order to mention the specificities and address the impacts in the very document. She states that the point of such meetings and discussions is to prevent possible overlooking and to minimize the impact on the local population in every sense.

The public discussions were closed at 4.45 pm.

Minutes created by Haris Zejnić.

Photographs of participants in the Public Consultations in Hutovo (premises of the Elementary School in Hutovo)




VUKOVAR

List of Participants in the Public Consultations

JP CESTE FEDERACIJE BIH

Javna rasprava o Planu upravljanja okolišem i društvenim pitanjima specifičan za lokaciju, uključujući monitoring nultog stanja za dionicu NEUM - STOLAC, Hutovo (Općina Neum), 20. februar 2018.g.

LISTA SUDIONIKA / LIST OF PARTICIPANTS

R.b. No.	Ime i prezime / Name and surname	Institucija/Institution	Tel.	E-mail	Potpis/Signature
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

JP CESTE FEDERACIJE BIH

13	GORAN MENALO	OPĆINA NEUM	063-913-797	goran.menalo@gmail.com	
14	LUKA KONJEVOD	MZ HUTOVO	063 688 683	luka.konjevod@[illegible]	
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16	ANTE KONJEVOD	HUTOVO	063/322 242	ante.konjevod@hotel-neum.com	
17	ŽIVKO MATUŠKO	OPĆINA NEUM	036/880 214		
18	ZRINKA KREŠIĆ	OPĆINA NEUM	036/880-134	kresic.[illegible]@gmail[illegible]	
19	PERO MAŠU	MZ GRADAC - Dubravica	063 706 974	—	
20	MUNIR TOTAGA	JPCFBiH	061 490 267	tmunir@jpcfbih	
21	SELMA LJUBIJANKIĆ	— II —	033 563 519	selma.ljubijankic@jpcfbih.ba	
22	AJLA MEHMEDOVIĆ	ENOVA d.o.o. SA	061 331 813 ~~033 251 077~~	ajla.mehmedovic@enova.ba	
23	MAJA JACIMOVSKA	ENOVA d.o.o. Sarajevo	033/279-118	maja.jacimovska@enova.ba	
24	HARIS ZEJNIĆ	JP CESTE FBiH	033/250-382	haris.zejnic@jpcfbih.ba	
25					
26					
27					
28					
29					

The answer to the question from the Minutes about the connection of the village of Hutovo

JP CESTE FEDERACIJE BIH

Broj: 01-02.1-2759/16-FT
Datum: 22.3.2016.god.

Za: Općina Neum
N/r: Dr.med. Živko Matuško, načelnik
Adresa: Kralja Tomislava b.b.
88390 Neum

Fax: 036 880 248

Predmet: IZRADA GLAVNOG PROJEKTA MAGISTRALNE CESTE M17.3, NEUM - STOLAC
ODGOVORI NA UPITE S JAVNE RASPRAVE ODRŽANE U HUTOVU 2.3.2016.

Poštovani,

Na Javnoj raspravi održanoj u Hutovu 2.3.2016, na temu Ažurirana studija utjecaja na okoliš i Procjena utjcaja na socijalne aspekte postavljena su neka pitanja, na koja je predstavnica JP Ceste FBiH preuzela obavezu dodatnih konsultacija s Upravom JP Ceste FBiH, Projektantom i Revidentom, te dostave pismene informacije najkasnije do 1.4.2016.

U tom smislu, **Projektantu i Revidentu postavljena su sljedeća pitanja**:

1. *"Na Javnoj raspravi za „Ažuriranu studiju utjecaja na okliš i procjeni utjecaja na društvene aspekte za dionicu Neum – Stolac", lokalna zajednica je postavila zahtjev da se odobri priključak za Hutovo i Ravno (preko regionalne ceste) na području izlaznog portala tunela Žaba iznad Hutova. S obzirom na to da se radi o revidovanom i usvojenom projektu, u ovom slučaju je neophodno da Projektant u Revident daju zvaničan pismen stav o tehničkoj mogućnosti predviđanja priključka u ovoj zoni, potkrijepljen stručnom argumentacijom.*
2. *Drugi zahtjev dolazi od načelnika Općine Neum, koji traži da se razmotri snižavanje nasipa u Broćancu na 0,5m, odnosno spuštanje na teren.*
3. *Treće pitanje koje su postavili, a odnosi se na projekat, je pitanje presjecanja regionalnog vodovoda, koji tvrde se presjeca na četiri lokacije. Da li je ovo projektom tretirano i kako je riješeno."*

Odgovor na postavljena pitanja, koji je dao **Projektant**, Divel d.o.o. Sarajevo je sljedeći:

1. "U vezi sa zahtjevom lokalne zajednice da se odobri priključak za Hutovo i Ravno (preko regionalne ceste) na području izlaznog portala tunela Žaba iznad Hutova dostavljamo vam sljedeće mišljenje:
   - Prema važećim Smjernicama za projektovanje, građenje i nadzor na cestama Sarajevo/Banja Luka 2005., izlazne rampe treba da budu smještene minimalno 350 metara od izlaznog portala tunela da bi omogućile dovoljnu udaljenost za znakove i promjene traka kretanja vozila.
   - Prema ovom uvjetu položaj raskrsnice bi bio minimalno 200 m udaljen od prijedloga lokalane zajednice. Na tom mjestu nagib terena iznosi preko 50%, što zahtijeva da priključna cesta u zoni raskrsnice bude na objektu, što opet enormno povećava cijenu izgradnje takve raskrsnice. U projektantskoj praksi još nismo imali slučaj formiranja površinske raskrsnice na objektu (mostu).
   - Dužina priključne ceste (od mjesta odvajanja sa postojeće magistralne ceste M-17.3 do raskrsnice iznosi 700 m u jako strmom terenu što je potpuno nepotrebno i neopravdano (značajno povećanje troškova).
   - Dodavanje trake za lijevo skretanje na magistralnoj cesti na strmom terenu je također nepotrebno i neopravdano.

24-03-20

Javno preduzeće Ceste Federacije BiH društvo sa ograničenom odgovornošću, Sarajevo • ul. Terezija 54, 71000 Sarajevo, Bosna i Hercegovina • **Tel.** +387(33)250-370 • **Faks** +387(33)250-400 • **Reg. br.** 065-0-Reg-11-000713 od 29.3.11., Općinski sud u Sarajevu • **JIB** 4200339240004 • **Računi** 1610000028440120 - Raiffeisen Bank d.d. BiH, 1540012000213884 - Intesa Sanpaolo Banka d.d. BiH

JP CESTE FEDERACIJE BIH

Radi svega navedenog smatramo da je zahtjev za promjenom položaja priključka za Hutovo postavljen od strane lokalne zajednice, a uzimajući u obzir važeću zakonsku regulativu, tehnički neprihvatljiv i neopravdan.

2. U vezi sa zahtjevom načelnika Općine Neum za spuštanjem nivelete magistralne ceste u Broćancu navodimo da je niveleta usvojena u skladu sa važećim pravilnikom (zakonom) za usvojenu računsku brzinu Vr=80 km/h i nije moguće spuštanje nivelete na ovom potezu.
3. U vezi primjedbe da trasa na četiri mjesta presijeca regionalni vodovod navodimo da je niveleta ceste postavljena tako da je omogućeno da trasa regionalnog vodovoda na dijelu za koji smo dobili podatke od Općine Neum prolazi ispod nivelete ceste i nije potrebno njegovo izmještanje."

Odgovor na gore navedena (ista) pitanja, koji je dao **Revident**, Građevinski fakultet Sveučićšta u Mostaru je sljedeći:

"Na sastanku 18.11.2013. godine usvojena je varijanta trase koja je sada u fazi realizacije, a koju je potvrdila Općina Neum. U nastavku je mišljenje Revizije:

- Usvojena varijanta je optimalno rješenje s obzirom na potrebe općine Neum i prostorna ograničenja i usvojena je u suradnji s predstavnicima Općine Neum.
- U području Broćanca cesta se pruža poljem i zatim diže na plato Prapratnice. S obzirom na tehničke uvjete koje mora ispunjavati cesta ovog ranga, i principe projektiranja (minimalna visina nasipa, uzdužni nagibi), Projektant je optimalno projektirao niveletu ceste.
- S obzirom na položaj Hutova, niti jedna varijanta nebi osigurala bliži priključak. Također ne postoji mogućnost priključka koji je bliže tunelu iz tehničkih i sigurnosnih razloga. Ono što jest legitiman zahtjev i prioritet Hutova je dovođenje u optimalno stanje ceste koja će povezati Hutovo (i Ravno) s priključkom „Hutovo".

JP Ceste FBIH i ovom prilikom izražava spremnost da se uz redovne konsultacije s predstvnicima lokalne zajednice u najvećoj mogućoj mjeri poštuju interesi svih uključenih strana. U tom smislu izražavamo spremnost da postojeću magistralnu cestu M17.3 nakon izvođenja radova prije predaje budućem upravljaču dovedemo u zadovoljavajuće stanje, što je rečeno na pomenutoj Javnoj raspravi.

Ukoliko smatrate da je potrebno dodatno zajednički sagledati neka od rješenja u projektu, izražavamo spremnost da se odazovemo Vašem pozivu na sastanak, na kojem bi uz predstavnike JP Ceste FBiH prisustvovali i predstavnici Projektanta i Revidenta.

Molimo Vas da ovaj odgovor proslijedite u Mjesnu zajednicu Hutovo. Koristimo i ovu priliku da izrazimo zahvalnost za Vaše aktivno učešće i konstruktivne primjedbe i sugestije.

Srdačno,

Direktor:

Ljubo Pravdić, dipl.ing.građ.

- Naslovu
- Mjesna zajednica Hutovo
- A/a

str. 2. od 2