Ministry of Agriculture and Environmental Protection
Directorate for Water Management
11070 Belgrade,
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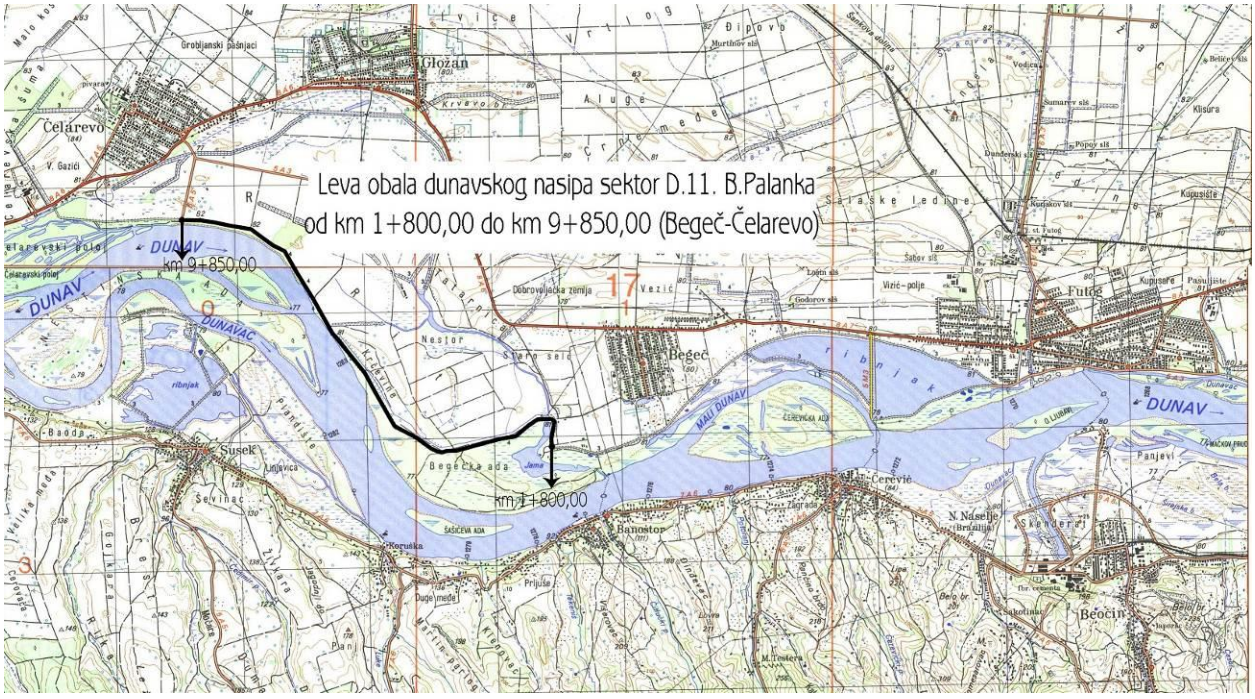
FLOODS EMERGENCY AND RECOVERY PROJECT (FERP)

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

for

Reconstruction of the left bank embankment on the Danube River on section Backa Palanka town (km 1+800 to km 9+850) and Sombor town (km 3+461 to km 6+583 and km 49+410 to km 52+400)

embankment crest stabilization (asphaltic road)



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B E L G R A D E, April 2015

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Abbreviations

EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ESMF	Environmental Management Framework Document
ESSS	Environmental and Social Safeguard Specialist
FERP	Floods Emergency Recovery Project
IFI	International Financing Institutions
MAEP	Ministry of Agriculture and Environmental Protection
OP	Operational Policy
PINP	Provincial Institute for the Nature Protection
PIU	Project Implementation Unit
PSC	Project Supervision Consultant
PWMC	Public Water Management Company
SSIP	Site Specific Implementation Plan
WB	The World Bank Group
WMP	Waste Management Plan

INTRODUCTION

In May 2014 the Republic of Serbia are afflicted with massive flooding caused by heavy rains which caused the formation of torrential streams, rivers overflowing across the dam and breach embankments at several places resulting in flooding of much of the territory of Serbia. The flood affected dozens of settlements and thousands of hectares of arable land.

This document presents the Environmental Management Plan (EMP), which has been prepared to ensure that the proposed Floods Emergency Recovery Project is implemented in accordance with the World Bank operational guidelines and local legislation related to environmental protection. The main purpose of this EMP is to serve as a valuable tool for identifying possible key environmental and social impacts that will result from the project and proposing mitigation measures to address the most significant impacts. The EMP also provides the responsibilities of different parties involved in the project implementation. Although major environmental issues are not anticipated (the project has been categorized as environmental Category B in according to the World bank OP/BP 4.01 on Environmental Assessment) since the investments are directed on the rehabilitation of existing embankment infrastructure, the EMP identifies several mitigation measures aimed at environment protection and maintenance of environmental conditions mainly during the civil works.

1. FLOODS EMERGENCY RECOVERY PROJECT - DESCRIPTION

1.1. Background

Unprecedented rainfall started in early/mid-May 2014 causing massive floods, resulting in the declaration of a national state of emergency in Serbia on May 15, 2014. The heavy rainfall, led to a rapid and substantial increase of water levels in eight of the main rivers in western, south-western, central and eastern Serbia. Flash floods destroyed houses, bridges and sections of roads, while rising water levels resulted in flooding in both urban and rural areas. The disaster resulted in 51 deaths, with approximately 32,000 people evacuated from their homes, and around 110,000 households cut off from electricity supply. Overall, the floods affected some 1.6 million people, or about one fifth of the total population living in 49 municipalities. Adverse weather conditions have continued since, causing further damage to harvest and energy infrastructure.

The Floods Emergency Recovery Project focuses on the priority sectors identified in the Recovery Needs Assessment including energy, agriculture, and flood protection. The project would help close the financing gap and ensure continued provision of electricity services, forestall a likely decline in direct support to farmers in affected areas at a time when the fiscal accounts are under severe stress and help improve resilience to disasters by financing investments in critical flood prevention infrastructure.

1.2. Project Description

Flood Protection Sub-Projects which are subject of this EMP document are:

- Sanation of the left-bank embankment on Danube River, Sector D.11.**Backa Palanka**, - **8,0 km of embankment crest stabilisation** (km 1+800 - km 9+850), section **Begec-Celarevo (P01)**
- Sanation of the left-bank embankment on Danube River, Sector D.12.**Sombor – 3,1 km of embankment crest stabilisation** (km 3+461 - km 6+583), section **Bogojevo (P02)**
- Sanation of the left-bank embankment on Danube River, Sector D.12.**Sombor – 3,0 km of embankment crest stabilisation** (km 49+410 - km 52+400), section **Bezdan (P03)**

All three projects will be implemented in northern-western part of Serbia, close to the Croatian Border, on the left bank of Danube River (Picture 2).

1.2.1. Embankment crest stabilization works description

The embankment crest works covered by the Project will be carried on existing embankment with no change of the alignments. The project therefore entails no resettlement and land acquisition as defined by OP 4.01, nor long lasting disruptions to the natural environment and human settlements and activities. On all three project locations, in the earlier period, flood protection structures are already constructed. However, the projected width of crushed stone material of 3.20 m is not been achieved. The required width of pavement surface of 3.20 m requires an extension of the existing layer of crushed stone material, in order to achieve greater width of roadbase layer (blanket course) of at least 10 cm on each side.

Excavation of soil material of embankment crest, in variable and the required width, is done symmetrically on both sides of the existing stone material. Digging depth is 25 cm. After the excavation of soil, filling with the new material is planned together with the construction of a new roadbase layer by using the same material used for construction of already existing roadbase. Bearing in mind that the existing roadbase layer material under traffic load, and that he had suffered the inevitable deformation, additional regulation course layer will be constructed in thickness of approximately 5 cm.

Over regulation course layer a two new asphalt layers will be constructed. The current roadbase layer is made of crushed stone aggregate fraction 0 / 31.5 mm. The projected pavement structure has the following composition:

* Road surface layer of asphalt concrete AB 11 thickness d = 4 cm
* bitumenous bearing layer BNS 22 B thickness d = 6 cm
* crushed stone material 0 / 31.5 for regulation course layer and expansion of the existing roadbase layer d ~ 5 cm
* existing layer 0 / 31.5 thickness d = 25 cm
* geogrid

Total: d ~ 40 cm

The projected cross slope (lateral gradients) is 7% and follows approximately the existing slopes, which guarantees an optimal drainage of surface water. The cross slope of asphalt pavement is planned in the amount of 2%.

After the construction of asphalt layers it is necessary to place back a humus material on the embankment slope. This is important to preserve the geometry of the embankment and the preservation of its required height.

Picture 1: Existing embankment on project location

Picture 2: Project locations: Begec, Bogojevo and Bezdan (yellow circles)

2. LEGAL AND INSTITUTIONAL FRAMEWORK

2.1. Relevant Institutions

The Ministry of Agriculture and Environmental Protection (MAEP), is the key relevant institution for environmental management for FERP related projects.

The other aspects of environmental management related to FERP projects are dealt with several other institutions, among which are the Institute for Nature Protection of Serbia and the Institute for Protection of Cultural Monuments of the Republic of Serbia, and the Public Water Management Companies (PWMC) “Serbia Vode”, “Beograd Vode” & “Vode Vojvodina”.

Directorate of Agrarian Payments (DAP) implements the Farm Incentives Program. Farmers applying for the program have to be registered in the Farm Registry to be eligible for support.

2.2. EIA procedure in the Republic of Serbia

In the juridical system of the Republic of Serbia, the Environmental Impact Assessment procedure is regulated by the Law on Environmental Impact Assessment, which is completely in line with European EIA Directive (85/337/EEC, 97/11/EC, 2003/35/EC and COM 2009/378). According to that Law, preparation of the Environmental Impact Assessment is not required for the flood protection rehabilitation projects unless their alignments are placed within or in the vicinity of the nature or culture protected areas. In such cases the Project Proponent is obliged to submit so-called “Request for Decision about Need for Environmental Impact Assessment” (RDNEIA) to the MAEP. Depending on the Ministry’s assessment of significance of potential environmental impacts of the project, it is decided if there is a need (or not) to apply partial or full EIA procedure for the relevant sub-project.

Request for opinion regarding necessity of EIA procedure for each sub-project which is found to be adjacent or within the nature/cultural protected area will be submitted to DoEIA.

2.3. Relevant Government Policies, Acts, Rules, Strategies and Guidelines

Environmental protection in Republic of Serbia is regulated by several national and municipal laws and by-laws. The environmental legislation in force in Serbia is summarized in Annex 1.

The main legal documents are:

- The Constitution of Serbia ("Official Gazette of RS" No. 98/06).
- The National Strategy for Sustainable Development ("Official Gazette of RS" No. 72/09, 81/09)
- Law on Environmental Protection ("Official Gazette of RS" No. 135/04, 36/09)
- Law on Environmental Impact Assessment ("Official Gazette of RS" No. 135/04)
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- The Law on Waste Management ("Official Gazette of RS" No. 36/09)
- The Law on Water ("Official Gazette of RS" No. 30/10, 93/12)
- The Law on Occupational Safety and Health ("Official Gazette of RS" No. 101/05)
- Law on Planning and Construction ("Official Gazette of RS" No. 72/09, 81/09)
- Law on Nature Protection, ("Official Gazette of RS" No. 36/09)
- Agricultural Land Law, ("Official Gazette of RS" No. 62/06, 41/09)

Regulations established on the basis of the Law on EIA include the following:

- Decree on establishing the List of Projects for which the Impact Assessment is mandatory and the List of projects for which the EIA can be requested ("Official Gazette of RS" No. 114/08)
- Rulebook on the contents of requests for the necessity of Impact Assessment and on the contents of requests for specification of scope and contents of the EIA Study ("Official Gazette of RS" No. 69/05)

2.4. Applicable Safeguards

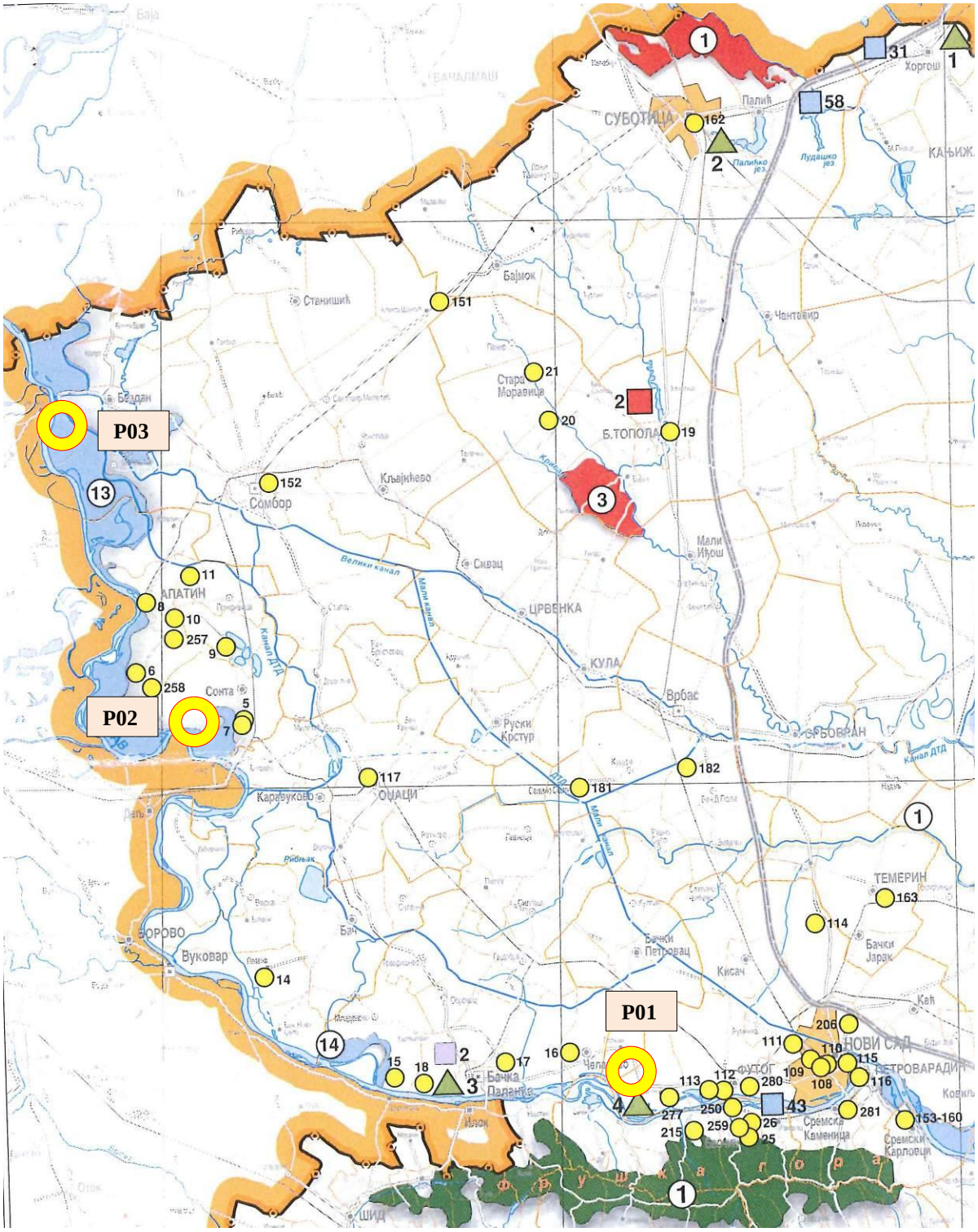
Safeguard Policies triggered by the Project:

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	**X**	
Natural Habitats OP/BP 4.04	**X**	
Forests OP/BP 4.36		**X**
Pest Management OP 4.09		**X**
Physical Cultural Resources OP/BP 4.11		**X**
Indigenous Peoples OP/BP 4.10		**X**
Involuntary Resettlement OP/BP 4.12		**X**
Safety of Dams OP/BP 4.37		**X**
Projects on International Waterways OP/BP 7.50	**X**	
Projects in Disputed Areas OP/BP 7.60		**X**

3. BASELINE CONDITIONS ASSESSED DURING ROUTE SURVEY

The Danube River created one of the most rich full wetland complexes in Serbia, Special Nature Reserve „Gornje Pondunavlje“ (Upper Danube Basin). The people from this region constructed river embankments and other fortification objects to protect themselves from the floods, but still there are spacious areas that are not protected. In those areas, many floral and animal species (including game) face floods every year. High water level of the Danube River is the most dominant factor of change of habitat conditions in this area.

In the alluvial plain of the Danube, along its left bank, in the area known as Begecka Ada, 18 km west of Novi Sad, close to Backa Palanka lays the Begecka Jama Nature Park.



Picture 3: Nature Protected sites and project locations: Begec, Bogojevo and Bezdan

3.1.1. Project Begec (P01)

Begec Project (P01) will be executed close to the zone of nature park “Begecka Jama”. Nature Park "Begecka Jama", located on the left bank of the Danube near the village of Begec, includes an approximate 7.8 km long (1276.2 to 1284 rkm) wetland between Backa Palanka and Novi Sad. The protected area contains a number of geomorphologic types of fluvial erosion - islands, beams, oxbow lakes and still waters, created mutually by fluvial erosion and reclamation. These types are from different ages and in accordance with that, the mosaic of wetland habitats is also at different stages of vegetation succession of the floodplains. The survival of this phenomenon is caused by the natural dynamics of flooding.

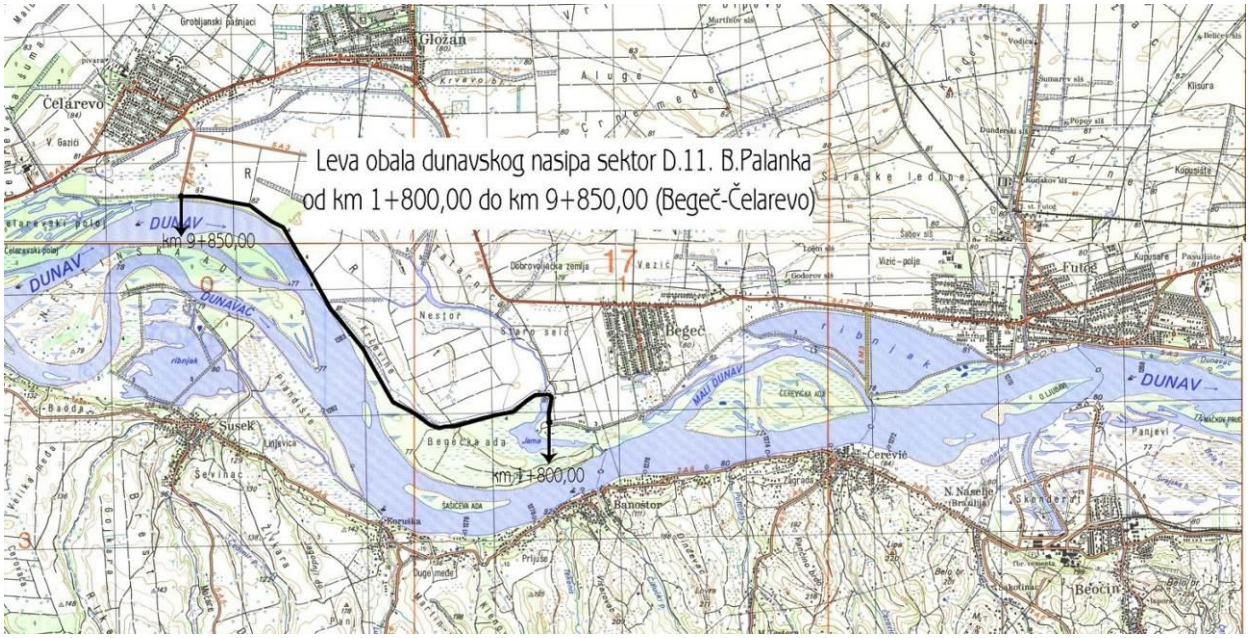
The area is dominated by Begecka Jama - a fluvial lake which is connected to the Danube via Begej canal and has a permanent presence of water. It is an extremely important torus for numerous types of Danube fish and the reproductive center for amphibians of the wider area.

Also worthy of mention are the 100 or more plant species, especially macrophytes that are an integral part of the swamp and pond ecosystem, some of them even remnants of subtropical vegetation from the pre-glacial period. The most important macrophyte species, proposed for entry into the Serbian Red List of endangered vegetation, are the white water lilys. Begecka Jama harbours 27 fish species, including Prussian carp, perch, catfish, carp, pike and bream, as well as crayfish, snails and shellfish.

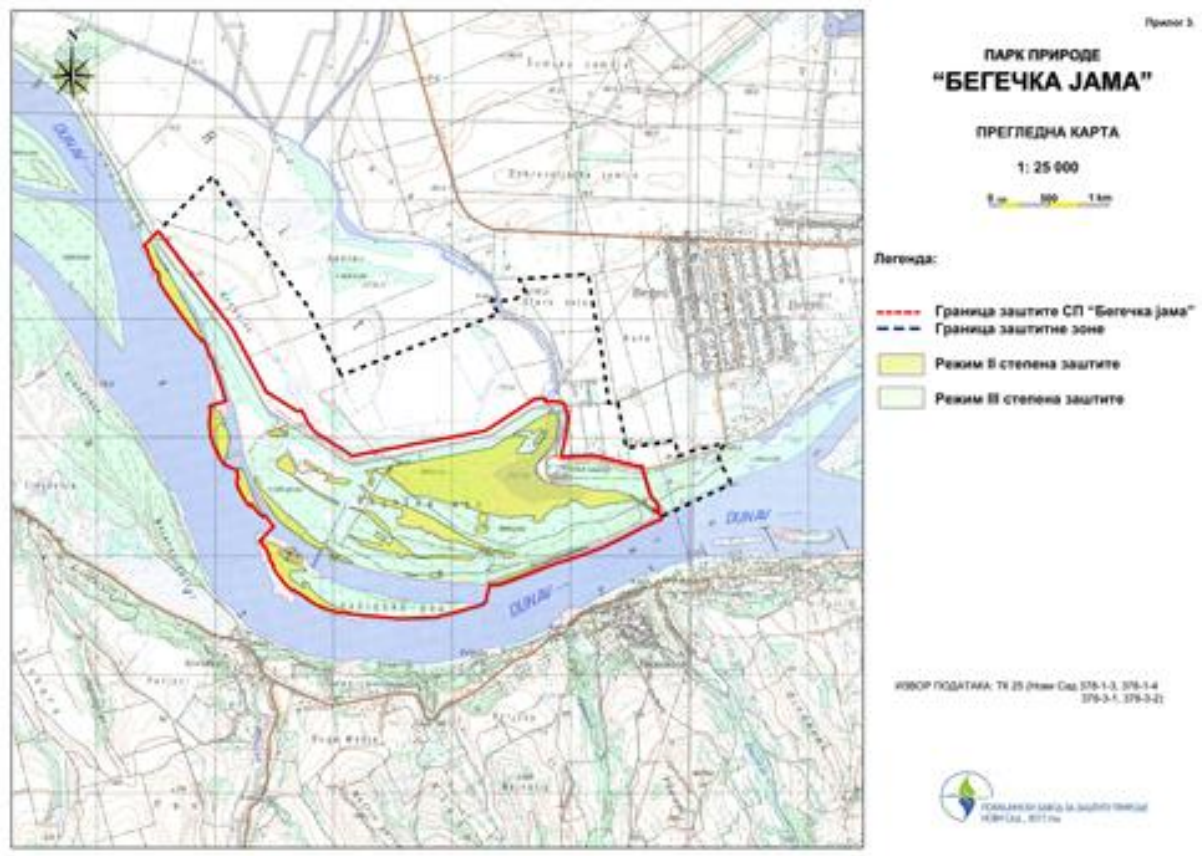
There are also some 150 bird species to be seen in the Begecka Jama Nature Park, most of which are transitory, wandering or wintering species. During the migration of birds from the north, up to 1000 different species stop off here. As many as 90 of the bird species that can be seen at Begecka Jama are candidates for the Serbia Red List, while 55 of them are considered natural rarities in Serbia. On the international and European Red Lists is the Ferruginous Duck.

Of the nesting species there is the Mute Swan, Common Coot, Little Grebe, Great Crested Grebe , Northern Lapwing , White and Black Stork, Great Cormorant and Little Bittern. Also occasionally seen in this area are the Great and Little Egret, Purple Heron and Black-crowned Night-heron.

The nature park also has two archaeological sites, Kuva and Acke . Within the park are the remains of a Roman fortification from the time of Diocletian, Castellum Onagrinum. It was the only fortified complex on the left bank of the Danube in ancient times. There are also remains of the original village of Begec from the first half of the 15th century, which was moved due to frequent heavy flooding.



Picture 4: Location of Begec project (P01)



Picture 5: Nature Park "Begecka Jama"

3.1.2. Projects Bogojevo and Bezdan (P02 and P03)

Projects Bogojevo and Bezdan (P02 and P03) will be executed within the Special Nature Reserve area named "Gornje Podunavlje" which is a large protected area of wetland in the northwest of Serbia (Vojvodina province). It comprises two big marshes along the left bank of the Danube River - the Monostor and Apatin marsh, including 66 km of the Danube course (1366 – 1433 km).

The terrain is flat or mildly undulating, with meanders, backwaters, old river beds and stands of marshy woodland intersected by ponds, swamps etc.

The Gornje Podunavlje region is important centre of biological diversity. The plant life here flourishes here under the influence of subterranean and flood waters. Its vegetation comprises 57 herbaceous, forest and bushy plant communities, and over 1000 plant species, including some of the most endangered species in Serbia: water violet, mare's tail and greater spearwort. The area has well-developed stands of aqueous, swamp, meadow, marshland and alluvial woodland, as well as dry-land woodlands of pedunculate oak, ash and poplar, in whose branches White-tailed Eagles and other birds of prey make their nests.

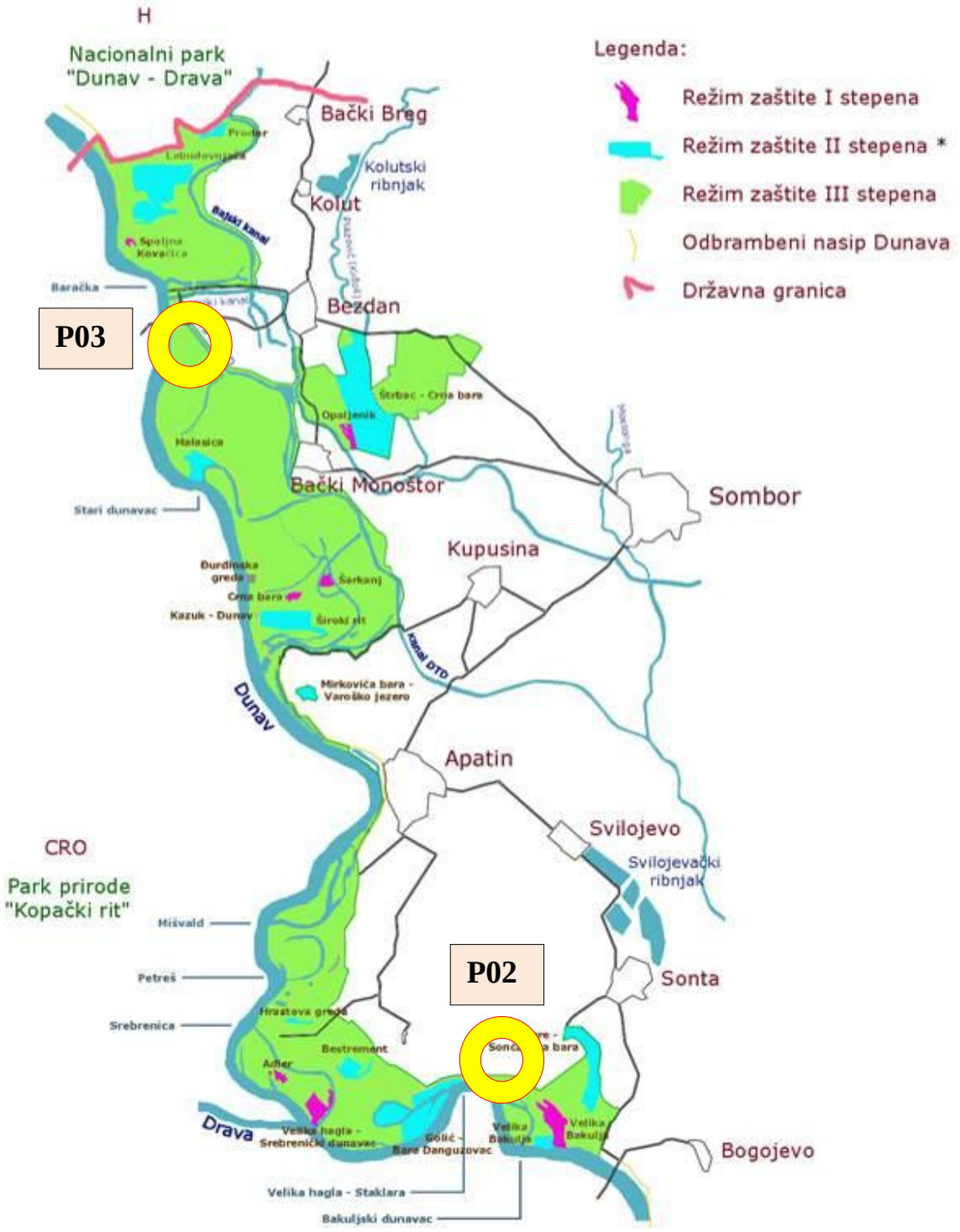
There are 60 species of butterfly, 55 fish, 11 amphibians, 9 reptile species, 230 species of bird and 51 species of mammal. The wider Danube area is an important natural spawning ground for fish such as carp, pike, ide, tench, bream, catfish, perch and others. Because of their rarity and endangered status, 16 fish species are on the Red List and 6 are natural rarities

Thanks to its exceptional natural resources, in 1989 Gornje Podunavlje was proclaimed the Important Bird Area (IBA). It is an integral part of the potential Biosphere Drava-Mura and one of the Ramsar Site candidate wetland.

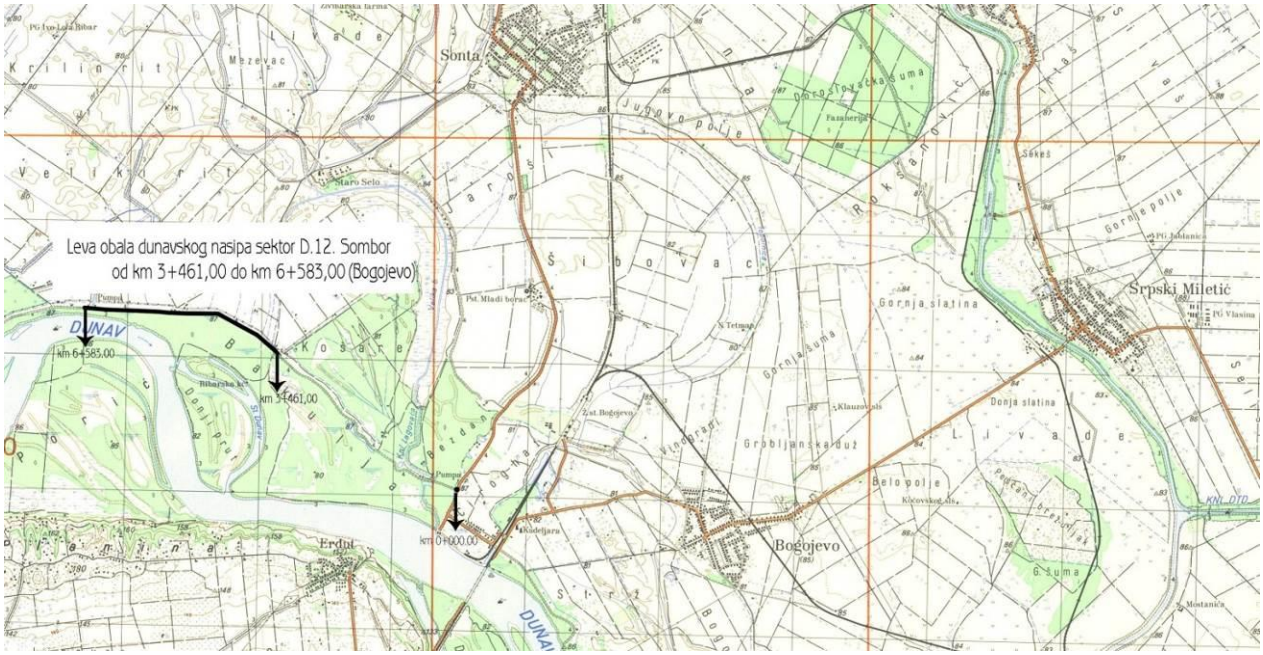
With the disappearance of huge tracts of marshland in the Pannonian Plain, the Gornje Podunavlje region remains one of the last nesting and flocking sites for a great number of birds: White-tailed Eagle, Black Stork, Mallard duck, Greylag Goose, several species of heron, gulls,

kingfisher and others. Particularly impressive is the colony of herons at Bezdan where, in nesting season, several hundred to several thousand birds congregate. This habitat is also on the migratory routes of many bird species as well as being the largest habitat of the European red deer in Serbia and home to wild boar, the latter both native species. Other animals worth noting are the roe deer, fox, wildcat, beech marten, European pine marten, weasel and – occasionally seen – the otter, a protected rare species in Serbia.

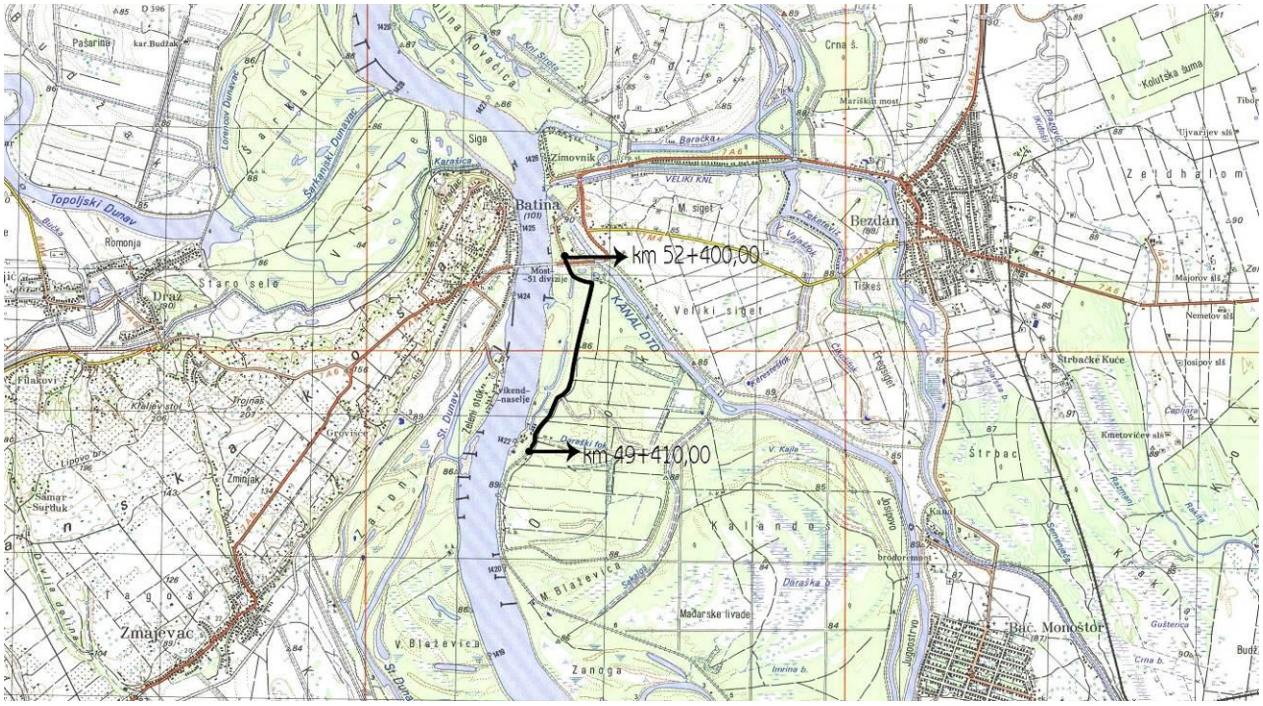
This area is famous for the hunting preserves of Kozara and Apatinski Rit, and for the presence of high-scoring trophy specimens of red deer, roe deer and wild boar.



Picture 6: Special nature reserve “Gornje Podunavlje” and location of Bogojevo and Bezdan projects (P02 and P03)



Picture 7: Location of Bogojevo project (P02)



Picture 8: Location of Bezdan project (P03)

4. POTENTIAL ENVIRONMENTAL IMPACTS

Embankment crest stabilization works on proposed sections will have only minor impacts on the environment (environmental category B). Most of the impacts are of temporary character and they disappear after the embankment crest stabilization works are completed.

Since the existing infrastructure will be rehabilitated and repaired during the realisation of the project, impacts on environment will be a consequence of human presence and construction machines, and the nature of construction works at a location, which are limited to the location of works or its surrounding vicinity.

The crest stabilization of existing flood protection structures would not pose significant risks to the environment. In addition, the project aims is only to improve the efficiency of flood control systems. As a consequence, the range of impacts is limited (impacts directly related to the rehabilitation activities) and their magnitude remains small (localized impacts and no significant effect on future operation). Considering the nature of the proposed project, it is anticipated that adverse environmental impacts can be expected in the construction phase mainly. The aspect of health and safety at work is also taken into consideration. It is to be noted that parts of the construction work are taking place in an urban environment, however in all parts in an environment already strongly influenced by human activities. Broadly, the impacts in the construction phase can be of the following types:

- **Soil and Water Pollution**: during construction activities, when using machinery, there is a possibility of soil contamination due to accidental spills of oils and fuel from construction machinery. In the area of construction works, construction waste is generated which, if not properly disposed of, may result in adverse impacts. The construction works carried out inside the river bed results in a temporary blur of the watercourse.
- **Flora and fauna**: construction works in the river bed along with the temporary blurring of the watercourse threaten freshwater habitats. Impacts on other habitats are not expected.
- **Disposal of excavated materials and construction wastes**. Demolition debris and excessive soil are usually generated during the rehabilitation works on drainage and flood control systems;
- **Degradation of landscapes and soil erosion**. The impacts on vegetative cover will be short-term, localized, and totally associated with rehabilitation works;
- **Impacts from temporary access roads and work areas**. Establishment of temporary dirt roads to access work areas and temporary dumping sites for excavated materials can enhance soil erosion, and degrade the landscape;
- **Noise and vibration disturbances** during construction and temporary air pollution (dust) related to the transportation of construction materials and truck traffic. These impacts will occur during the construction and rehabilitation works, but will be only short-term. Effects include dust from construction activities, noise during trench excavation, possible effect of vibration caused by operation of heavy machinery, etc.;
- **Safety hazards from construction activities**. No major hazards are expected the construction of the proposed project elements, as long as proper construction practices and safety procedures are applied;
- **Impacts on historic-cultural and archaeological monuments**. No archaeological or cultural resources are expected to be encountered during project implementation since major works consist in rehabilitation of existing systems where excavations have been conducted before and no findings have been reported.

4.1. Potential impacts of the Project

In general, all negative impacts in the phase of construction are temporary and can be mitigated by applying good construction practices.

Significant negative impacts on natural environment in the operational phase are not expected. On the contrary, impacts in the operational phase are considered to be highly positive, as project aims at prevention of risks for environment, humans and property.

Construction of flood protection structures is based on the river bank regulation; it is about preventing the flooding of relatively small areas of urban zones, and at relatively shallow depths. Thus, the volume of the retained water that could possibly influence the natural wave retardation in the river is negligible, compared to the volume of water wave, therefore the downstream impact on other users is negligible.
Project impacts by phases are shown in following table:

Phase	Type of impact
Construction phase	Soil compaction and erosion Dust emission Noise Soil and water pollution Impact on aquatic ecosystem Degradation of riparian vegetation caused by construction work Risk to people and/or animals of unfenced and unlabelled construction site Health and safety risk for workers on the construction site due to the potential land sliding
Operational phase	Low impact on natural environment on the project location Positive impact in terms of prevention of risks for environment, humans and property
Degree of negative impact	Minimum if mitigation measures are applied

4.2. Other positive impacts of FERP Project

The repair of flood-damaged infrastructure and facilities will bring economic, social, health and ecological benefits, to population and local community in this area. Experiences of similar projects show that the project will have many positive effects on society through the creation of conditions for population's standard growth in almost all segments (education, health protection, additional employment).

In case of unemployment and poverty in the project area, manpower resources will not be reduced. If some of the unemployed are employed or if employment has impact on unemployment, the project creates social benefits due to decreased social support or aid to the unemployed. That is the case in the flood emergency response project.

4.3. Potential negative Impacts and recommended Mitigation Measures

Summary of key impacts during construction phase and recommended mitigation measures are described in following table:

impact	Signifi-cance	comment
impacts on land use/ settlements,	low	There will be no land acquisition as defined by WB OP 4.01 during the project implementation. In case of any land acquisition – RFP document is prepared for this Project
ground and surface water,	low	Due to low amount of drainage water that can be potentially drained into Danube river the consequential impact is expected to be minimal to negligible
air quality,	low	Temporary impact. Local air quality may experience some moderate and temporary deterioration due to dust from construction traffic and elevated levels of nitrogen oxide (NOx) and sulphur oxide (SOx) from construction equipment exhausts. Impact can be mitigated by following GEMM procedures

impact	Signifi-cance	comment
flora and fauna (protected areas and species),	low	No loss or damage of vegetation and loss and damage or disruption to fauna can occur during works. Impacts can be offset or mitigated by following GEMM procedures. There will be no negative impacts on protected areas due to nature of works. Recommendations for execution of works will be additionally prescribed within the preconditions obtained by Institute for nature protection
noise and vibration,	low	Only limited temporary impact during the crest stabilization phase. Impact can be mitigated by following GEMM procedures.
soil quality,	low	Soil contamination can occur from: drainage of dredged materials, spillage of hazardous and toxic chemicals. Impact can be mitigated by following GEMM procedures
waste,	low	Ensured through environmental management - waste and wastewater management plan will be prepared and implemented
cumulative impacts etc.	Mediu m/ moder ate	Rehabilitation and crest stabilization works may cause a slight increasing of noise levels and air pollutants concentrations during the works only, which can temporary affect sensitive animal species within the natural habitats in project zone

The possible temporary impacts as consequence of the construction activities will consist of among others: damage to access roads; noise, waste and dust nuisance; and air emissions; potential impacts of soils and water resources; brief disturbance to biota, and momentary interference to neighbouring settlements through various construction and operation activities. Off-site activities include quarry, borrow pit and asphalt plant operations, which if not managed properly, may cause localized adverse impacts. The Contractor's yard and workers' camp can be potential sources of temporary adverse impacts.

4.4. Potential water / wetland contamination

Cases of water contamination may occur during the crest rehabilitation from site run off, spills and water from the equipment maintenance areas and sanitary wastewater effluent from the work camps.

As for the potential pollution during operation, these are limited to accidents only. In such a case, procedures for action in incidental situations, as defined by the Ministry of Interior and in the Water Law, will apply.

Fuel and lubricant spills can, in most instances, occur at the Contractor's work camp and motorpool while maintaining and washing equipment and work vehicles. The oily wash-water should be passed through an adequately sized, gravity oil separator prior to discharge.

Should spills occur in any part of the project area, especially in the vicinity of natural protected area (zone of Nature Park "Begecka Jama" and zone of Special Nature Reserve "Gornje Podunavlje"), to mitigate the problem the Contractor should use absorbing materials, such as absorbent mats/fabrics, or sand and scrape off the contaminated soils and dispose them in approved facility, in accordance with the Law.

4.5. Other project impacts

- Pollution of water and soil because of improper disposal of excavated materials and construction wastes
- Loss of top soil due to temporary access roads and work areas, Landscape degradation
- Temporary air pollution (dust) related to the transportation of construction materials and truck traffic.
- Noise and vibration disturbances
- Staff safety

5. MITIGATION MEASURES AND ENVIRONMENTAL MONITORING ACTIVITIES

This EMP document is produced as a complementary part of Detailed Design, as a free-standing document. It ensures incorporation of the relevant environmental factors into the overall project design and will identify linkages to other safeguard policies relating to the project.

5.1. Mitigation Measures

5.1.1. General

The environmental impacts identified at this stage are preliminary in nature and will need to be further elaborated specifically (subproject wise) and potential for occurrence has to be ascertained during further stages of subproject design and implementation.

This section details out the potential environmental impacts of the sub-projects funded by WB under FERP.

5.1.2. Environmental Impacts and adequate Mitigation Measures

Erosion of embankment slopes

Impact - The earthworks for the sub-project activities might cause negative impacts in form of erosion on embankment slopes, dust, noise and vibration to disturb the local people.

Mitigation Measures - Excavation and/or filling will be done in such a way that the slope of the embankment should be within right of way and will not disrupt drainage problems. The Contractor should use erosion control measures such as re-vegetation of disturbed areas and placing of tarps. The Contractor shall stabilize the cleared areas not used for rehabilitation activities with vegetation or with the appropriate surface treatments as soon as practicable following completion of activities.

Potential air pollution - Dust

Impact - Possible sources of air pollution will be dust due to maintenance activities, machinery movement and other sources. Rehabilitation works involve breaking up, digging, crushing, transporting, and dumping small quantities of dry materials. Locally, the air quality may experience some moderate and temporary deterioration due to dust from construction traffic and elevated levels of nitrogen oxide (NOx) and sulphur oxide (SOx) from construction equipment exhausts. The dust may settle on vegetation, crops, structures and buildings.

Mitigation Measures - Spraying of water is the main way of controlling dust. Water is, in any case, required to be added to fill material during the rehabilitation works.

Potential water contamination

Impact - Water contamination may occur during the execution of the project from site run off, spills from the equipment maintenance areas and sanitary wastewater effluent from the work camps. As for the potential pollution during operation, these are mostly limited to accidents. In such a case, procedures for action in incidental situations, as defined by the Ministry of Interior and in the Water Law, will apply.

Mitigation Measures - Fuel and lubricant spills can occur at the Contractor's work camp while maintaining and washing equipment and work vehicles. During the normal operations, these areas should be equipped with the adequately sized, gravity oil separator. Should spills occur, to mitigate the problem the Contractor should use absorbing materials, such as absorbent mats/fabrics, or sand and scrape off the contaminated soils and dispose them in approved facility, in accordance with the Water Law.

Potential contamination of soils due to pesticide usage and improper waste disposal

Impact - Potential contamination of soils due to increased use of pesticides during implementation of Farm Incentives Program (FERP – Component 2).

Mitigation Measures - Integrated Pest Management Approach (IPM) is mandatory during project execution. Ensuring of appropriate selection and safe use of pesticides when they are needed by project demands related to safeguard OP 4.09 - Pest Management. Avoiding of use of pesticides that fall in WHO classes IA, IB or II.

Impact - Potential contamination of soils and watercourses as a result of improper disposal of liquid and solid wastes from rehabilitation activities.

Mitigation Measures - The mitigation measure to avoid contamination of soils and watercourses is to ensure that waste materials are properly disposed to the suitable locations. Partly, inert waste materials can be used as filling material.

Contractor should produce a Waste Management Plan for the Project. Mitigation measures should, among other requirement, contain contractor obligations to:

- locate the garbage pit/waste disposal site min 500 m away from the residence so that peoples are not disturbed with the odour likely to be produced from anaerobic decomposition of wastes at the waste dumping places. Encompass the waste dumping place by fencing and tree plantation to prevent children to enter and play with. All solid waste will be collected and removed from the work camps and disposed in approval waste disposal sites.
- In case oil and grease are trapped for reuse in a minimum 60cm thick lined pit, care shall be taken to ensure that the pit should be located at the lowest end of the site and away from the residential areas.
- In case of filling of low-lying areas with wastes, it needs to be ensured that the level matches with the surrounding areas. In this case care should be taken that these low lying areas are not used for rainwater storage

Equipment maintenance and fuelling

Impact - equipment maintenance and fuelling may cause contamination of soils and watercourses, including groundwater, if handling of lubricants, fuels and solvents is improper or careless.

Mitigation Measures - To avoid damage to natural environment there is a need to ensure proper handling of lubricants, fuels and solvents while maintaining the equipment.

Occupational Health and Safety

Impacts - Construction workers may be affected adversely due to hazardous working environments where high noise, dust, unsafe movement of machinery etc. may be present.

Mitigation Measures - The Contractor shall instruct his workers in health and safety matters, and require from the workers to use the provided personal safety equipment. Contractor has to ensure that all operators of heavy or dangerous machinery are properly trained/certified, and also insured. He will have to provide first aid facilities, rapid availability of trained paramedical personnel, and emergency transport to nearest hospital with accident and emergency facilities.

Before commencing work, the Contractor will be required to identify potential hazards. Provisions for emergency responses are to be included in the Contractor's site safety plan which is to include nomination of a person who will be immediately contacted should an accident occur. The site safety plan will be submitted to the PSC for approval one week prior to starting work.

Safety requirements:

1. The contractor's site safety plan will include provision for a safe work environment and provide safety measures and protective equipment to all workers including; hand, head, eye and ear protection and safety footwear.
2. The site safety plan will include provision for first aid facilities on-site and employ a trained first aid person, in accordance with the Law on Safety and Health at work ("Official Gazette of RS", 101/05).
3. The contractor will provide supplies of potable water, toilets and wash water to the workers.
4. Safety and Labour Management Plan (SLMP), prepared by the PERS, will be consisting part of bidding documentation, in order to ensure H&S provisions during rehabilitation works.
5. The contractor will be required to keep the site free of drugs and alcohol.
6. Contractor is obliged to perform all project activities by respecting SMP recommendations and all Serbian laws and sub-laws which are covering H&S issues.

Noise

Impact - Noise caused by the rehabilitation works will have only a temporary impact. Although temporary and mostly moderate, noise impacts in the vicinity of residential areas may cause negative health impact, if not mitigated.

Mitigation Measures - In sensitive areas (schools, nature parks, hospitals) special care regarding noise emission will be taken by the Contractor, strictly respecting the EMP requirements. In case of noise disturbance with noise emissions which are above permitted level, temporary noise barriers should be considered as appropriate mitigation measure. Awareness building and administrative measures should be taken to ensure proper maintenance of vehicles. In case of exceeded noise limits for sensitive areas the Contractor should erect temporary shields to prevent a free noise spreading to the sensitive receptors.

Based on the preliminary assessment, key mitigation measures recommended under this Environmental Management Plan (EMP) are listed as follows:

- Identify and locate on project plans any sensitive natural resources in the project area including but not limited to patches of natural habitat, bird colonies, and wetlands, unique plant communities etc. (consult with local nature protection authorities).
- Identify local access routes through and around cultivated land and pasture.
- Minimize requirements for temporary or permanent alteration of lands outside the embankment right of way.
- Dredging for embankment materials should occur only within marked navigation channels to minimize destruction of fish habitat.
- Provide for zones of preliminary accumulation of wastes that will cause no damage to the vegetation cover and other components of the environment.
- Transport and disposal of construction concrete rubbles, debris and spoils in approved paths and landfills/dump sites.

- Delineate access roads/ work areas carefully and prevent their expansion.
- Rehabilitate access roads and work areas after work completion (scratch soil with special engine, put fertile topsoil in place, etc.).
- Use closed/covered trucks for transportation of construction materials.
- Clean the surrounding area from dust by water sprinkling, removal of excess materials and cleaning of sites upon completion of activities.
- Restoration to quasi-original conditions of landscape after completion of construction and rehabilitation works.
- Arrange necessary preservation measures (establish protection zones, by-pass these areas during transportation and other).
- Cease the works as soon as historical and cultural monuments are encountered during earthworks and provide relevant information to the State Agency for Historical and Cultural Monuments Protection.
- Conduct mid-term and end-of-project inspections to the sites during construction and rehabilitation works.

Prior to initiating works, the Contractors will be required to prepare and submit for approval Site-Specific Implementation Plans (SSIP) consisting of:

- Waste and wastewater management plan
- Oil and fuel storage management plan
- In-river works management plan:
  The Contractor's SSIP should cover procedures and plans for safeguarding aquatic habitats and fish during in-river work (Danube River) and will complement the Construction Method Statements
- Camp management plan
- Re-foresting plan
- Emergency response plan

The following table present Mitigation Plan for FERP Sub-projects Begec, Bogojevo and Bezdan and it is intended as a checklist to ensure that relevant mitigation measures are implemented at appropriate project stages.

5.2. Mitigation Plan for FERP Sub-Projects Begec, Bogojevo and Bezdan

Phase	Issue	Mitigating measure	Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Supervision	
PRE-CONSTRUCTION	**EIA Procedure and Bid documents preparation**				
	Bid documents prepared with access to or use of the this EMP in a translated version	No bid documents will be prepared without incorporated a (Serbian) copy of the mitigation and monitoring plan EMP, which shall be included in the safeguard clauses of the Technical Specifications in the contracts and commitment to comply with Lender Requirements	PIU	PIU	
	EIA requirements based on possible project conflict with area of nature park "Begecka Jama" and special nature reserve "Gornje Podunavlje"	PIU is obliged to obtain **preconditions** from Institute for nature protection (Novi Sad) in order to avoid environmental risks during rehabilitation works in the vicinity of natural protected area - zone of Begecka Jama and Gornje Podunavlje	PIU	PIU	
CONSTRUCTION	**Material supply**				
	Asphalt plant, dust, fumes, workers health and safety, ecosystem disturbance	use existing asphalt plants; requirement for official approval or valid operating license	Asphalt plant	Asphalt plant	a)-c) to be specified in bid documents- Conditions for selection of subcontractors for material supply
	Sand and gravel borrow pit disturbance of river bed, water quality, ecosystem disturbance	use existing borrow pits or buy material at licensed separations; requirement for official approval or valid operating license	Sand and gravel Contractor or Separation	Sand and gravel Contractor or Separation	
CONSTRUCTION	**Material transport**				
	Asphalt dust, fumes	All trucks are to be covered This is a problem area through-out the region and I this will not be achieved unless the selection contractors operating trucks is managed	Truck operator	Truck operator	a)-d) to be specified in bid documents-

Phase	Issue	Mitigating measure	Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Supervision	
	Stone Dust	wet or cover truck load	Truck operator	Truck operator	Technical Specifications for realization of works
	Sand and gravel Dust	wet or cover truck load	Truck operator	Truck operator	
CONSTRUCTION	**Construction site**				
	Potential water and soil pollution from improper material storage, management and usage	organize and cover material storage areas; isolate concrete, asphalt and other works from watercourse by using sealed formwork or covers; isolate wash down areas of concrete and asphalt trucks and other equipment from watercourse by selecting areas for washing that are not free draining directly into watercourse Operate construction site in a way to reduce the risk of generating sediments and wastewater that may pollute local soils or receiving water bodies (considering situations such as including stormwater runoff, wastewater generated from facilities on site such as wheel washing facility). Soil Management Plan shall be prepared for the controlled removal of top soil, storage and reuse. Prevent sediments flowing into surface waters and drainage channels by localised control measures (e.g. sediment fences, check dams, mulch barriers, rock groynes, or geofabric barriers, sediment basins), contouring to optimise slope angle and steepness, Prevent wind erosion via fencing, covering, etc.	Construction Contractor	Construction Contractor	
	Water and soil pollution from improper disposal of waste materials	dispose waste material at location protected from washing out, should be marked in the site plan; if not on site, then at authorized landfill / depot	Construction Contractor	Construction Contractor	
	Water and soil pollution from improper disposal of	Storage of wastes according to international best practice (IFC EHS General Guideline). Apply additional measures	Construction Contractor	Construction Contractor	

Phase	Issue	Mitigating measure	Institutional responsibility		Comments (e.g. secondary impacts)
			Install	Supervision	
	waste materials	for storage of hazardous wastes (such as use of secondary containment, access restriction, provision of PPE etc.) as necessary to prevent harm to construction staff, environment and public. Use and labelling of designated waste collection containers and storage areas for different kinds of wastes.			
	Potential contamination of soil and water from improper maintenance and fuelling of equipment	apply best engineering practice in safe storage and handling of lubricants, fuel and solvents by secured storage; ensure proper loading of fuel and maintenance of equipment; collect all waste and dispose to permitted waste recovery facility	Construction Contractor	Construction Contractor	
	Water and soil pollution from improper disposal of waste materials	Transport of waste in marked vehicles designed to the type of waste to minimise the risk of release of materials (hazardous and non-hazardous materials) and windblown debris. Training of drivers in handling and disposal of their cargo and the documentation of the transport describing the nature of the waste and its degree of hazard.	Construction Contractor	Construction Contractor	
	Workers safety	provide workers with safety instructions and protective equipment; safe organization of bypassing traffic	Construction Contractor	Construction Contractor	
OPERATION	**Maintenance**				
	Possible air, water and soil pollution / dust, vehicle exhaust, fuel and lubricants spills	apply best engineering practice in safe storage and handling of lubricants, fuel and solvents by secured storage; ensure proper loading of fuel and maintenance of equipment; collect all waste and dispose in line with the Law on waste management; organize and cover material storage areas; isolate asphalt from watercourse by using sealed formwork; selecting areas for washing that are not free draining directly or indirectly into watercourse (Danube River); dispose waste material at location protected from washing out	Maintenance Contractor	Maintenance Contractor	

Phase	Problem/activity impact	Mitigation measures	Costs		Institutional responsibility		Comment
			Planning	implementation	Planning	implementation	
Planning/ Designing	Assure compliance with relevant construction field legislation	Acquire construction permit Provide Water management guidelines if subprojects are executed near surface watercourses,	n/a	n/a	Project applicant	Project applicant	
Planning/ Designing	Potential damages to the existing infrastructure and facilities, especially underground installations (water supply and sewerage pipeline etc.) which cause obstacles in the provision of services to consumers.	Precisely situate the position of infrastructural facilities and underground installations at the location of works in cooperation with relevant institutions at all levels of authority.	n/a	n/a	Designer	Project applicant in cooperation with designers and representatives of relevant institutions of local authority.	
Planning/ Designing	Increased possibility of employment and gaining income in the local community.	Prioritise qualified local population in employment.	n/a	n/a	Project applicant	Contractor	Problems should be regulated through tender documentation.
Rehabilitation/ Reconstruction/ Repair	Supply of material	Use the existing quarries, asphalt and concrete bases for the supply of material Use licenced suppliers for other materials	n/a	n/a	Contractor	Contractor	Borrow pits from which materials of asphalt and concrete base are supplied must have valid environmental permits.
Rehabilitation/ Reconstruction/ Repair	Transport of material.	Using trucks with awning and special vehicles depending on the type of material.	n/a	n/a	Contractor	Contractor	When transporting material, drivers must observe speed limitations
Rehabilitation/ Reconstruction/ Repair	Violation of vegetation cover	Replant or re-seed vegetation. Apply measures of good construction practice	n/a	n/a	Contractor	Contractor	Problems should be regulated through the Works execution contract.

Phase	Problem/activity impact	Mitigation measures	Costs		Institutional responsibility		Comment
			Planning	implementation	Planning	implementation	
Rehabilitation/ Reconstruction/ Repair	Emissions of dust from the landfill of earth material, due to vehicles' movement on macadam roads and construction works execution.	Compact deposited earth material. Sprinkle dust sources with water in order to reduce impacts on the surrounding population and vegetation. Control the speed of vehicles in order to reduce dust rising. Prepare and implement a Plan for construction site organisation that includes good construction practices.	n/a	n/a	Contractor	Contractor	Problems should be regulated through the Works execution contract.
Rehabilitation/ Reconstruction/ Repair	Emission of gases and particles from vehicles, mechanisation and generators.	Regular equipment maintenance. The contractor is obliged to submit evidence of vehicle roadworthiness in line with the regulations on hazardous gases emission. Prepare and implement the Construction Site Organisation Plan that incorporates good construction practice measures.	n/a	n/a	Contractor	Contractor	Problems should be regulated through the Works execution contract.
Rehabilitation/ Reconstruction/ Repair	Noise in the operation of heavy mechanisation and generators.	Observe law-defined working hours at the construction site. Make the generator casings sound proof if they are located near residential units. Ensure mufflers for heavy machinery. Prepare and implement the Construction Site Organisation Plan that incorporates good construction practice measures.	n/a	n/a	Contractor	Contractor	Problems should be regulated through the Works execution contract.

Phase	Problem/activity impact	Mitigation measures	Costs		Institutional responsibility		Comment
			Planning	implementation	Planning	implementation	
Rehabilitation/ Reconstruction/ Repair	Increased water turbidity as a consequence of the works.	Construction works should be executed in a way that surfaces and natural contents outside the project are not damaged and that works are performed so that watercourses are not unnecessarily made turbid and watercourses discontinued. Works should be executed in dry weather. Prepare and implement a Construction Site Organisation	n/a	n/a	Contractor	Contractor	Problems should be regulated through the Works execution contract.
Rehabilitation/ Reconstruction/ Repair	Soil, groundwater and surface water pollution, with oils and lubricants due to equipment poor maintenance and repairs and refuelling at the construction site.	Avoid servicing and refuelling at the site. Use protective foils during possible vehicle refuelling and maintenance at the construction site. Provide absorbing material in case of fuel spills. Used oiled materials and agents should be managed in line with the Waste management report. Procedure for actions in case of incidental oil and lubrication spills. Prepare and implement the Construction Site Organisation Plan that incorporates good construction practice measures, measures from water management documents and measures from the Waste management report.	n/a	n/a	Contractor	Contractor	Problems should be regulated through the Works execution contract.

Phase	Problem/activity impact	Mitigation measures	Costs		Institutional responsibility		Comment
			Planning	implementation	Planning	implementation	
Rehabilitation/ Reconstruction/ Repair	Water and soil pollution due to inadequate disposal of communal, inert and hazardous waste.	Typical containers for solid communal waste are placed at the construction site locations; Acceptance of collected communal waste and its disposal by authorised institutions; Hazardous waste fractions (used waste oils, oiled packaging, bitumen agents waste, waste transformer oils, waste asbestos-cement pipes etc.) are separately collected into typical containers or metal barrels; they are to be consigned to entities authorised for hazardous waste management; Re-usage and recycle of waste whenever possible. It is prohibited to incinerate waste in the open and at the location. Actions in line with the waste management report.	n/a	n/a	Contractor	Contractor	Problems should be regulated through the Works execution contract.
Rehabilitation/ Reconstruction/ Repair	Reconstruction of damaged brides	Avoid driving on the riverbank or river; Ensure riverbed and bank in the zone of bridges, upstream and downstream from bridges, as to ensure their protection from erosion processes.	n/a	n/a	Contractor	Contractor	Problems should be regulated through the Works execution contract.

Phase	Problem/activity impact	Mitigation measures	Costs		Institutional responsibility		Comment
			Planning	implementation	Planning	implementation	
Rehabilitation/ Reconstruction/ Repair	Reduced passability through the area where the works are executed.	Plan the relocation of equipment at times when daily traffic is not jammed; Provide alternative passage for pedestrians and vehicles in cooperation with local authorities or provide a safe passage through the construction site; Avoid roads through inhabited areas especially near schools and hospitals; Prepare and implement the Construction Site Organisation Plan that incorporates good construction practice measures.	n/a	n/a	Contractor	Contractor	Problems should be regulated through the Works execution contract.
Rehabilitation/ Reconstruction/ Repair	Potential pollution of soil and water due to the discharge of waste sanitary waters from the construction site	Installation of ecological toilettes for workers	n/a	n/a	Contractor	Contractor	Problems should be regulated through the Works execution contract.
Rehabilitation/ Reconstruction/ Repair	Population at increased risks of traffic accidents and construction works to population.	Assure adequate warning signs, lighting, protective fencing etc. Observe traffic rules. Clean construction waste form the construction site both in the construction phase and after works completion, when closing the construction site. Assure medical supplies and aid through institutional and administrative arrangements with municipal hospitals at the construction site Implement the Construction Site Organisation Plan.	n/a	n/a	Contractor	Contractor	Problems should be regulated through the Works execution contract.

Phase	Problem/activity impact	Mitigation measures	Costs		Institutional responsibility		Comment
			Planning	implementation	Planning	implementation	
Rehabilitation/ Reconstruction/ Repair	Risk of injuries at work.	Demand from all workers to abide by the Protection at work measures; Provide protective equipment; Install warning signs at the construction site; Prepare and implement the Construction Site Organisation Plan and Protection at work measures plan.	n/a	n/a	Contractor	Contractor	Problems should be regulated through the Works execution contract.
Construction site closure	Construction material leftovers of after the closure of temporary construction sites	All shivers and material that remain after the closure of temporary construction sites are to be removed from the location and re-used/recycled where possible. All remains are to be disposed of in a manner that will not be harmful to environment; this is to be done by companies that have permits to perform such works.	n/a	n/a	Contractor	Contractor	Problems should be regulated through the Works execution contract.

Summary of Potential Environmental Impacts and Mitigation Measures

POTENTIAL IMPACTS	STAGE / MECHANISM	MAGNITUDE	DURATION	SUGGESTED MITIGATION MEASURE	RESIDUAL EFFECT	RESPONSIBILITY	TIMING	COSTS
HYDROLOGY & HYDROGEOLOGY Changes to surface and ground water quantity and quality	Construction Activities	Negligible	Construction Period	No mitigation measures required.	None	Not applicable.	-	-
	Operation and Maintenance	Negligible	Lifespan of embankment	No mitigation measures required.	None	Not applicable.	-	-
SOILS Erosion or compaction of soils	Construction Activities	Minor	Construction Period	• Salvage of topsoil and sod for reclamation following completion of the works.	None	Contractor & Local Water Authority	During and at completion of construction. Periodic monitoring until reclamation criteria achieved.	Included in the bill of quantity
	Operation and Maintenance	Negligible	Lifespan of embankment	No mitigation measures required.	None	Local Water Authority	-	-
AQUATIC RESOURCES Disturbance of wetlands or fish	Construction Activities	Minor	Construction Period	• Follow approved dredging practices. • Minimize disturbance to riparian wetlands.	None	(Ministry or Directorate responsible for fish management) Institute for Nature Conservation (in protected areas)	During dredging.	-
habitat	Operation and Maintenance	Negligible	Lifespan of embankment	No mitigation measures required.	None	Not applicable.	-	-

POTENTIAL IMPACTS	STAGE / MECHANISM	MAGNITUDE	DURATION	SUGGESTED MITIGATION MEASURE	RESIDUAL EFFECT	RESPONSIBILITY	TIMING	COSTS
VEGETATION Disturbance to vegetation communities, tree removal	Construction Activities	Minor	Construction Period	• Locate borrow pits and sand drainage areas to minimize new areas of disturbance. • Utilize existing disturbed areas whenever possible.	Removal of some trees and vegetation	Tendering agency/ local water authority	Detailed design (tender specification).	Included in the bill of quantity
	Operation and Maintenance	Negligible	Lifespan of embankment	No mitigation measure required.	None	Not applicable.	-	-
WILDLIFE Disturbance and dislocation from habitat	Construction Activities	Minor	Construction Period	• Schedule construction to minimize disturbance to nesting birds.	None	Tendering agency.	Detailed design (tender specification)	
	Operation and Maintenance	Negligible	Lifespan of embankment	No mitigation measures required.	None	Not applicable.	-	-
POLLUTION Fuel spills or improper waste disposal	Construction Activities	Minor	Construction Period	• Equipment free from leaks and in good operating condition. • Refuel at least 15 m away from surface water. • Prompt clean-up of fuel spills. • Solid and human waste management plan for the construction site.	None	Tendering agency/ local water authority/ contractor	Construction start-up and construction period. (condition of tender)	Normal construction cost(Included in the bill of quantity)
	Operation and Maintenance	Negligible	Lifespan of embankment	No mitigation measures required.	None	Not applicable.	-	-

6. MONITORING ACTIVITIES

DWM/PIU and PSC will monitor overall environmental performance during project implementation. Each FERP sub-project will have a site specific EMP document in which a monitoring plan(s) and check-lists are presented.

For each of the environmental components, the monitoring plan specifies the parameters to be monitored; location of the monitoring sites and duration of monitoring. The monitoring plan also specifies the applicable standards, implementation and supervising responsibilities.

In addition to the critical locations selected during design stage, the environmental monitoring will also be done at the construction camp site and any other plant site as determined relevant during rehabilitation works stage.

World Bank guidance on the environmental aspects of project monitoring, including its health and socio-economic aspects, is provided in Environmental Assessment Sourcebook Update 14 Environmental Performance Monitoring and Supervision (June 1996).

The project's monitoring program included surface and groundwater quality impacts, disturbance to important ecological habitats including riverside ecosystems, unscheduled environmental compliance inspections during construction, final inspection upon completion to ensure site condition is satisfactory, and assessment of sites prior to and after construction to ensure no loss of natural values.

Elements of an environmental performance-monitoring program:

Objectives

Indicators linked to project impacts and mitigation measures

Measured parameters

Institutional responsibilities, timing

Reporting arrangements

Cost and financing provisions

The following table presents the monitoring activities and responsibilities over the implementation of proposed mitigation measures, during execution of FERP sub-projects Begec, Bogojevo and Bezdan.

6.1. Monitoring Plan for FERP Sub-Projects Begec, Bogojevo and Bezdan

Phase	What is the *parameter to be monitored?*	Where *the parameter should be monitored?*	How *the parameter should be monitored?/ type of monitoring equipment*	When *the parameter should be monitored? (frequency of measurement or continuous)*	*Why the parameter should be monitored? (optional)*	Institutional responsibility Operate
CONSTRUCTION			**Material supply**			
Asphalt plant	possession of official approval or valid operating license	asphalt plant	Inspection / supervising engineer	before work begins	assure plant compliance with environment, health and safety requirements	Plant Operator
CONSTRUCTION			**Material transport**			
Asphalt	truck load covered	job site	supervision	unannounced inspections during work, at least once per week	assure compliance of performance with environment, health	Supervision Contractor
Stone	truck load covered or wetted	job site	supervision	unannounced inspections during work, at least once per week	and safety requirements and enable as	Supervision Contractor
Sand and gravel	truck load covered or wetted	job site	supervision	unannounced inspections during work, at least once per week	little disruption to traffic as it is possible	Supervision Contractor
Traffic management	hours and routes selected	job site	supervision	unannounced inspections during work, at least once per week		Supervision Contractor

Phase	What is the *parameter to be monitored?*	Where *the parameter should be monitored?*	How *the parameter should be monitored?/ type of monitoring equipment*	When *the parameter should be monitored? (frequency of measurement or continuous)*	*Why the parameter should be monitored? (optional)*	Institutional responsibility
						Operate
CONSTRUCTION			**Construction Site**			
Dust	air pollution (solid particles)	at and near job site	inspection and visual observation	unannounced inspections during material delivery and construction	health and safety requirements and enable as little disruption to traffic as it is possible	Supervision Contractor
Workers safety	protective equipment; organization of bypassing traffic	job site	inspection	Unannounced inspections during work. It is recommended to use EBRD template for this purpose (next table)		Supervision Contractor
OPERATION			**Embankment crest (asphaltic road) safety**			
Increased vehicle speed	condition of traffic signs; vehicle speed	Road on embankment crest	visual observation; speed detectors	unannounced	enable safe traffic flow	Traffic Police
Erosion, rockfall, hazardous conditions	road section included in project	condition of hazard signs	visual observation	during maintenance activities		Contractor

Phases	Monitoring parameter	Monitoring location	Monitoring manner / monitoring equipment	Monitoring time – measurement frequency or permanently	Why is monitoring necessary	Costs		Responsibility	
						Planning	Implement.	Planning	Implement.
Supply of material	Possession of environmental permits for plants of quarries, asphalt and concrete bases from which material is supplied	Legal entities that own the plants	Insight into the documentation	During material supply	Assure that the plant conforms to the requirements of environment protection, health protection and human safety		Incorporated into the supervision implementation costs	Supervising body	Supervising body
Transport of material	If trucks are covered during powdered material transport	At the construction site and transport roads	Visual supervision	During material transport	See that no dust is emitted into the air and material spilled into environment		Incorporated into the supervision implementation costs	Supervising body	Supervising body
Rehabilitation/ Reconstruction/ Repair	Degradation and soil pollution	At the construction site and directly around the construction site	Visual supervision	Weekly	To establish if liquid oil derivatives leaked, soil erosion and landslide occurred due to construction works		Incorporated into the supervision implementation costs	Supervising body	Supervising body
Rehabilitation/ Reconstruction/ Repair	Does the construction site meet the criteria from the guidelines for good construction practice	At the construction site	Visual supervision, insight into the documentation.	During the works execution	To assure environment protection and prevent the occurrence of incident situations at the construction site.		Incorporated into the supervision implementation costs	Supervising body	Supervising body

Phases	Monitoring parameter	Monitoring location	Monitoring manner / monitoring equipment	Monitoring time – measurement frequency or permanently	Why is monitoring necessary	Costs		Responsibility	
						Planning	Implement.	Planning	Implement.
Rehabilitation/ Reconstruction/ Repair	Occurrence of noise and air pollution	At the works execution location	Standard air quality and noise level measurement equipment.	Upon received citizens' complaints	In order to establish the level of air pollution and noise and make comparison with legal limit values. In case of aberration additional mitigation measures.		1100 KM/ per measurement spot	Contractor	Company that has licence to perform environment monitoring works
Rehabilitation/ Reconstruction/ Repair	Destruction of crops, woods, meadows etc.	At the works execution location and in the vicinity	Visually	Upon received citizens' complaints	In order to establish that works are only executed at project-envisaged locations		Incorporated into the supervision implementation costs	Supervising body	Supervising body
Rehabilitation/ Reconstruction/ Repair	Working hours control.	At the works execution location	Visually and comparison with the construction site organisation plan.	Upon received citizens' complaints	In order to establish that working hours and noise emission limitations are observed during daily working hours.			Supervising body	Supervising body
Rehabilitation/ Reconstruction/ Repair	Waste management during the works execution	At the construction site	Visually and by comparison with the waste management report.	Permanently	Are containers/bins for communal waste installed, is hazardous waste treated in adequate manners, in order to prevent uncontrolled waste disposal		Incorporated into the supervision implementation costs	Contractor	Supervising body

Phases	Monitoring parameter	Monitoring location	Monitoring manner / monitoring equipment	Monitoring time – measurement frequency or permanently	Why is monitoring necessary	Costs		Responsibility	
						Planning	Implement.	Planning	Implement.
Rehabilitation/ Reconstruction/ Repair	Number of registered accidents Existence of hygienic conditions for workers, Protective equipment application	At the construction site	Visually and insight into the register	Permanently during the works execution	In order to establish that protection at work measures are implemented.		Incorporated into the supervision implementation costs	Contractor	Supervising body
Rehabilitation/ Reconstruction/ Repair	Impact on population due to the limitation of business activity and right to use land	Local community	Insight into the register	Upon received citizens' complaints	In order to timely prevent impact		Incorporated into the supervision implementation costs	Project applicant	Project applicant
Rehabilitation/ Reconstruction/ Repair	Quality of executed works Quality of material that is installed	At the construction site	Visual monitoring and through register	Permanently during the works execution and construction site removal	Poor monitoring and works execution quality assessment can cause damages to environment, bad quality structures and usage of poor quality material, can result in damages to structures and expose inhabitants to risks and possible accidents		Incorporated into the supervision implementation costs	Contractor	Supervising body
Construction site closure	Waste remnants and soil degradation	At the project location	Visually	After the works completion	In order to establish whether all waste was removed from the construction site whether field was restored		Incorporated into the supervision implementation costs	Contractor	Supervising body

POTENTIAL NEGATIVE IMPACT	MONITORING PARAMETER	MONITORING SITE	MONITORING TYPE /EQUIPMENT	TIMING	RESPONSIBLE PARTY
Pollution of water and soil because of improper disposal of excavated materials and construction wastes	Existence of zones/sites for preliminary accumulation of wastes	At and near work site	Inspection	During construction works	Contractor, Supervisor Engineer
Loss of top soil due to temporary access roads and work areas, Landscape degradation	Clear delineation of access roads and work sites to prevent their expansion	At access roads and work sites	Inspection, Observation	During construction works	Contractor, Supervisor Engineer
	Cleaning of access roads and work sites after construction works completion	At access roads and work sites	Inspection, Observation	After construction works	Contractor, Supervisor Engineer
	Restoration of landscape to quasi-original condition after completion of works and after use of quarries	At work site and quarries	Unannounced Inspection	After works completion.	PIT Environmental Specialist
Temporary air pollution (dust) related to the transportation of construction materials and truck traffic	Sprinkling of water to suppress the dust	At access roads and work sites	Inspection, Observation	During construction works	Contractor, Supervisor Engineer
Noise and vibration disturbances	Termination of construction works at the established time (e.g. work on daylight hours)	At access roads and work sites	Inspection, Observation	During construction works	Contractor, Supervisor Engineer
	Measure noise levels (Db)	At and near the work site	Inspection	During construction works	Contractor, Supervisor Engineer
Staff safety	Use of protective equipment, organization of by-passing traffic	At work site	Inspection	During construction works	Contractor, Supervisor Engineer

7. ENVIRONMENTAL MANAGEMENT RESPONSIBILITIES

For each potential impact the EMP identifies:

- the proposed mitigation measure(s); and
- the parties or agencies charged with implementing those measures, separated into:

- Executing agencies responsible for executing the measure. For this specific assignment the executing agencies (e.g. contracted design institutes) shall ensure that all necessary agreements and permits (e.g. EIA conclusion, permits for water use and discharge and for the disposal of excavated materials, wastes, and demolition debris) are obtained from relevant state and local authorities before the construction works are tendered out. Construction contractors shall take the responsibility for physical implementation of mitigation measures provided under the EMP during the construction phases according to the Bank's policies and Serbia environmental legislation.
- Supervising agencies responsible for supervising the executing agencies to ensure that they execute the mitigation measures as planned. The Directorate of Water and Serbia Floods Emergency Recovery Project Implementation Team (PIT) will be responsible for supervising the timely, proper and reliable implementation of works and measures in the consequence provided by the EMP. PIT will also ensure that all necessary agreements and permits are obtained by appropriate contractors from relevant state and local authorities before the construction works are tendered out. The World Bank during supervision missions may request randomly to check if such permits are issued and are valid (e.g., not expired) as well as if the EMP mitigation and monitoring aspects are implemented on the ground during the construction phases according to the Bank's policies and Serbia environmental legislation.
- Various Ministries give different permits. Ministry of Finance together with Ministry of Infrastructure and Ministry of Agriculture and Environmental Protection control License process for works. Ministry of Agriculture and Environmental Protection with Directorate of Water, The Public Water Resources Management Companies Srbijavode, Beogradvode and Vode Vojvodine providing preparation of water resources management technical documentation, different kind of license requested for works and supervise construction, organization and implementation of water pollution protection measures. Hydro meteorological Institute take water samples and monitoring quality of water.

7.1. Environmentally sound clauses for civil works contracts

Most construction phase impacts will be possible to mitigate by including appropriate clauses into the civil works contracts. Revisions of clauses should cover, but not limited to, the following issues:

- Compliance with general national environmental guidelines;
- Compliance with relevant World Bank Operational Policies;
- Protection of Historic-cultural monuments;
- Adequate disposal of construction and excavation wastes;
- Proper location of construction camps;
- Restoration of the quasi-original conditions of landscape in construction sites after works completion;
- Occupational safety and health (Consultants and contractors working on the program will be required to adhere to all applicable laws and regulations controlling workplace health and safety), etc.

Construction works contracts should include this EMP with its Environmental Mitigation Plan and Environmental Monitoring Plan presented within the chapter 4 and chapter 5 of this EMP document.

8. IMPLEMENTATION ARRANGEMENTS

The Office for Reconstruction will be responsible for overseeing the overall project implementation. Project management functions and day to day operations will be the responsibility of EPS, the Directorate for Agrarian Payments (DAP) (with the support of Treasury), and the Project Implementation Unit (PIU) established under DWM.

9. MONITORING AND REPORTING ARRANGEMENTS

9.1. FERP Project Monitoring

The FERP project will be monitored by EPS, and the PIU under the DWM. Information and data collected at each of the implementation agencies will be fed into overall monitoring and evaluation (M&E). The Office for Reconstruction will oversee M&E activities regularly through the project reports, evaluate the results achieved and guide the implementing agencies on corrective management actions.
The Construction contractor is obliged to perform all monitoring activities (sampling, measurement, etc.) prescribed within the Monitoring Plan of EMP document produced for project on which the Contractor is engaged.

Supervision Consultant is responsible to monitor all construction activities, including environmental protection during project rehabilitation. PSC will be authorized to perform additional sampling in case he finds this needed.

9.2. Environmental Monitoring Plans

Monitoring plan for FERP projects should be in respect of the bidding documents. The main components of the monitoring plans include:

- Environmental issue to be monitored and the means of verification
- Specific areas, locations and parameters to be monitored;
- Applicable standards and criteria;
- Monitoring of the procurement of materials (checks that valid permits are in place)
- Duration
- Institutional responsibilities for monitoring and supervision

9.3. Reporting Arrangements

9.3.1. Contractor to PIU

The Contractor will prepare his compliance reports in respect to EMP and his SSIP as a Quarterly Progress Reports and submit them to PIU, in both Serbian and English language, in hard copy and electronic versions.

Construction Contractor will provide quarterly reports to PIU which document the environmental mitigation and protection measures, together with prescribed monitoring activities carried out during that quarter’s reporting period. Construction Contractor will take care of the environment quality according to the mitigation and monitoring plan which are part of EMP.

The same applies to the Environmental Monitoring and Supervision Contractors for their part of mitigation and environmental monitoring activities.
If any kind of accident or endangerment of environment happens, reporting will be immediate. PIU and the Contractor have joint responsibility for reporting and investigating incidents. The Contractor is obliged to inform the project manager and local authorities about accident immediately after it happened.

9.3.2. Project Supervision Consultant to PIU

The findings of the regular monitoring activities, including activities specified in the Generic Monitoring Plan, carried by the Contractor will be included in the quarterly PSC progress reports.

9.3.3. PIU to MAEP, WB, Annual Environmental & Social Report

Each Contractor is obliged to produce and deliver to PIU an Annual Environmental and Social Report (AESR) covering all project activities during a calendar year. PIU shall provide Annual reports to MAEP and IFIs regarding the status of implementation of mitigation measures by the Contractors, additional mitigation measures that may need to be implemented, incidents of non-compliance with applicable environmental permits, complaints received from local residents, NGOs, etc. and how these were addressed. In case of fatalities or major incidents on site the PIU will immediately report to WB.
Monitoring and compliance in accordance with ESMF and site specific EMPs, including monitoring of implementation of site-specific measures on each sub-project/section during project implementation will be undertaken by PIU and its implementation unit, and reported in writing to the Bank on semi-annual basis. An environmental specialist will be appointed to the Project by PIU to ensure quality in the implementation of EMPs.

10. PUBLIC CONSULTATIONS AND PUBLIC DISCLOSURE OF THE EMP

Draft version of EMP will be publicly disclosed in the Ministry of Agriculture and Environmental Protection the Directorate of Water building during March 2015, on period of two weeks.

11. REFERENCES

1 Detailed design of sanation – Danube left bank's embankment on Sector D.11. **Backa Palanka**, Embankment crest stabilization (km 1+800 - km 9+850), **Begec-Celarevo**, Designer: GMP GRAMONT-NS" DOO

2 Detailed design of sanation – Danube left bank's embankment on Sector D.12. **Sombor**, Embankment crest stabilization (km 3+461 - km 6+583), **Bogojevo**, Designer: GMP GRAMONT-NS" DOO

3 Detailed design of sanation – Danube left bank's embankment on Sector D.12. **Sombor**, Embankment crest stabilization (km 49+410 - km 52+400), **Bezdan**, Designer: GMP GRAMONT-NS" DOO

4 Environmental Assessment Sourcebook No 25, Environmental Management Plans, The World Bank Environment Department, January 1999

5 Project Appraisal Document, PAD1129, Serbia - Floods Emergency Recovery Project, September 2014

6 Integrated Safeguards Data Sheet, ISDSA1019, Integrated Safeguards Data Sheet (Appraisal Stage) - Floods Emergency Recovery Project - P152018, September 2014

7 Project Information Document, PIDA12087, Project Information Document (Appraisal Stage) - Floods Emergency Recovery Project - P152018, September 2014

8 Environmental and Social Management Framework, ESMF, Floods Emergency Recovery Project - P152018, February 2015

9 Resettlement Policy Framework, RPF, Floods Emergency Recovery Project - P152018, February 2015

Annex 1

LEGISLATION

MAIN SERBIAN LEGISLATION:

ANNEX 1: RELEVANT NATIONAL LEGISLATION AS OF JANUARY 2015

The main laws and regulations currently in force in Republic of Serbia which are relevant to the environmental protection during planning, design, construction and operating of this Project are listed below:

1. Law on planning and construction ("Official Gazette of RS" No. 72/2009, 81/2009)
2. Law on nature protection ("Official Gazette of RS", 36/09)
3. Law on environmental protection ("Official Gazette of RS" No. 135/04, 36/09, 72/09)
4. Law on EIA ("Official Gazette of RS" No. 135/2004, 36/2009)
5. Law on Strategic EIA ("Official Gazette of RS" No. 135/2004)
6. Law on waste management ("Official Gazette of RS", 36/09)
7. Law on noise protection ("Official Gazette of RS", 36/09, 88/10)
8. Law on water ("Official Gazette of RS", 30/10, 93/12)
9. Law on forest ("Official Gazette of RS", 46/91, 83/92, 54/93, 60/93, 53/93, 67/93, 48/94, 54/96, 101/05)
10. Law on air protection ("Official Gazette of RS", 36/09)
11. Law on Safety and Health at Work ("Official Gazette of RS", 101/05)

Regulations established on the basis of the Law on EIA include the following:

12. Decree on establishing the List of Projects for which the Impact Assessment is mandatory and the List of projects for which the EIA can be requested ("Official Gazette of RS" No. 114/08)
13. Rulebook on the contents of requests for the necessity of Impact Assessment and on the contents of requests for specification of scope and contents of the EIA Study ("Official Gazette of RS" No. 69/05)
14. Rulebook on the contents of the EIA Study ("Official Gazette of RS" No. 69/05)
15. Rulebook on the procedure of public inspection, presentation and public consultation about the EIA Study ("Official Gazette of RS" No. 69/05)
16. Rulebook on the work of the Technical Committee for the EIA Study ("Official Gazette of RS" No. 69/05)
17. Regulations on permitted noise level in the environment ("Official Gazette of RS" No. 72/10)
18. Decree on establishing class of water bodies ("Official Gazette of SRS" No. 5/68)
19. Regulations on dangers pollutants in waters ("Official Gazette of SRS" No. 31/82)

Other relevant Serbian legislation

20. Law on confirmation of convention on information disclosure, public involvement in process of decision making and legal protection in the environmental area ("Official Gazette of RS", 38/09)

22. European Environment and Health Committee. Serbia. Copenhagen, WHO Regional Office for Europe, 2006 (http://www.euro.who.int/eehc/implementation/20061010_9 accessed 29 December 2009).

24. National Assembly. Law on Protection against Environmental Noise. Official Gazette of the Republic of Serbia, No. 36/09, 88/10.

25. National Assembly. Law on Waste Management. Official Gazette of the Republic of Serbia, 2009, No. 36/09.

26. National Assembly. Constitution of the Republic of Serbia. Official Gazette of the Republic of Serbia, 2006, No. 98/06.

27. National Assembly. Law on Environmental Protection. Official Gazette of the Republic of Serbia, 2004, No. 135/04.

28. National Assembly. Law on Air Protection. Official Gazette of the Republic of Serbia, 2009, No. 36/09.

29. National Assembly. Law on Management of Chemicals. Official Gazette of the Republic of Serbia, 2009, No. 36/09.

30. National Assembly. Law on Biocidal Products. Official Gazette of the Republic of Serbia, 2009, No. 36/09.

31. National Assembly. The Law on Environmental Protection. Official Gazette of the Republic of Serbia, 2009, No. 36/09.

32. National Assembly. Law on Occupational Safety and Health. Official Gazette of the Republic of Serbia, 2005, No. 101/05

33. National Assembly. Law on Environmental Impact Assessment. Official Gazette of the Republic of Serbia, 2004, No. 135/04 (http://www.basel.int/legalmatters/natleg/serbia-02e.pdf, accessed 11 January 2010).

39. Federal Assembly. Regulation on permitted level of noise in the environment. Official Gazette of the Republic of Serbia, 2010, No. 72/10.

40. National Assembly. Law on Integrated Pollution Prevention and Control. Official Gazette of the Republic of Serbia, No. 135/04 (http://www.basel.int/legalmatters/natleg/serbia-04e.pdf, accessed 11 January 2010).

Annex 2

PRECONDITIONS OBTAINED FROM RELEVANT INSTITUTIONS

Annex 2: Preconditions obtained from Provincial Institute for Nature Protection will be obtained prior to commencement of the works

Annex 3

FINAL ENVIRONMENTAL APPROVAL

Annex 3: Final Environmental Approval will be obtained prior to commencement of the works

Annex 4

REPORT ON PUBLIC CONSULTATIONS

ANNEX 4: REPORT ON PUBLIC DISCLOSURE AND PUBLIC CONSULTATION

To be completed after Public Consultations